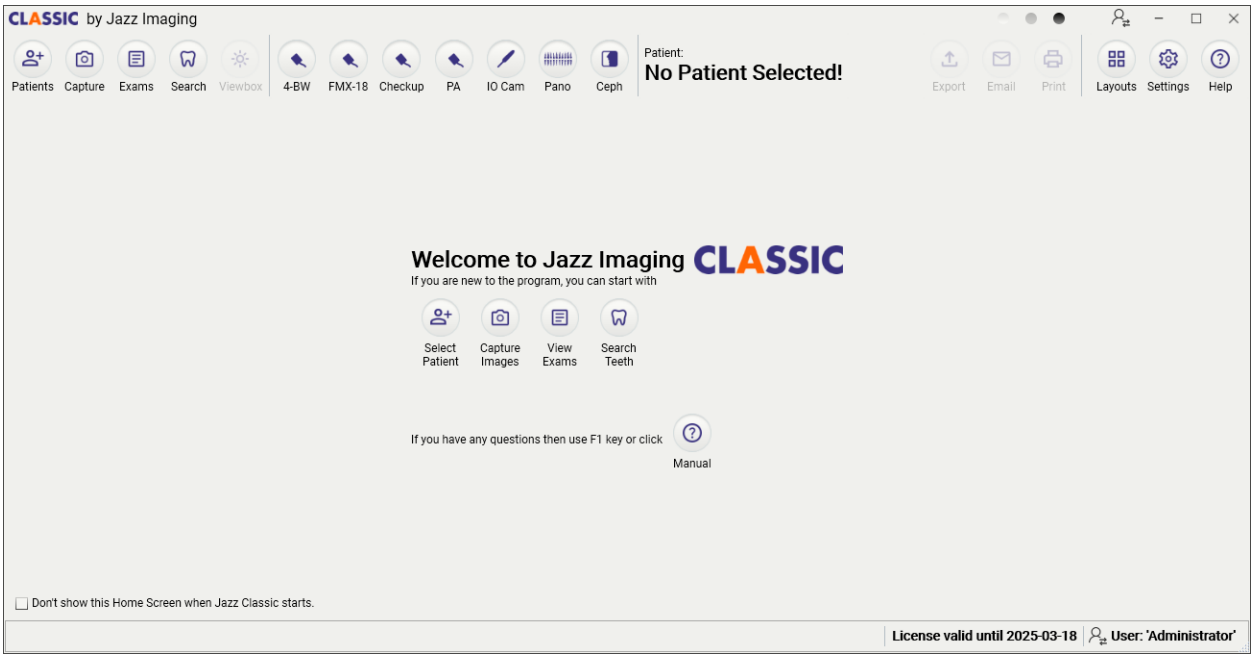
CLASSIC

USER MANUAL



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Getting Started

Welcome to Jazz Imaging

Welcome to Jazz Imaging and THANK YOU for your investment in the Jazz Classic Imaging Software. We are committed to delivering you the best intraoral sensors and support available in the market, and we trust you will have an outstanding experience with our products and services.

Our Jazz Classic software is designed and developed in the U.S. by engineers with over 25 years of experience in digital imaging. Drawing from our experience and the feedback received from our JAZZ IMAGING reference sites, our goal was to develop an affordable and user-friendly dental imaging system with the highest image quality available.

Like everything new, we know there will be a short but steep learning curve before being proficient. That's why our support team will be available during normal office hours, at no extra cost, to assist you with inquiries and help you may need with your new Jazz Classic Imaging Software.

Thanks again and welcome to the Jazz Imaging family.

Purpose

Jazz Classic is a dental imaging software that allows access to diagnostic images on any PC. Jazz Classic's application design makes the imaging experience fast, familiar, and simple to operate.

Jazz Classic is feature rich, including full feature parity with traditional client-server based dental imaging software. With Jazz Classic, you can use digital dental imaging devices in a manner consistent with your existing imaging solutions and bridge patient information either from your existing client-server-based practice management software or modern practice management software.

Jazz Classic is a Class II dental imaging software that includes the ability to acquire, view, annotate, and organize dental radiographs and color images.

Usage

Indications for Use

Jazz Classic is a clinical software application that captures images and data from Jazz intraoral x-ray sensors and various imaging sources (e.g., radiographic devices, digital still/video capture devices, and generic image devices such as scanners). Jazz Classic enables the storage of images, clinical notes, and clinical exam data. Jazz Classic is intended to be used for general populations which includes use for pediatric populations.

It is intended to acquire, display, edit (e.g., resize, enhance), review, print, and distribute images using standard PC hardware. Jazz Classic is intended for diagnostic and non-diagnostic purposes by dental professionals trained to provide dental care. If you are not a trained dental professional, you should not be using this software.

The software is an aid to diagnosis only. It is ultimately your responsibility to make the correct judgements before deciding on a course of treatment.

Pediatric Use - Summary

Special care should be exercised when imaging patients outside the typical adult size range, especially smaller pediatric patients whose size does not overlap the adult size range (e.g., patients less than 50 kg (110 lbs.) in weight and 150 cm (59 in) in height, measurements, which approximately correspond to that of an average 12 year old or a 5th percentile U.S. adult female[1].)

Exposure to ionizing radiation is of particular concern in pediatric patients because:

1. ***for certain organs and tumor types, younger patients are more radiosensitive than adults (i.e., the cancer risk per unit dose of ionizing radiation is higher for younger patients)***
2. ***use of equipment and exposure settings designed for adults of average size can result in excessive and unnecessary radiation exposure of smaller patients.***
3. ***younger patients have a longer expected lifetime over which the effects of radiation exposure may manifest as cancer.***

To help reduce the risk of excessive radiation exposure, you should follow the ALARA (As Low As Reasonably Achievable) principle and seek to reduce radiation dose to only the amount necessary to obtain images that are adequate clinically.

References for Pediatric Dose Optimization:

The following resources provide information about pediatric imaging radiation safety and/or radiation safety for intraoral X-ray devices:

- FDA's website provides radiation safety information references from a variety of groups including the Image Gently Alliance: Pediatric X-ray Imaging and Medical X-ray Imaging:
  - Pediatric X-ray Imaging | FDA
  - Medical X-ray Imaging | FDA
- In addition, FDA's Pediatric X-ray Imaging Website contains links to device-specific pages on Computed Tomography, Fluoroscopy, and Dental Cone-beam Computed Tomography.

Device Specific Features and Instructions:

Jazz Classic provides the following specific design features that enable safer use of our device with pediatric patients:

Design feature important to pediatric imaging	**Page number reference in Instructions for use**
Dedicated pediatric layouts which support the most typical pediatric patient checkup exams.	34
Primary Teeth and Mixed Dentition notation available for all supported Tooth Numbering Systems (UNS/FDI ISO-3950/Alphanumeric/Haderup (Danish)).	39, 49, 54, 98, 165

[1] McDowell, M.A., C.D. Fryar, C.L. Ogden, and K. M. Flegal. 2008. Anthropomorphic Reference Data for Children and Adults, United States, 2003-2006. National Health Statistics Reports, 10, 1-48.

Clear Patient age displayed after the Patient Name. When the patient age is less than 18 years, then the number of months of age will be displayed as well, in order to make the pediatric patients age more specific	11

Intended Use

Jazz Classic software is designed for use by dental practices for acquiring and presenting patient images which are utilized by dental professionals to assist in treatment planning and case diagnosis. Results produced by the software's diagnostic and treatment planning tools are dependent on the interpretation of trained and licensed dental practitioners.

It is intended to acquire, display, process, edit (e.g., resize, adjust contrast, annotate), review, store, print, and distribute images using standard PC hardware.

Jazz Classic interacts with imaging devices connected to a Windows PC. Jazz Classic controls the direct capture of digital x-ray images from Jazz intraoral x-ray sensors and other FDA approved radiographic imaging devices, views and captures live images from intraoral USB cameras, imports images from various sources such as radiographic devices, flatbed scanners, digital cameras, and generic image devices, exports, e-mail, prints images, processes digital images with several tools to enhance their diagnostic value, and creates a database of patients and store images in patient folders on server storage.

Prescription Use Only:

Caution: Federal law restricts this device to sale by or on the order of a Dentist.

System Requirements

Jazz Classic is designed and developed for the Microsoft Windows platform. It works with Windows 10, (x64) or newer, but Jazz Classic is ***NOT*** compatible with the ARM64 based versions of Microsoft Windows!

Below are the recommended and minimum system requirements:

Item	Recommended	Minimum	Description
CPU	64-bit Intel or AMD 1.5GHz or higher with SSE/SSE2 instruction support	64-bit Intel or AMD 1GHz	The image processing requires relatively high CPU performance and will utilize SSE/SSE2 instructions when available. So, the CPU type and clock frequency will have major impact on performance.
RAM	8GB or higher	4GB	High resolution radiograph images require large memory during processing and displaying. RAM has a major impact on performance.
Hard Disk	250GB SSD or higher	100GB	High resolution radiograph images take up a large amount of hard disk space.
Display	1920 x 1080 or higher in 24-bit or 32-bit color	1024 x 768 in 24-bit color	High resolution radiographs will require high resolution displays to see all details without having to zoom into the images.
Network	1Gbps Ethernet	100Mbps Ethernet or Wireless	Wireless networks are not recommended because of the typical lower reliability and lower transfer speeds than a dedicated 1Gbps ethernet.
Monitor	17” monitor or larger with a native resolution of at least 1920 x 1080 @ 30fps	Native resolution of 1024 x 768	It is very important to review radiographs on a high-quality monitor since the display of images is vital to the correct diagnosis. If the room is highly lit, then the monitor will have to be able to produce sufficient contrast in the images.

User Authentication

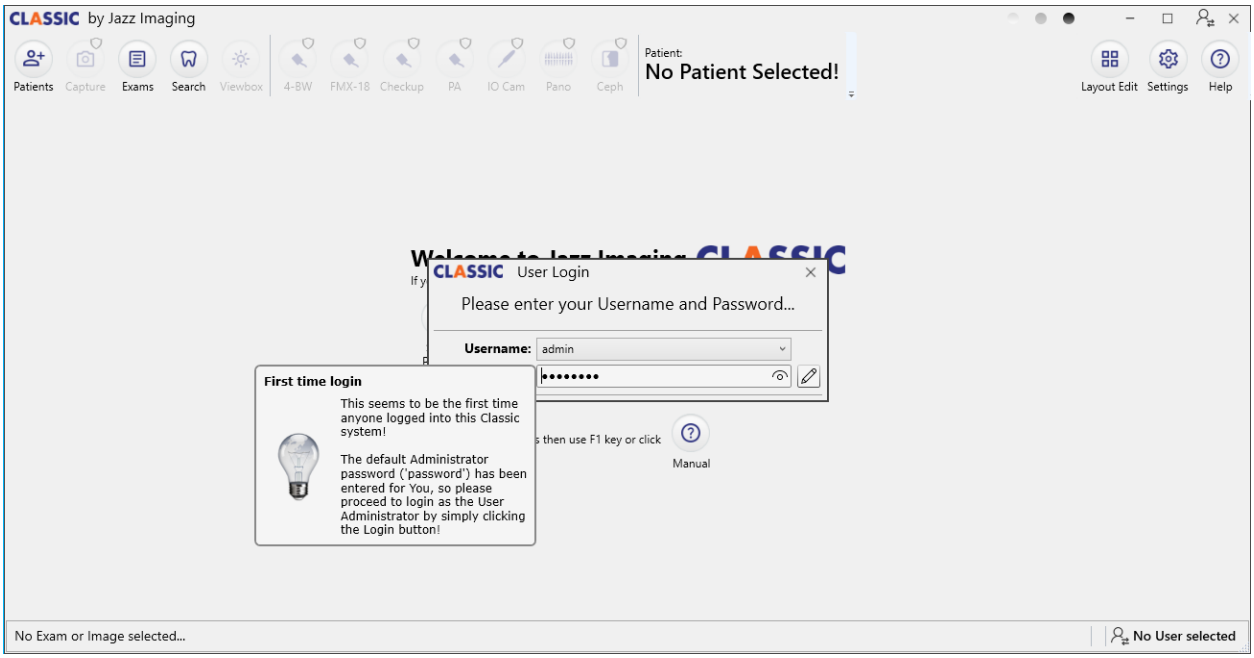
Jazz Classic requires all users to log in with a valid User Account before they can use the application. Each user account is assigned a User Role, and some features may or may not be available to the user depending on the assigned User Role.

First-time Login

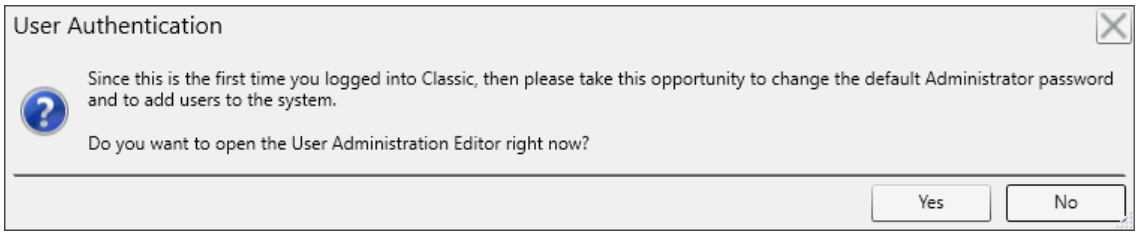
When Classic is initially installed, a single “Administrator” user account will be available:

Username: `admin`
Password: `password`

Classic will automatically determine when it is the very first time a user logs in and automatically populates the login window with the default username and password:



The first user will then be asked to open the User Administration Editor and add new users to the system and to change the default Administrator password:



Click Yes to open the User Administration Editor. Please see User Administration section for details.

For security reasons, it is highly recommended that the first user takes the time to at least change the default Administrator password and furthermore creates additional user accounts that represent the day-to-day users of the system! This can also be done later by going to the Settings Window and opening the User Administration tab-page.

Normal User Login

When Classic is started, the user will have to select a Username from the list of configured users, and then type in the correct Password to proceed.

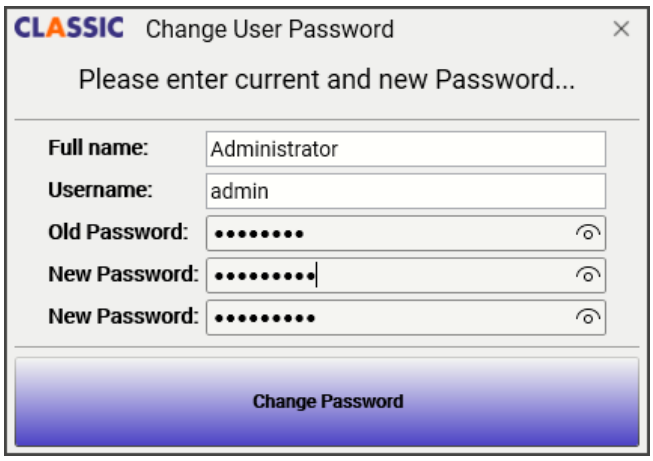
The View Password button ( ) allows the user to temporarily view the password.

Classic will remember the Username from the last successful login. The user will then simply have to type the correct password to proceed.

If a user attempts to login more than 5 times in a row with the wrong password, then the system will generate a Cyber Security Event that can only be cleared by a user with System Administrator privileges. Please see Cybersecurity Event Handling for more details.

Change Password

The User Login window allows users to change their current password by pressing the ***Change Password*** button ( ). This opens the ***Change User Password*** window.



The old password will have to be entered correctly, and a new password will have to be entered twice before it can be changed. The Change Password button will remain grayed out until all password restrictions are met!

The following restrictions apply to the selection of the new password:

1) The new password cannot be an empty string.
2) The new password will have to be different from the old password.

Please see the User Administration chapter for more information on how to add/edit/delete users.

General Overview

Jazz Classic is a standard Windows application with a user interface optimized for ease of use and simplicity in day-to-day operation. It's designed to maximize screen "real estate" for capturing, manipulating, enhancing, and viewing images.

It's recommended to use a high-quality mouse with a scroll-wheel to operate Jazz Classic; however, the layout and size of the UI buttons allow it to work with a touch screen as well.

The UI comprises the following key areas:

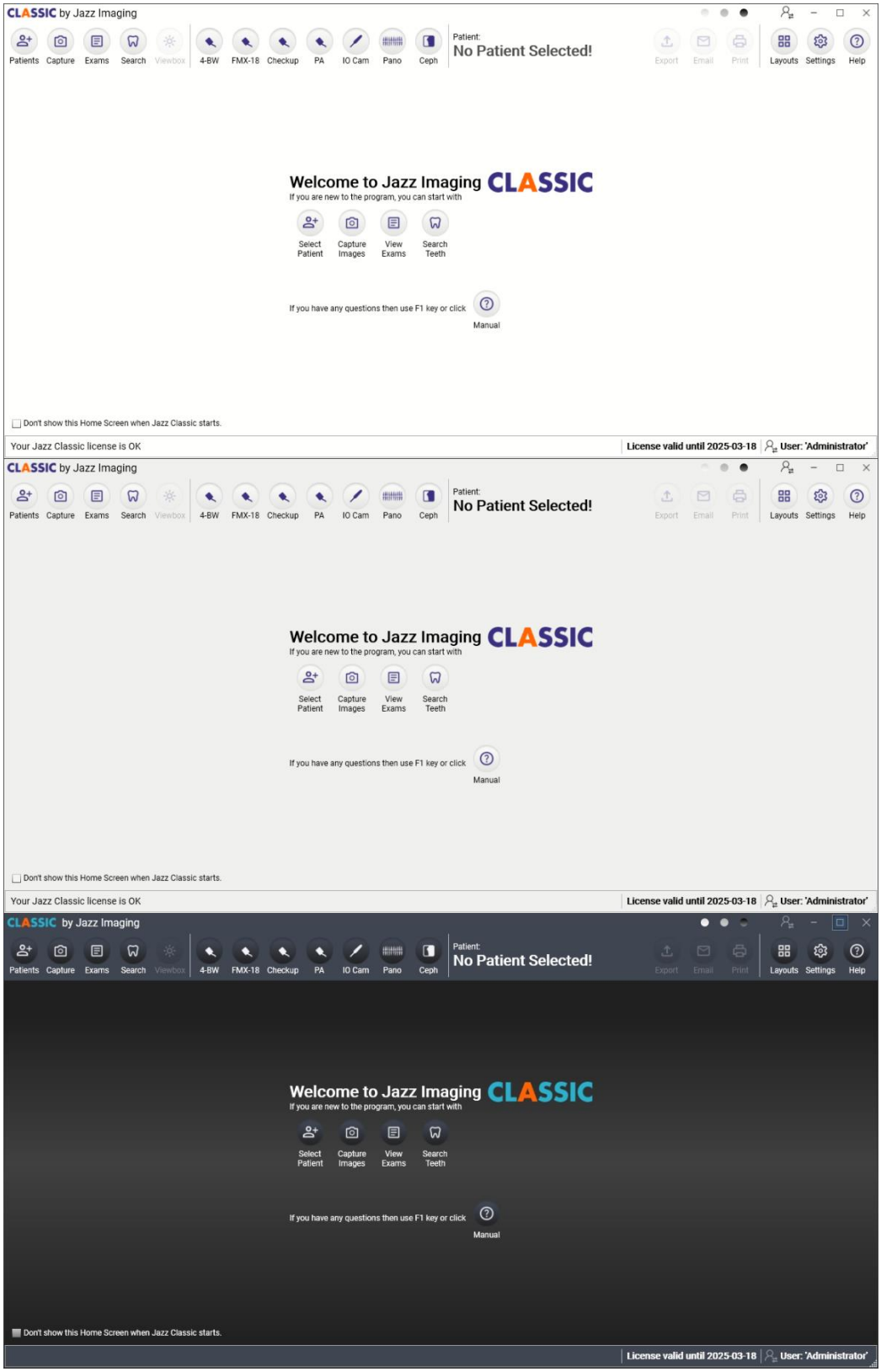
1 Caption bar

Displays the name, birth date, and age of the selected patient, as well as the standard Windows controls for minimizing, maximizing, restoring, and closing Jazz Classic. Additionally, users can log out by clicking the ***Logout/Switch User*** button ( ) located next to the ***Close*** button.

Users can easily switch between Light/Dark/Neutral UI themes by clicking one of the ***Theme*** buttons ( ).

When the patient's age is less than 18 years, the application will also display the number of months to provide more specific age information for pediatric patients.

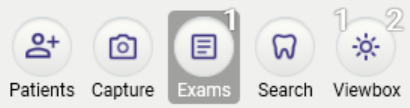
The following figures show the Home screen in its **Light**, **Neutral** and **Dark** UI themes:



2 Main Toolbar

The user interface provides a familiar Window's toolbar with the most frequently used options readily available. It is divided into smaller sections containing groups of commonly used features:

1) Main Features

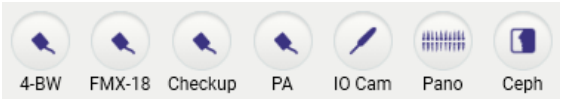


The main features include:

- **Patient** Management
- Image **Capture**
- View **Exams**
- **Search** for specific teeth within Exams
- View selected images from one or multiple Exams in **Viewbox**

In addition to the main functionality, each operatory in a dental practice can have its own set of commonly used acquisition shortcuts set up on the toolbar. Jazz Classic offers shortcuts for the most used capture layouts, which can easily be customized in the Settings window.

2) Acquisition Shortcuts

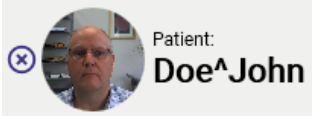


Acquisition Shortcuts comprises buttons that, with a single click of the mouse (assuming a patient has already been selected), will pick a specific layout, select a specific device, and start the image acquisition

If no patient has been selected, the user will be prompted to select a patient before the automatic acquisition begins.

3) Selected Patient display

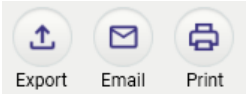
Next to the Acquisition Shortcuts, the selected patients profile picture (optional) and name will be displayed.



And there is a small close button to the left of the name, making it easy to close the patient again.

The Patient Name format can be modified in the Settings dialog. The default format is <Last Name>^<First Name>.

4) Communication Features

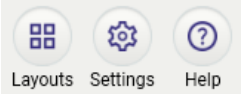


To the right side of the patient's name, the communication functions are displayed.

- **Export** the selected exam images to disk in various file formats
- **Email** exam images directly to associates or insurance companies
- **Print** the selected exam images together with detailed exam and patient information

Whenever images have been selected (either as exams or as individual images in the ViewBox), it is possible to Export, Email or Print these images using the communication buttons. If no images or exams have been selected, these communication function buttons will be grayed out.

5) Settings functions

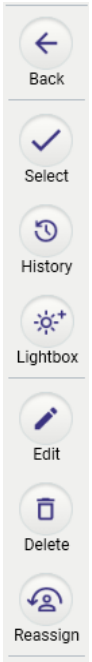


Finally, there is a section that provides access to the Layout editor/manager, the Jazz Classic Settings, and the User Manual.

3 Left-side Toolbar

This toolbar contains context sensitive buttons that reflect available actions. The number of available buttons and their functions will depend on which View is currently displayed on the Desktop (central) area. This toolbar dynamically changes its contents as new Views are selected and when the user interacts with the objects displayed on the center Desktop area. Individual buttons might be grayed out or hidden depending on the user interactions.

The simplest form would be a single Back button, but in some cases, the number of buttons/features can be longer.
The following example is from the ***Exam Overview*** View:



To change the toolbox's Look-And-Feel, select ***Settings > Look-And-Feel***. From there, it's possible to change the button icon size as well as hide/show the texts underneath the icons.

4 The Desktop

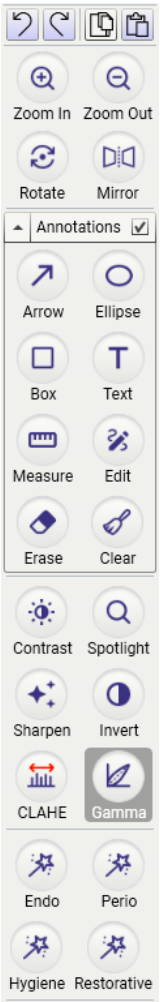
The Desktop is the large central area where images are displayed when they are being viewed or new images are captured from an external source such as sensors, scanners, etc. This area is also used when the user needs to select individual objects from lists/grids.

5 Right-side Toolbar

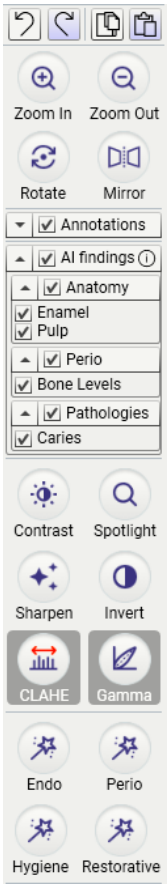
This interface provides easy access to a range of commonly used features and functions on the right-hand side of the screen. The content will depend on which View is currently selected in the Desktop (central) area.

For most Views, the Right-side Toolbox area is closed. Instead, the area is used to display the main Desktop area, maintaining a large image display area.

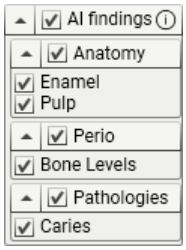
1) Image Editor Toolbox – This toolbox is displayed when users are reviewing and/or editing images.



If the Jazz Classic **AI Plugin** feature has been enabled in the system settings and AI findings exists for the selected image, an **AI findings** section will display in the right-side toolbar:



AI findings update dynamically depending on what findings exist for the image. Users can choose which findings to display as an image overlay in this panel. The main function of the AI findings panel is to enable the user to hide/show specific AI finding types in the image overlay.



There are three AI findings categories:

- Anatomy
- Perio
- Pathologies

The ***Anatomy*** section contains one or more anatomical landmark types from the following list:

- Teeth outlines
- Enamel
- Pulp
- Dentine crown
- Root
- Jaw anatomy (Mandibular canal, Mental foramen, Maxillary sinus, etc.)

The ***Perio*** section contains one or more periodontal measurements:

- Bone level (in mm)
- Bone ratio (in %)

The ***Pathologies*** section contains one or more pathologies or tooth restoration from the following list:

- Decay
- Missing teeth
- Calculus
- PA Radiolucency (PARL)
- Fillings/Inlays
- Bridges
- Root Canal Treatments (RCT)
- Impacted soft tissue
- Impacted teeth
- Complete/Partial Bony Impactions
- Prosthesis
- Implants
- Open margins
- Tooth fractures
- Crowns

AI findings marked with an asterisk (*) have not been cleared by the FDA.

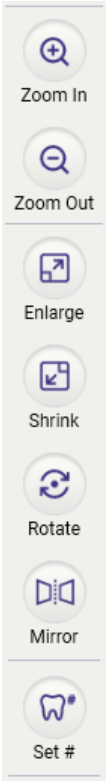
The AI findings are rendered in order from most to least radiodense.

In order:

a) Crown (most radiodense)
b) Bridge
c) Filling
d) Enamel
e) Root canal treatments (RCT)
f) Calculus
g) Pulp
h) Decay
i) Periapical Radiolucency (PARL) (least radiodense)
j) The periodontal measurements are added on top of everything else.

Zoom/Rotate/Mirror functions and the Annotations/Measurement functions are available for all image types. However, the Image Processing functions are only available on monochrome (X-ray) images. The Image Processing buttons are automatically hidden when color photos are selected.

2) Layout Editor Toolbox – This toolbox is displayed when the user edits custom Layouts.



6 Status Bar

The status bar at the bottom of the user interface displays information about the current state of the program. Some features include:

1) **Tool Tips and Status Indicators** – This field is displayed at the left of the status bar. It provides a description of the operation associated with the toolbar or toolbox button that the cursor is currently hovering over. It also provides the status of an operation.
2) **AI status**- This field shows the current status of the AI processing and retrieval of AI findings.
3) **License Status** - This field is displayed at the right hand of the status bar. Shows the current License Status.
4) **User Information** – This field is displayed at the right hand of the status bar and shows the Full name of the current User. The ***Logout/Switch User*** button () allows you to easily Logout the current User and force a new Login.

 By double-clicking the License Status field, Jazz Classic will request an updated License from the online Jazz License Server.

Managing Patients

Patient Management in Jazz Classic can either be done “automatically” via a Practice Management (PM) software bridge interface, or “manually” using the Patients View selected from the Main Toolbar by clicking the **Patients** button 

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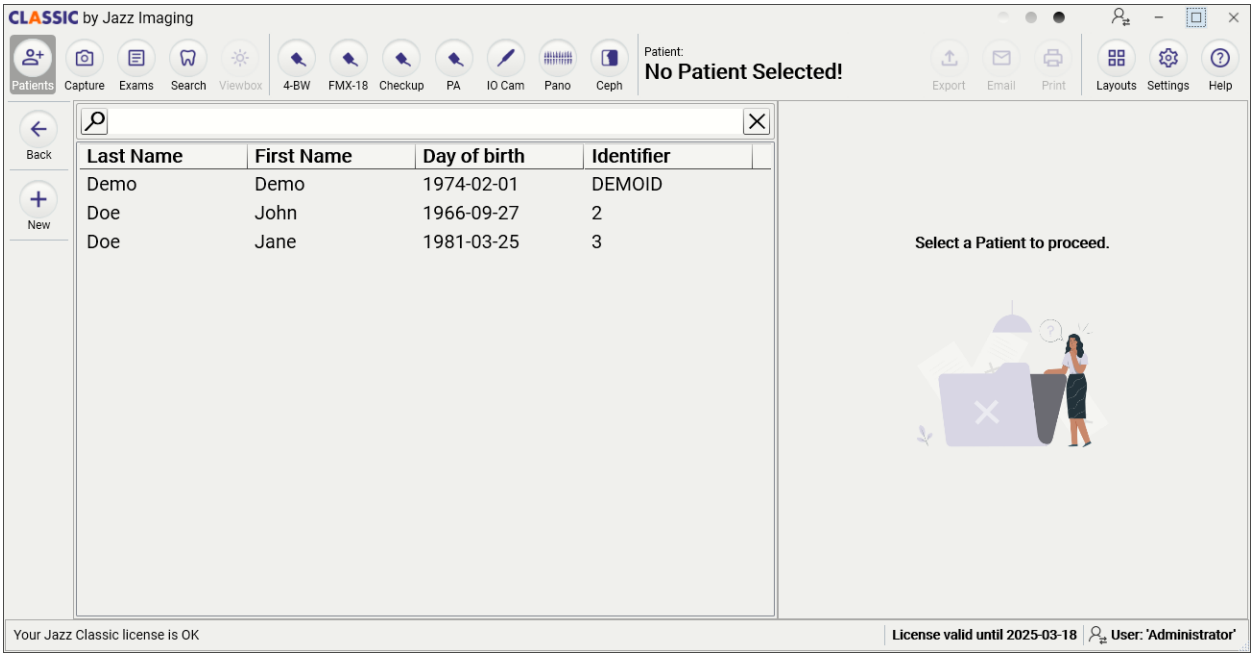


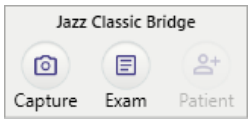
Open/Create Patients Using a Practice Management Bridge

Jazz Classic offers users various methods to create or open patient records. Although patient records can be manually created, the preferred method to create patients is to “bridge” the patient information in directly from the Practice Management (PM) software.

PM bridging automates the patient creation process by carrying over the necessary patient information (as a minimum the ***first name***, ***last name,*** and ***patient identifier***) to Jazz Classic via our Jazz Classic Bridge tray-icon application or an integrated bridge in the PM software. PM bridging ensures that patient information in the imaging application matches the information contained in the PM application.

A PM bridge can be established using the following methods:

1) Jazz Classic **Bridge** – background process that runs in the Windows System Tray. Users simply select a patient's record in the PM application and open the Chart, and then click on one of the Capture/Exam/Patient buttons.



Jazz Classic automatically launches, carrying over the patient’s information. The patient's record will open if the patient already exists in Jazz Classic or will be automatically created and selected. The Patient button will not be available for all PM systems since it depends on the availability of detailed patient data from the PM system into the Jazz Classic Bridge.

2) **Direct Practice Management Bridge** – Most Practice Management (PM) software's already have a built-in feature capable of bridging patients into Jazz Classic. Please contact your PM software support provider to see if this can be set up.

To manually launch Jazz Classic Bridge, click the Windows Start button and find the Jazz Classic ***Bridge*** program group. Then, click the shortcut. When Jazz Classic Bridge is running, a ***Bridge*** icon will display in the System Tray: 

1) Open the practice management screen that contains the patient information (typically the patient Chart). The Jazz Classic Bridge will automatically appear on the screen if the PM is detected.
    a. Click on one of the buttons on the Jazz Classic Bridge floating window with the left-mouse button.

The Patient Information screen that Jazz Classic Bridge grabs information from varies from one PM application to another. If needed, contact Jazz Technical Support for assistance setting up the Classic Bridge.

Once the patient's name and identifier is detected, Jazz Classic Bridge pulls the necessary patient information from the PM and launches Jazz Classic. A new patient record is automatically created if the Patient hasn't already been added to Jazz Classic. Alternatively, the patient record will be opened if the patient already exists in the Jazz Classic database.

In many circumstances, before a PM bridge is implemented, a dental practice manually creates patients in the software. As a result, patient information may not exactly match the information being passed via the PM bridge. After the PM bridge is implemented, the user may be presented with a 'Patient Does Not Exist' dialog box when attempting to open a patient that DOES exist in Jazz Classic, indicating a mismatch in the patient information being passed.

Manually Adding a New Patient

If a Practice Management Bridge isn't being used, then all the Patient Management must be done manually directly in Jazz Classic. The current user must have a User Role with Patient Management privileges to Add/Edit/Delete patients.

Follow the steps below to add a new patient to the Jazz Classic database:

1) Select the Patient View on the main Toolbar by clicking the ***Patients*** button 

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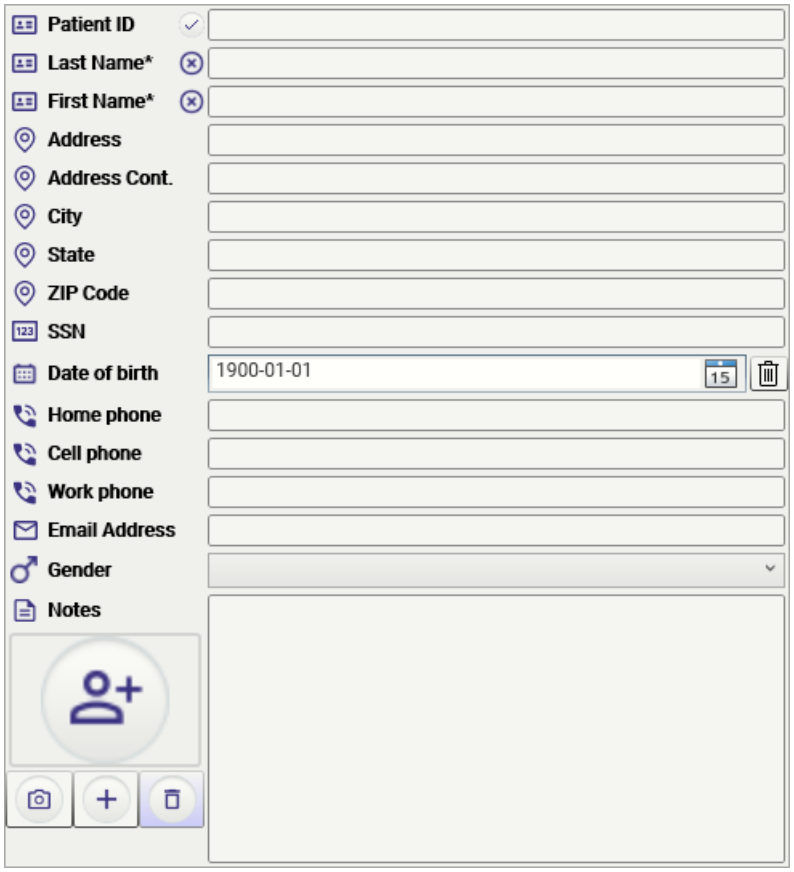
2) Click the ***New*** button 

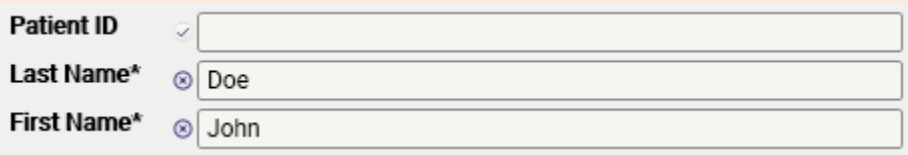
on the Left Toolbar. The ***New Patient*** information view will appear on the right-hand side of Jazz Classic.



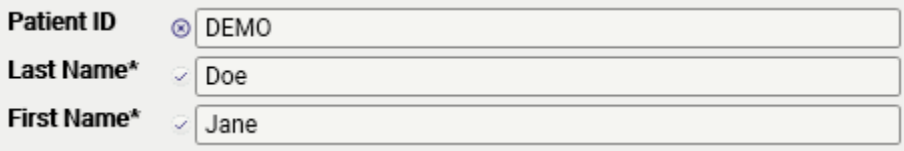
3) Enter the necessary patient information and Click the Save button. Most fields are optional and can be omitted, except for the two Patient Name fields and the Patient ID field.

The 'Last Name' and 'First Name' fields are mandatory. The "Patient ID" field must be unique within the Jazz Classic patient Database. However, if this field is left empty, the system will automatically assign a unique Identifier string based on the Patient Entry number in the Database.

Example 1: The Last Name + First Name combination is not unique:



Example 2: Unique ID is not unique when a new user is being added:



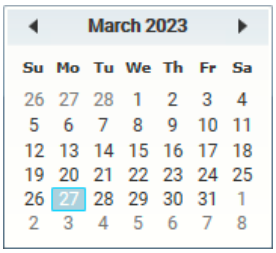
Further restrictions are placed on the following entries:

- ***State***:
  - Maximum of 25 characters
  - Must either be a two-character abbreviation of the US State (e.g., CA, WA, or NY) or the full US State name (e.g., California, Washington,
  - or New York)
- ***ZIP Code***:
  - Maximum of 25 characters
  - Five-digits US Zip-code, optionally followed by a four-digit area code separated by '-' (e.g., 95134 or 95134-1382)
- ***SSN*** (Social-Security Number):
  - Maximum of 25 characters
  - Contain a total of 9 digits, split in three groups, separated with '-' (e.g., 123-45-6789)
- ***Patient ID***:
  - Maximum of 100 characters
  - Can contain characters, digits, or symbols.
  - Must be unique within the Jazz Classic Patient Database.

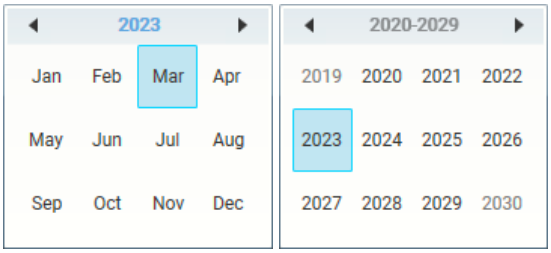
The fields mentioned above will display an exclamation mark to the left of the edit field if the content is not valid. For example, if the ZIP code is more than 5 digits.

The Date of Birth can be typed in directly as displayed below:

Alternatively, it can be selected using the built-in calendar tool on the right-hand side of the edit box:

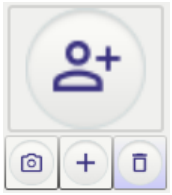


It is possible to “zoom out” on the calendar window by clicking the header text. This makes it easier to select dates that are further back in time without having to navigate month by month!



Adding a Profile Picture

Furthermore, it’s possible to associate a profile picture with the newly created patient. This can be done by either clicking the ***Add*** button  , which will open a Windows File Explorer where an image can be selected, or simply by using drag-and-drop directly from a Windows File Explorer onto the Profile Picture view area.



Another option is to capture a new still picture using a Web camera connected to the PC. Click the ***Capture*** button  , select the web camera settings, and capture the image using the Web Camera Image Capture window.

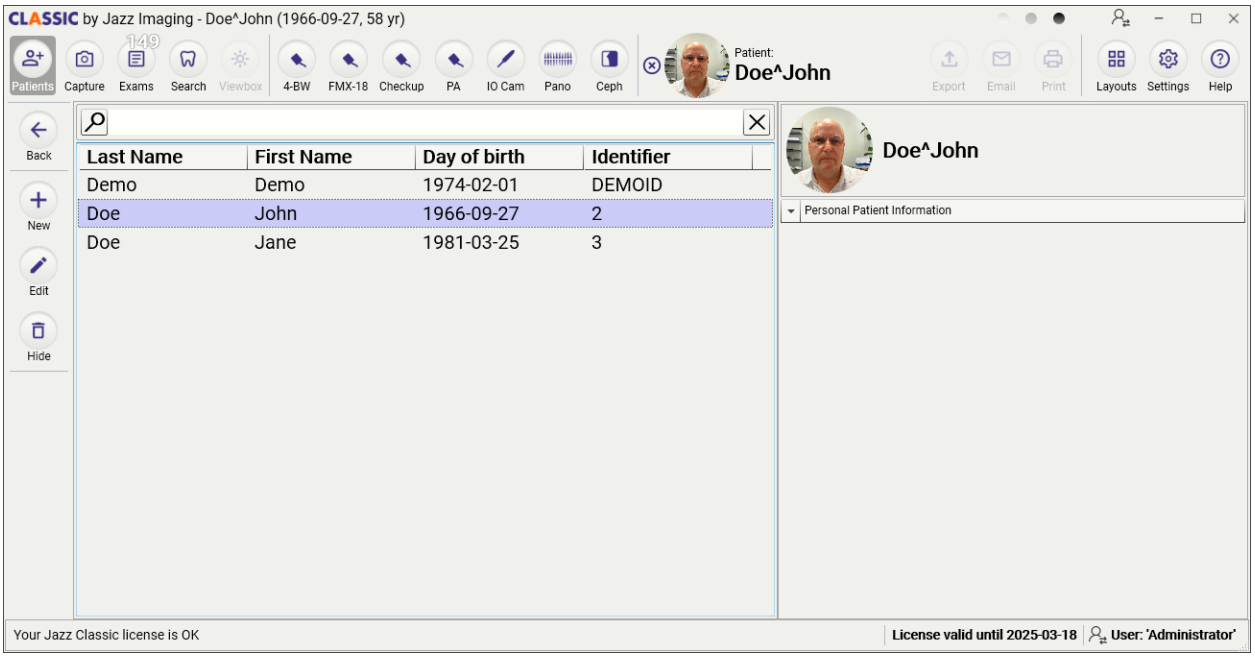
Finally, it is possible to remove an existing profile picture by simply clicking the ***Delete*** button  .

When all the needed patient data has been successfully entered, click on the ***Save*** button 

to create the new patient record in the Jazz Classic Patient Database.

The title bar will refresh to indicate that the new patient record has been successfully created and opened.

Now, you can capture your first X-ray images for the new patient!



By default, 'Personal Patient Information' will not display when a new patient is selected. This is done to limit the exposure of personal details such as SSN and Birth Date of the patients to other people. To reveal all the Patient Information stored by Jazz Classic, click the arrow on the left of the Expander. However, please note that the User Role of the current user might block the display of the information altogether.

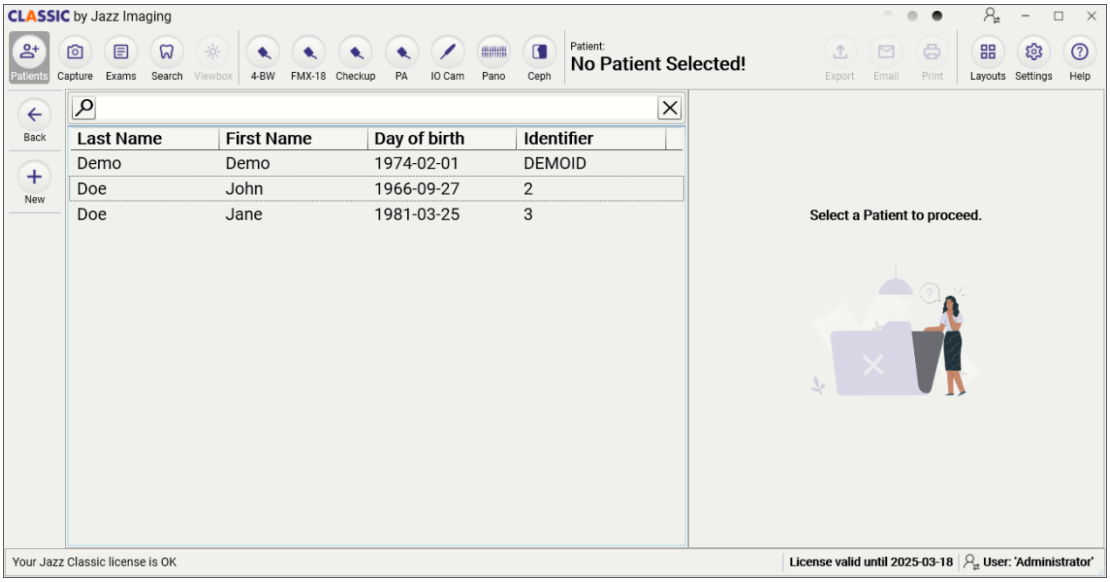
Opening an Existing Patient Record

To manually open an existing patient record, navigate to the Patient Management view:

1. Click the ***Patients*** button 

on the toolbar.

   The Patient Management View will now appear.



2) Scroll down to find the patient record in the patient list or enter distinguishing patient information in the patient search box at the top of the Patient View. Classic performs a new patient search for every character entered/deleted, automatically updating the list with all patients that fit the search criteria. The string that is entered in the search field will be used for a combined search of both the First Name and the Last Name fields in the database.
3) To open the patient's Exam records, double-click on the patient entry, or simply select the record from the list and click on the ***Exams*** button 

in the main toolbar.

The title bar will automatically refresh to indicate that the new patient record is open.

Hiding or Deleting an Existing Patient Record

In Jazz Classic, you can choose whether to ***permanently delete*** patient records or simply ***hide*** patient records from being displayed to normal users.

When a patient record has been hidden, it's possible to "unhide" the patient record later and without losing any data. However, if the patient record is permanently deleted, all associated exams and images, along with patient information, will be permanently lost (unless a backup has been made prior to the patient record being deleted).

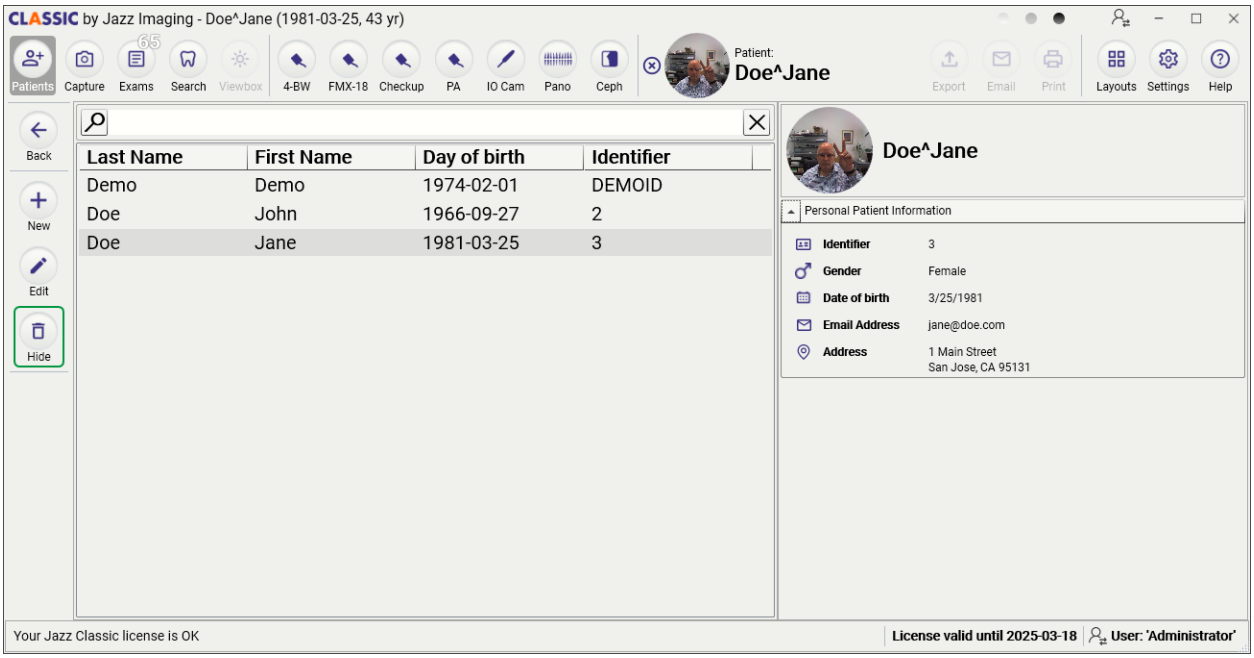
Permanently deleting patient records has the primary benefit of freeing up disk space in both the database and the data location, as all associated image data and patient data are removed. Additionally, Classic system backups will be smaller if the physical image files have been deleted from the data location.

To Hide Existing Patient Records:

1) Click ***Patients*** button 

on the toolbar.

The Patient Management View appears.



2) Select one or more of the patient records from the patient list. This will enable the ***Hide*** button 

on the left-side toolbar.
3) Click the ***Hide*** button and confirm your decision to hide the selected patients when prompted by Jazz Classic.

To Unhide Existing Patient Records:

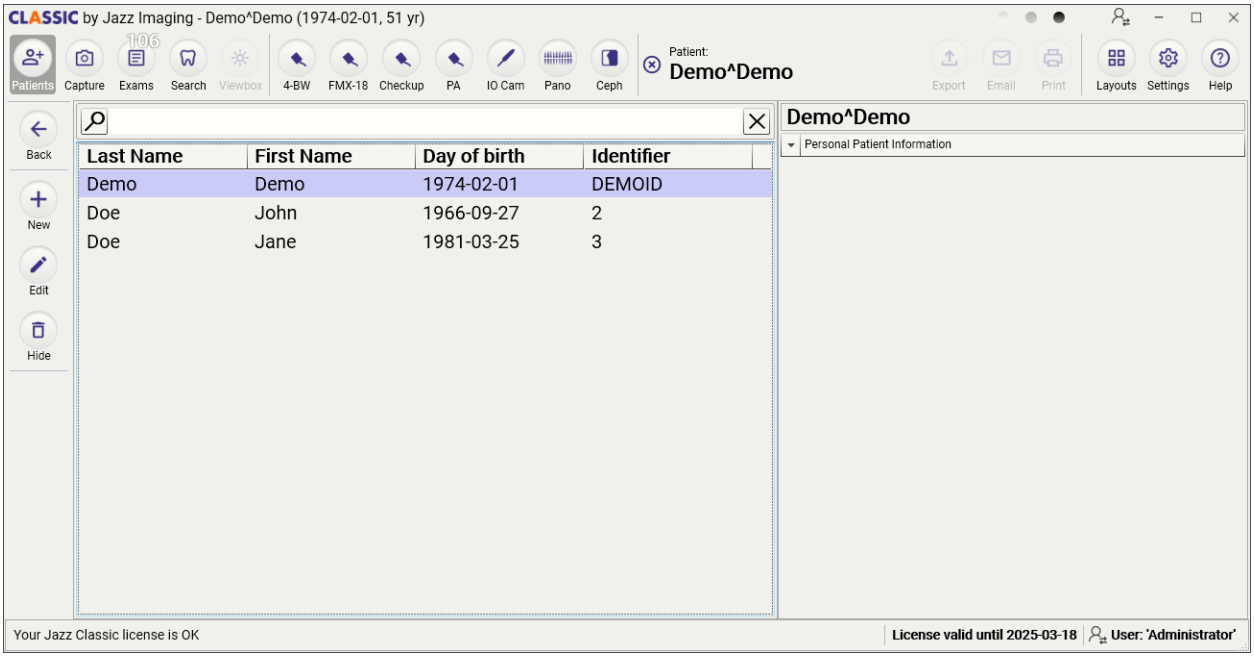
As expected, hidden patient records will not be displayed to the normal user during a patient search. However, you can include all hidden patient records in the patient list by pressing and holding the ***CTRL+ALT*** keys on the keyboard during the patient search!

The following steps will illustrate how to display a complete patient list that includes both visible and hidden patient records, and then unhide any previously hidden patients:

1) Click the ***Patients*** button 

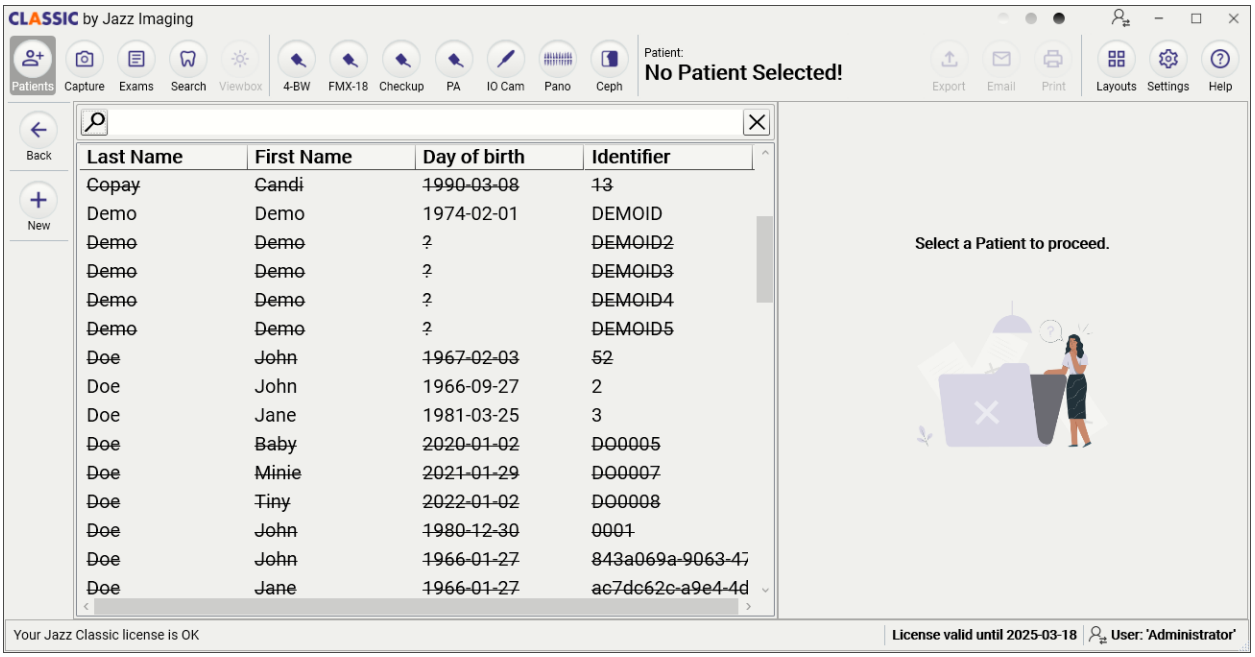
on the toolbar.

The Patient Management View appears.



2) Enter the desired patient search criteria in the search box above the patient list (or keep it empty to search for all patients).
3) Press and hold the CTRL+ALT keys on the keyboard, then simultaneously click the Search button  located above the patient list, next to the search box.

The patient record list will now update and include all the hidden patient records that fit the entered search criteria:



The previously hidden patients will appear with a "strikethrough" font, and they can now be selected just like any regular patient.

4) Select one or more hidden patients from the list, click the ***Unhide*** button, and confirm your decision to unhide the selected patients when prompted by Jazz Classic.
5) After successfully unhiding the selected patients, Jazz Classic will automatically perform a new "standard" search and will not display any of the currently hidden patients.

To Permanently Delete Existing Patient Records:

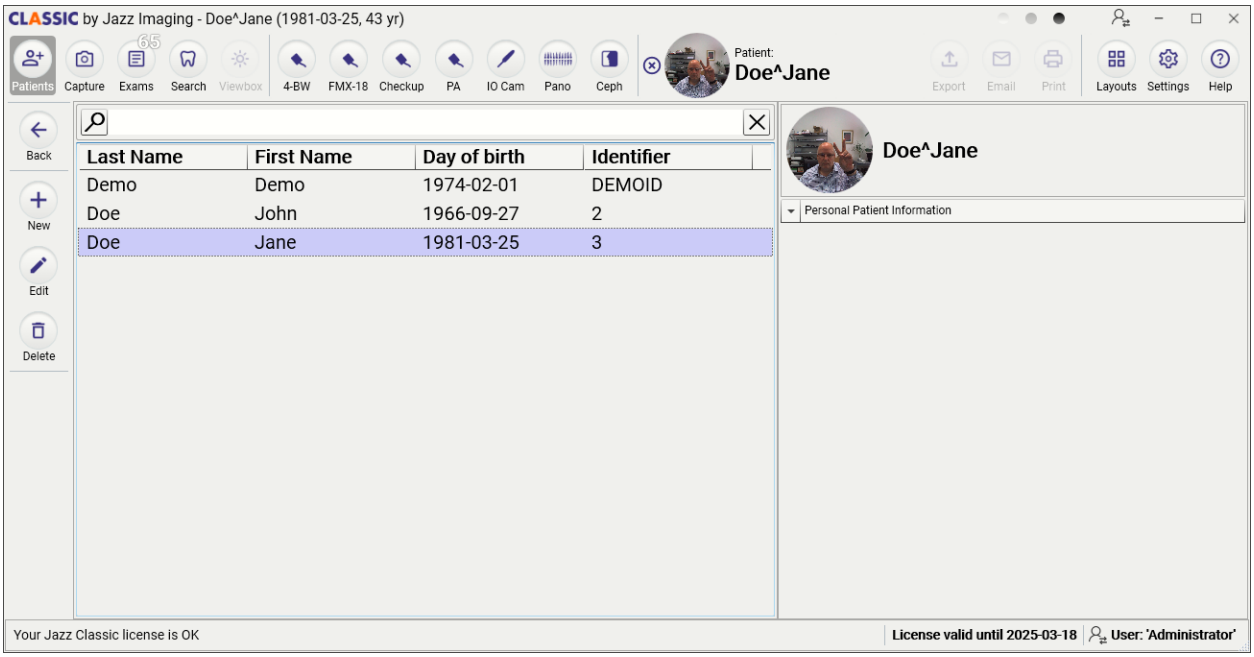
When patient records are permanently deleted, all associated patient data and images files will be removed from the system, and it will not be possible to undo the deletion later! So, we urge users to carefully consider whether it would be better to just hide the patient records instead!

The following steps show how to permanently delete one or more patient records:

1) Click ***Patients*** button 

on the toolbar.

The Patient Management View appears.



2) Select one or more patient records from the patient list and press and hold the SHIFT key on the keyboard. This enables the ***Delete*** button 

on the left-side toolbar.
3) Keep the SHIFT key depressed while clicking the ***Delete*** button and confirm your decision to permanently delete the selected patients when prompted by Jazz Classic.

When a Patient Record is manually deleted in the Jazz Classic Database, ***all*** the existing exam information and image files will be lost. It is ***NOT*** possible to undo this delete operation and all the patient information and exam images will be gone for good!

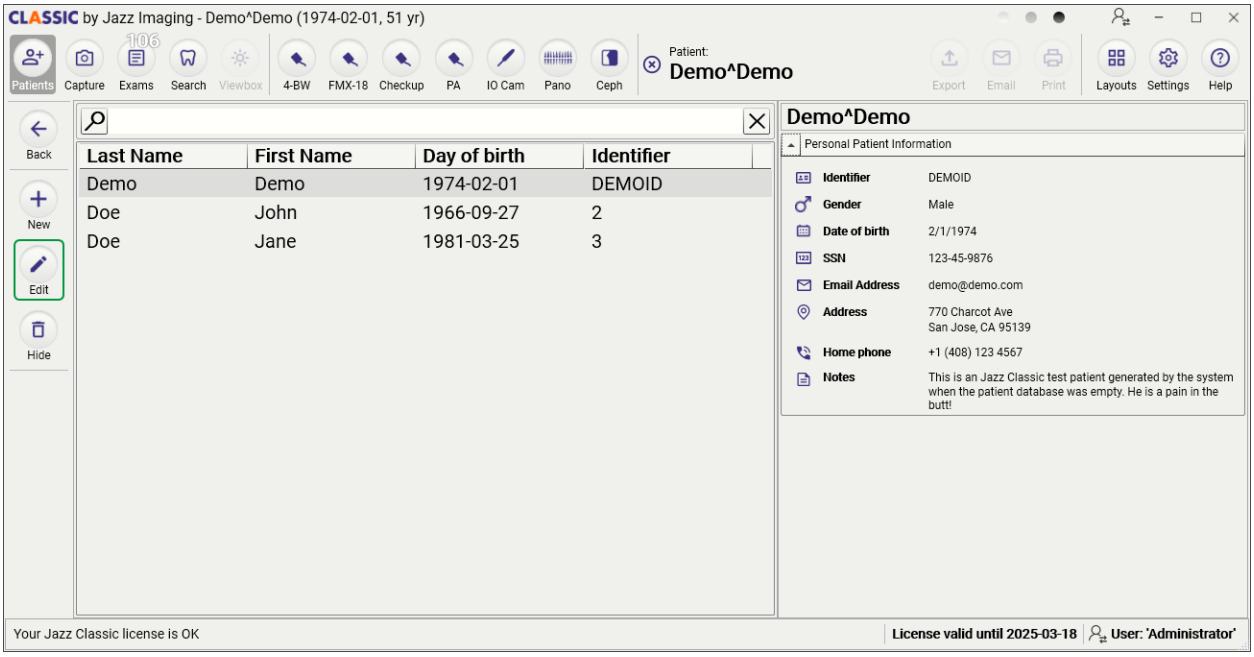
If you want to permanently delete hidden patients, perform the hidden patient search as described above in the previous chapter. Then, select any of the hidden patient records from the list and follow the delete instruction steps above.

Editing an Existing Patient Record

To edit the information in an existing patient record:

1) Click ***Patients*** button  from the toolbar.

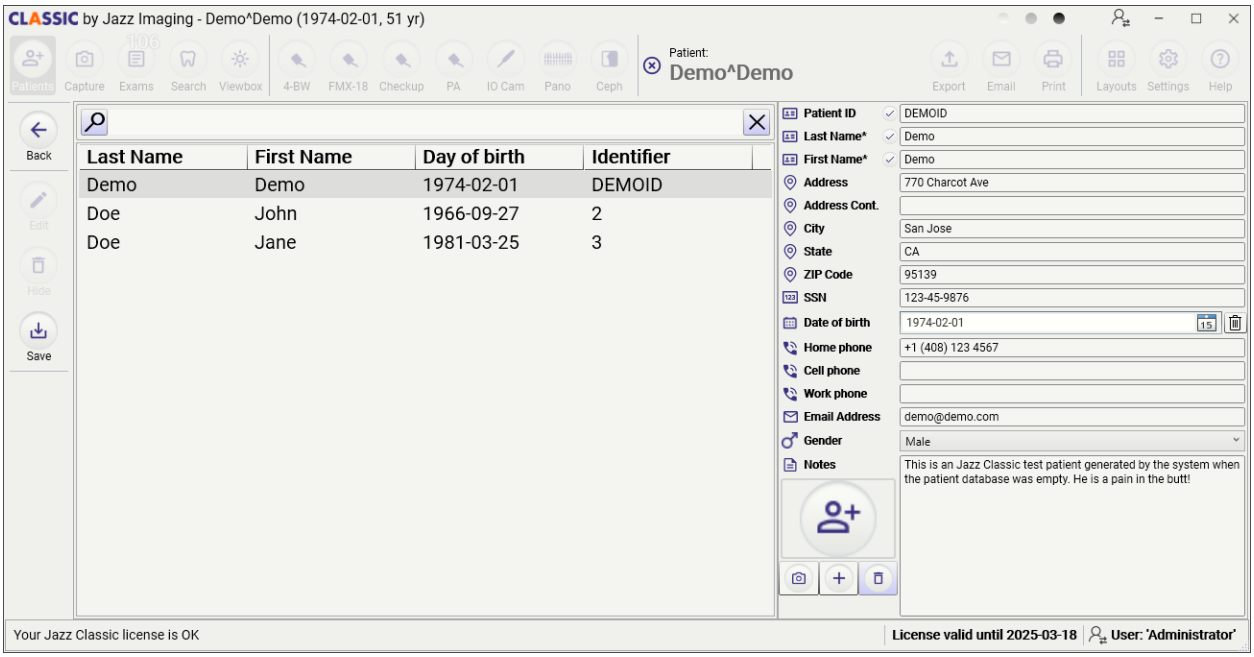
The Patient Management View appears.



2) Select the patient record from the patient list. This enables the ***Edit*** button  on the left-side toolbar.

3) Click the ***Edit*** button.

   This opens the Patient Information Details view, where all the fields can be edited.



After updating the fields, click the ***Save*** button  on the left-side toolbar.

It is not possible to edit patient data for the patients that are created using the PM Bridge. To update these patients, you'll have to update the patient record in the PM software and ***synchronize*** the patient data via the PM bridge!

Capturing Images

Once a patient record has been opened, you can now capture one or more images into a ***Layout*** (template), which eventually becomes a new ***Exam*** (study) within the Jazz Classic database.

All images captured in Jazz Classic must be captured into a Layout that the user must select before the capture begins!

After completing all the image capture(s) within the selected Layout, the combination of the **Layout** and the captured images become the "***Exam***" that will later be referenced when the images are reviewed.

Understanding Layouts/Templates

The main purpose of Layouts is to specify how many images are included within the Exam and to hold detailed information about each individual image within the template such as:

- Image Type (a "suggested" type such as "***Intraoral X-Ray size 1.5***" or "***Panoramic***")
- Image Rotation (typically the cable direction for the intraoral X-ray sensors)
- Associated teeth numbers (can be used when searching for older images containing specific teeth)
- Capture Order # within the template, enabling the ***Auto-Capture*** feature to proceed automatically to the next image within the template.

During Image Capture, the selected Layout guides the user through the capture of individual images and helps organize them into the pre-defined "tiles", displaying the images as thumbnails once the capture is completed. It is not mandatory to acquire all images within a given Layout. If a single image has been acquired, an Exam can successfully be created, even if some of the image tiles are empty.

Pre-created and Custom Layouts/Templates

Jazz Classic provides a selection of pre-created Layouts. Users can add new custom layouts to the system using the Layout Editor if the standard Layouts are not ideal.

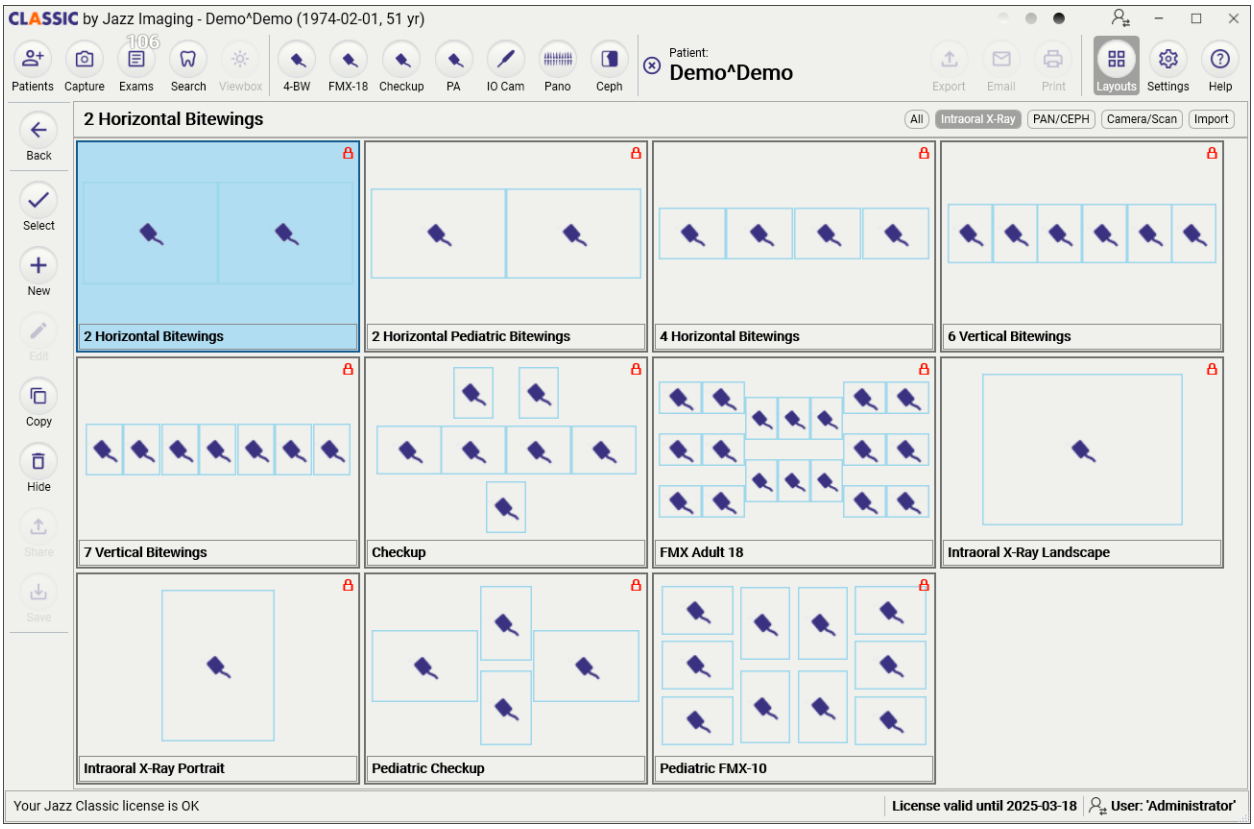
All Layouts are grouped into the following four categories:

1) Intraoral X-Ray
2) Panoramic/Cephalometric
3) Camera/Scan
4) Import

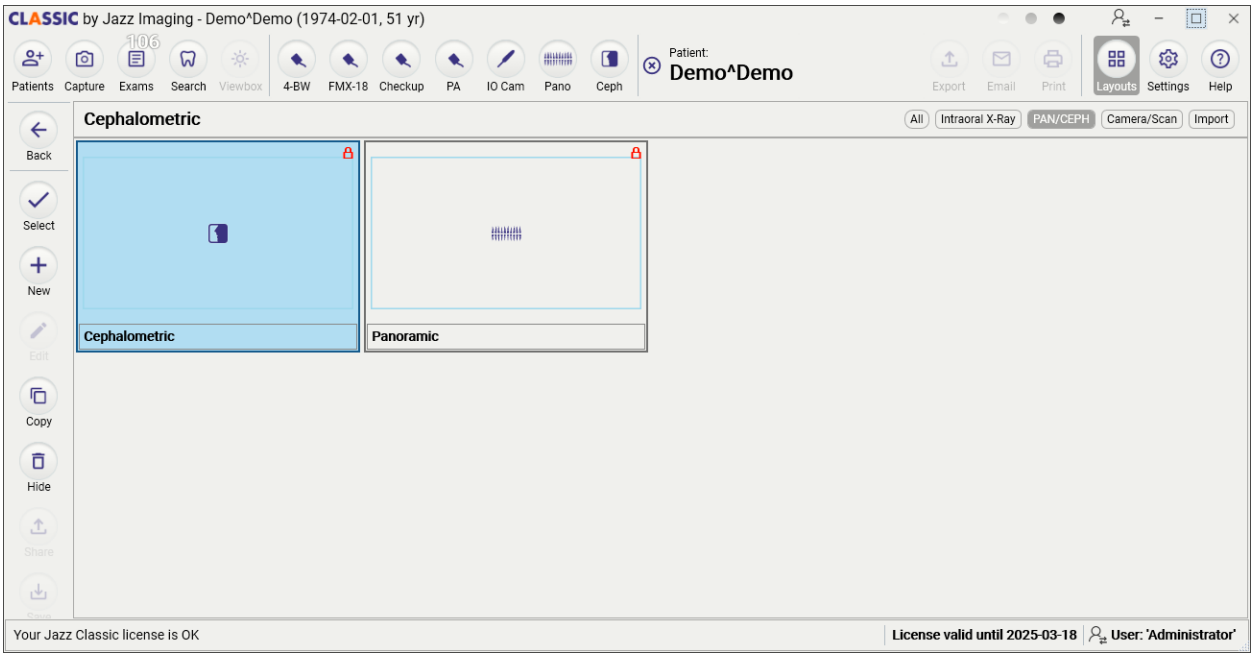
All layouts for each individual group can be displayed, or all layouts from all groups can be displayed together. This is selected using the Layout Group selection found above the Layout view.

The following Layouts are included when Jazz Classic is installed:

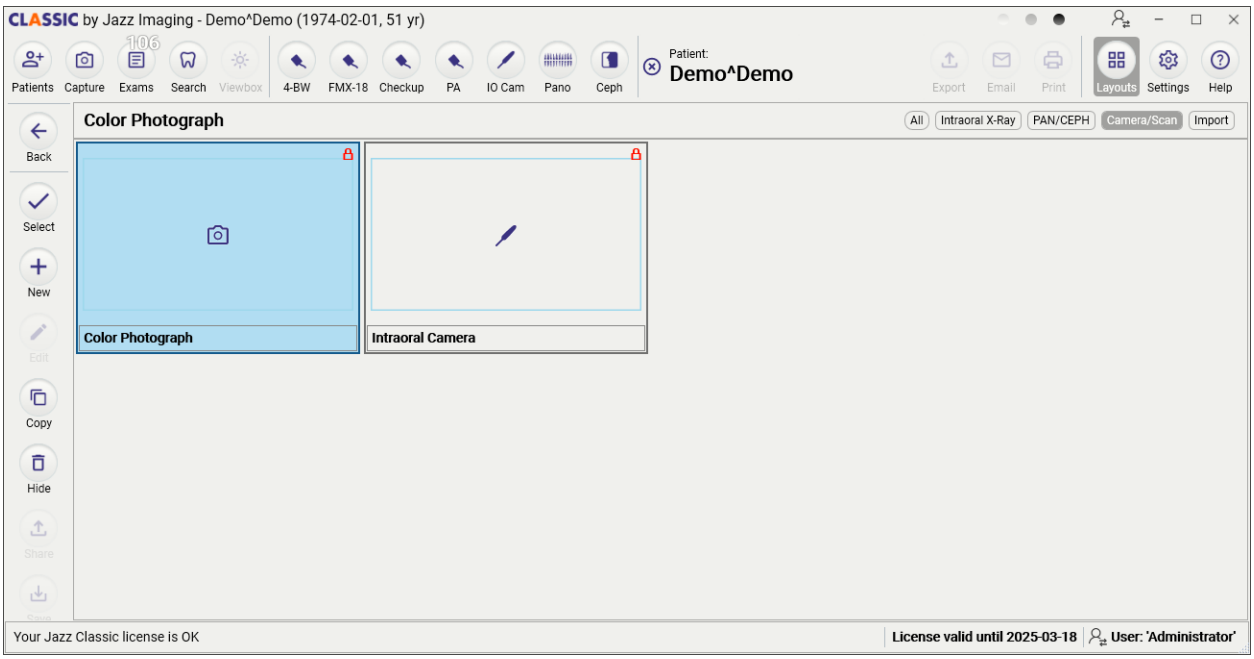
1) Intraoral X-Ray group
    a. 2 Horizontal Bitewings for adults
    b. 2 Horizontal Bitewings for children
    c. 4 Horizontal Bitewings for adults
    d. 6 Vertical Bitewings for adults
    e. 7 Vertical Bitewings for adults
    f. Checkup for adults (four horizontal Bitewings and three vertical anterior images)
    g. Checkup for kids (two horizontal Bitewings and two vertical anterior images)
    h. Horizontal PA (no teeth specified before capture)
    i. Vertical PA (no teeth specified before capture)
    j. Full-mouth series FMX-18 for adults
    k. Full-mouth series FMX-10 for kids



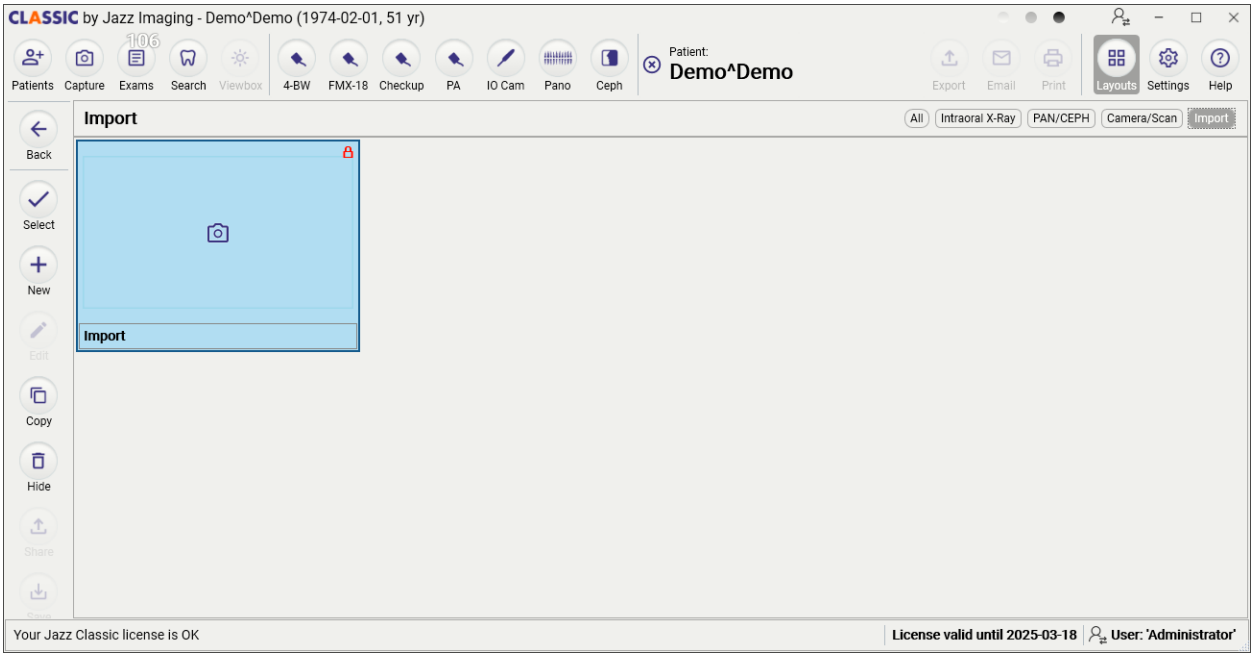
2) Panoramic/Cephalometric group
    a. Single Panoramic (TWAIN) image
    b. Single Cephalometric (TWAIN) image



3) Camera/Scan group
    a. Intraoral Camera (multiple images displayed in grid)
    b. Extraoral Camera/Color photographs (multiple images displayed in grid)



4) Import group
    a. Generic import (multiple images displayed in grid)



The Import Layout can be used to import any modality, and if multiple images are imported simultaneously, Classic will automatically rearrange all images in a grid.

Grid examples:

2 images:

1	2

3 Images:

1	2
3	

4 Images:

1	2
3	4

5 images:

1	2	3
4	5	

6 images:

1	2	3
4	5	6

7 images:

1	2	3
4	5	6
7		

10 images:

1	2	3	4
5	6	7	8
9	10		

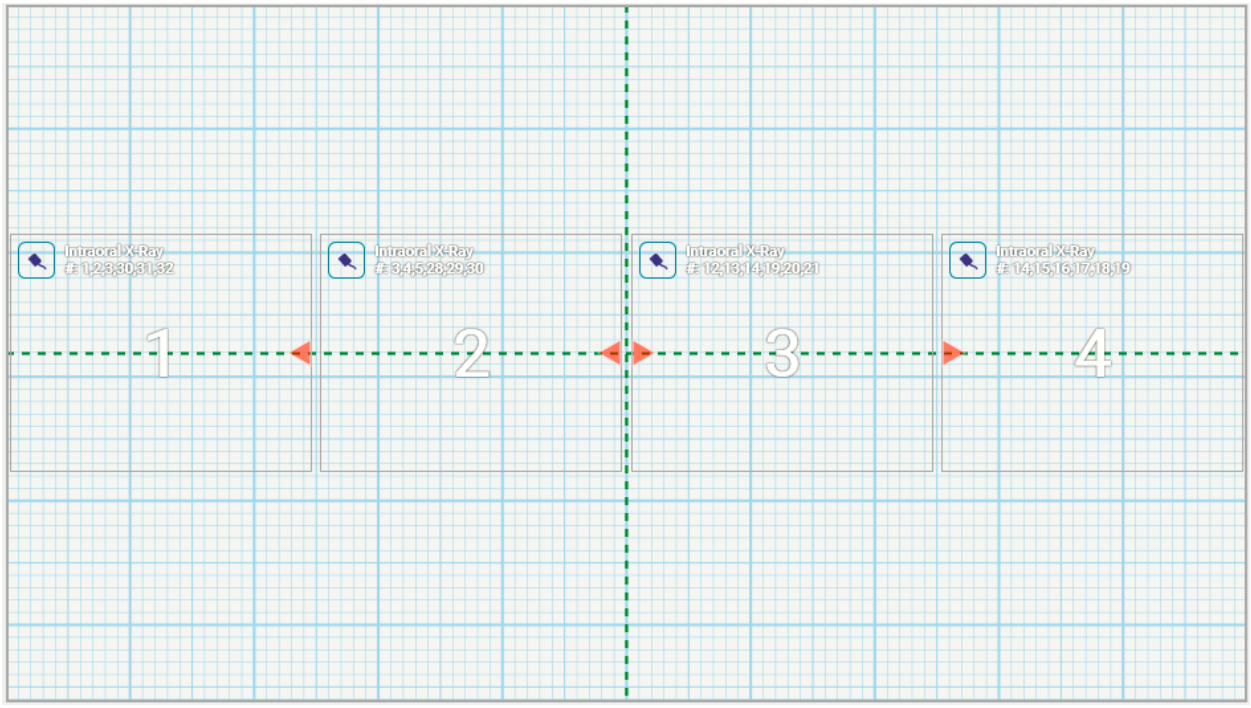
13 images:

1	2	3	4
5	6	7	8
9	10	11	12
13			

17 images:

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17			

The following image, taken from the ***Layout Editor***, illustrates one of the standard Intraoral X-Ray Layouts (4 Horizontal Bitewings using Intraoral X-ray sensors). The direction of the IO X-ray sensor cable is indicated by triangles on the image tiles, and the Auto Capture Order # is shown in the center of each image tile:



The teeth numbers associated with the individual image tiles are shown next to the device type.

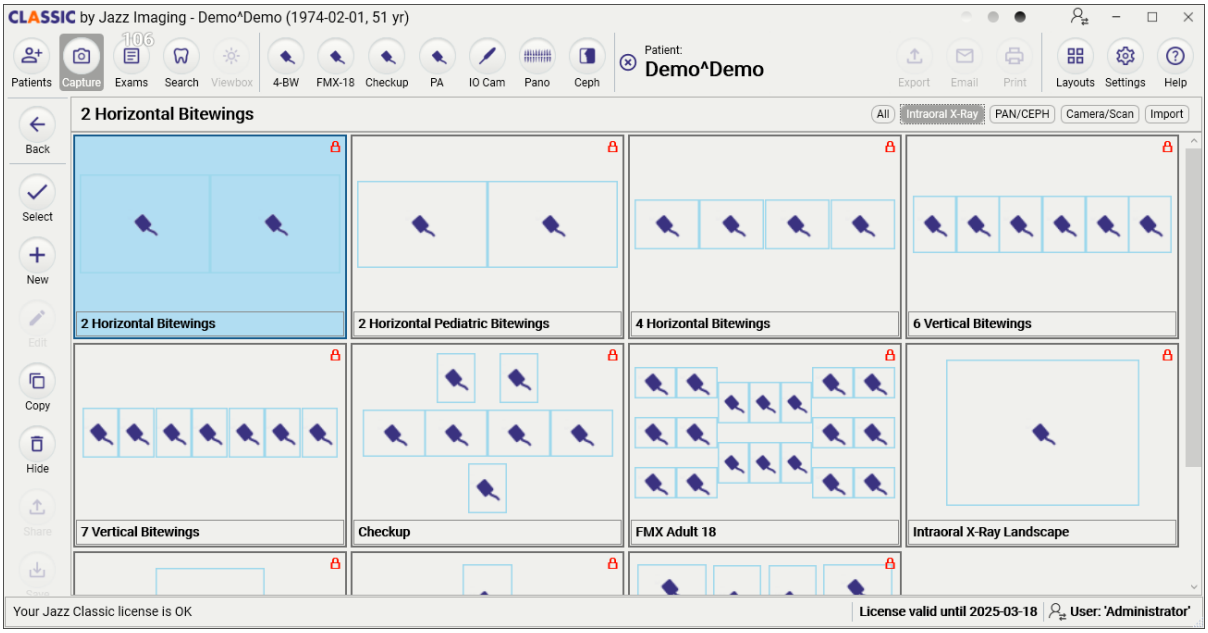
Capturing Intraoral X-Ray Images

X-Ray Image capture normally includes two simple steps:

1) Select the (Intraoral X-ray) Layout/Template to be used.
2) Select whether to utilize Auto-Capture, which automatically advances to next image and arms the sensor for capture, or manually capture the individual images by selecting a tile and then clicking the Manual Capture button for each image.

Start the capture process by clicking the ***Capture*** button 

in the main toolbar. This opens the Layout Selection View:

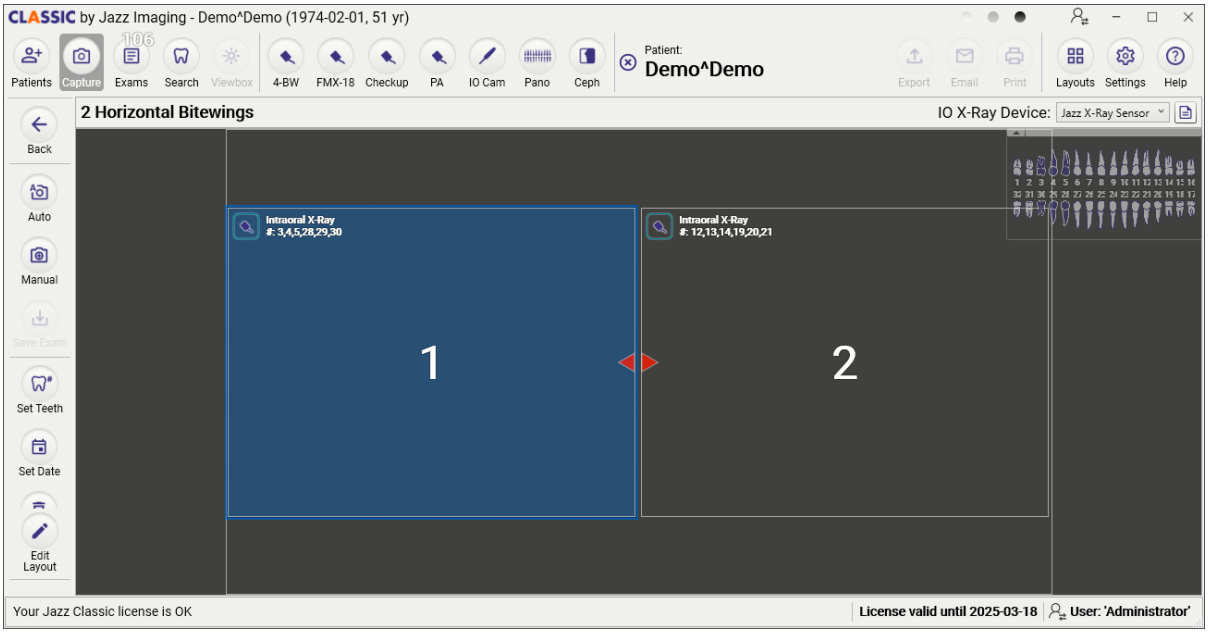


It is now possible to either directly select one of the Templates or filter the list of templates by type by clicking one of the filter buttons above the Layout selection grid:

To proceed with the capture, simply double click the Template that is going to be used or select the desired Layout and click the ***Select*** button 

on the left side toolbar.

This opens the Image Capture View, displaying the selected template:



At this point, the image capture can be started by clicking either the ***Auto Capture*** button 

or the ***Manual Capture*** button 

.

Auto Capture can also be started by simply double clicking the image tile with the Order Number "1" (which is the default selected tile when the Image Capture View is displayed).

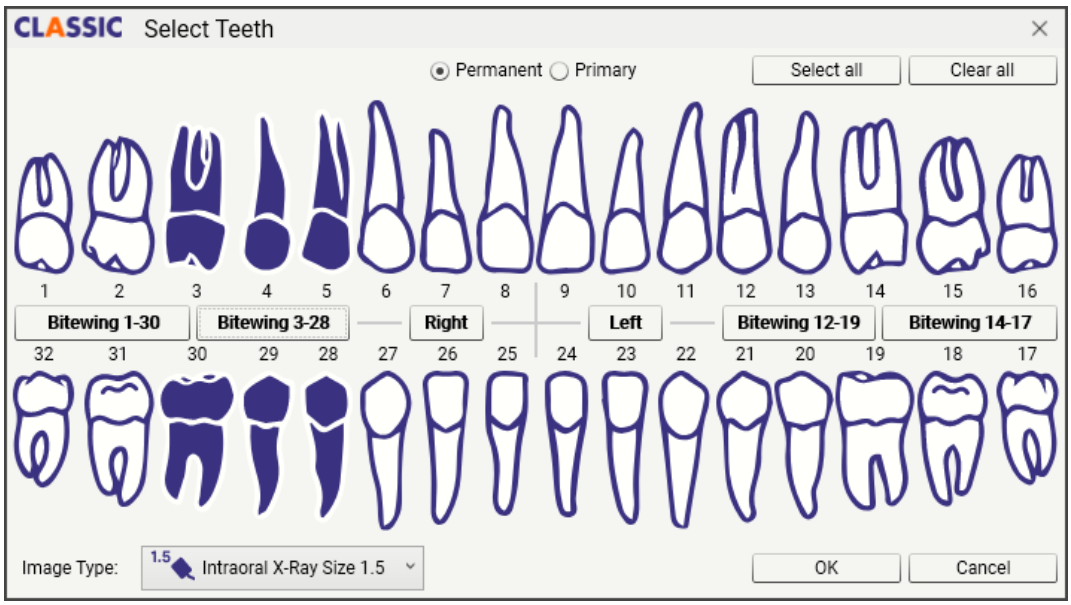
Before starting the actual image capture, please ensure to select the correct ***Capture Device*** from the drop-down list shown in the upper-right corner of the Capture View. The selected Capture Device will be used for capturing all images in the template unless another device is manually selected during the image capture.

Additionally, you can (re)configure the selected Capture Device using the Configure button  next to the Capture Device list. Any changes to the configuration will be stored and used for all image captures by the selected device!

When an image tile is selected, the upper-right side of the Image Capture View will display an opaque "Teeth Overview" of the associated teeth (if any teeth numbers have been specified in the Layout or manually selected by the user). Teeth Overview is provided to assist the user with the placement of the sensors/holders during the image capture.

Moving the mouse cursor over the Teeth Overview removes the opacity, making the Overview image clearer!

If the next image tile in the Layout doesn't have any teeth associated with the image (for instance Horizontal and Vertical PA templates), the user will be automatically prompted to select the teeth numbers before the actual image capture begins:



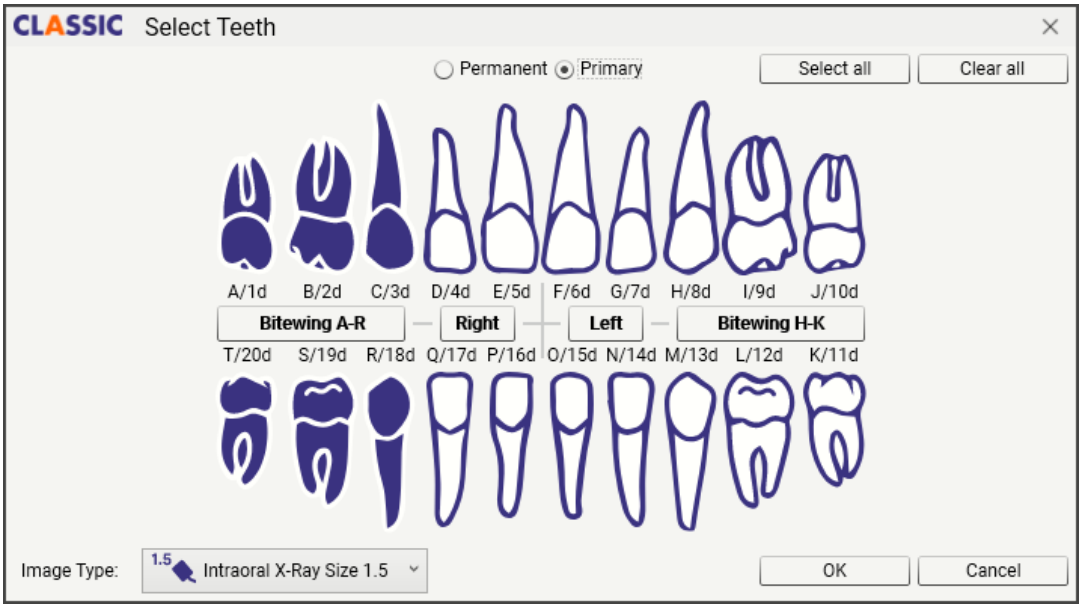
Each tooth can be selected/deselected by clicking the individual tooth, or users can use one of the "quick selection" buttons to easily select bitewings.

By pressing and holding the CTRL key down while selecting teeth, an "anatomical range" of teeth will be selected.

Example 1: If you select tooth #3 and then hold down CTRL key while clicking tooth #28, all teeth within the selected "region" (teeth #3, #4, #5, #30, #29 and #28) will all be selected.

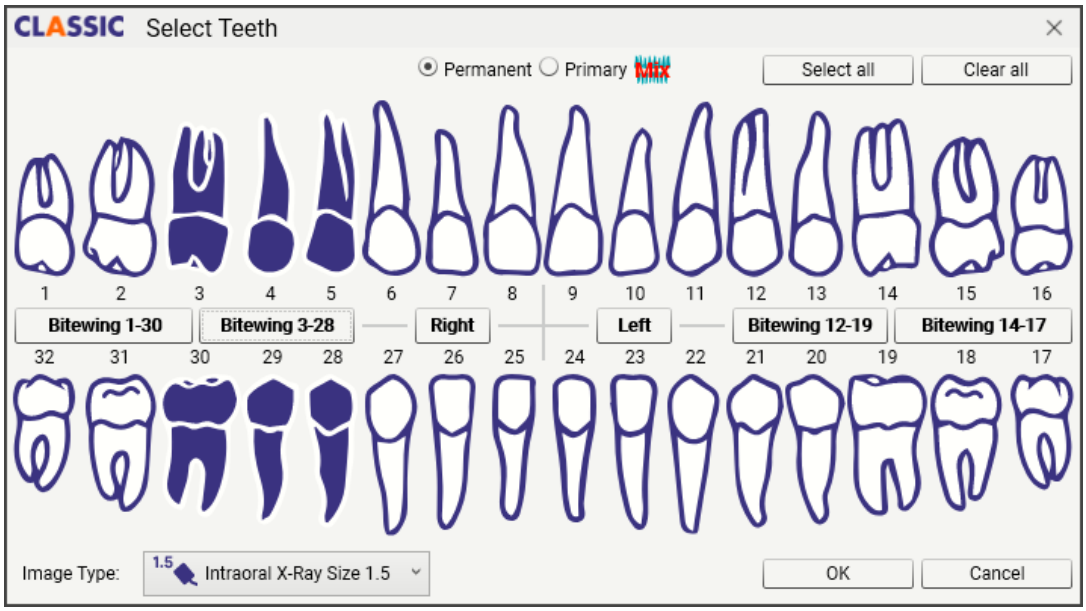
Example 2: If you select tooth #3 and then hold down CTRL key while clicking tooth #5, all teeth within the selected "region" (teeth #3, #4, #5) will be selected.

If the patient is young and has primary teeth, it is possible to switch the teeth selection from the default Permanent dentition into Primary dentition.



It's even possible to create a "mixed dentition" selections if necessary: simply select teeth from both the Permanent Dentition and Primary Dentition views.

When Mixed Dentition is detected, a small icon  is displayed next to the Dentition selection radio-buttons.



It is not mandatory to select teeth numbers before image capture! However, if images are being stored as DICOM images, the teeth information must be selected prior to the capture. Otherwise, the teeth information will not be saved in the DICOM image metadata!

When associated teeth are selected, they will be stored in the Jazz Classic Database. However, it will still be possible to modify the teeth selection at a later point if it is necessary when the Exam is being viewed.

Rearranging Captured Images

If an image has accidentally been captured into a wrong image tile, it can be easily corrected by simply dragging the image to the correct tile location. The template will not change, including teeth numbers and the sensor orientation.

If an image is dragged onto a tile that already has an image, the two images will automatically be swapped. If the destination tile is empty, the image will just be moved to the new tile.

Deleting or Recapturing Images

Any image that has previously been captured into a tile can be deleted or recaptured if the image is unusable.

To delete an image, select the tile that needs to be deleted, then press the ***Delete*** button  on the left toolbar.

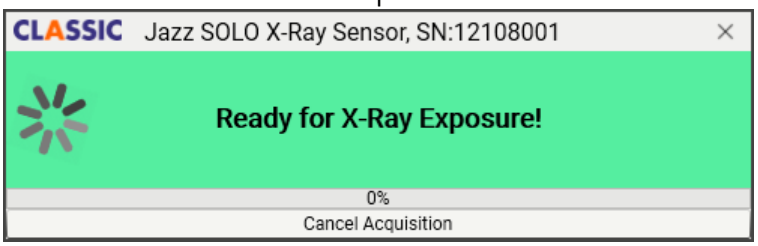
To recapture an image, select the tile that needs to be recaptured, then press the Auto Capture button  or the Manual Capture button  on the left toolbar.

Image Capture Progress

Once the Image Acquisition has started, an Acquisition Progress Window will be displayed to provide progress information during the capture. It displays status information and provides a standardized way for the user to cancel the acquisition if something goes wrong.

The contents and colors used on the Acquisition Progress Window will depend on the selected Capture Device. Below is a typical sequence capturing an image using a Jazz SOLO X-Ray Sensor:

Image Acquisition start...



X-Ray detected by the sensor…

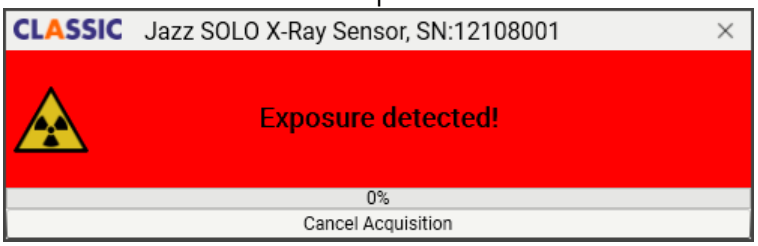


Image is being transferred from sensor to PC...

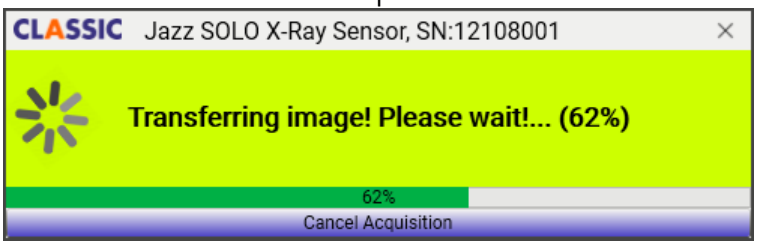


Image is being processed and saved to disk…

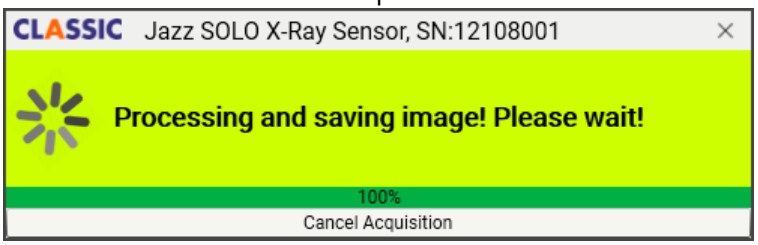


Image Acquisition done!

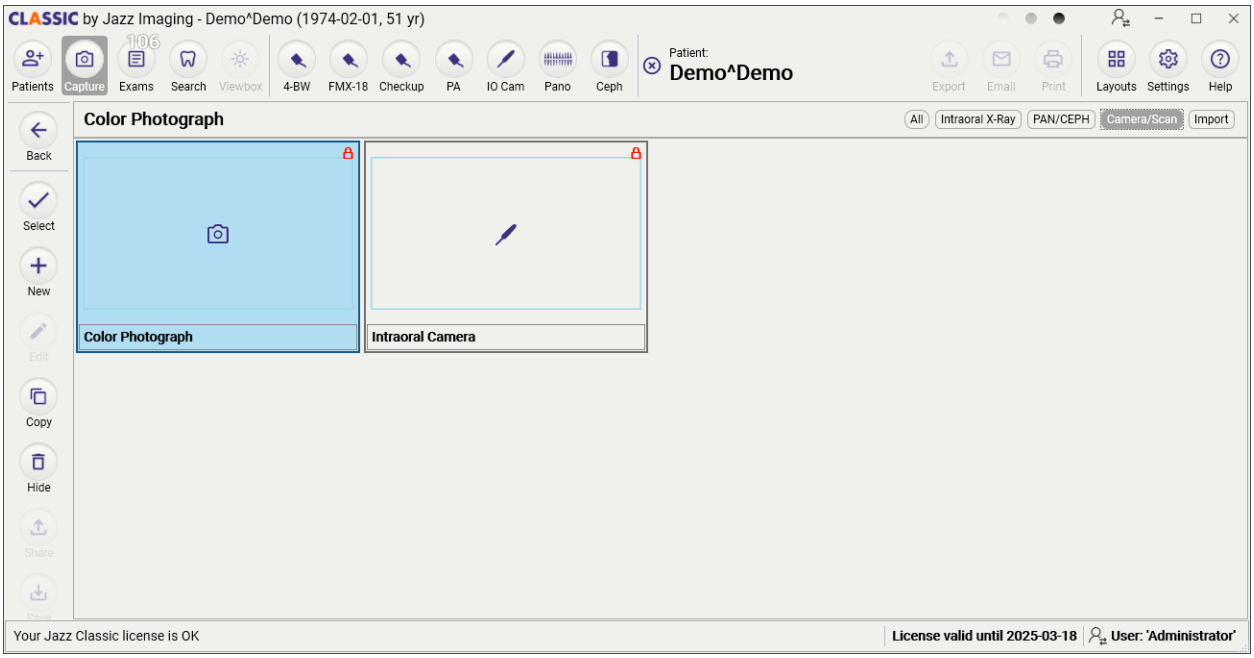
Capturing Intraoral Camera Images

Capturing Intraoral camera images normally includes two simple steps:

1) Select the Intraoral Camera Layout
2) Click either the ***Auto Capture*** or the ***Manual Capture*** button to start acquisition.

Start the capture process by clicking the ***Capture*** button 

in the main toolbar. This opens the Layout Selection View:



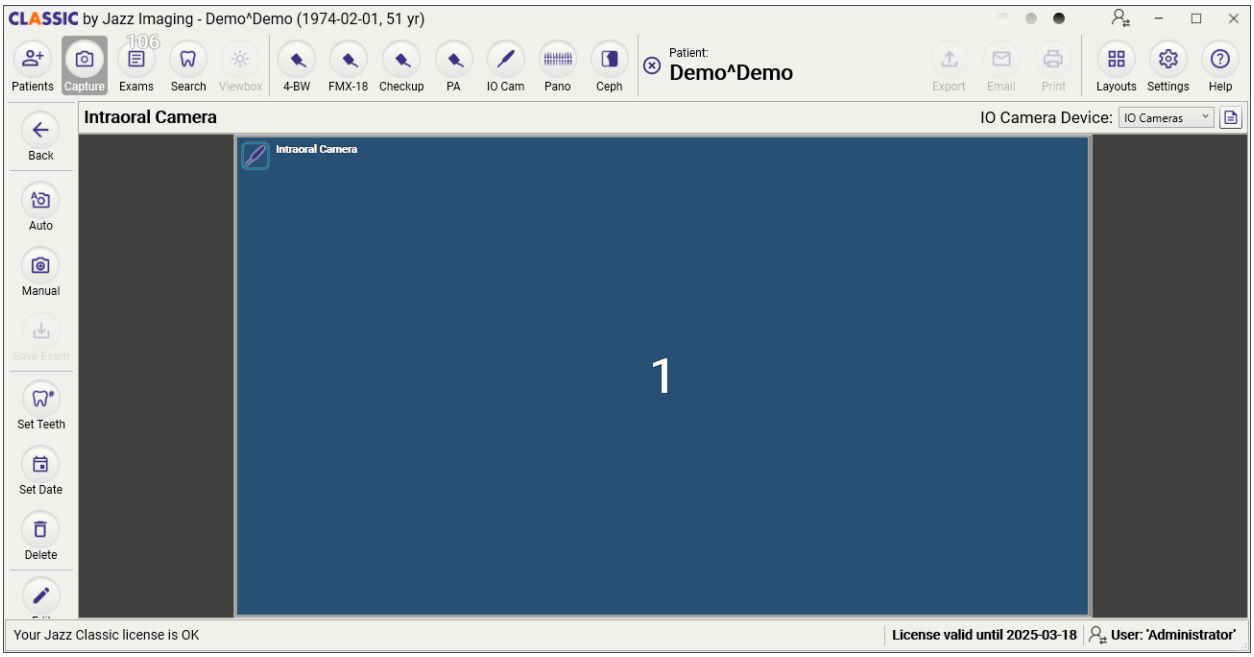
Select the ***Intraoral Camera*** Layout and press the ***Select*** button 

, or simply double-click the ***Intraoral Camera*** Layout. This will display the Intraoral Camera capture View.

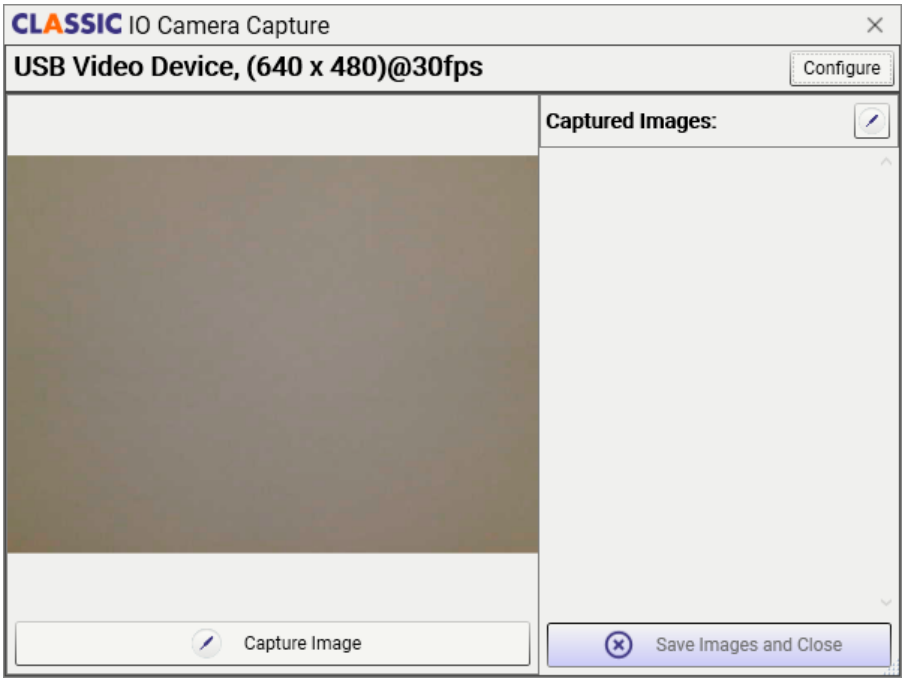
Now ensure to select the IO Camera Device (default ***IO Cameras***, but ***File Import*** may also be used), and press the ***Auto*** capture button 

or the ***Manual*** capture button 

on the left toolbar. The acquisition can also be started by simply double-clicking the Layout tile.



This opens the ***IO Camera Capture*** Window:

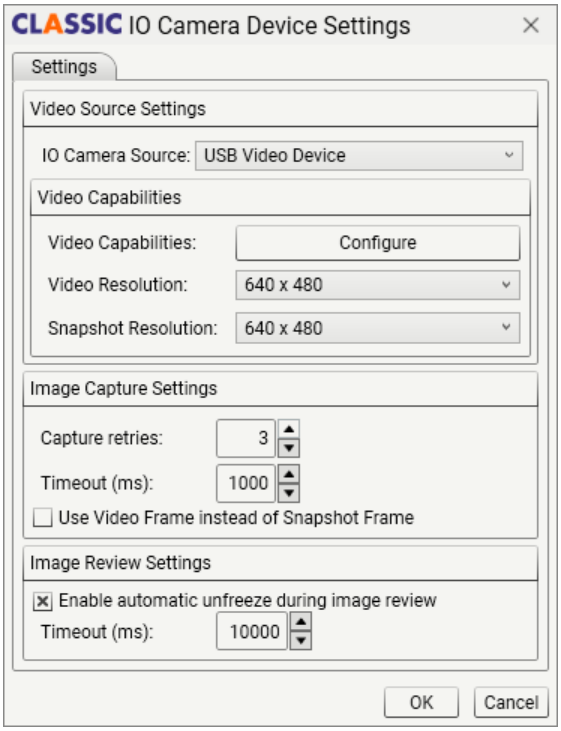


On the left-hand side of the IO Camera Capture window, live video from the camera will be displayed (assuming that the IO Camera device has already been selected and properly configured).

However, the first time you use the IO Camera Capture Window, you'll need to select the IO camera from the list of detected camera devices and ensure the camera is correctly configured.

Configuring the IO Camera

Click the ***Configure*** button to open the IO Camera Device Settings window:



In this configuration window, you're able to select the IO Camera Source from a list (assuming it is plugged into the computer) and configure important settings like video and snapshot resolution (not available on all IO Cameras).

The Video Resolution and Snapshot Resolution are chosen from the list of supported resolutions that your chosen IO camera model reports to the system. The Snapshot Resolution is the image resolution that will be used when the IO Camera images are captured, and the Video Resolution is only used when displaying Live video.

In some IO Camera devices, the highest Snapshot resolution will be smaller than the highest Video resolution. In these cases, it is possible to force the acquisition plugin to use the Video frames instead of the Snapshot frames. This is done by checking the "Use Video Frame instead of Snapshot Frame" in the configuration window!

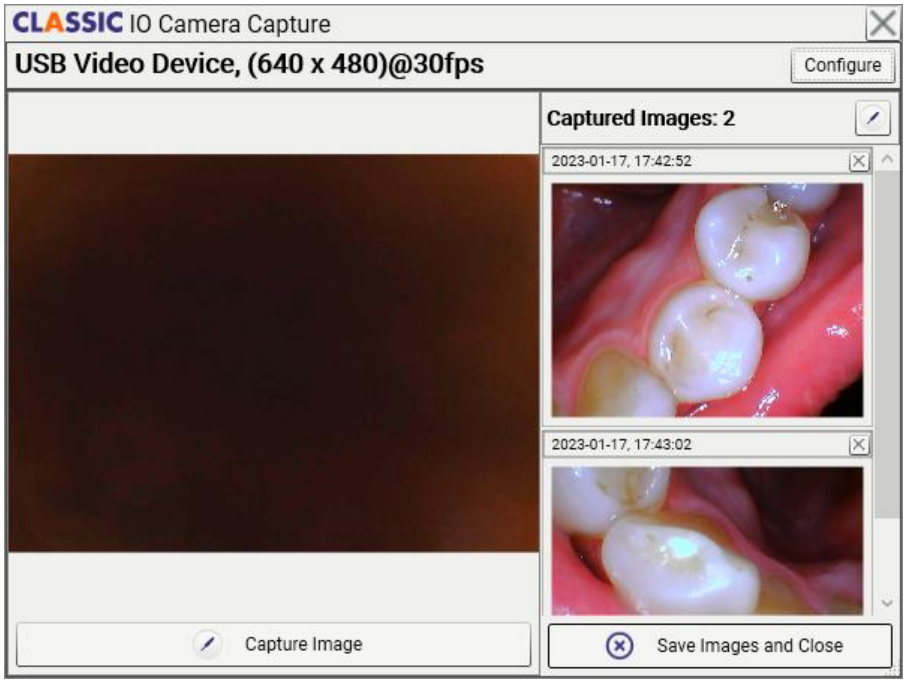
Capturing IO Camera Images

After the settings have been configured, the camera will be able to take images, typically by simply pressing the ***Snapshot*** button located directly on the IO Camera handle.

If the IO Camera device doesn't have a Snapshot button, the images can manually be captured by pressing the "T" key on the keyboard or clicking the ***Capture Image*** button at the bottom of the Capture Window!

Every time a new image is captured, the image will automatically be added to the image list on the right-hand side of the window. The total number of images will be displayed over the image list.

The following example shows two IO Camera images in the image capture list:



Reviewing Captured Images

It is possible to review each captured IO camera images before finalizing the capture session. This is done by simply selecting the image in the image list on the right-hand side of the Window.

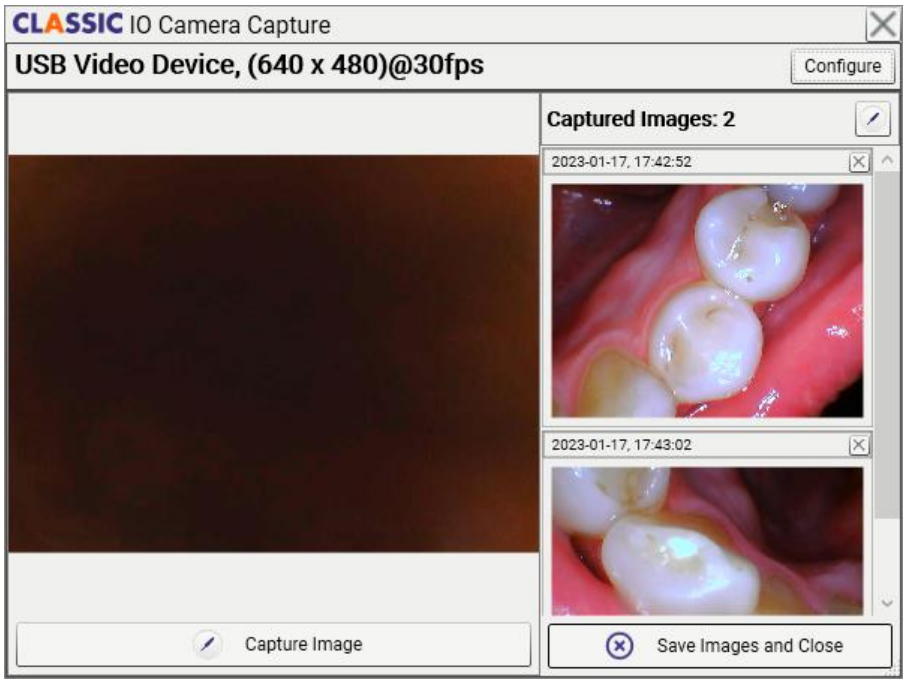
When an image is selected from the list, it will be displayed instead of the Live video image in the main window area. The Live video will restart after 10 seconds or when the user clicks the image display area.

Deleting IO Camera Images

If one or more of the captured images need to be discarded from the right-hand side list, simply click the small [x] in the upper-right corner of the individual image. This will permanently remove the image from the list and hence not be included in the resulting IO Camera Exam.

Saving IO Camera images

After all the required images have been captured, simply click the ***Save Images and Close*** button to proceed or close the window.

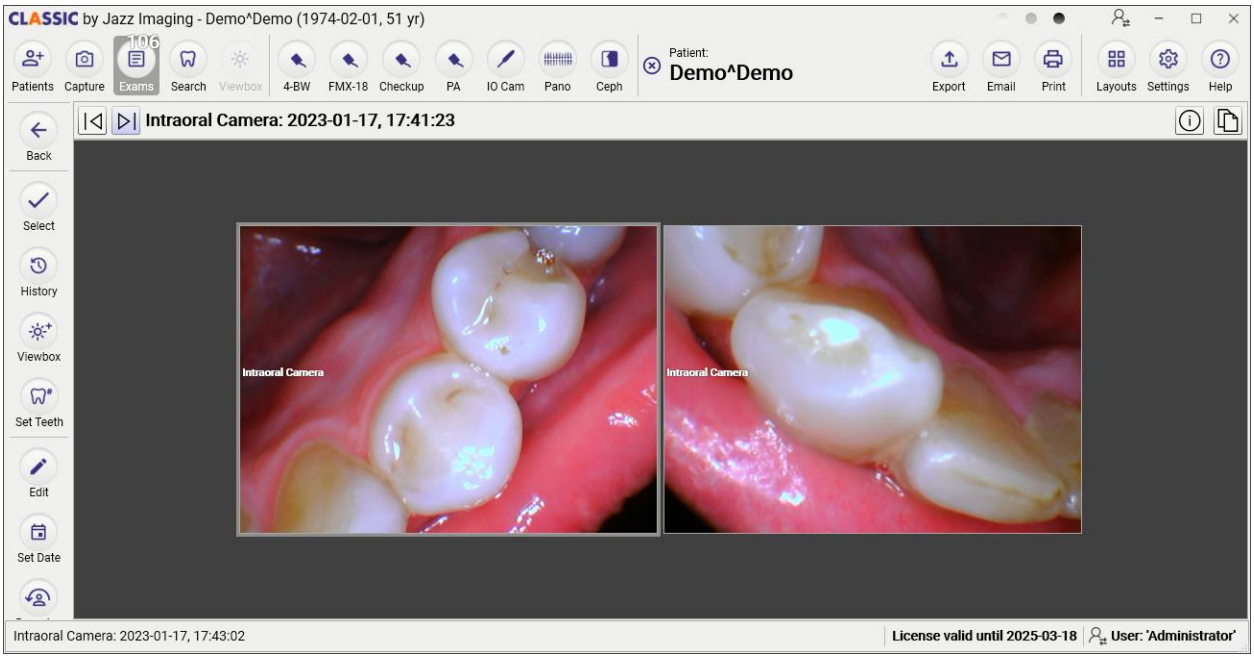


This will close the IO Camera Capture window and return to the Jazz Classic Exam View.

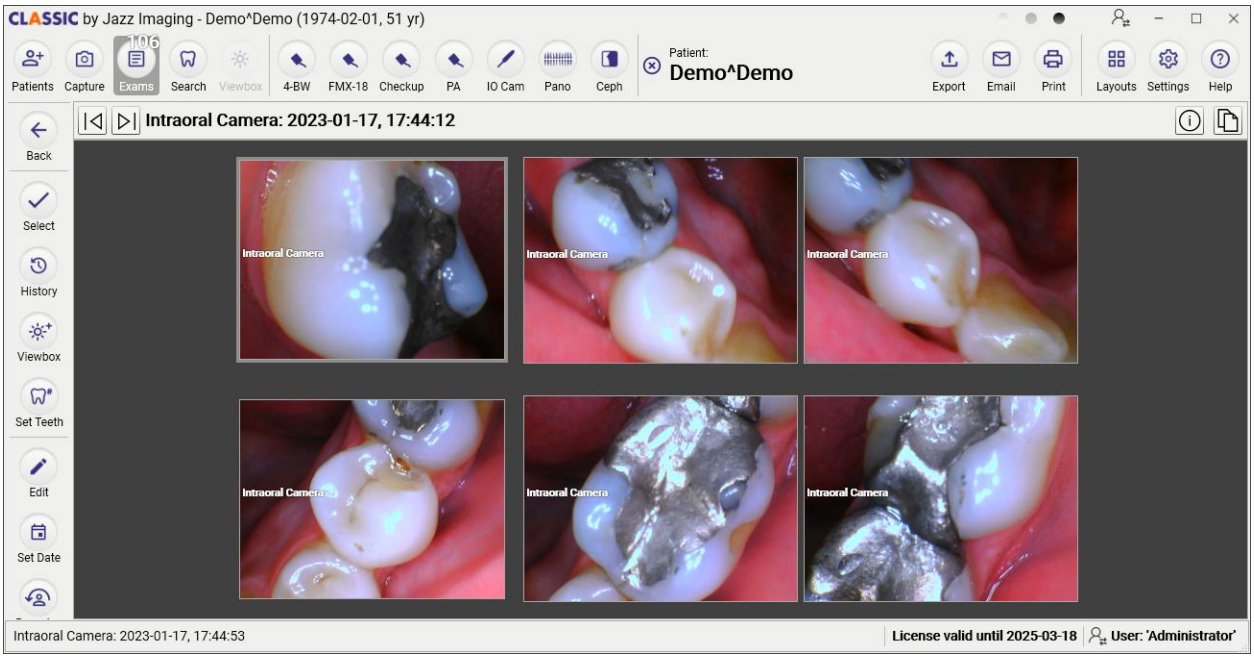
Classic then automatically generates a new Exam where all the captured images are arranged in a grid.

The IO camera images are automatically arranged in a grid, so the number of rows and columns depends on the total number of images captured. If, for instance, nine images are captured, the exam will contain a grid with 3 rows and 3 columns.

The following example shows an IO Camera exam with two captured images:

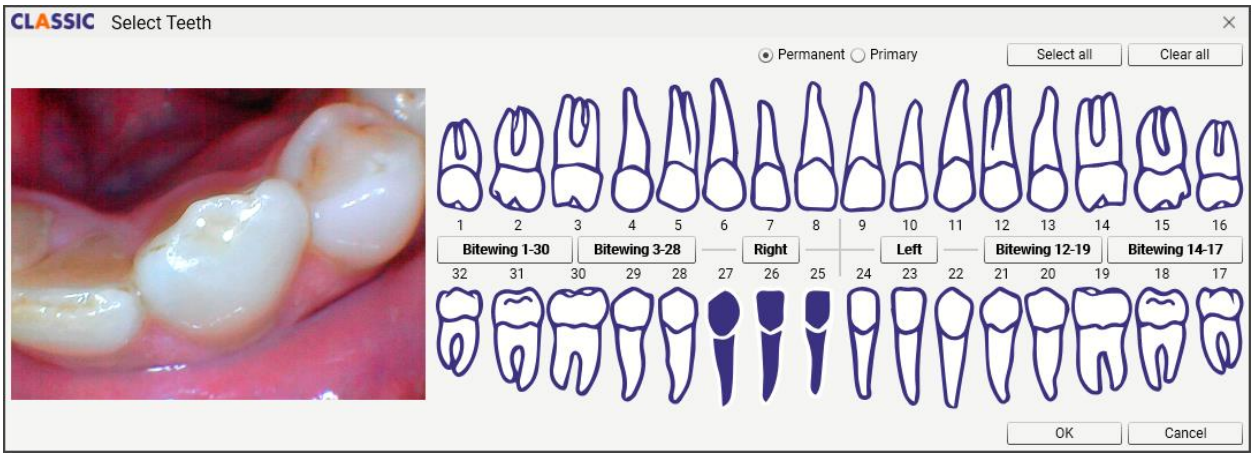


This following example shows an IO Camera exam with six images. These six images are automatically arranged and displayed in a 3x2 grid:



Setting Teeth Numbers

Before the IO Camera Exam is saved in the database, Classic will run through all the captured IO Camera images and ask the user to select the teeth numbers for each individual image:



If the user clicks the **Cancel** button, then the Exam will be created without any further prompts.

The teeth numbers can also be changed/assigned for the individual images by using the ***Set Teeth*** button 

at any time.

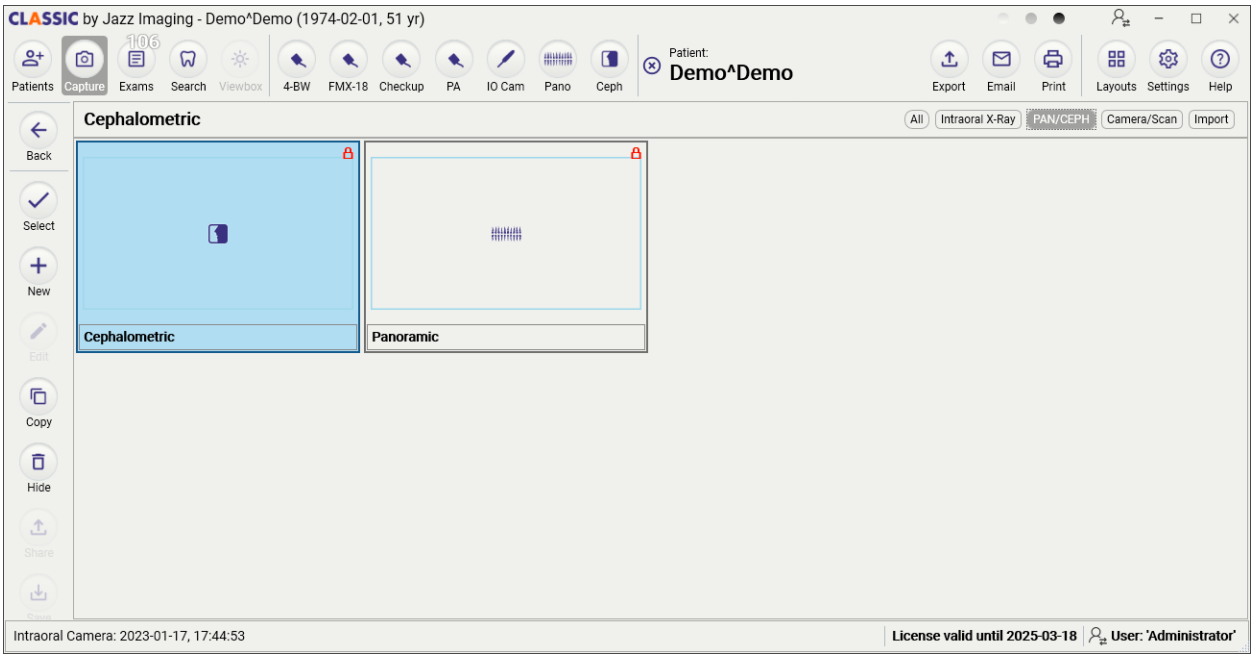
Capturing Extraoral Panoramic and Cephalometric images

Capturing Pan/Ceph images normally includes two simple steps:

1) Select either the Panoramic Layout or the Cephalometric Layout
2) Click either the ***Auto Capture*** or the ***Manual Capture*** button to start acquisition.

Start the capture process by clicking the ***Capture*** button 

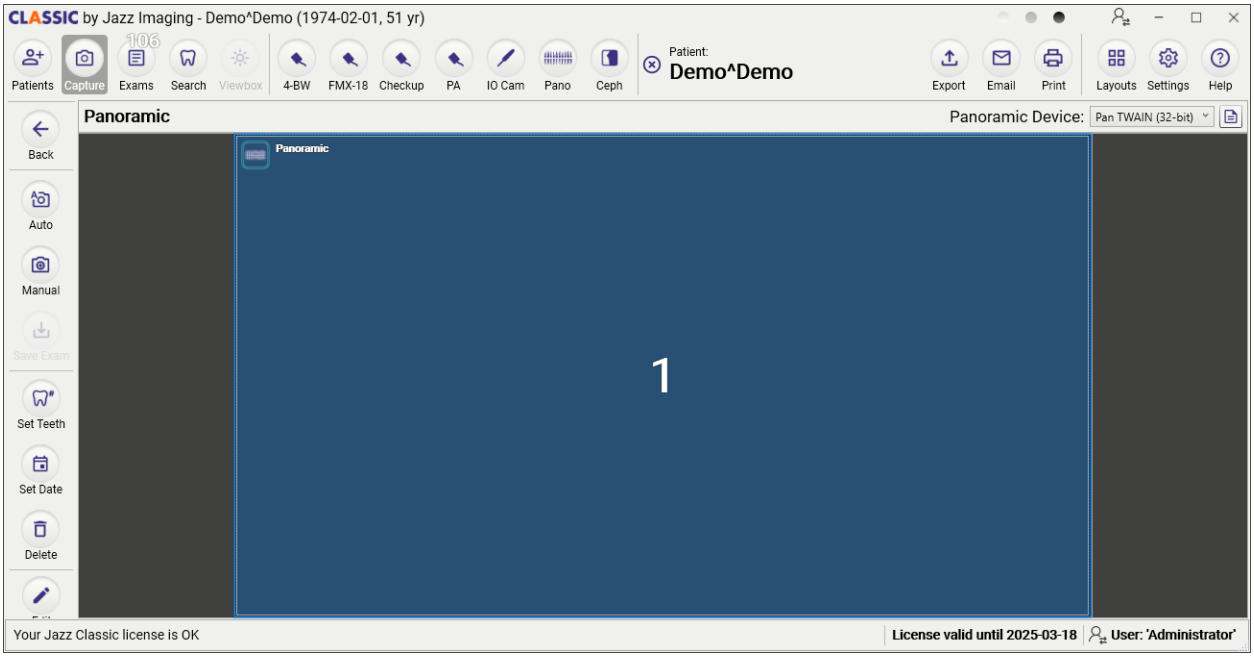
in the main toolbar. This will open the Layout Selection View:



Select either the Panoramic or Cephalometric Layout and press the ***Select*** button 

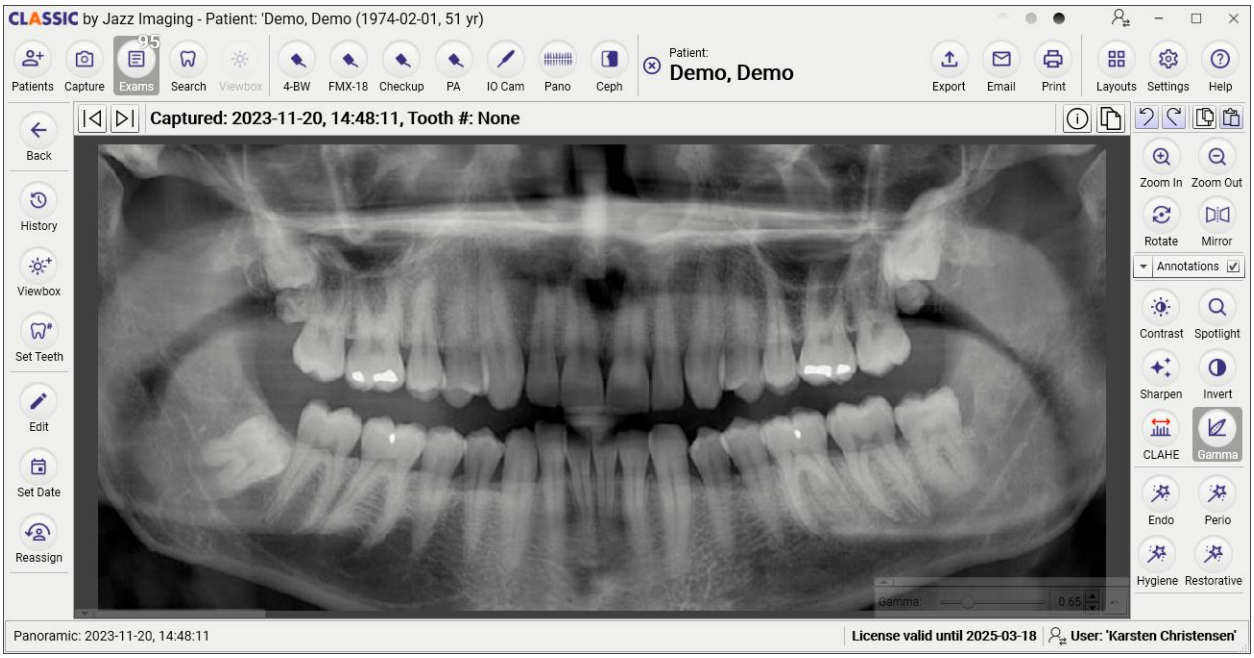
, or simply double-click either the Panoramic or Cephalometric Layout.

The following example shows the Panoramic capture view.

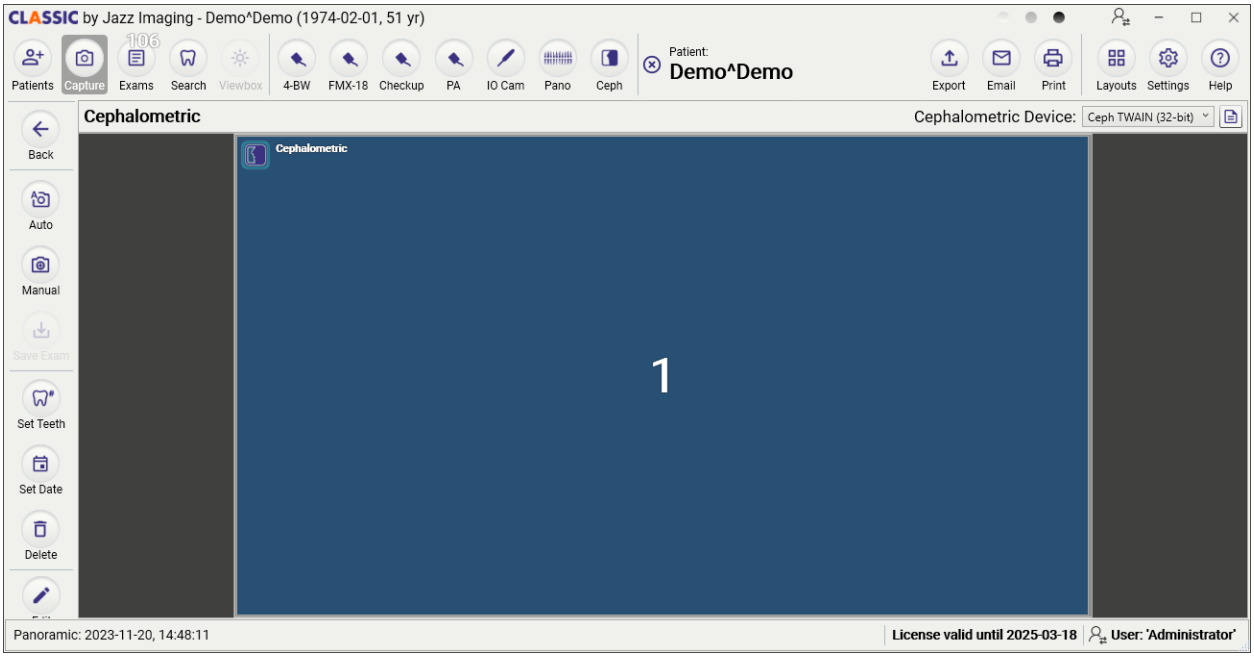


Select the Panoramic Device (default is ***Pan TWAIN***, but file imports might also be used) and either press the ***Auto Capture*** or the ***Manual Capture*** button or double-click the Layout tile to start acquisition.

The list of Panoramic devices contains two TWAIN entries: one 64-bit version named ***Pan TWAIN*** and a 32-bit version named ***Pan TWAIN (32-bit)***. Most Panoramic hardware manufacturers only provides a 32-bit version of their TWAIN Data Source, so you might only be able to find the Pan TWAIN device in the 32-bit device list.

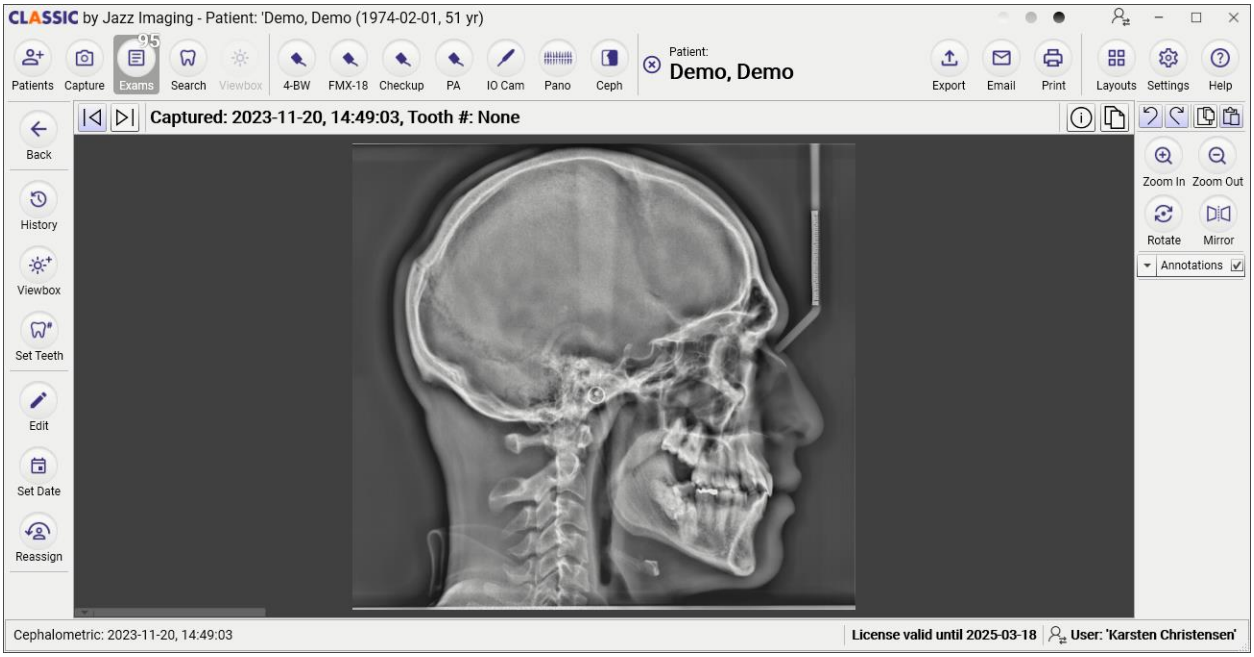


The following example shows the Cephalometric capture view.



Select the Cephalometric Device (default is ***Ceph TWAIN***, but file imports might also be used), and either press the ***Auto Capture*** or the ***Manual Capture*** button, or double-click the Layout tile to start acquisition.

The list of Cephalometric devices contains two TWAIN entries: one 64-bit version named ***Ceph TWAIN*** and a 32-bit version named ***Ceph TWAIN (32-bit)***. Most Cephalometric hardware manufacturers only provides a 32-bit version of their TWAIN Data Source so you might only be able to find the Ceph TWAIN device in the 32-bit device list.



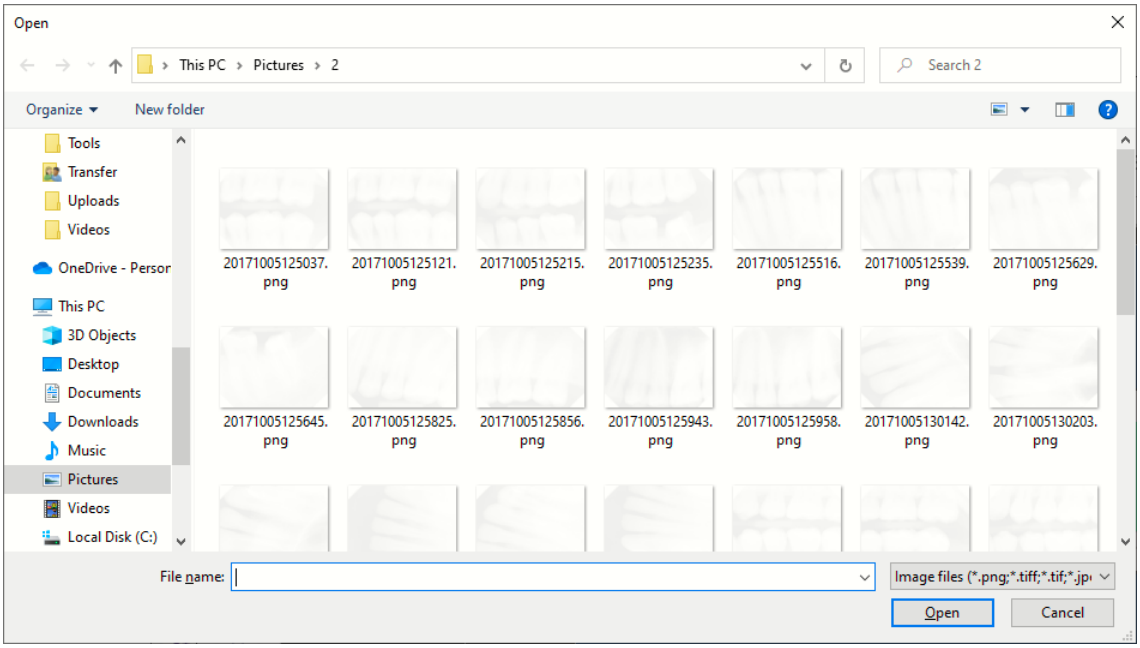
Importing Images

Importing images normally includes two simple steps:

1) Select the Import Layout
2) Click either the ***Auto Capture*** or the ***Manual Capture*** button to start acquisition.

Start the image import process by clicking the ***Capture*** button 

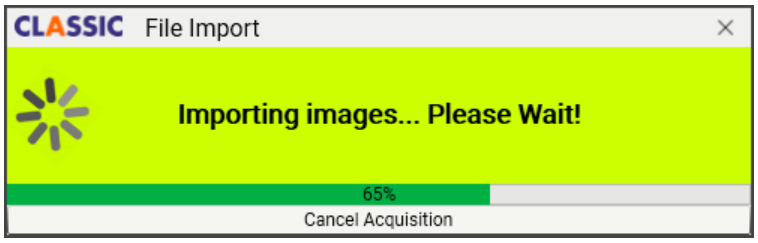
in the main toolbar. This will open the standard Windows File Selection window where one or multiple images can be selected.



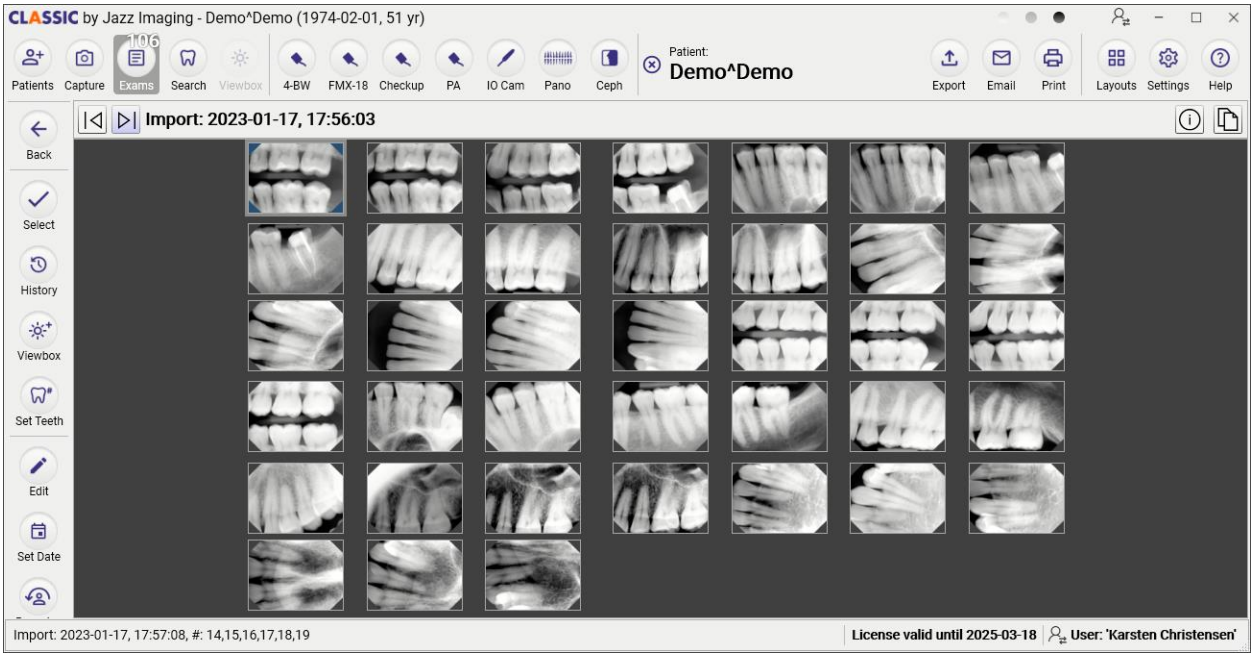
The following image file formats are currently supported by Jazz Classic:

File type	Extension	Description
PNG images	.png	Portable Network Graphics. Lossless bitmap image format with support for transparency via separate alpha-channel.
TIFF	.tif, .tiff	Tagged Image File Format. Typically used with lossless LZW compression.
JPEG	.jpg, .jpeg	Joint Photographic Experts Group. Lossy compressed file format.
DICOM	.dcm, .sc, .crio, .pano, .ceph, .rvg	DICOM images. Typically contains metadata about the patient and anatomy. The extensions .sc, .crio, .pano, .ceph and .rvg are typically used as DICOM file extensions by Carestream. However, Jazz Classic currently only supports 10-bit, 12-bit, 14-bit, and 16-bit monochrome DICOM images.

If more than one image is being imported, a File Import dialog will be displayed, and the progress will be shown during the import process.



All the imported images will be arranged and displayed inside the new Exam as a grid, and the number of rows and columns are automatically calculated based on the total number of imported images.



Setting Teeth Numbers

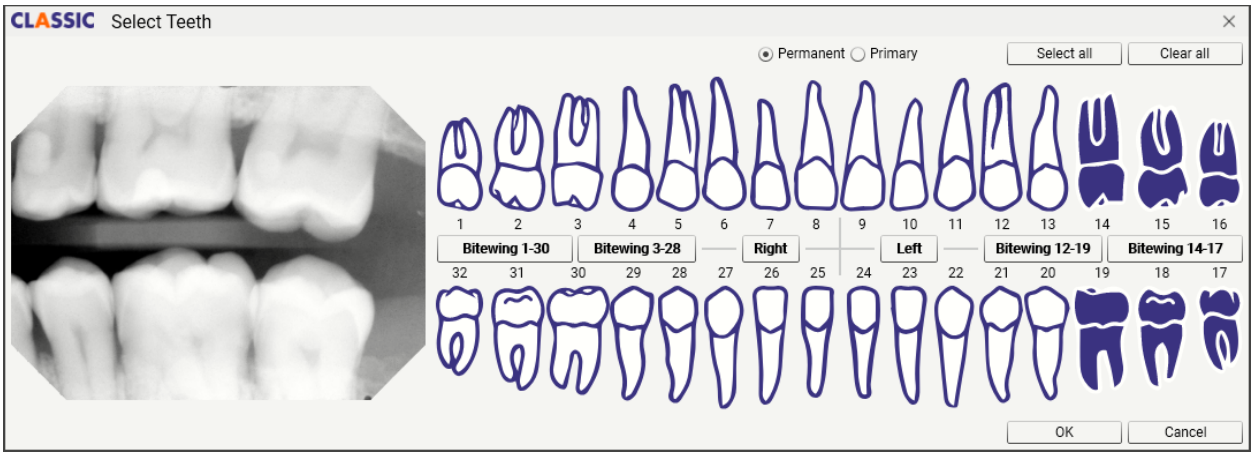
Since the imported images typically don't have information about the associated teeth numbers for individual images, we recommend users to always assign teeth numbers.

Before the Imported Exam is saved in the database, Classic will run through all the imported images and ask the user to select the teeth numbers for each individual image.

This can also be done by selecting an image and click the ***Set Teeth*** button 

as shown above.

This will open the ***Select Teeth*** window:



If the user clicks the **Cancel** button, then the Exam will be created without any further prompts.

Users can specify both Primary and Permanent teeth numbers, as well as creating mixed dentitions if necessary.

These teeth numbers can then be used later to search for specific teeth of the selected patient across multiple exams, either by using the ***History*** 

feature during image review or while performing regular teeth ***Search*** 

from the main toolbar.

Capturing Images Using Acquisition Shortcuts

Most operators will use the same few acquisition templates repeatedly, so Jazz Classic has built-in ***Acquisition Shortcuts*** that both simplifies and speeds up the most common capture operations.

The Acquisition Shortcuts are located on the main toolbar and make it possible to start a new Exam capture with a single click of the mouse.

Each Acquisition Shortcut button references a specific Layout (like “Checkup” or “FMX Adult 18”) as well as a specific Acquisition Device Type (such as IO X-ray, IO Camera, or Panoramic). It then references a specific Acquisition Device (like Jazz SOLO or Schick 33), or simply the last selected acquisition device for the Acquisition Device Type.

For instance, to start a new FMX-18 acquisition, the user simply clicks the *FMX-18* Acquisition Shortcut button. This automatically selects the “FMX Adult 18” Intraoral X-Ray template and starts the acquisition using the currently selected IO X-Ray device.

The Acquisition Shortcut buttons can be edited in the Settings window, where the number of shortcuts can be changed, and other templates and acquisition devices can be selected by the users. A maximum of 10 Acquisition Shortcuts can be defined at one time.

Viewing a Patient's Images

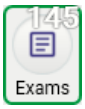
Once a patient record has been opened, all the Exam images captured for the selected patient can be viewed.

Jazz Classic provides two different options for how to access and view a patient's images.

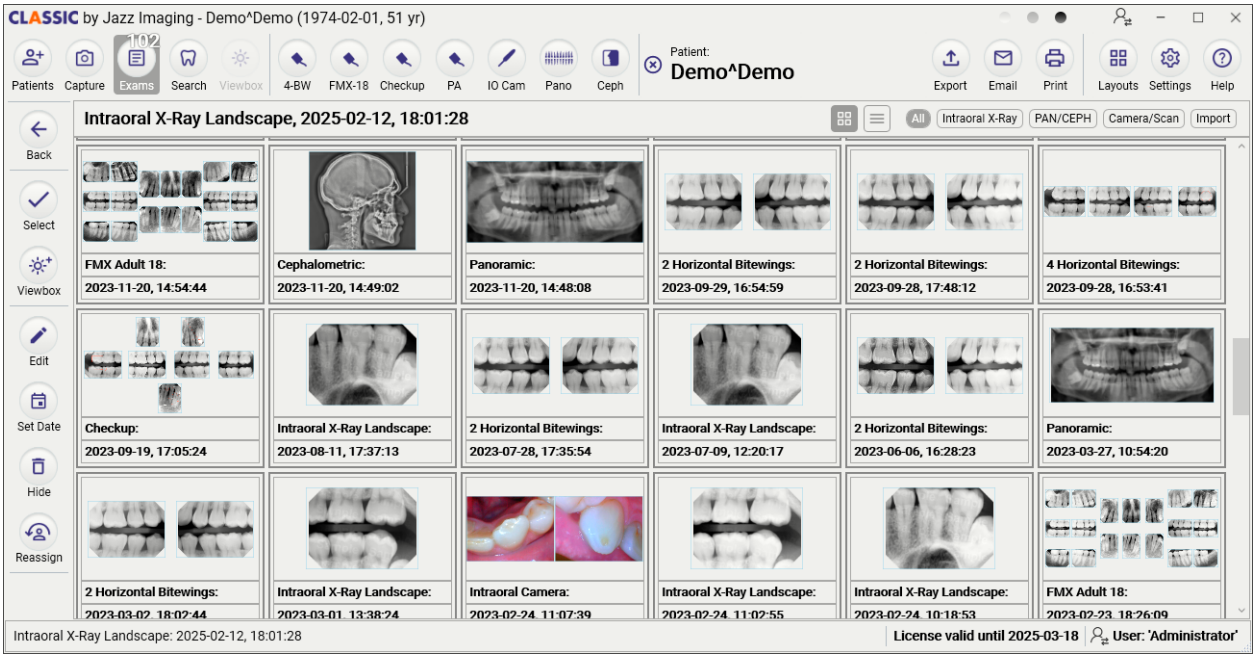
- Select a specific Exam
- Search for specific Teeth across all Exams

Selecting a Specific Exam

When a patient is selected, the ***Exams*** button's "overlay" directly indicates how many Exams have been captured for the selected patient. The following example demonstrates that there are currently 145 Exams recorded for the patient:



Clicking the **Exams** icon  on the main toolbar displays the ***Exams Selection*** view.



The layout of the Exam Selection View can be customized using the two buttons on the top of the main view area.

You have two options: 

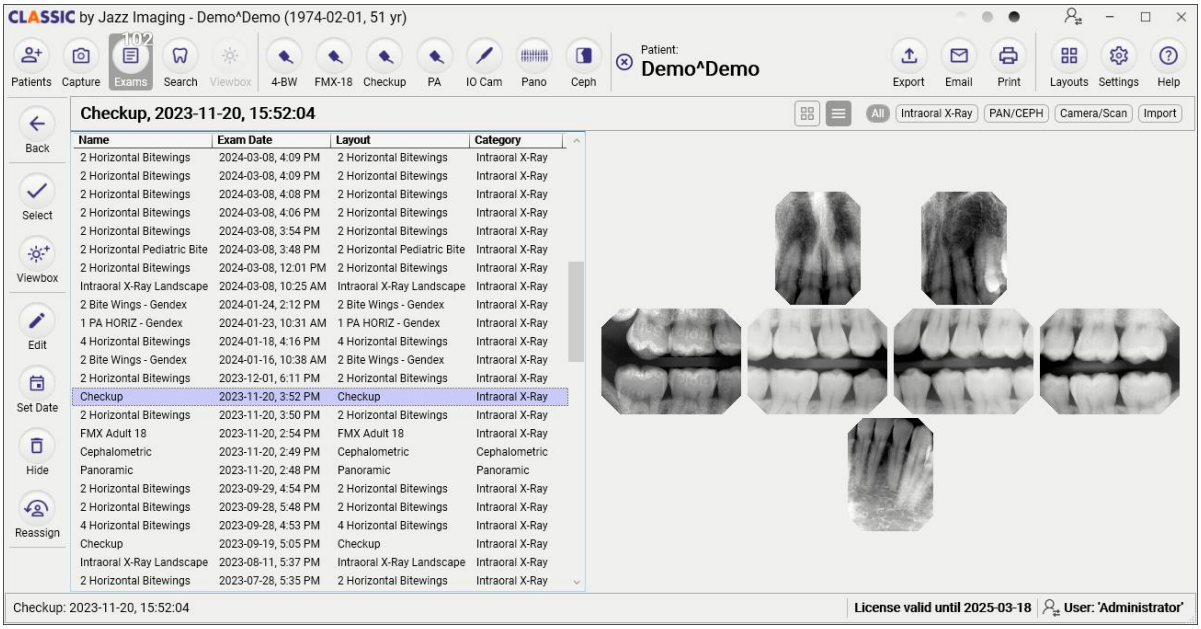
- Grid View
- List View

The default Exam Selection view is the Grid View where all the Exams are displayed as miniature Layouts that are sorted with the ***newest*** Exam on top and the oldest at the opposite end of the grid.

To open one of the listed exams, either double-click the Exam tile in the grid or select the Exam tile and click the ***Select*** button 

on the left-side toolbar.

The Exams Selection can be switched into a 'split' list view, with a preview of the selected Exam on the right-hand side of the screen, by clicking the List button:



The exams are sorted chronologically by default, with the newest exam on top. However, clicking the header fields on the Exam list allows sorting by either Name, Exam date, Layout type, or the exam Category.

Additionally, the Exam Selection can be filtered by choosing one of the following "categories" using the filter buttons above the exam selection view:

- All Exams
- Intraoral X-ray
- PAN/CEPH
- IO/Camera/Camera/Scan/Photos
- Import

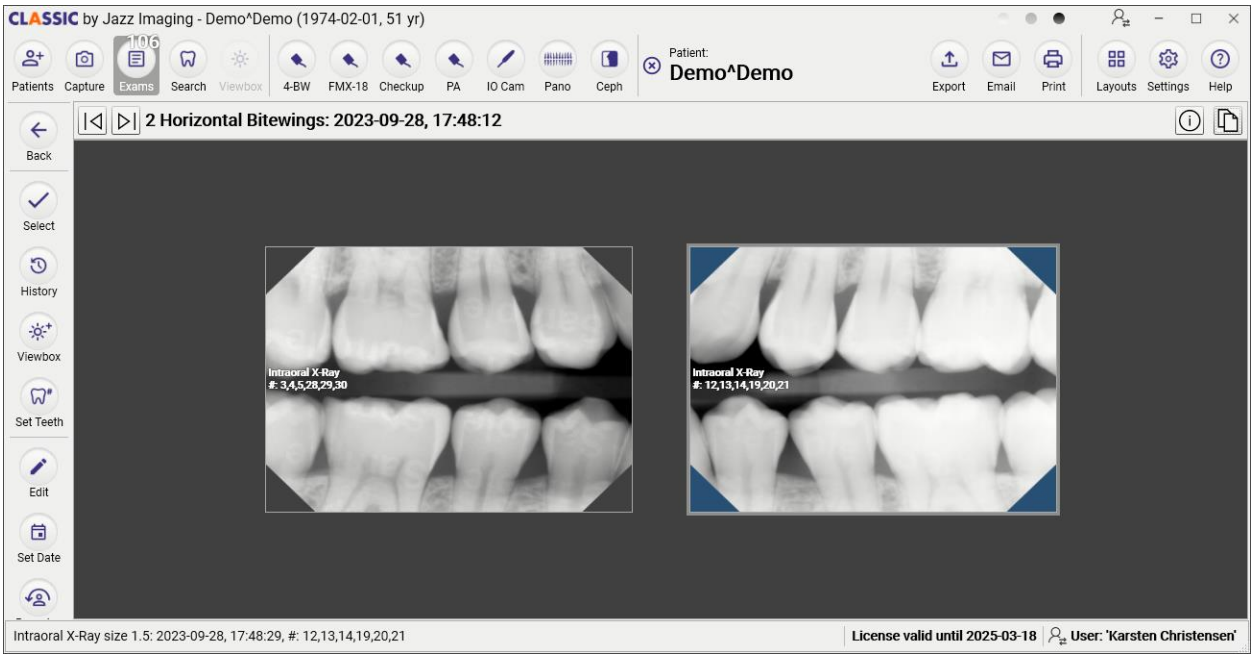
This narrows the list of Exams according to the selection, making the selection somewhat easier.

Viewing Individual Images Within an Exam

When an Exam is selected, you can view and process the individual images within the Exam.

If the Exam contains more than one image, an ***Exam Overview*** will initially be displayed. The images will be arranged according to the selected Layout when the Exam was originally created.

However, if only a single image has been acquired, the full image will be displayed immediately to save the additional mouse click.



If the Classic AI Plugin feature is enabled and a supported AI provider subscription is properly configured, Classic can automatically upload images to the selected AI provider's portal and retrieve the corresponding AI findings once processing is complete.

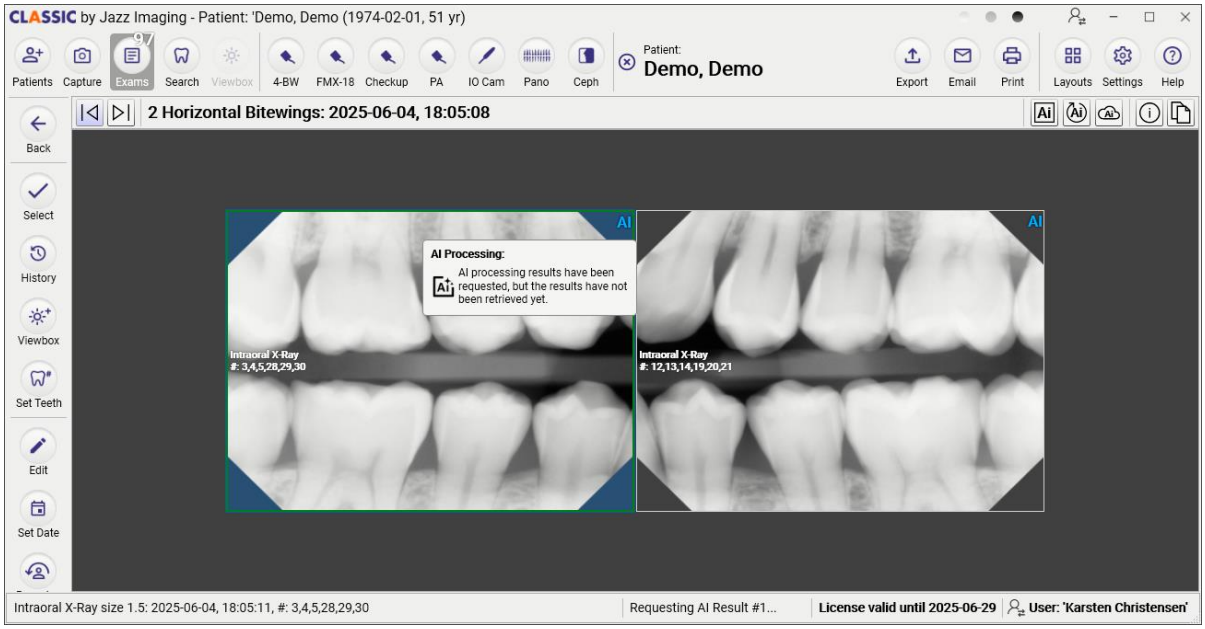
The AI processing time may vary based on the image content and the specific AI provider, but results are typically available for display within approximately 30 seconds.

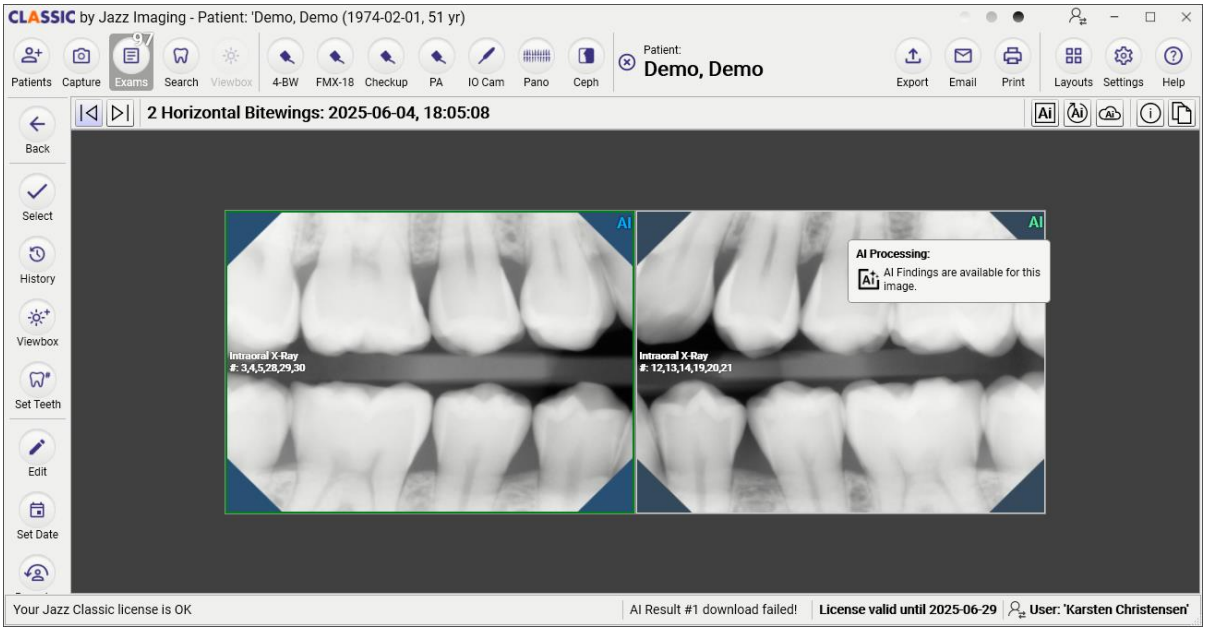
Viewing AI Findings

With the AI Plugin feature enabled in Classic, the Exam Overview image will display the current status of the AI processing, along with additional AI Plugin buttons for manually controlling image uploads, retrieving AI findings, and accessing the AI provider's portal.

In the upper-right corner of an Exam Overview image, you will see an "AI" indicator. The color of this indicator reflects the current status:

- **Blue "AI" -** The image has been successfully uploaded to the AI provider's portal
- **Green "AI"** - The AI findings have been successfully retrieved and are ready to view as an overlay on the X-ray image.





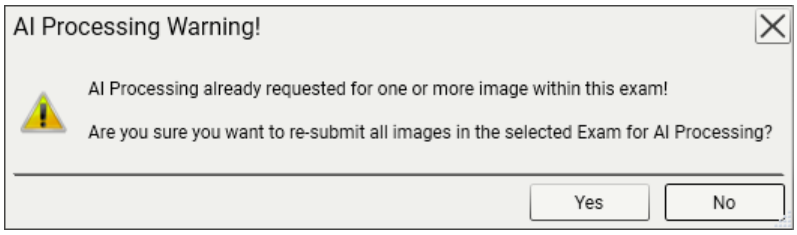
The Exam Overview toolbar includes three AI-specific buttons, as shown in the image below:

Request AI processing

The  button allows you to manually request AI processing for all images within the selected exam. While image submission normally occurs automatically when new images are captured, this button can be used to:

- Re-submit images for processing
- Submit older images taken before the AI Plugin feature was enabled

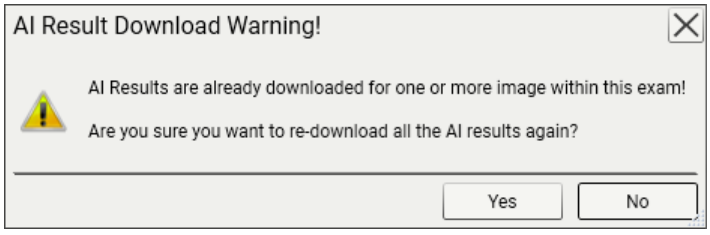
If the images have already been submitted, you will be prompted to confirm whether you want to re-submit all images for processing.



Download AI Results

The  button requests the download of the AI processing results for all images within the selected exam. Normally, results are downloaded automatically once AI processing has been completed. However, if the user wants to re-download the AI findings, this button can be used.

If the AI findings have already been downloaded, you will be prompted to confirm whether results should be re-downloaded.



Access AI Portal

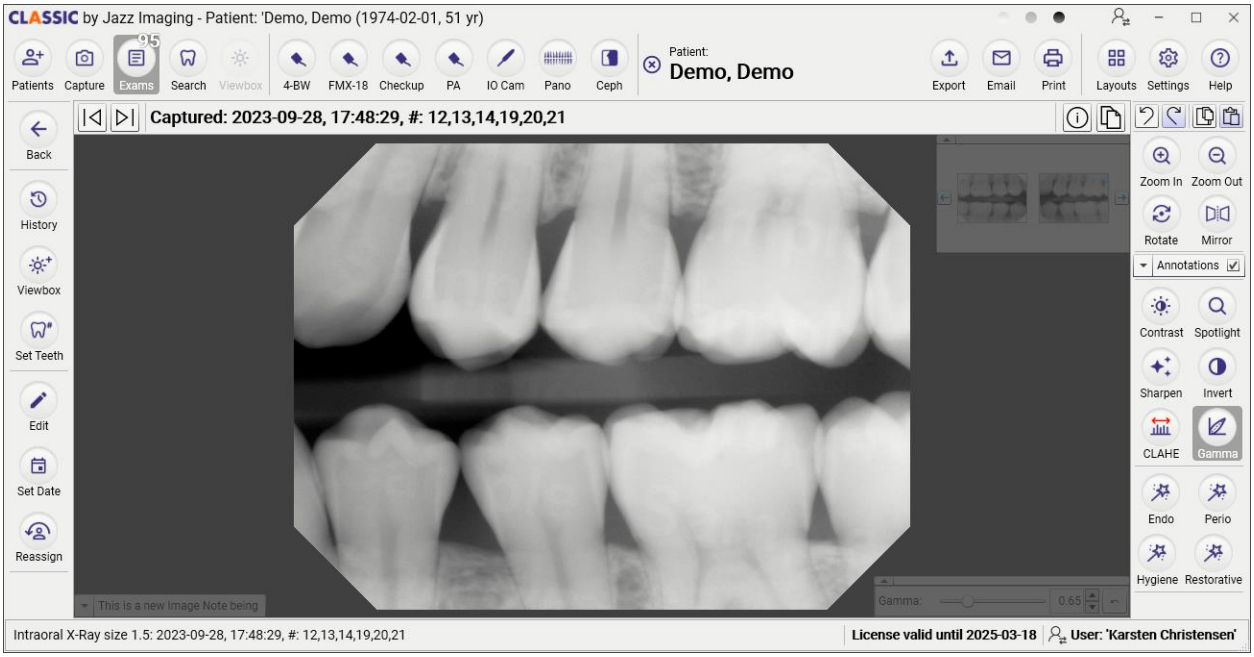
The  button opens the selected exam directly in the AI provider's portal, allowing you to view the images and associated AI findings within the provider's interface[2].

[2] Not all AI Providers supports this feature so this button might instead redirect to the landing page portal for the selected patient, and not the page for the specific Exam.

In the Exam Overview, you can get a detailed view of any of the captured images by either double-clicking the image tiles or by selecting one of the images and clicking the ***Select*** button 

on the left-side toolbar.

This will open a detailed image view where the image can be manipulated to fit the needs of the user:



At this point, it is now possible to View and Process the selected image.

The detailed image view contains a semi-transparent Exam Overview in the upper-right corner. You can easily navigate between the individual exam images by clicking the small thumbnail pictures in this overview window. The left/right arrows will step back/forward within the exam images, following the original capture order for the images.

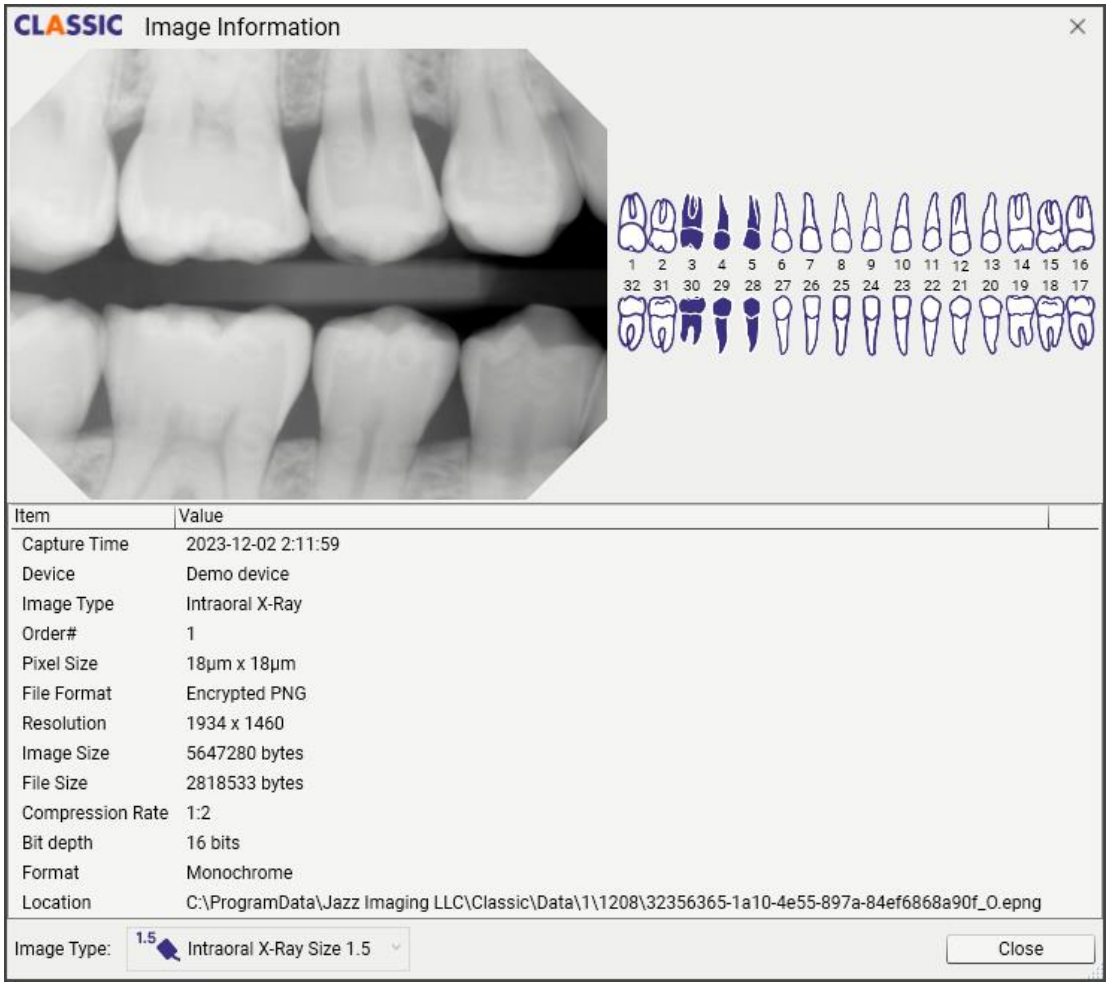
In the upper left corner of the Detailed Image View window, two Exam Navigation buttons () make it easy select the Previous or the Next exam for the selected patient.

Displaying Detailed Image Information

In both the Exam Overview and the Detailed Image View, you can get detailed information about the selected image by simply pressing the ***Image Info*** button (ⓘ) located right above the image, to the right-hand side of the image capture and teeth details.

The Image Info button will open an Image Information window that contains details about the ***Original*** captured image file, such as:

- Teeth associated with the image
- Capture date and time
- Capture device
- Imaging device type
- Image resolution
- Pixel size (in micrometers)
- File format
- Image size
- Compression Rate
- Bit depth
- Pixel format

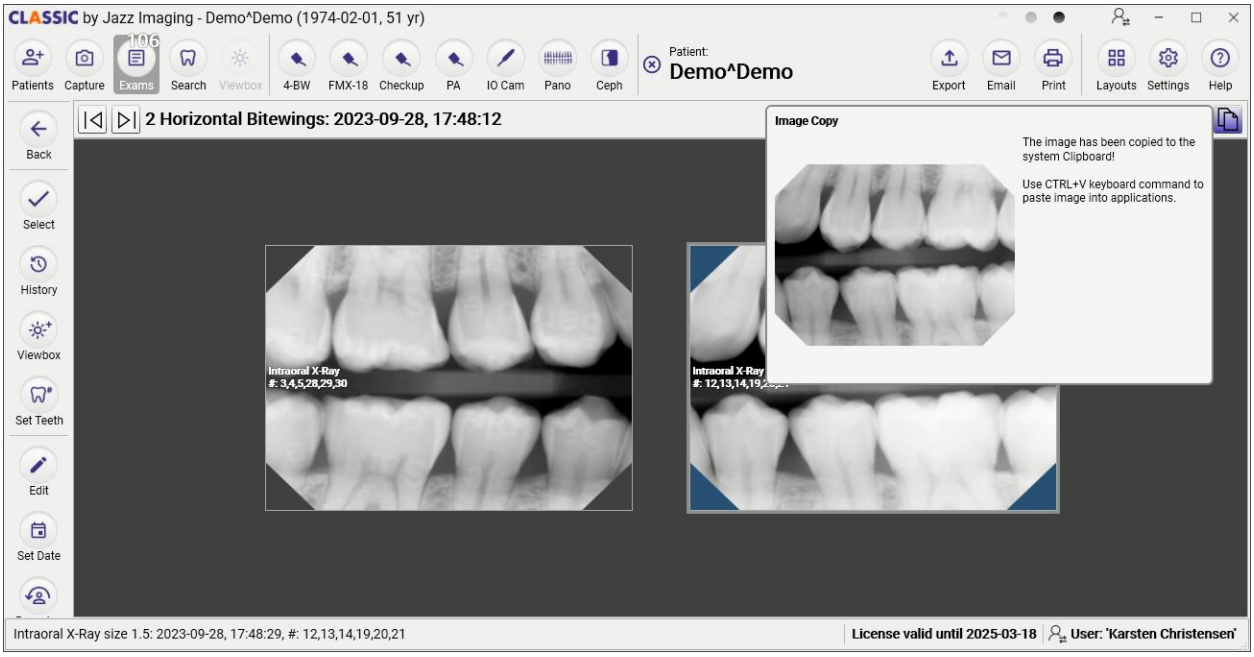


Copying Images to the Windows Clipboard

In both the Exam Overview and the Detailed Image View, you can copy the selected image into the Windows Clipboard to easily paste it into any 3rd party application that can utilize the Windows Clipboard for adding images. Simply press the ***Image Copy*** button ( ) located above the image to the right-hand side of the Image Info button.

The selected image can also be copied to the Clipboard using the standard key-combination CTRL+C and pasted into other applications using the standard key-combination CTRL+V.

If the image is successfully copied to the Windows Clipboard, a popup message will be displayed containing a preview of the copied image.



If the image is copied from the Exam Overview screen, the image size will be reduced to the size of the largest thumbnail image stored by the system (typically image width is 640 pixels, and the height depends on the aspect ratio of the originally captured image).

On the other hand, if the image is copied to the Clipboard from the Detailed Image View, the image will have the full resolution of the originally captured image (as shown in the Image Information Window described above).

Viewing Image Details

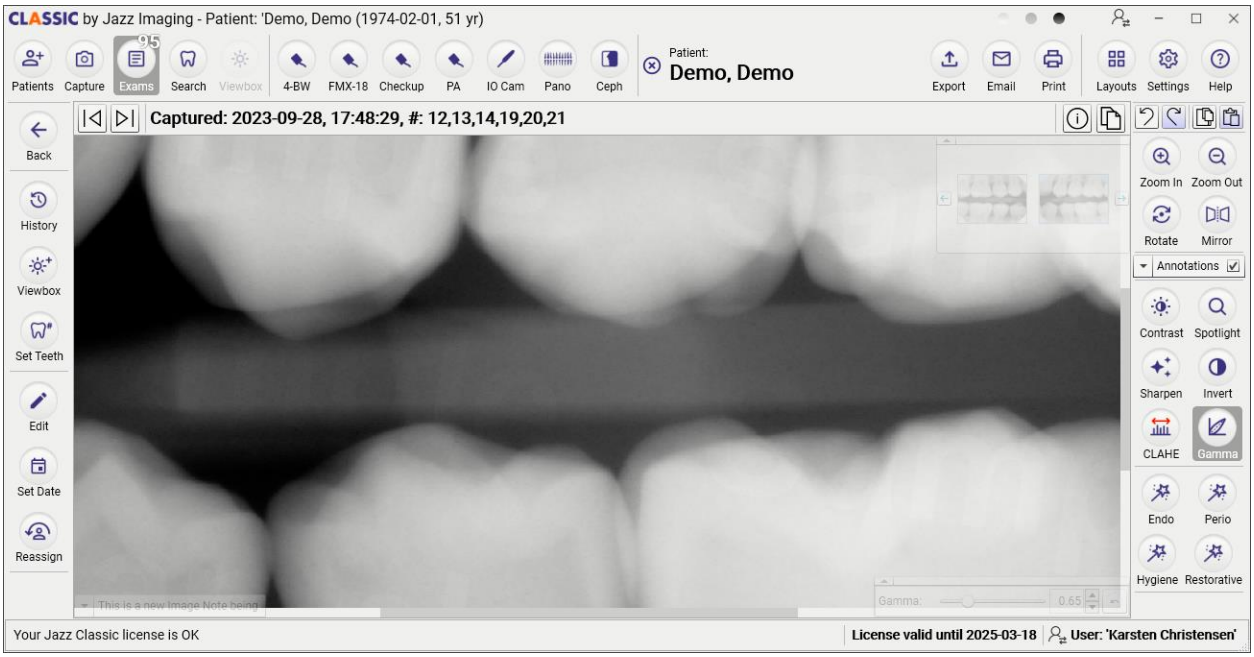
The primary function of the Detailed Image View is to allow the users to easily zoom in on image details and to pan around in the image.

The easiest way to Zoom In/Out is to use a mouse with a scroll-wheel. Scrolling the wheel “upwards” zooms in on details while keeping the center of the zoom location where the mouse cursor is located within the image. A downwards scroll will zoom back out again.

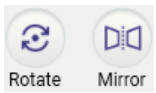
Another option is to use the “Zoom In” and “Zoom Out” buttons on the right-side toolbar:

While the image is zoomed in, the user can easily pan the image up/down/left/right by pressing down and holding the left mouse button while dragging the mouse within the image area.

Another option is to use the image scrollbars that are automatically displayed beside the image area when the image is zoomed in.



You can also Rotate and/or Mirror the images in case the templates and/or acquisition plugin doesn’t automatically orient the image during capture process. This can typically happen if the TWAIN acquisition plugin is being used with a sensor that Jazz Classic doesn’t have a Direct Integration plugin available.



The Rotate button rotates the selected image 90 degrees clockwise. It may have to be click multiple times to get the rotation right.

The Mirror button will flip the image over the Y-axis. Clicking it twice will revert the image back to normal.

The Mirror functionality should normally be avoided since it adds unnecessary image processing every time the image is being displayed! The best practice is to instead use the Mirror feature in the Acquisition Plugin to perform the Mirror operation, ensuring it only happens once during image capture. After that, the image no longer needs to be mirrored every time it is being displayed.

Undo and Redo tracking during image review

After an image has been displayed in the detailed image view, Classic will keep track of any changes made to the image (like for instance changes to the Image Processing filters and/or changes to annotations and measurements). The user will be able to Undo and/or Redo the individual changes using the Undo/Redo buttons ( ) in the upper right side of the detailed image view window.

It is important to note that the Undo/Redo history is not saved anywhere, so if you switch to another image then all Undo/Redo history for the previous image will be lost and a new tracking of changes will be initiated for the new image only!

Copy Image Processing settings

Classic makes it possible to easily copy the Image Processing settings from any image and then apply these copied settings to any other individual images or Exams.

To copy the Image Processing settings from an image, simply click the Copy Processing button ( ) in the upper right corner of the View Window or by pressing the Ctrl+Alt+C key combination.

Pasting Image Processing settings

After the Image Processing settings have been copied from an image, they can now easily be applied to any other image by simply clicking the Paste Processing button ( ) in the upper right corner of the View Window or by pressing the Ctrl+Alt+V key combination.

It is also possible to paste the Image Processing settings to all images within an exam.

From the Exam Overview window, either select a single image and click the Paste Processing button to selectively apply the Image Processing to the selected image only or press and hold the CTRL key while clicking the Paste Processing button to apply the copied Image Processing to all images within the Exam.

Annotating Images

Sometimes the user will need a way to point out specific areas within the exam images, so Jazz Classic has a dedicated Annotation Toolbox for that purpose. The Annotation Toolbox is normally collapsed to save space but can easily be expanded by pressing the small arrow to the left of the text ***Annotations***.

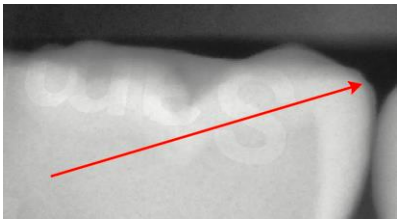
This toolbox allows the user to draw basic shapes and text, as well as perform measurements and calibrations within individual images.

Drawing Basic Shapes

To draw one of the basic annotation shapes, select one of the following four buttons:

- Arrow
- Ellipse
- Box/Rectangle
- Text

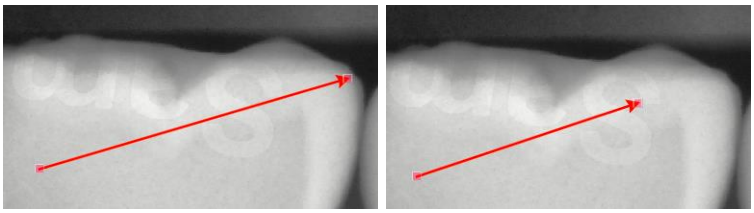
After selecting the needed tool, simply click and drag the mouse within the image area to add the selected annotation shape to the image.



Releasing the left mouse button will complete the drawing of the shape.

Annotations can be easily edited (moved/adjusted) by selecting the ***Edit*** tool 

, then selecting/clicking the annotation that needs to be edited. This action displays anchors in the corners of the selected shape. The user can manually drag the anchors to resize the shape, or simply drag within the shape to move it.



To move the Arrow annotation, the user can move the mouse cursor over the arrow line and drag the endpoint with the mouse.

To finalize editing the annotation, uncheck/unselect the ***Edit*** tool 

or press the ESC key on the keyboard.

When using the Text annotation, click where the text will be placed and start typing the desired text immediately. The text annotation is completed when the text loses focus, or the user presses the ESC key on the keyboard.

Both the text annotation's text and location can be edited using the ***Edit*** tool 

.

Performing Measurements in IO X-ray Images

Jazz Classic makes it easy to measure distances between two points within the captured IO X-ray images, and multiple measurements can be performed within the same images. The measurements will be stored as both graphical annotations visible on the images, as well as metadata associated with the individual images.

Important note:

Measurements made in the software are done under your own responsibility. Because an X-ray is a two-dimensional image of a three-dimensional object, measurements are subject to error in radiology. We strongly recommend that you do measurements only in calibrated images. It is recommended that calibrations on an image are done on a reference segment of known length, such as for example an inserted radiographic ball or an inserted file.

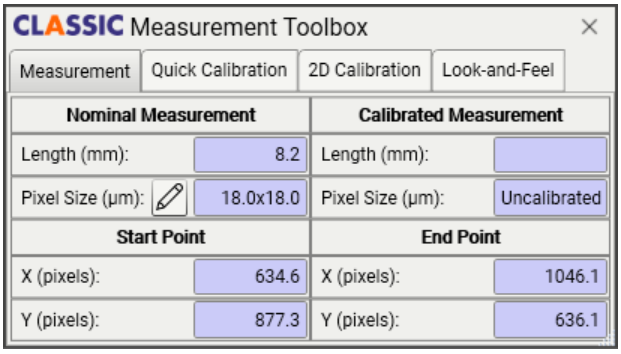
Due to the inherent nature of Panoramic images, there will be significant distortions due to magnification both vertically and horizontally, which will also vary greatly along the image. Any calibration on such image can only serve as a rough guide that apply only within immediate vicinity where it is planned to make a measurement.

For each measurement, the distance is calculated by determining the accurate "pixel distance" between the two-point pair and then converting this pixel distance into millimeters by taking the physical pixel size/pitch as well as the physical geometry of the scene into account. See Appendix A: Measurement accuracy and Calibration for more information regarding geometry and how it influences the accuracy of measurements.

Adding new measurements

To start adding new measurements, simply click the ***Measure*** Button 

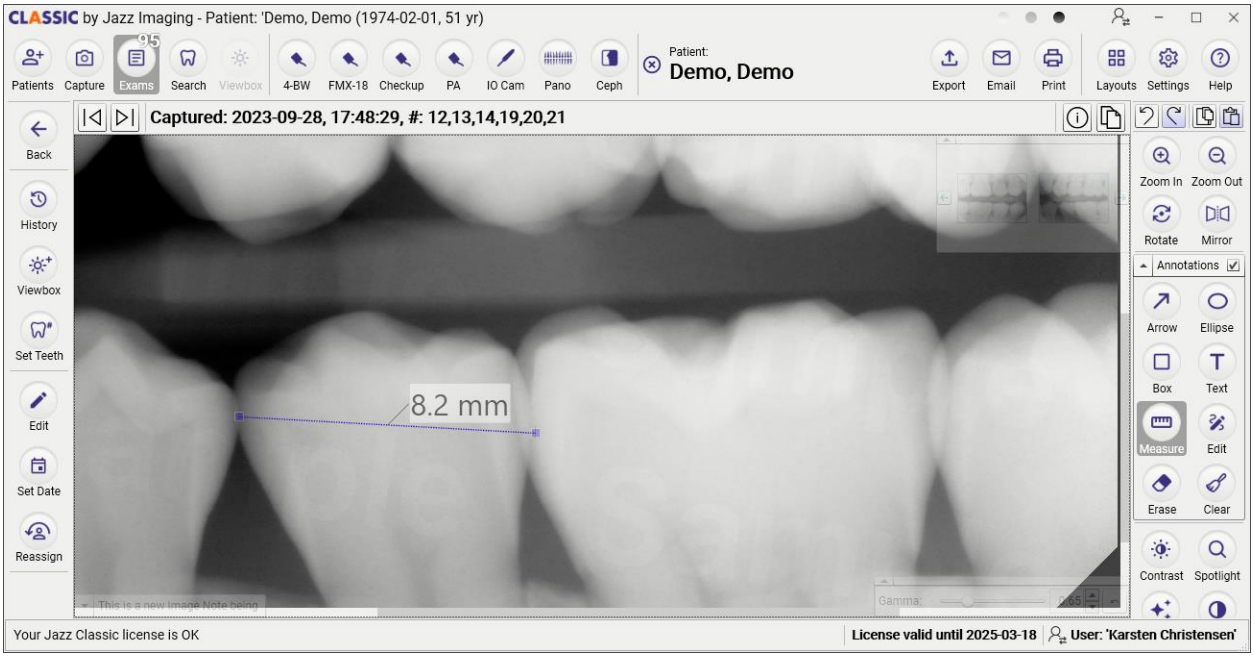
from the Annotation Toolbox. This in turn opens the Measurement Toolbox that displays details about the current/selected measurement.



To perform a new measurement, simply press and hold the left mouse button, and then drag the "crosshair" mouse cursor within the image between the two points where the distance needs to be measured. To finalize the measurements, either click the mouse cursor somewhere within the image or close the Measurement Toolbox.

As the cursor is dragged between the two points, the measured nominal distance will be displayed dynamically on the image. The measurement line will be shown with a dash pattern until the measurement is completed.

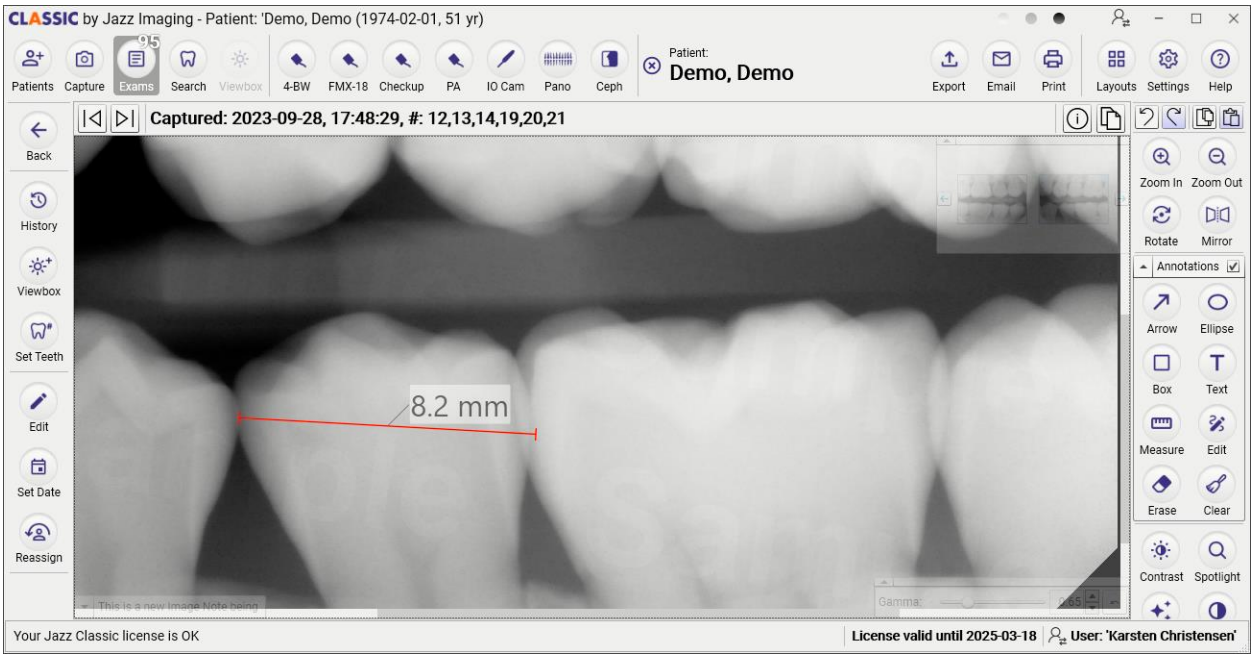
Adjust the endpoints by dragging and moving them, and the measured distance display will update accordingly.



Once the end-point locations are correct, click anywhere else in the image to finalize the new measurement. The measurement display will then change so the endpoints become perpendicular lines.

The "nominal" distance measurements assume that the X-ray sensor is "perfectly" perpendicular to the radiation from the X-ray source and that the exact size of each pixel and the x-ray system geometry is known in advance. To achieve higher accuracy and correct for non-perpendicular sensor placement, the user will have to perform a calibration on the individual images as described in Appendix A: Measurement accuracy and Calibration.

Any existing measurement can be (re)selected and (re)adjusted as described above when the Measure button is selected. To select an existing measurement, simply click anywhere on the measurement line.

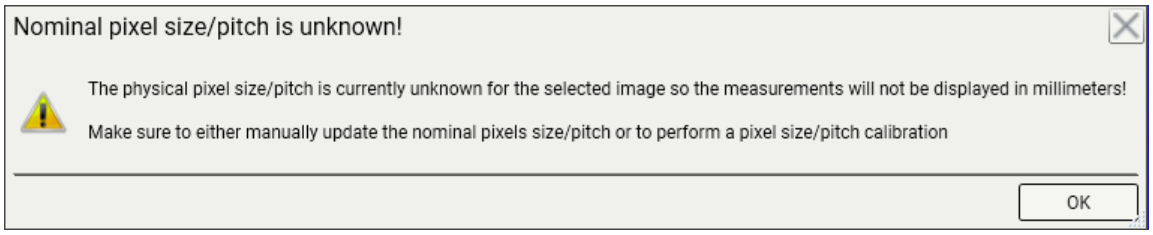


To end the measurement process altogether, either click the Measure button tool again (to deselect it), press the ESC key on the keyboard, or manually close the Measurement Toolbox window.

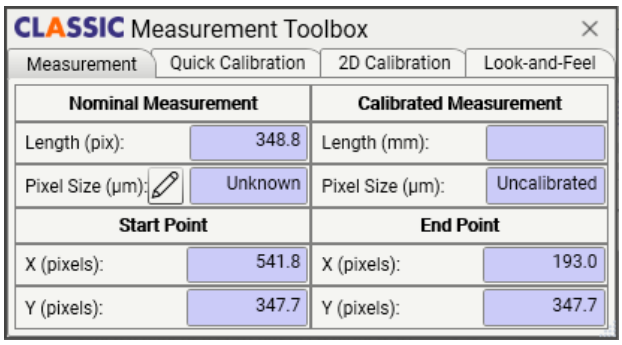
Multiple measurements can be added to the same image by repeating the click-and-drag operation mentioned above while the Measure button is still selected.

Adding new measurements to images with unknown pixel size/pitch

If the pixel size/pitch is unknown (typically when using TWAIN acquisition), then the user will see the following warning when the Measure Button is pressed:



The Measurement Toolbox will in that case display the measured distances in the display unit “pixels”, and the nominal pixel size is marked as “Unknown” as shown below.



The Pixel size can then be manually edited by pressing the pixel size Edit button ( ) which in turn opens a Size edit dialog where the physical pixel size/pitch can be specified in micrometers.

When the pixel size is set to 1.0 µm by 1.0 µm then the pixel size is considered "Unknown". Please refer to the technical documentation from the IO X-ray sensor manufacturer or vendor in order to determine the nominal pixel size!

The following example is setting the pixel size/pitch of an image captured using the TWAIN Acquisition Plugin from a Carestream RVG 6200 sensor which has a known pixel size/pitch of 19.0x19.0 micrometers:

If the image is being calibrated as described in Measurement Calibration, then the pixel size/pitch will automatically be calculated based on the calibration process and any manual adjustment of the nominal pixel size is no longer necessary.

Hiding Annotations

All annotations can be temporarily hidden by unchecking the checkbox in the Annotation Toolbox header area. The annotations are stored in the Classic database so they can be displayed again at a later point by simply checking the checkbox again.

It is possible to select whether annotations are displayed on the thumbnail images in both the exam selection view and in the exam overview. This is done in the Capture Settings.

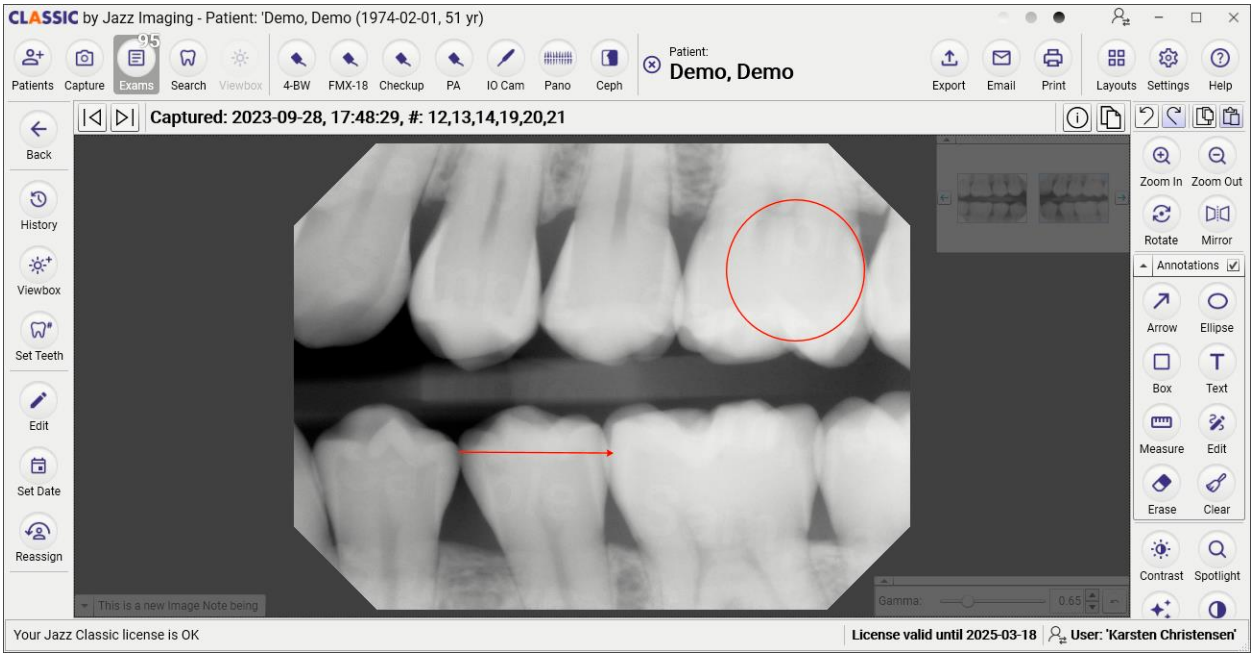
Editing Annotations

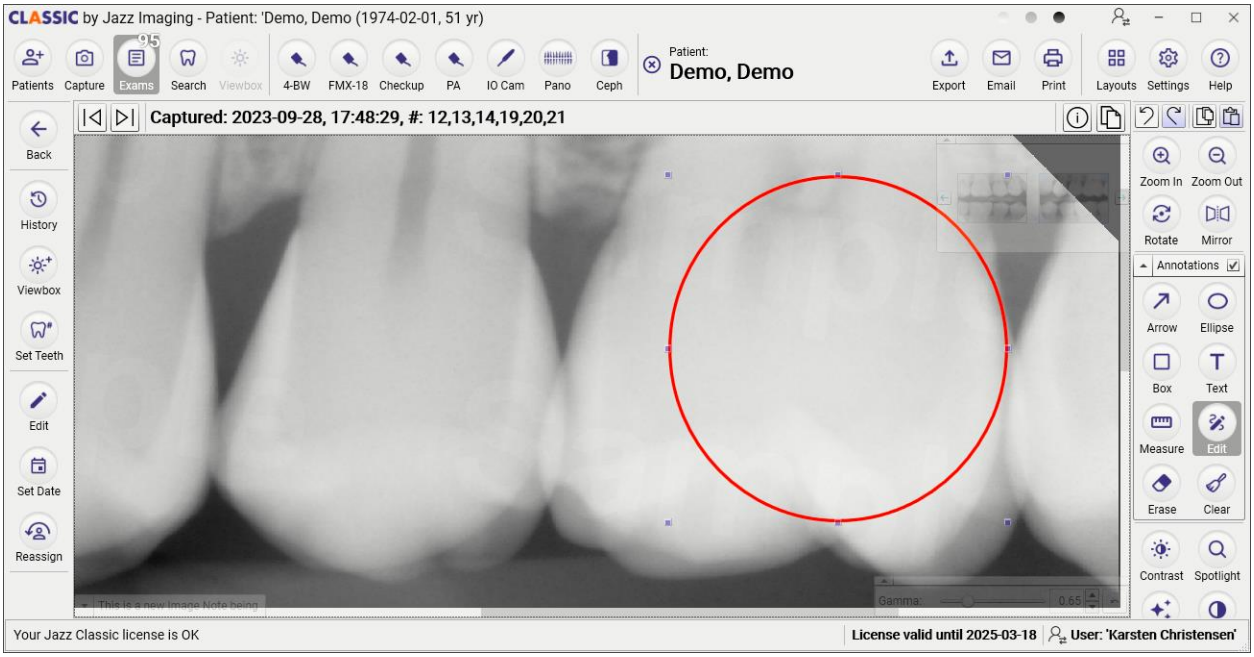
All annotations can be manually edited using the ***Edit*** tool 

in the Annotations toolbox.

While the Edit button is selected, the user can select individual annotations by simply clicking any part of the annotation within the image. The selected annotation will be displayed with “resize anchors”.

Arrows will have a resize anchor on each end, and the shape of the arrow can be adjusted by simply dragging the endpoints of the arrow.





Ellipses, Boxes, and Texts will have anchors in the corners and at the midpoints on all horizontal and vertical sides.

The size of the ellipses, boxes, and texts can be adjusted by dragging any of the anchors, and the annotations can be moved by dragging the selected annotation within the bounding box.

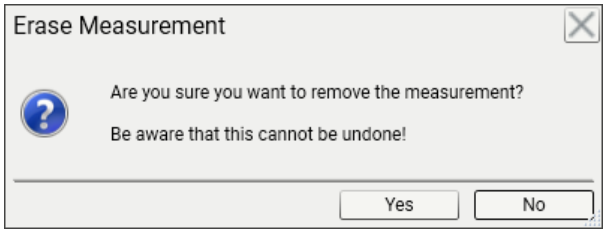
Deleting Annotations and Measurements

All annotations and measurements can be manually deleted using the ***Erase*** tool 

in the Annotations toolbox.

While the Erase button is selected, the user can delete individual annotations by simply clicking any part of the annotation within the image. The mouse cursor will change to a hand cursor when the mouse is over the annotation, and the annotation is deleted if the left mouse button is clicked.

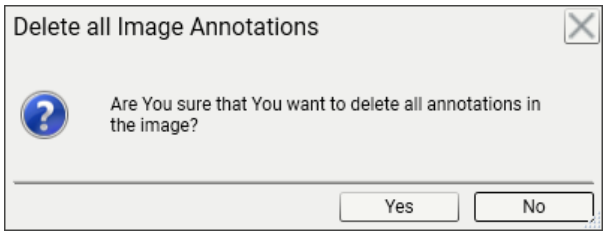
If a measurement is clicked, the user will be prompted to confirm that the measurement should be erased.



All annotations can also be deleted with one click by using the ***Clear*** button 

in the Annotation toolbox.

The user will always be prompted to confirm that all the annotations should be deleted.

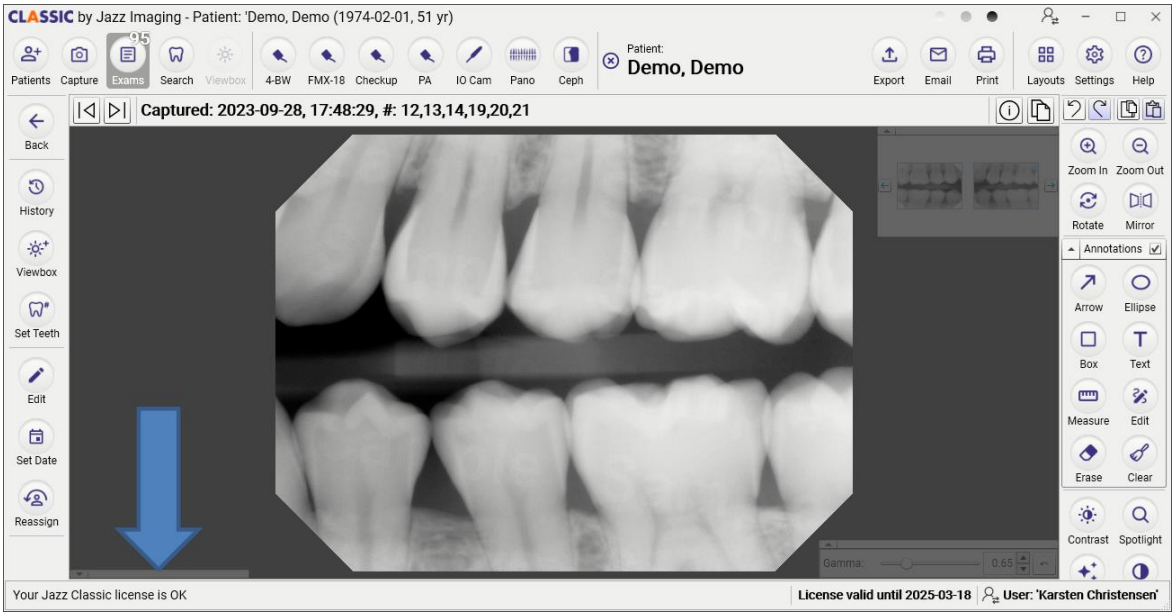


The Clear button will not erase any of the measurements. Please use the Erase button to delete the individual measurements one by one.

Adding and Viewing Image Notes

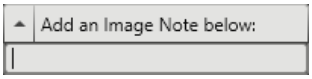
Each image can have a text note, and these notes can be easily added and viewed directly in the lower left corner of the main view area.

If no note has been added, the note editor will be collapsed and appear semi-transparent, ensuring it doesn't hide any image details:

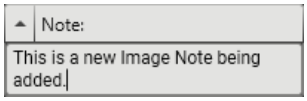


When the mouse cursor is placed over the note editor area, it will automatically expand and become visible. Depending on whether a note has already been added or not, the text in the note editor header will differ:

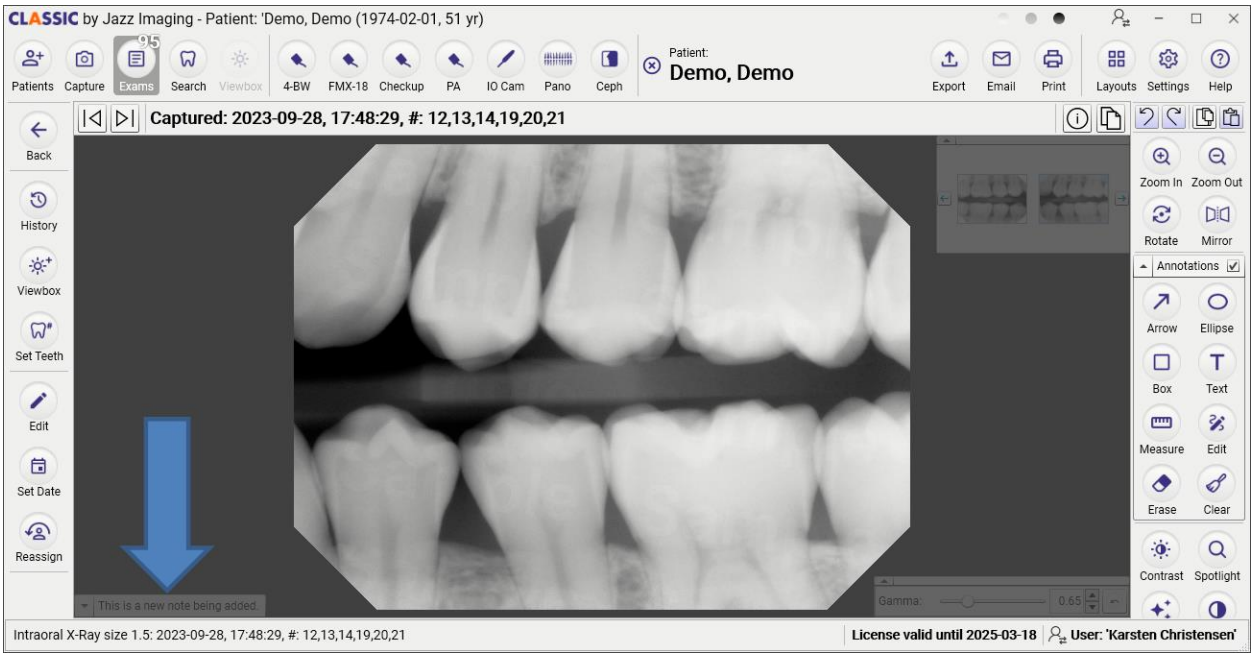
If no note has not already been added, then the editor will open, and the note can be added by selecting the edit area and start typing the note text:



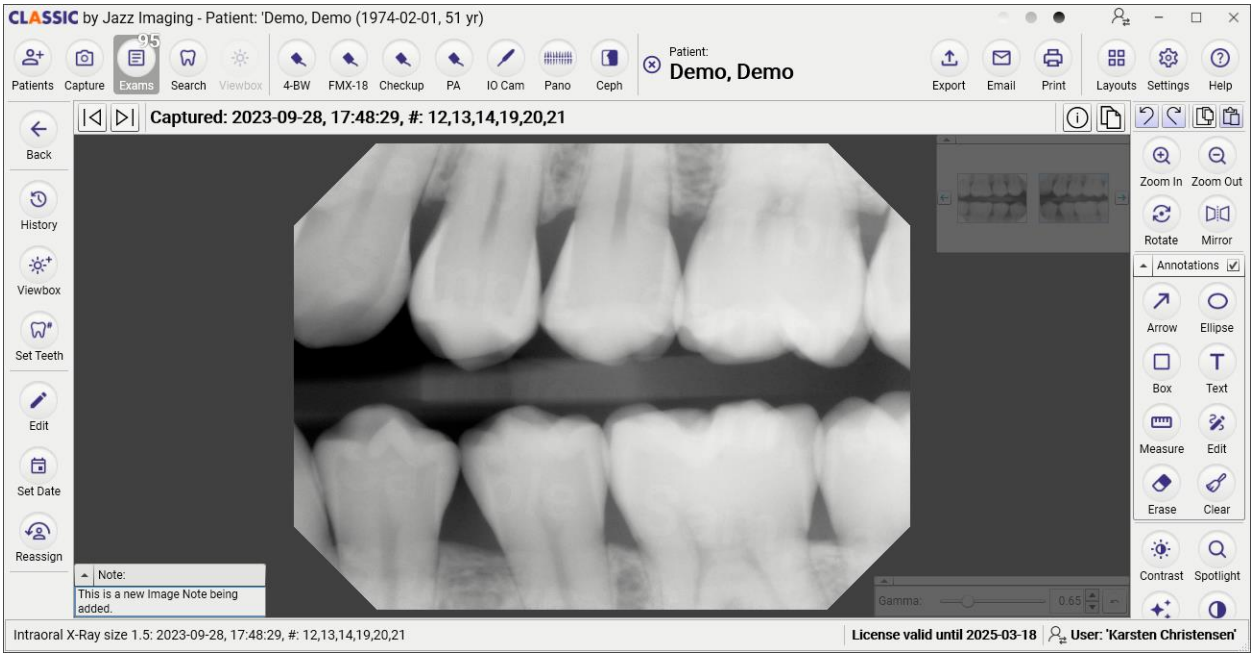
When the user starts typing the note text, the header will automatically change to ‘Note:’, when the mouse leaves the Image Note editor, the note will automatically be added to the Classic Database



In the main view area, you can now see that an Image Note has been added to the selected image because the Image Note editor now displays the note as the header text, as shown in the example below:

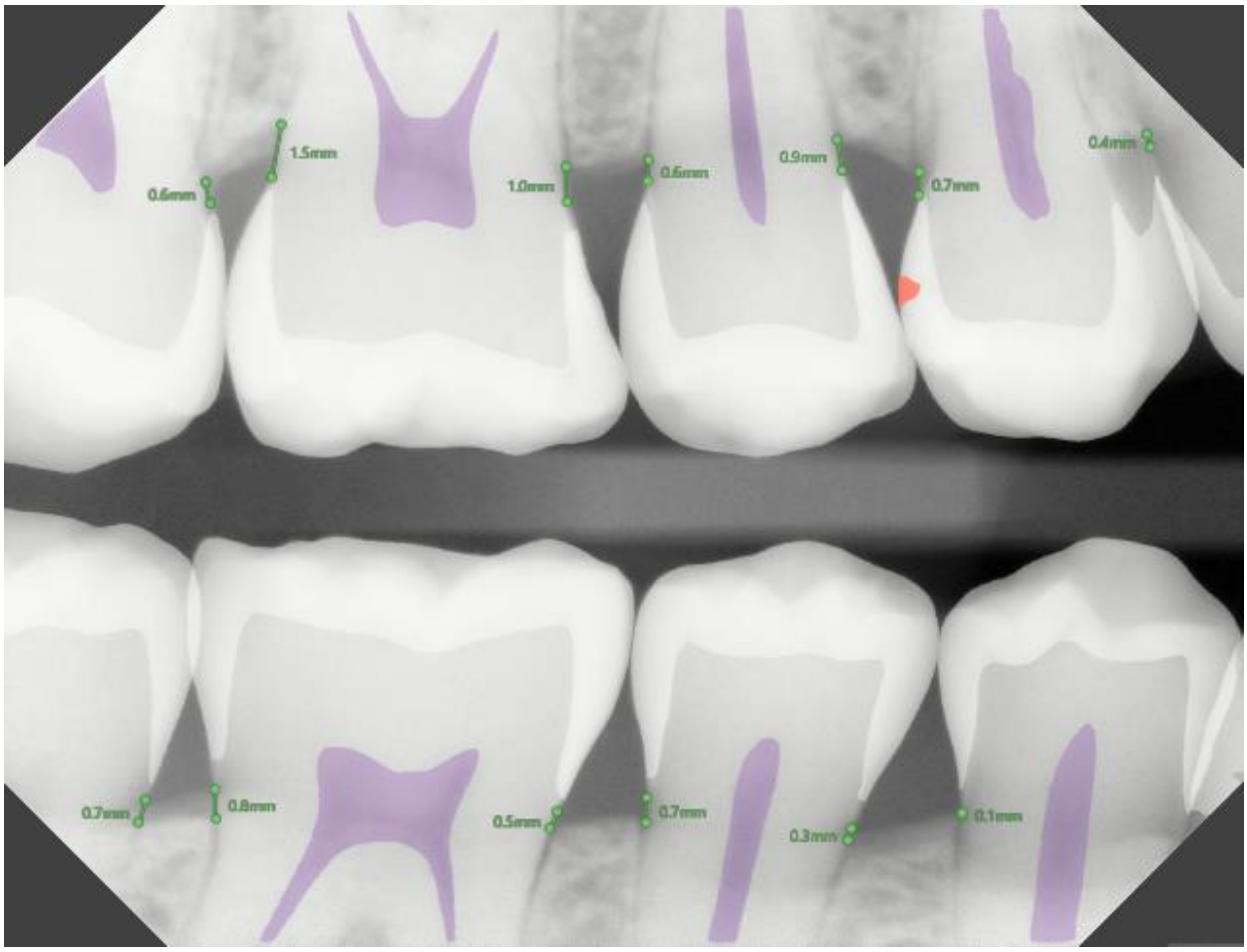


To see the note more clearly, simply move the mouse cursor over the Image Note editor and the note will automatically be displayed as long as the mouse is hovering over the editor area:



Viewing AI findings

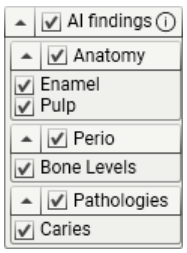
Jazz Classic makes it easy to integrate third-party dental AI services and display a graphical overlay of AI findings directly on X-ray images, as shown below.



All AI findings fall within one of the following three categories:

1) Anatomical landmarks
2) Periodontal measurements
3) Pathologies and restorations.

Users can toggle individual AI findings types and categories on or off using the AI Findings panel located on the right-hand side of the screen:



The checkboxes in the AI Findings panel allows users to show or hide all AI finding **categories** (such as anatomical landmarks) or in individual findings.

Anatomical landmarks

The ***Anatomy*** section contains one or more anatomical landmark types from the following list:

- Teeth outlines
- Enamel
- Pulp
- Dentine crown
- Root
- Jaw anatomy (Mandibular canal, Mental foramen, Maxillary sinus, etc.) in Panoramic images

Periodontic measurements

The ***Perio*** section contains one or more periodontal measurements:

- Bone level (in mm)
- Bone ratio (in %)

Pathologies and restorations

The ***Pathologies*** section contains one or more pathologies or tooth restoration from the following list:

- Decay
- Missing teeth
- Calculus
- PA Radiolucency (PARL)
- Fillings/Inlays
- Bridges
- Root Canal Treatments (RCT)
- Impacted soft tissue
- Impacted teeth
- Complete/Partial Bony Impactions
- Prosthesis
- Implants
- Open margins
- Tooth fractures
- Crowns


If the AI finding types are marked with (*) then the AI finding type has not yet been cleared by the FDA.

AI findings are rendered in order from most to least radiodense.

In order:

a) Crown (most radiodense)
b) Bridge
c) Filling
d) Enamel
e) Root canal treatments (RCT)
f) Calculus
g) Pulp
h) Decay
i) Periapical Radiolucency (PARL) (least radiodense)
j) The periodontal measurements are added on top of everything else.

Applying Image Processing Filters

Depending on the use-case, users may have to utilize the built-in ***View Filters*** in Jazz Classic to enhance specific parts of the images in order to see certain image details while doing a diagnosis.

When images are being captured in Jazz Classic, the acquisition plugins will typically try to preserve all the image details, saving “raw”/neutral version of the original images in the data storage.

This enables users to review images later in multiple ways without losing important details from the original capture, as the ***original*** images are always “preserved” in the image database.

Jazz Classic comes with a small set of built-in filters that users can easily enable, disable, combine depending on the tasks at hand.

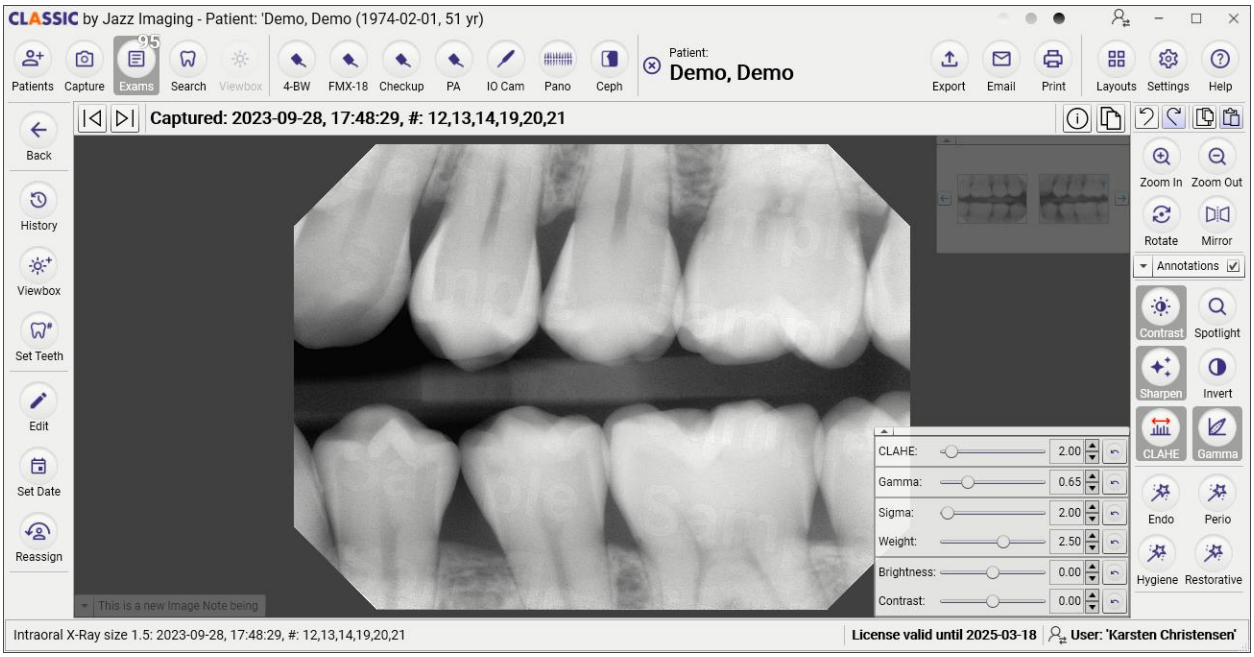
The View filters are all accessible from the right-hand side toolbar.

Applying Basic Image Processing Filters

The upper portion of the image processing toolbar contains “basic” filters that can be combined and applied to individual images at the same time.

You can toggle filters on and off by clicking their respective filter buttons. When a filter is enabled, you can adjust its parameters directly from the user interface below the image view area.

Each filter parameter can be reset to its default by clicking the ‘Reset’ button. This makes it easy to restore the default settings if you’ve selected the wrong filter setting.



The following basic filters are available for Intraoral X-ray images:

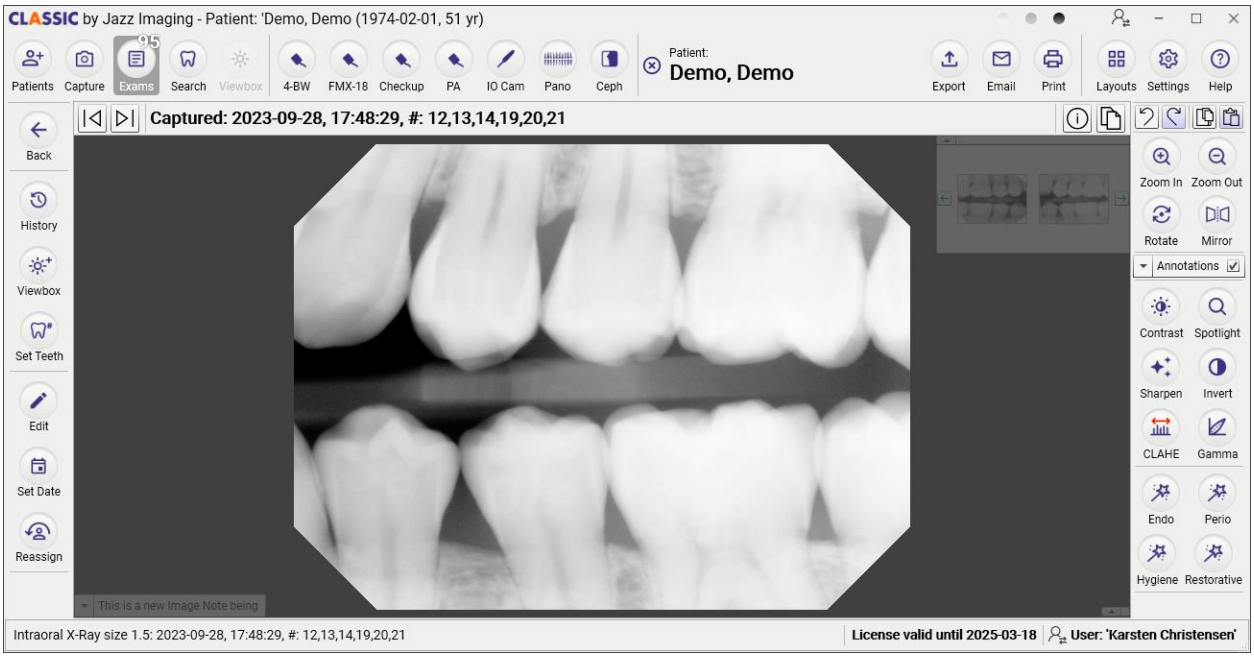
- **Contrast** and Brightness
- **Spotlight** tool
- **Sharpen** tool
- Image **Invert**
- Contrast-Limited Adaptive Histogram Equalization (**CLAHE**)
- **Gamma** correction

Applying Brightness and Contrast Adjustments

Applying Contrast and Brightness corrections to images allows users to view parts of the dynamic range that would otherwise be hidden or suppressed due to the overall contents of the image data.

In cases where images contain dense teeth or fillings, and when parts of the image are directly exposed to the x-ray radiation (which is often the case in bitewing radiographs), the pixel values that lie between these extremes may not always be displayed optimally. This is because the typical normalization of the full image will distribute the pixel values evenly across the dynamic range.

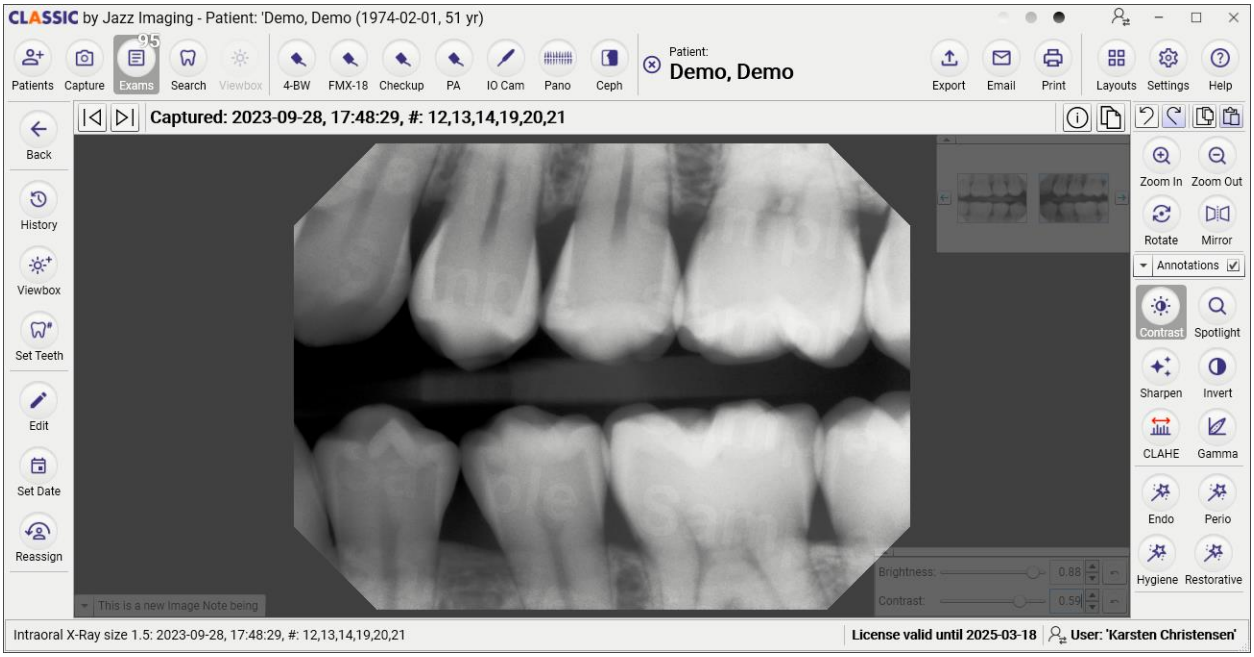
The following example shows a typical horizontal bitewing image without any brightness or contrast enhancements. In this image, it is very hard to discern details in the bright areas (like the DEJ) and bone structures.



Selecting the Contrast button allows users to adjust the brightness and/or contrast of the image by dragging the mouse cursor while pressing and holding the left mouse button.

The Brightness and Contrast filter compresses or expands parts of the image value ranges, enhancing specific parts of the images accordingly.

In the following example, the Brightness and Contrast have been adjusted so the brighter parts of the image have been “expanded” (showing more details) while at the same time the darker parts of the image have been “compressed” (showing less details):



The individual parameters can also be adjusted using the filter parameter toolbox in the bottom right of the image view area.

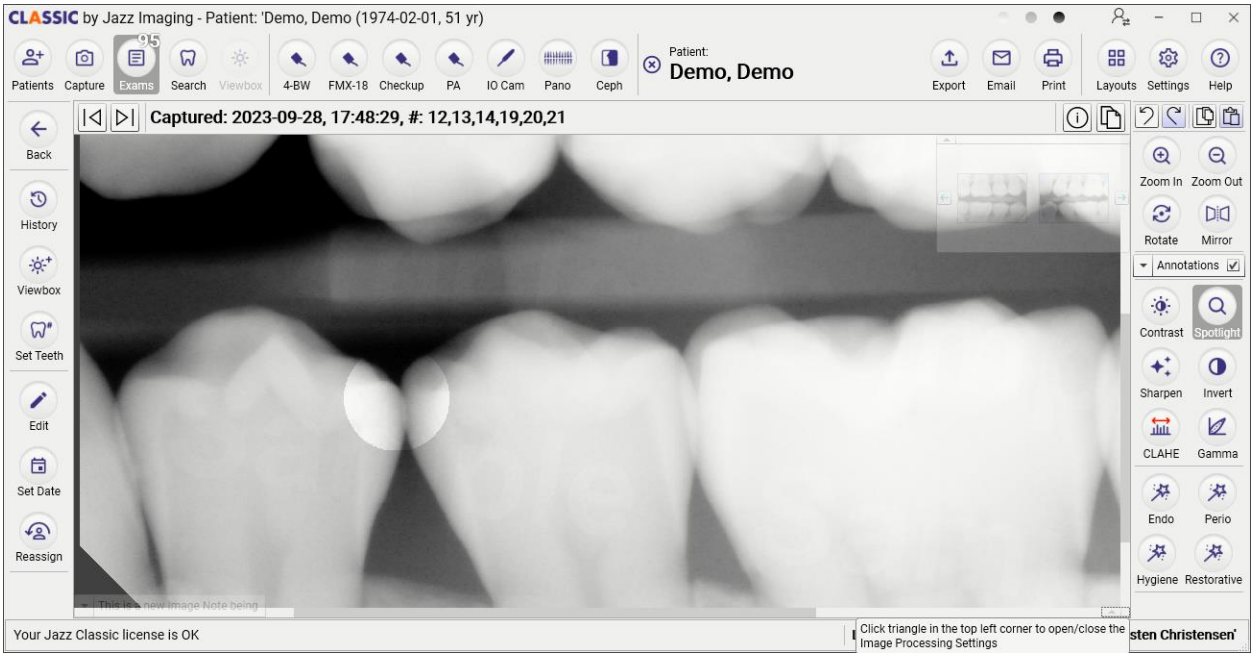
Deselecting the Contrast button temporarily disables the Brightness and Contrast adjustment, but the selected parameter values will be preserved in the image database so they can be re-enabled at a later point in time.

Using the Spotlight Tool

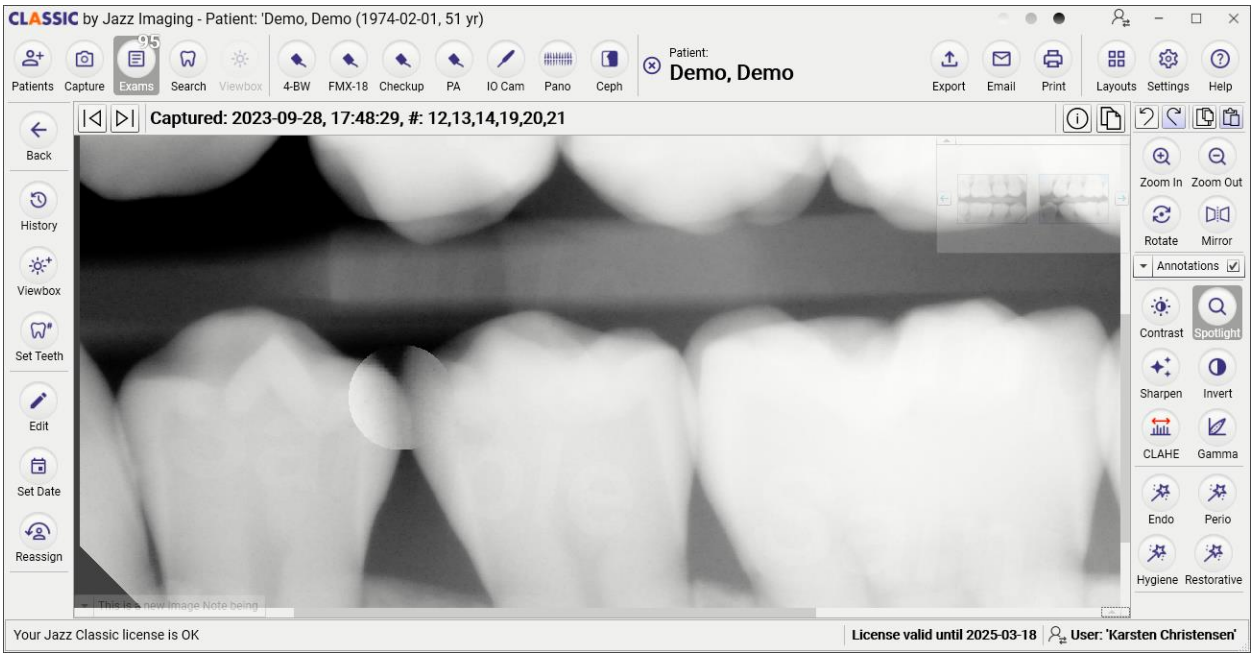
Most normalizations will analyze an entire image, and based on the full image histogram, try to expand the contrast so the image utilizes the full pixel value range. However, this often leaves parts of the images very hard to analyze because the details are so compressed by the normalization being applied.

The Spotlight Tool allows you to enhance contrast in small regions of the image without taking the rest of the image data into account. This feature can be used to inspect details of the image that are otherwise hidden. When the Spotlight tool is enabled, the mouse cursor area will change.

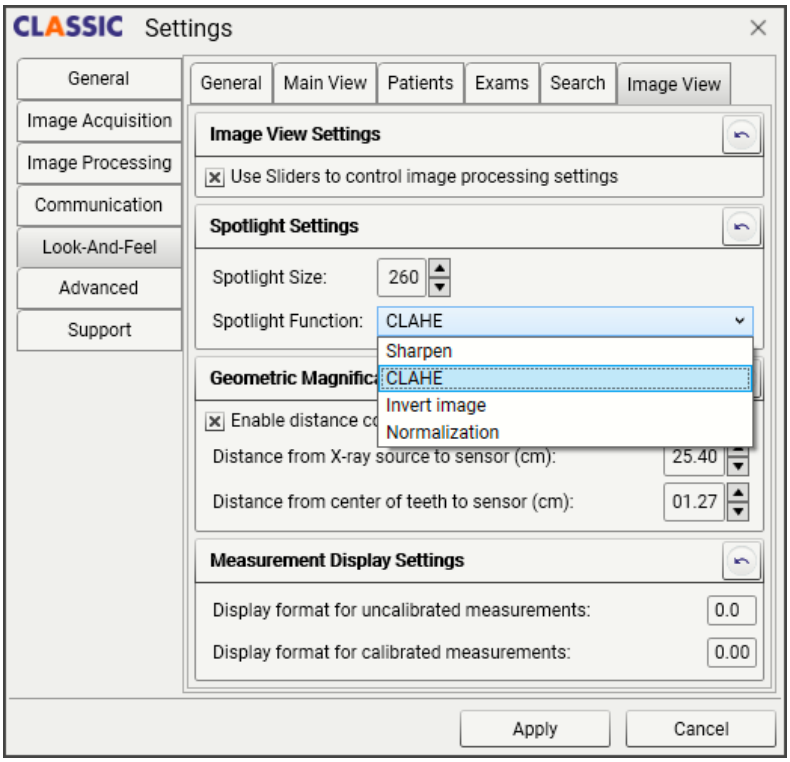
The following example shows the Spotlight tool in action:



If the left mouse button is pressed while the spotlight tool is selected, the spotlight tool area will display a ***2x*** zoomed version of the enhanced image as shown in the example below:



Jazz Classic offers multiple Spotlight algorithms that influence the spotlight circle area displays. The Spotlight size and algorithm can be changed in the Settings dialog under the ***Look-And-Feel->Images*** tab:



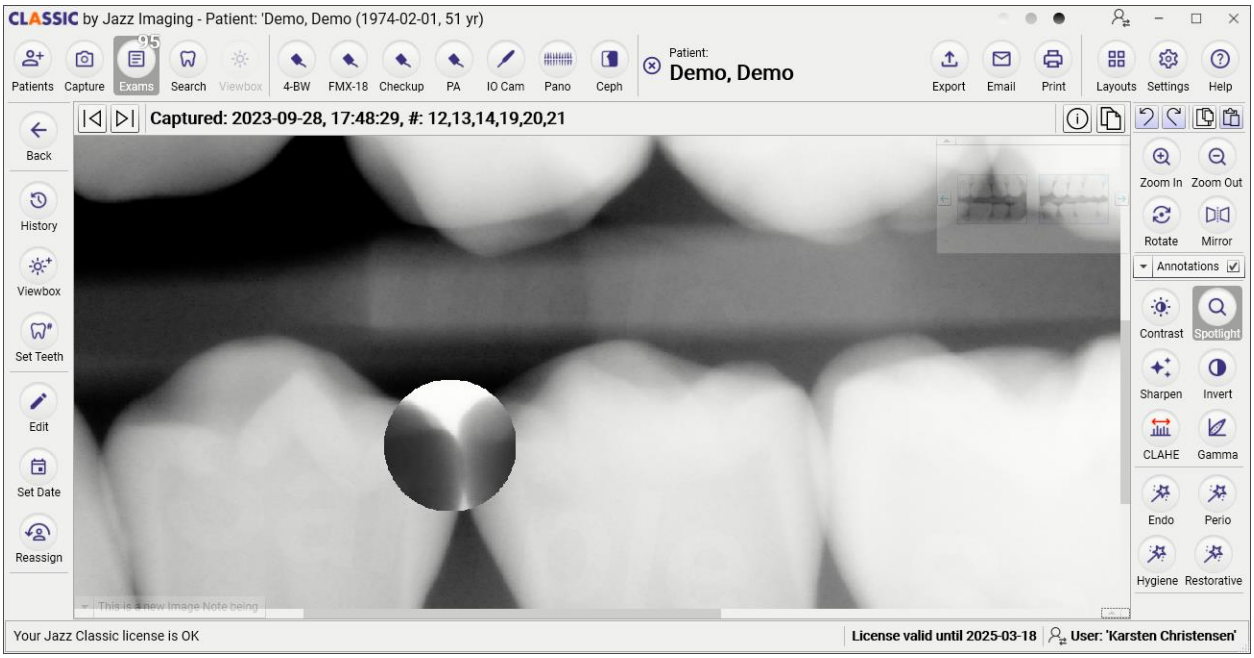
The size of the Spotlight tool is restricted to a diameter between 100 and 500 pixels.

It is easy to adjust the size of the spotlight tool directly without going to the Settings window. Simply press and hold the CTRL key while using the Scroll-wheel on the mouse. The spotlight can also zoom 2x by pressing and holding the CTRL key.

Currently the Spotlight tool offers the following algorithms:

- Sharpen (based on the Unsharp Mask algorithm)
- CLAHE (Contrast-Limited Adaptive Histogram Equalization)
- Invert
- Normalization

The following example shows the ***Invert*** Spotlight tool:

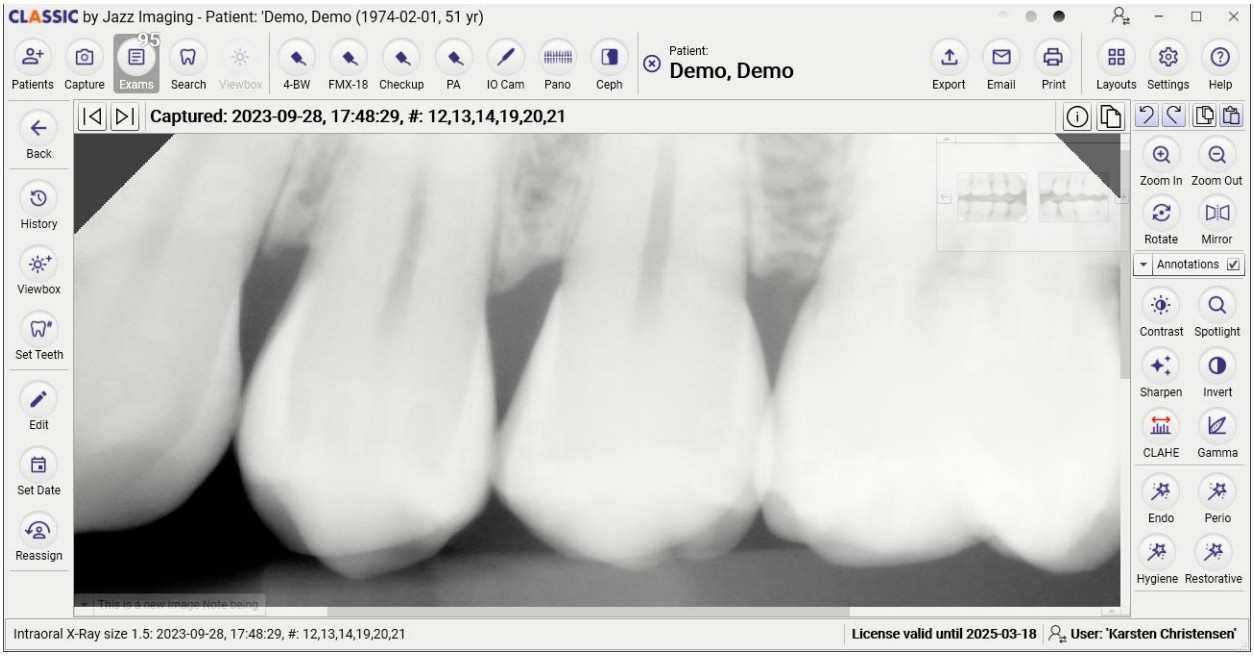


Using the Sharpen Tool

X-ray images can sometimes appear relatively “soft” or blurred. This is often caused by motion-blur (slight patient or x-ray generator movement while the image is being exposed) or because of characteristics of the x-ray sensor itself.

The Sharpen tool allows users to enhance/increase all edges in the images, making the images “sharper” to the human eye. However, one typical side-effect of image sharpen filters is that the images become visibly noisier, especially at low x-ray dose and when the images are zoomed in to see small details.

The following two figures show the same image without and with the Sharpen tool enabled:



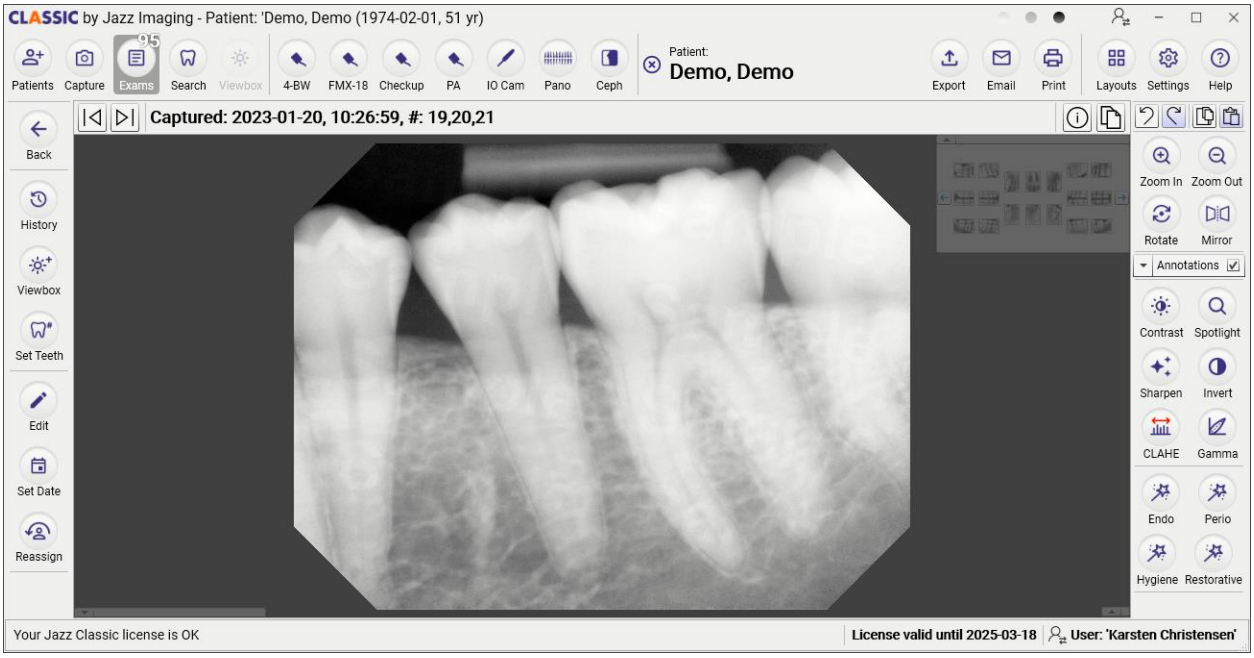
The Sharpen tool reveals more details in the original image, but also introduces more noise to the image.

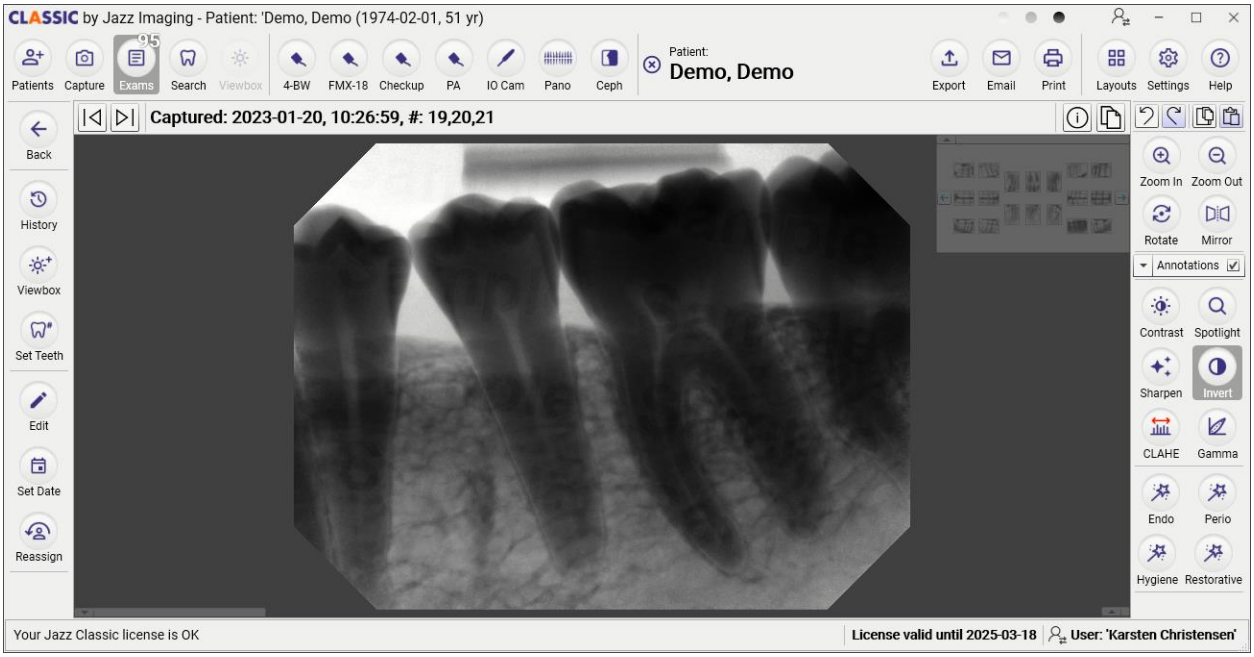
Using the Invert Tool

X-ray images are typically displayed with an inverted palette, where the teeth appear bright in the image and the background appears darker.

Jazz Classic makes it very easy to switch between the inverted (default) and non-inverted view of the X-ray image by toggling the ***Invert*** button.

The following images show the same X-ray image without and with the Invert tool enabled:





Using the CLAHE Tool

When X-ray images are being acquired, images are always being “normalized” by the acquisition plugins so that the pixel data content in the raw images received from the sensor are being expanded to utilize the full dynamic range of the system.

Most imaging applications utilize some form of “adaptive normalization” based on the histogram of the ***full*** image. The normalization filters will try to determine the minimum and maximum pixel values within any given image and then linearly “scale” all the pixel data, so the resulting normalized image will utilize the full dynamic range.

After applying the normal adaptive normalization, images taken with very low X-ray dose and images taken with very high X-ray dose will basically look identical in brightness (except for the noise level, which is lower when the X-ray dose is increased) and normalize the look of the images.

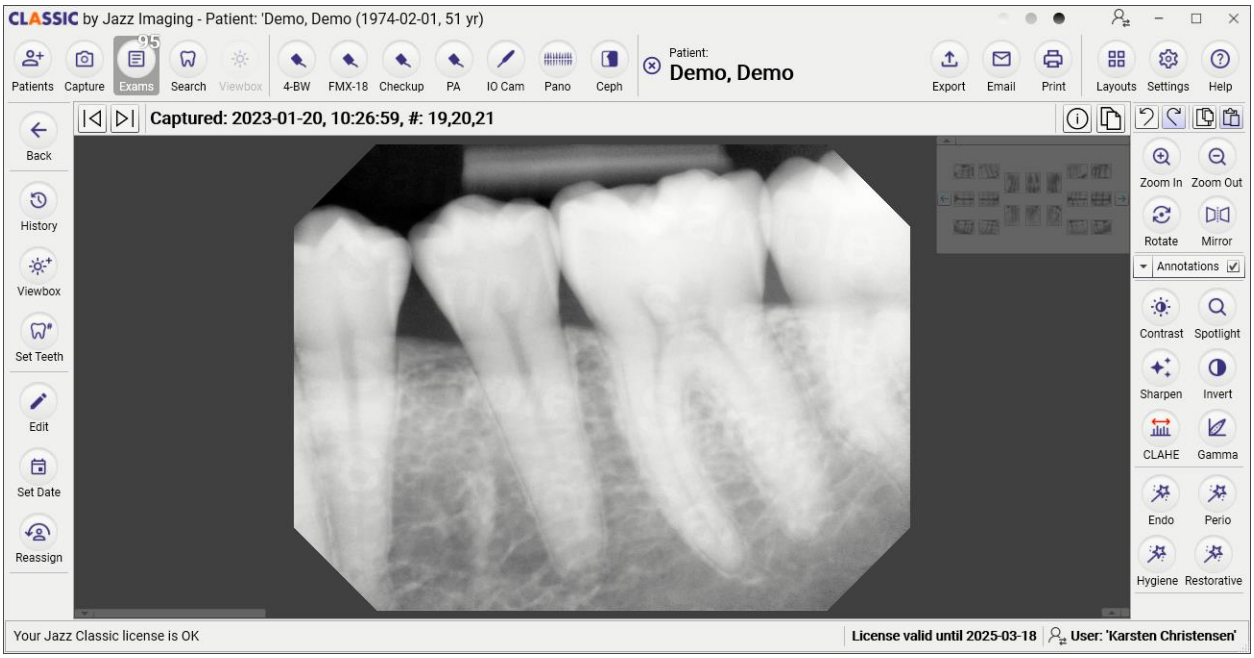
Since adaptive normalization is typically based on the raw full image histogram, images with large bright areas and large dark areas often will not display details in the bright and dark areas very well because these areas are linearly represented and the contrast in these areas are relatively low.

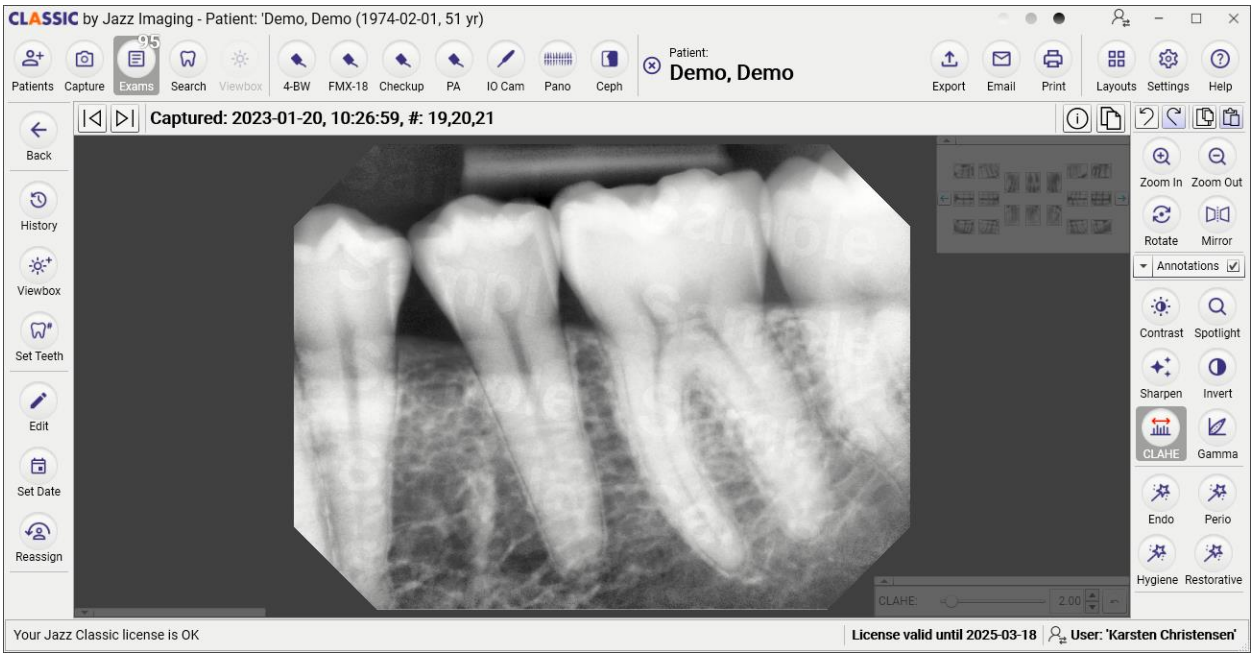
However, Jazz Classic is equipped with a **Contrast-Limited Adaptive Histogram Equalization** (CLAHE) filter that can improve the overall contrast across the image by utilizing Adaptive (localized) histograms to perform Histogram Equalization within the local regions. The main difference between the regular normalization and the CLAHE filter is that the latter can independently expand the contrast in both the darker and lighter areas, resulting in improved contract across the image.

The CLAHE tool is enabled using the CLAHE button 

.

The following images show the same image without and with CLAHE filter enabled:





In the second image, you can clearly see that the DEJ and the bone structures are clearer.

The Contrast Limit can be dynamically adjusted, where higher values will increase the overall image contrast across the image.

In general, CLAHE is a great tool to use if the “brightness” of an image ***varies*** a lot across the image. The CLAHE will lower the contrast variations and the images will overall appear to have better contrast.

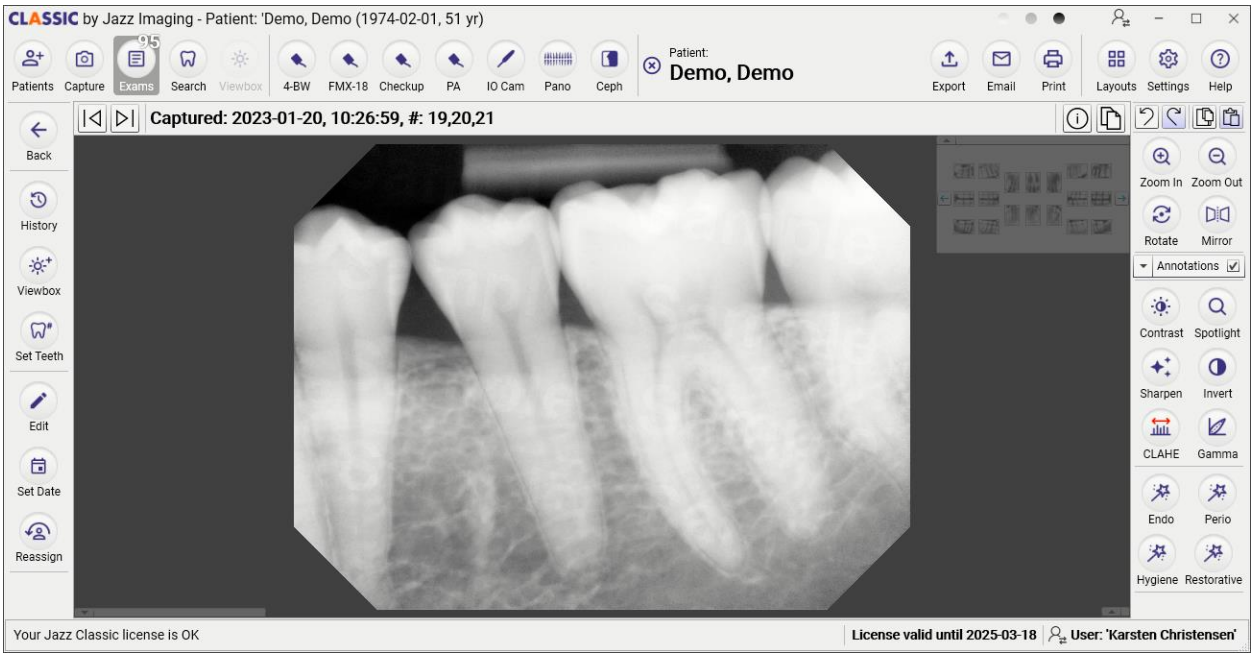
Using the Gamma Correction Tool

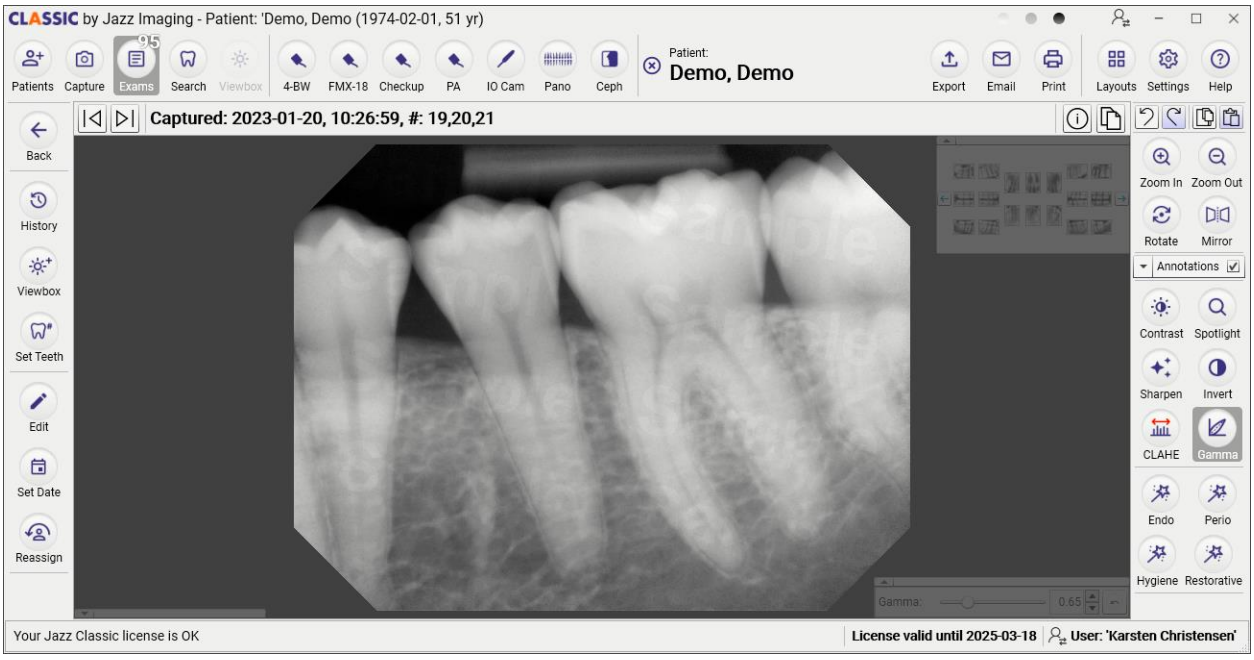
X-ray images can sometimes appear too bright or too dark overall. A common way to adjust the overall brightness is to apply a non-linear ***Gamma Correction*** filter that either darkens or brightens the mid-tones of the image, without changing the very bright and dark areas very much.

Gamma Correction is enabled using the Gamma button 

.

The following images show the same image without and with Gamma Correction enabled:





A Gamma correction value less than 1.0 will darken the images and a Gamma correction value above 1.0 will brighten the images.

Applying Image Processing Preset Filters

The lower part of the toolbar contains four image processing “presets” that can be customized to suit typical use-cases in the dental office.

Each of these preset filters are “exclusive”, meaning that only one (or none) of them can be applied at any given time. They can also be combined with any of the basic filters if desired.

Jazz Classic comes with the following four default presets:

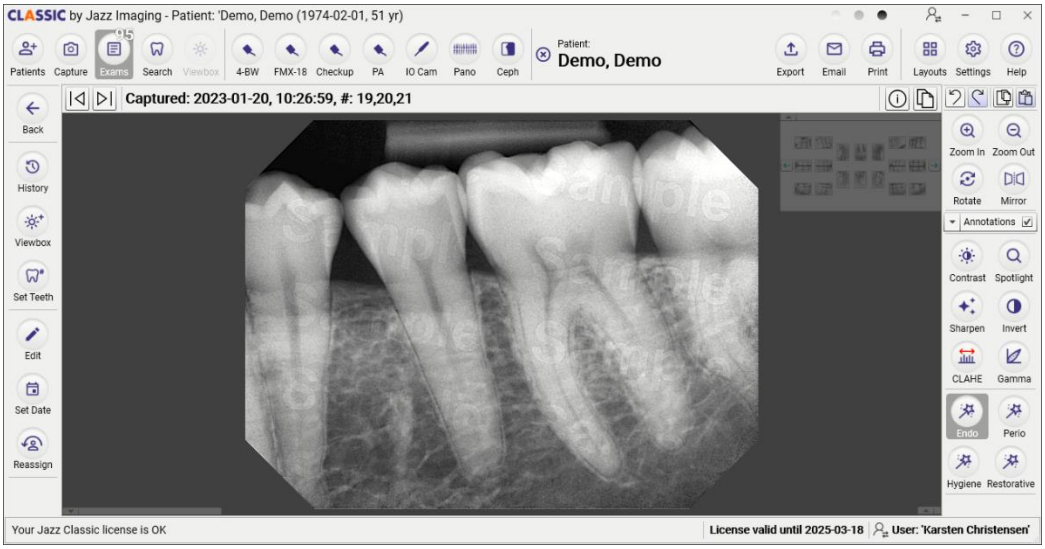
- Endodontic
- Periodontic
- Hygiene
- Restorative

Each of the four preset filters can be configured (or even completely replaced) in the Settings window. An advanced image filter editor allows users to create and test custom filters based on basic image processing filter primitives, such as noise filter, adaptive normalization filter, sharpen filter, gamma filter etc.

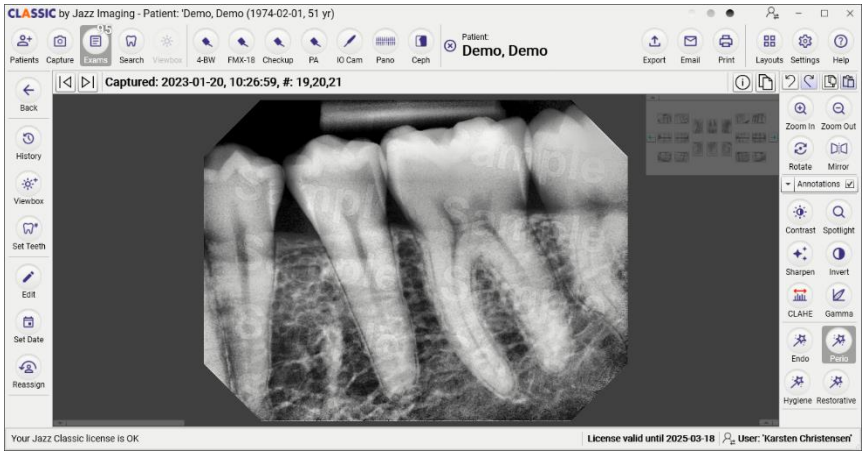
Each preset filter is constructed from a series of image processing steps that are all applied to the original images sequentially.

The following images show the same image with the four default Preset Filters applied:

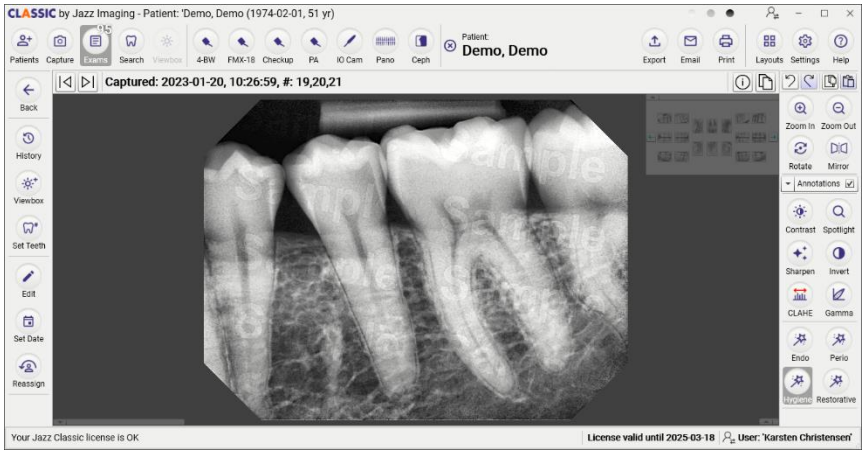
Endo Preset:



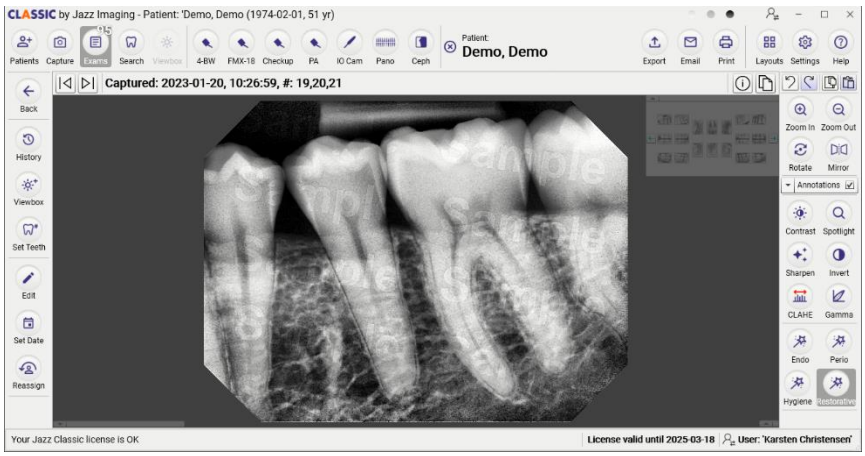
Perio Preset:



Hygiene Preset:



Restorative Preset:



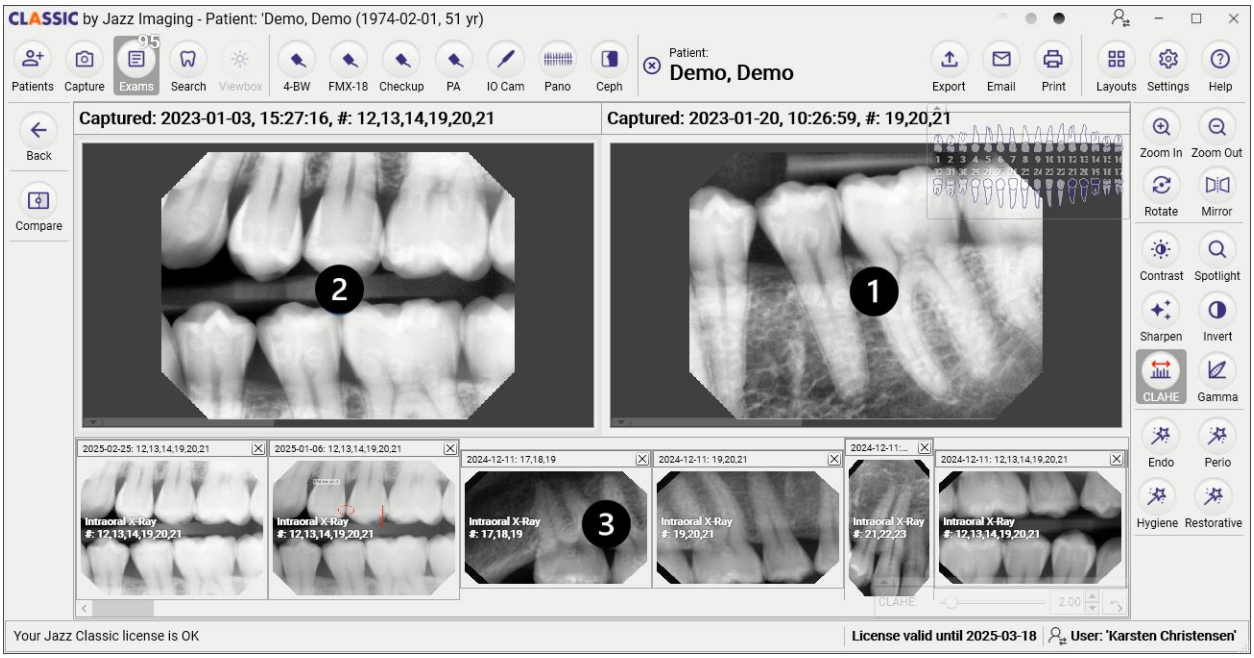
The four presets can be edited/replaced using the Filter Editor described in the Editing Image Processing Preset Filters section.

Viewing Teeth History

Jazz Classic simplifies the process of locating all images that contain the same teeth numbers as the image that is currently selected within an exam or being reviewed.

Simply click the ***History*** button 

on the left-hand side toolbar. This brings up the History View for the selected image:



The History View is split into three logical regions:

1 **Reference image:** Displays the image that has been chosen as reference for the History Search.

2 **Selected image:** Display the currently selected image. Images are selected from the list below.

3 **History List:** List that contains all images that have teeth associated with the reference image.

To select another image for the 2 area, click or select any image from the history list or drag-and-drop any image from the history list onto the 2 area.

Image processing filters can be applied to each image individually. Simply select either the 1 or 2 area and use the filter buttons on the right-hand side toolbar.

You can also configure whether the History search returns images from all modalities or just the same modality as the reference image and choose whether to include images with no teeth associated as well.

Managing Exams

From the Exam Selection view, users with administration privileges can manage the existing exams (see User Administration for more info on user roles).

The following operations are available to the user:

- Edit the selected exam
- Set the Exam Date for the selected exam
- Hide or permanently delete the selected exam
- Reassign the selected exam to another patient

Edit Exams

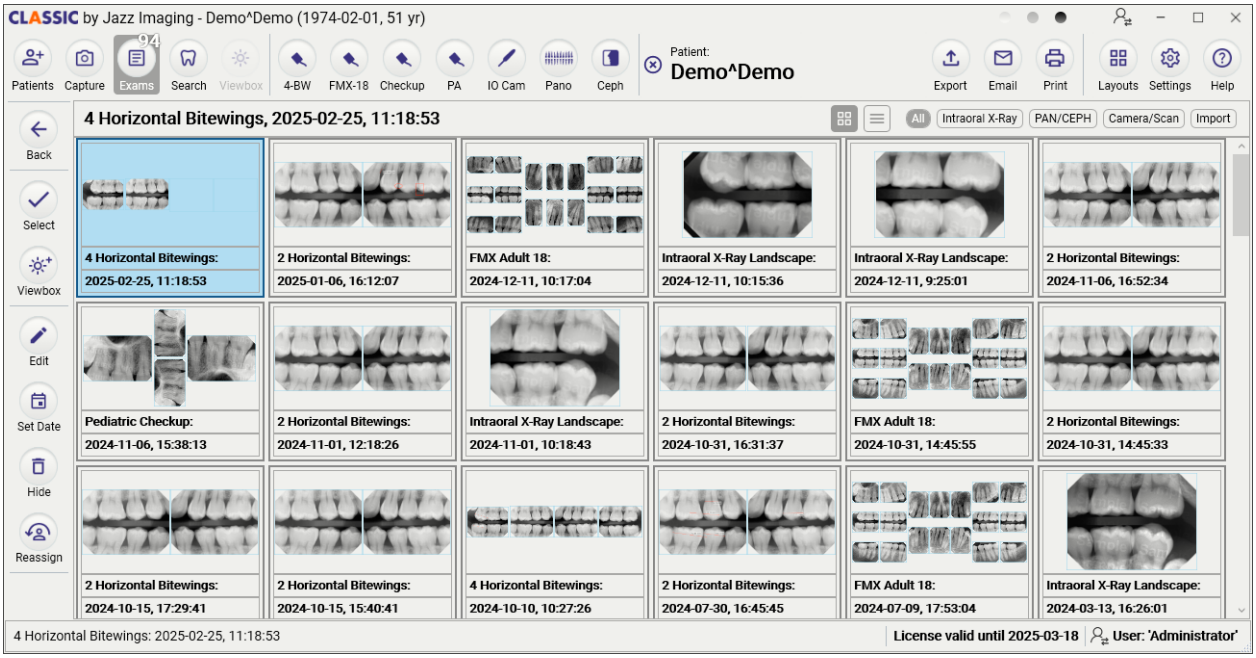
If an exam is incomplete or there are other issues, Jazz Classic allows the user to edit the exam. This makes it possible to return to the Image Capture View and perform the following types of operations on the Exam:

- Capture missing images into empty image tiles
- Retake images, replacing old images with newly captured images
- Swap/move images between image tiles if images were incorrectly located within the Layout
- Modify location and size of the image placeholders

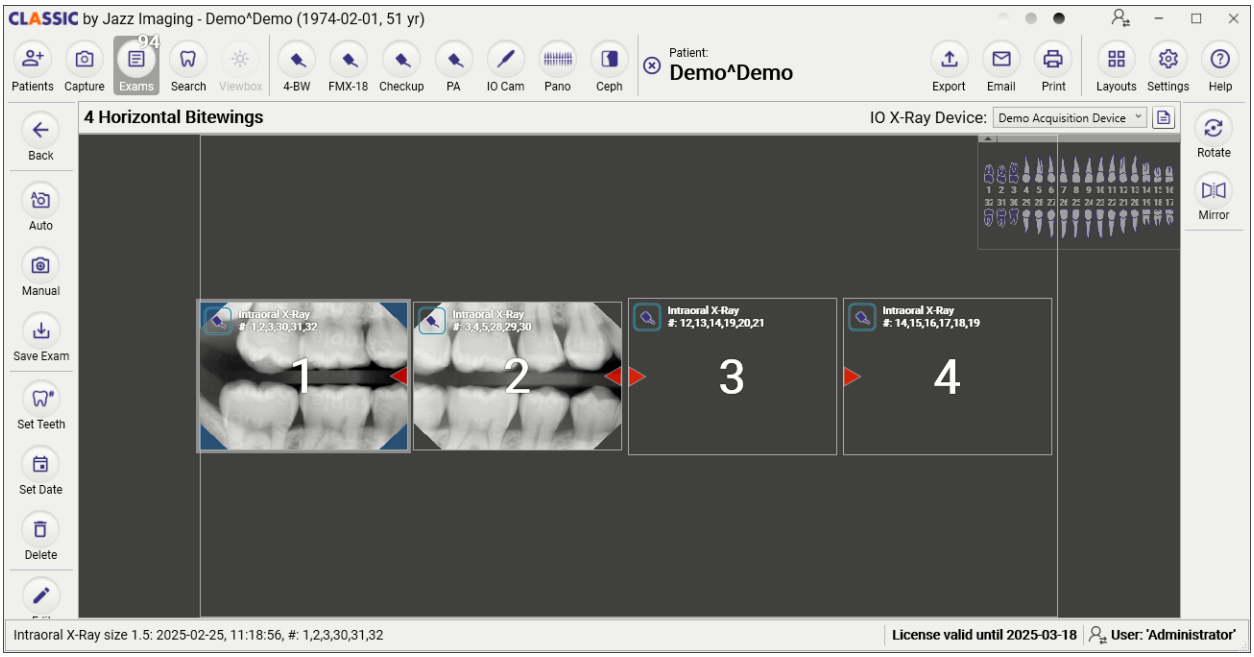
To edit an existing exam, simply select the exam and press the ***Edit*** button 

.

The following example shows a partially finished 4 Horizontal Bitewing exam:



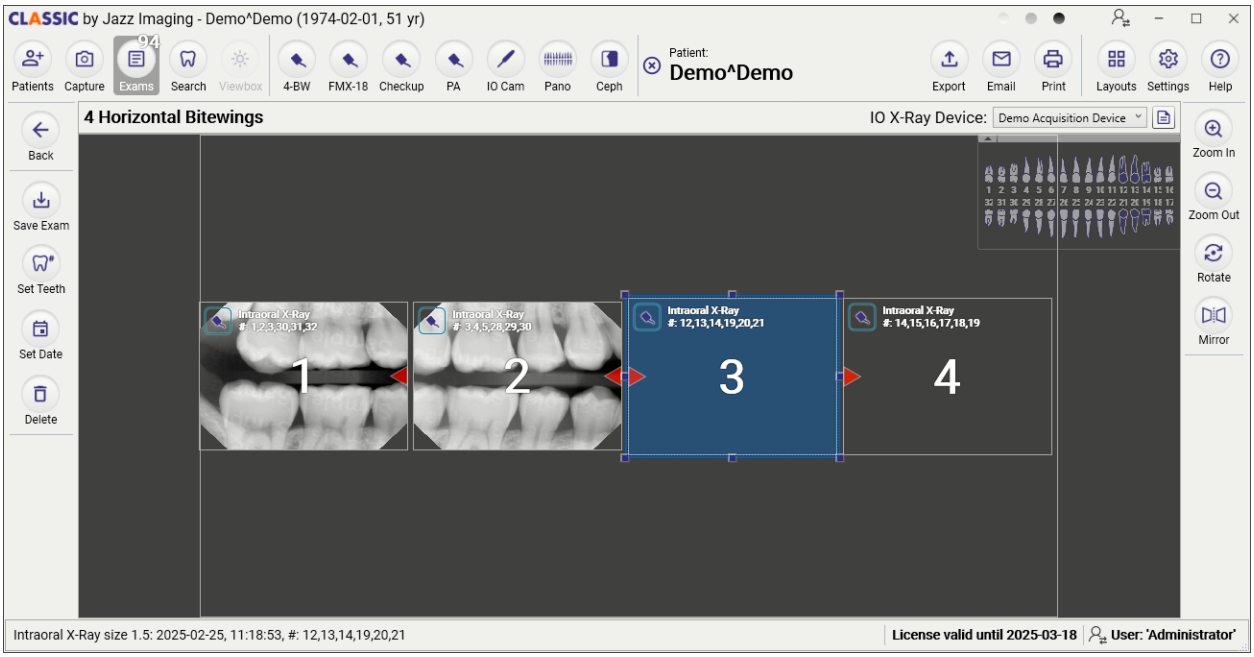
Clicking the edit buttons opens the selected exam in the Capture view.



Select an image tile and click the Auto or Manual capture buttons to finish capturing the missing bitewing images or retaking the ones.

Images captured in the wrong tile can be easily moved by dragging and dropping it from one tile to another. If both tiles contain images, the two images will be swapped by the drag-and-drop operation.

Images can also be resized or rearranged within the template. Click the Edit button to select an image tile and adjust the tile size and location to your preference.



Changing Exam Date

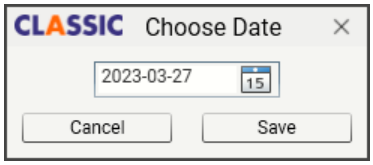
It is possible to change the Exam dates in Classic, but it's important to understand that this should only be done if the automatically generated exam date for some reason is incorrect. Typically, this is ONLY the case if images are being imported into an exam and hence the date/time when the exam is created in Classic differs from the time the individual images were captured originally!

During image import, Classic will automatically try to calculate the exam date based on the capture date/time for the individual images, but this might not always be correct.

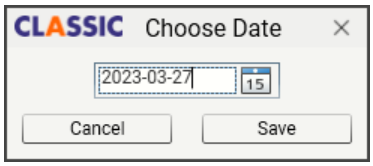
To change the date of an existing exam, simply select the exam and press the ***Set Date*** button 

.

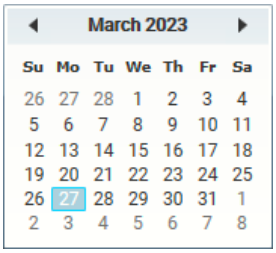
This will open the Date Selection window:



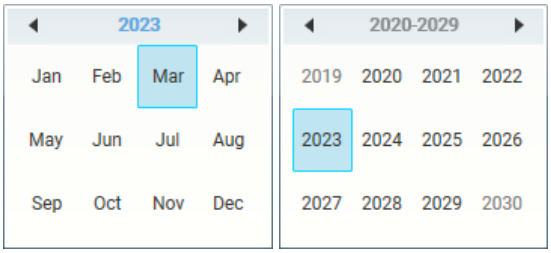
The new date can now be edited directly in the text field:



The Calendar window can also be used by clicking the calendar button on the right-hand side:



You can zoom out of the calendar window by clicking the header text. This makes it easier to select dates that are further back in time.



Hiding or Permanently Deleting Exams

In Jazz Classic, you can choose whether to ***permanently delete*** exams or ***hide*** exams from being displayed to the normal users.

When an exam has been hidden, you can "unhide" the exam later without losing exam data. However, if the exam is being permanently deleted, the exam and related images will be permanently lost unless a backup has been made prior to deleting the exam.

The primary benefits of permanently deleting exams are that all associated image data will be removed to free up disk space in the data location. Classic system backups will be smaller as well if the physical image files have been deleted from the data location.

Hiding Exams:

To hide an existing exam, simply select the exam and click the ***Hide*** button 

. Confirm your decision to hide the selected exam when prompted by Jazz Classic.

Unhiding Exams:

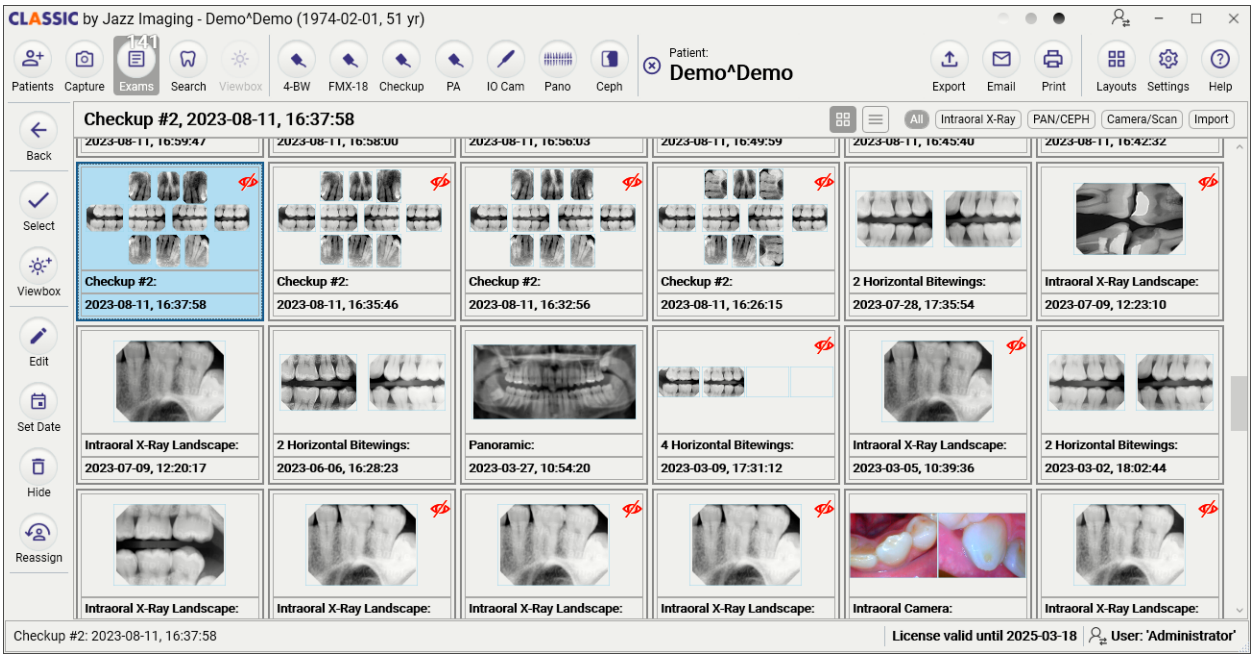
As expected, hidden exams will not be displayed to normal users when performing an exam search. However, it is possible to include all hidden exams in the exam list by pressing and holding the ***CTRL+ALT*** keys on the keyboard while searching for exams.

The following steps demonstrate how to view a complete exam list that includes both visible and hidden exams, and then unhide any of the previously hidden exams:

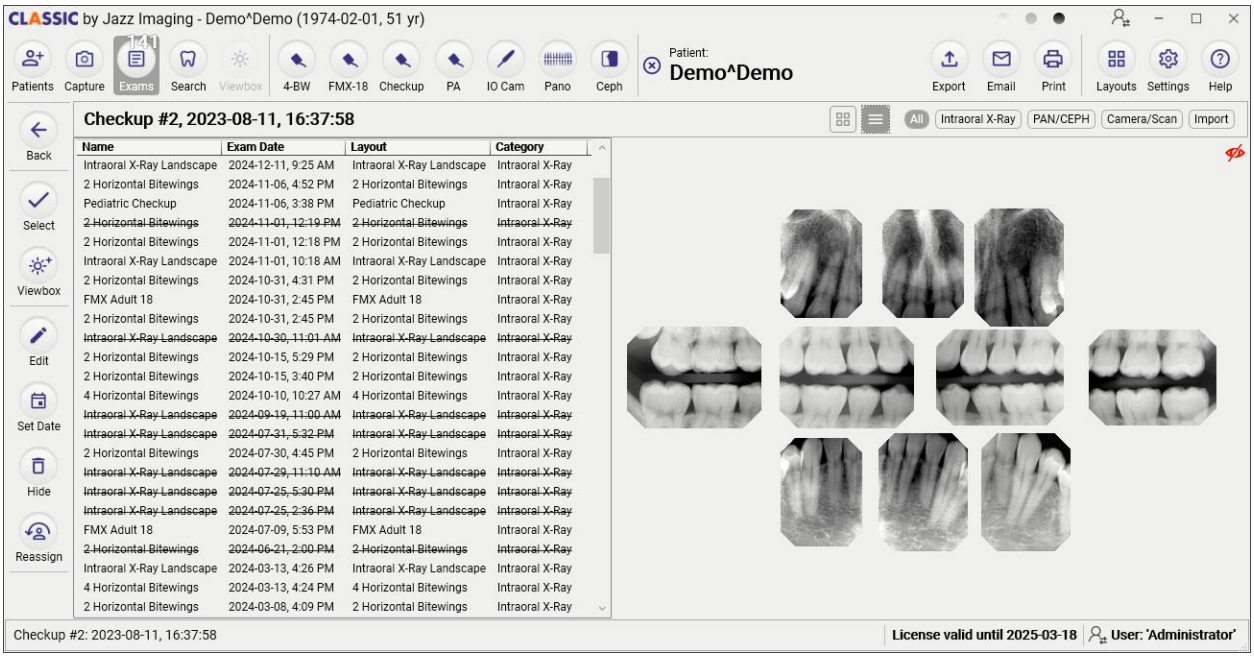
1) Press and hold the ***CTRL+ALT*** keys on the keyboard while clicking the ***Exams*** button 

on the toolbar.

The Exam View will appear, and all hidden exams will now be included. The hidden exams can easily be identified by the "hidden" icon  , as shown below.



If the Exam List view is used, the hidden exams are identified by the strikethrough font in the exam list as well as the "hidden" icon  in the upper-right corner of the Exam preview area:



2) Select the hidden exam from the list and click the ***Unhide*** button and confirm your decision to unhide the selected exam when prompted by Jazz Classic.
3) After successfully unhiding the selected exam, a new “standard” search will be automatically performed and none of the currently hidden exams will be shown.

To Permanently Delete Exams:

It is possible to delete complete exams and all associated image files, but it is important to understand that this cannot be undone, and all images and information will be lost forever if an exam is deleted.

To permanently delete an existing exam, simply select the exam and press and hold the SHIFT key while simultaneously clicking the ***Delete*** button 

.

When an Exam is manually deleted in the Jazz Classic Database, ***all*** the existing exam information and image files will be lost. It is ***NOT*** possible to undo this delete operation, so all the patient information and exam images will be gone for good!

If you want to permanently delete hidden exams, perform the hidden Exam search as described in the previous section, select any of the hidden exams from the list, and follow the delete instructions above.

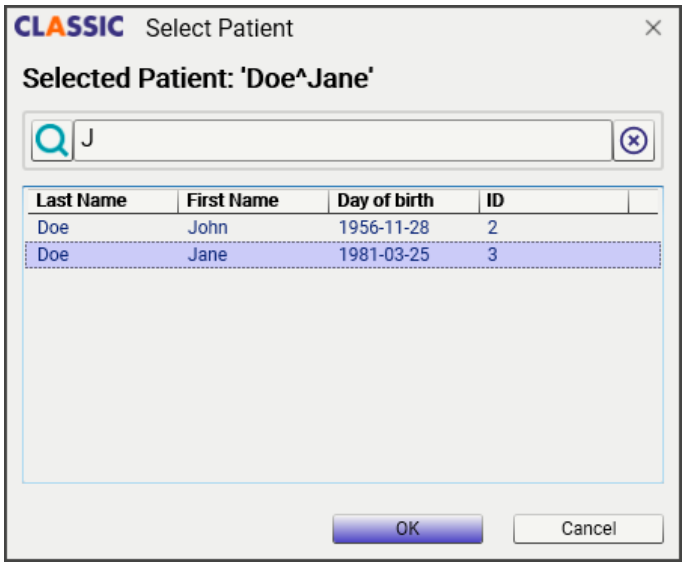
Reassigning Exams

Finally, users can reassign exams to other patients in case a wrong patient was selected when the exam was originally performed.

To reassign an existing exam, simply select the exam and press the ***Reassign*** button 

.

This opens a new Patient Selection window where the new patient can be selected from a list.



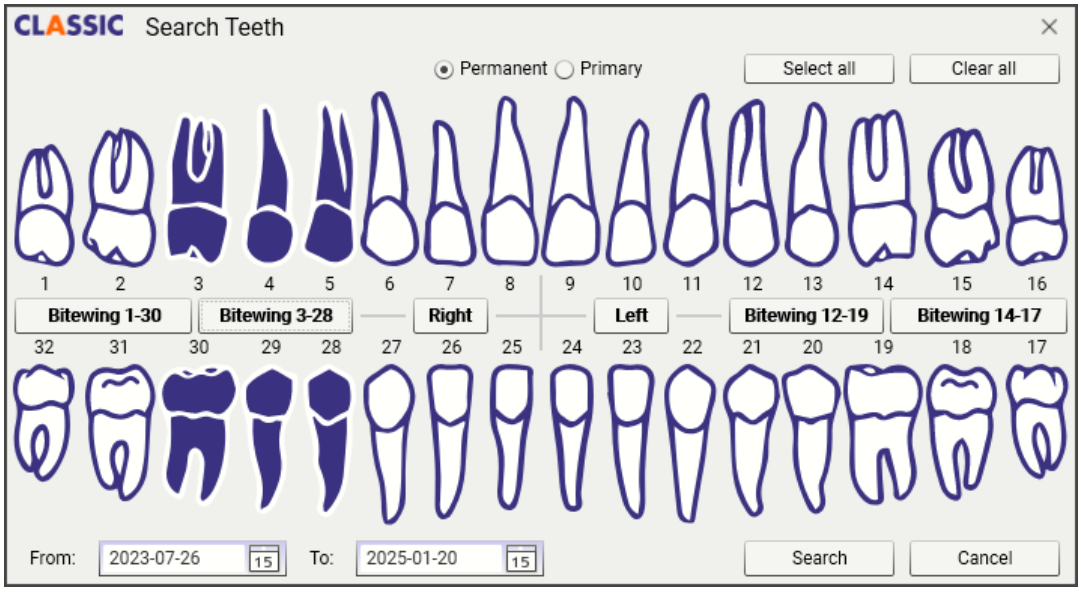
When the new patient has been selected, press the OK button. This completes the exam reassignment and designates the new patient as the current patient.

Using Teeth Search

If a user doesn't want to select a specific Exam but wants to view all images that contain specific teeth, it is possible to start a **Teeth Search** by clicking the ***Search*** button 

on the main toolbar.

This will open the ***Search Teeth*** window:



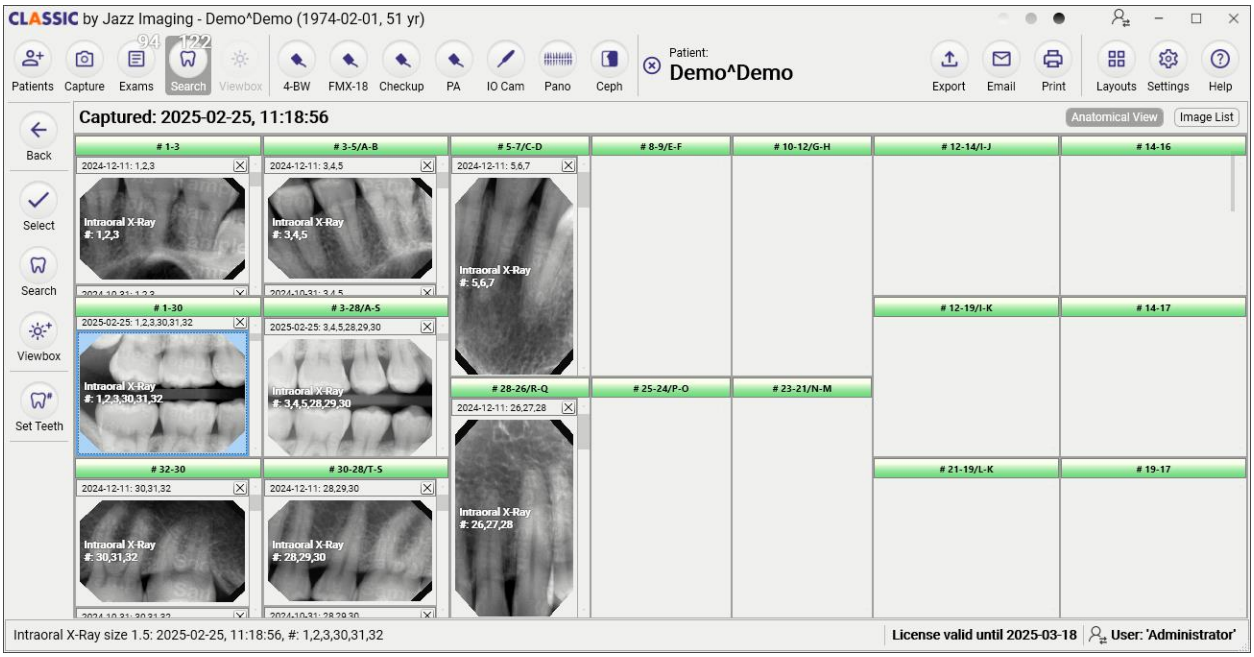
The teeth search feature will search for all images that ***include*** the specified teeth numbers and were captured within a specific time period.

To start the search, simply select which teeth to search for. You can also specify the start Exam date (From) and stop Exam date (To) to narrow the search even further.

If the teeth are left unselected, the search will include all teeth. You can manually select all teeth by using the keyboard shortcut CTRL+A. By default, the **From** and **To** dates will be set to the oldest and newest Exam date in the Classic database.

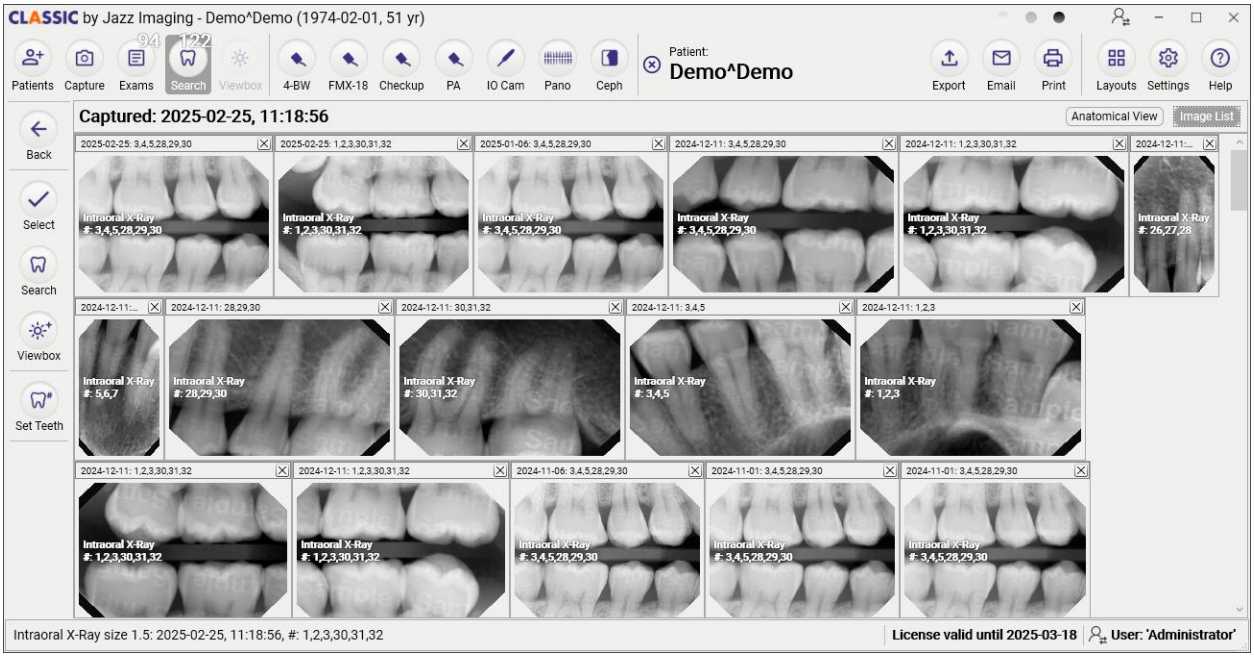
Finally, click the ***Search*** button. This will open a new Search View containing all the images that match the selected search criteria.

The Search View will open an Anatomical view that groups individual images by their assigned teeth numbers at the time of capture. The groups adhere to the teeth groupings typically employed in an FMX-18 template.



You can switch between **Anatomical** view and **Image List** view by clicking the filter buttons in the upper right side of the Search View:

The Image List View will display a list of all the images that fit the Teeth Search criteria, with the newest images positioned at the top of the list.



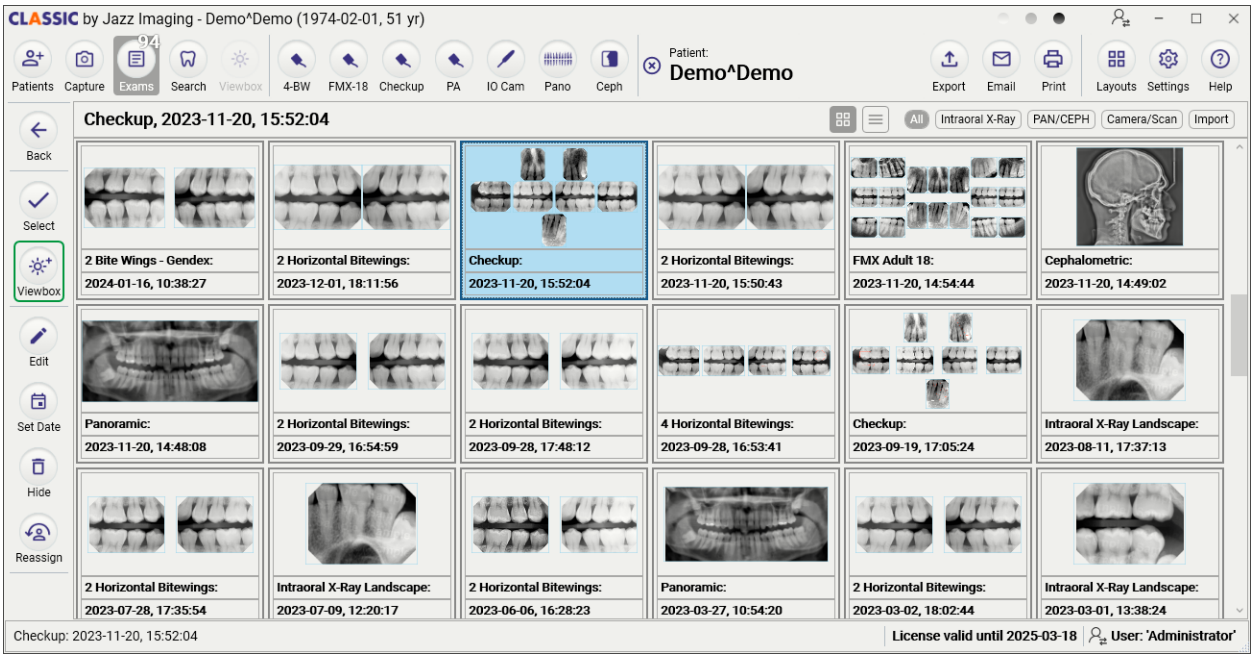
Using Viewbox

If a user instead wants to compare two or more images from any Exam, they can select individual images and transfer them to ***Viewbox*** for review. The images can either be selected from the Exam Selection list, Exam Layouts, or when the individual images are being displayed.

Adding Exams to the Viewbox

To transfer all images from an Exam to Viewbox, simply select the Exam from the Exam Selection View and click the ***Viewbox*** button 

on the left side toolbar. This will add the exam and all the exam images in one operation.



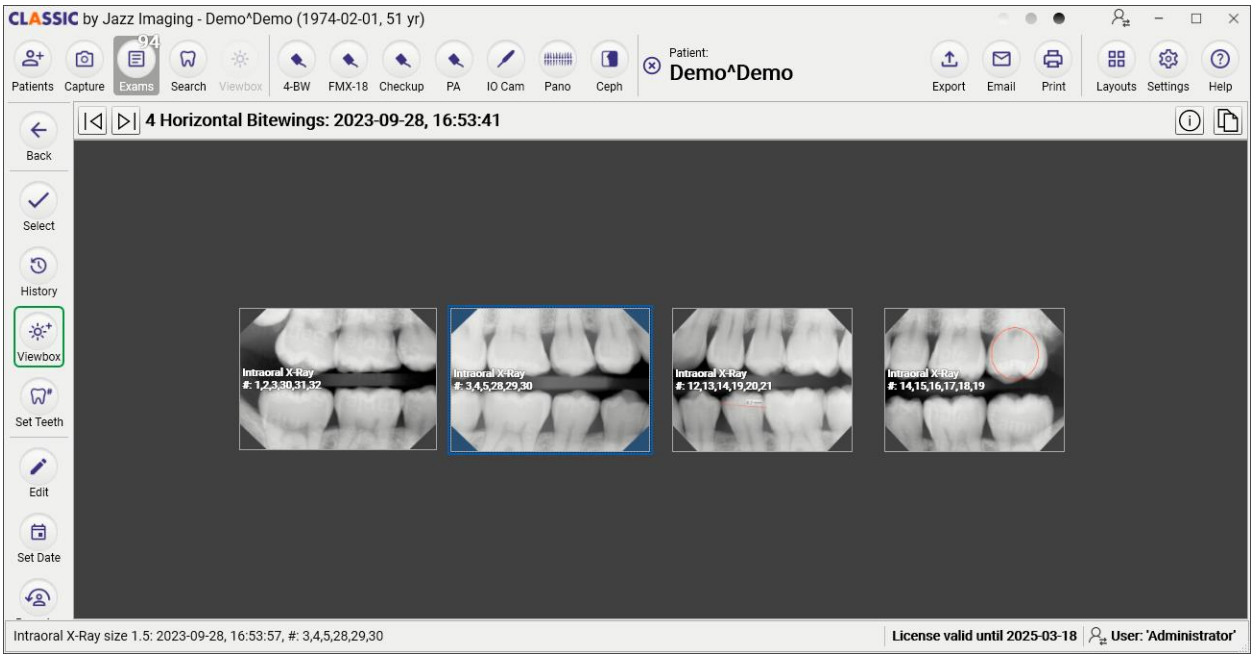
Once all the Exam images are added to Viewbox, the Viewbox button will become enabled. An overlay on the Viewbox button will display the current number of Exams and the total number of images in the Viewbox. In the example below, the Checkup Exam (which contains 7 images) was added. The upper left overlay indicates that a single exam has been added, and the upper right overlay indicates that a total of 7 images are currently in Viewbox:

If we add an FMX-18 Exam to the above Viewbox icon, the overlay will appear like this:

Adding Individual Images to Viewbox

To transfer an image to Viewbox, simply select the image from the Layout and click the ***Viewbox*** button 

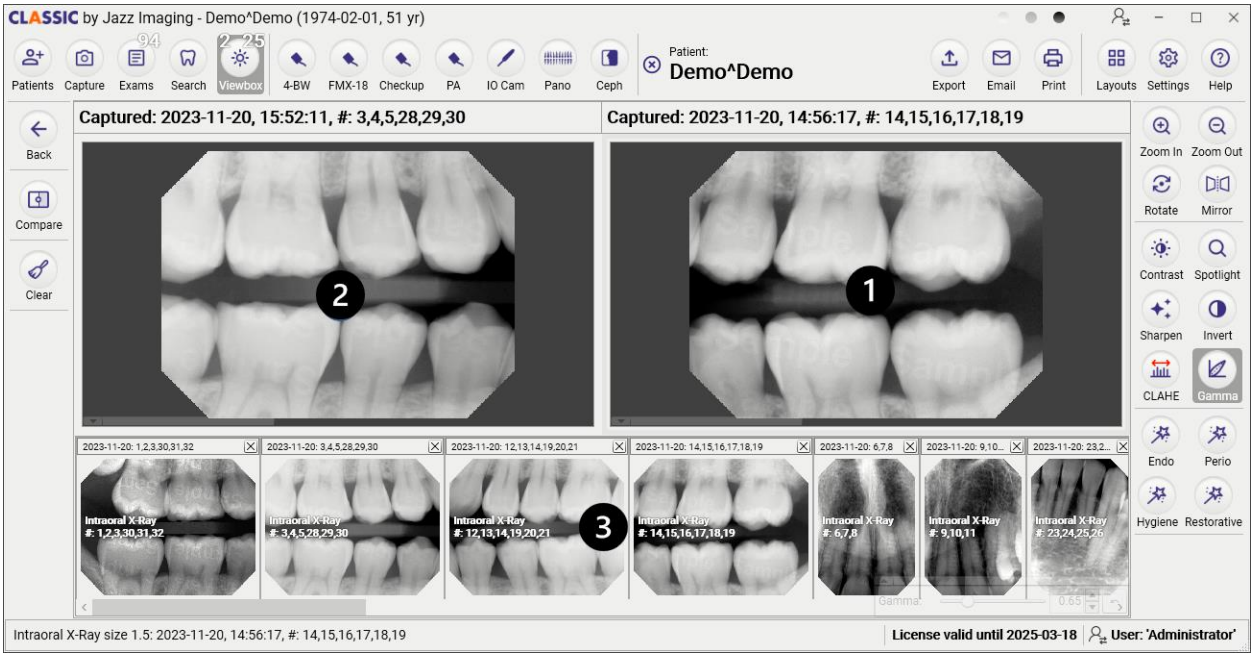
on the left side toolbar.



When the image is added to Viewbox, the Viewbox button will become enabled and the current number of images in Viewbox will be displayed.

When all the necessary images have been added to Viewbox, click the ***Viewbox*** button 

on the main toolbar to open the Viewbox View.



Viewbox is split into three logical regions:

1 **Primary image:** Displays the first image that has been chosen for Viewbox.

2 **Secondary image:** Display the second image that has been chosen for Viewbox.

3 **Image List:** List that contains all images that have been chosen for Viewbox.

To select another image for either the 1 or 2 areas, either click any image from the image list or drag-and-drop any image from the image list onto either the 1 or 2 area.

The image processing filters can be applied to either of the two images independently. Simply select either the 1 or 2 area and use the filter buttons on the right-hand side toolbar.

If one or more of the Viewbox images need to be removed from the image list, simply click the small [x] in the upper-right corner of the individual image.

You can also clear all images from the Viewbox by pressing the ***Clear*** button 

from the left-hand side toolbar. This will close the Viewbox completely and return to the ***Exam Selection*** view.

Communication

Jazz Classic facilitates sharing individual images and Exams through various means, including exporting, e-mailing, or directly printing the image files from any exam.

When an exam or individual images are selected, the three Communication buttons in the Main toolbar will become enabled:

Each of these three buttons offers configurable options, all of which will be described below in the following sections.

Exporting Images

Jazz Classic simplifies the process of exporting Exam images and Layouts, making it easy to share them with others.

After selecting the Exam images that need to be exported, press the ***Export*** button 

on the main toolbar to open the Export view.

The exported files will be placed in a sub-folder named:

<Last Name>^<First Name>_export_<YYYY><MM><DD><hh><mm><ss>

,where:

- <Last Name> is the patients Last Name
- <First Name> is the patients First Name
- <YYYY> is 4-digit export Year [2023..]
- <MM> is 2-digit export Month [01..12]
- <DD> is 2-digit export Day [01..31]
- <hh> is 2-digit export Hour [00..23]
- <mm> is 2-digit export Minute [00..59]
- <ss> is 2-digit export Second [00..59]

The <Last Name> and <First Name> might be omitted if the Export is **Anonymized** by selecting the Anonymize option, as explained below.

The Export View will look slightly different depending on the type of image selection (Exam, Teeth search or Viewbox selection), so each type will be described separately:

Exporting Exams Images and Layouts

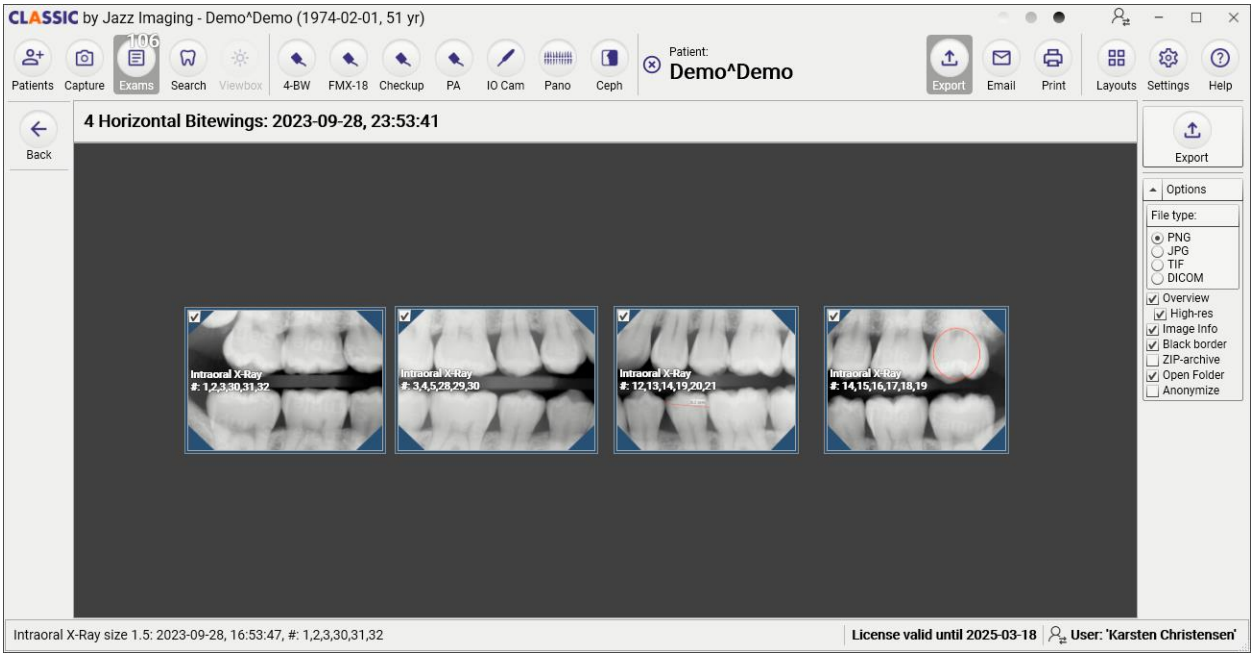
Selecting an Exam allows users to export the Layout overview as well as individual images within the exam.

To start the export, click the Export button:

This will export the Layout overview as well as all the individual selected exam images.

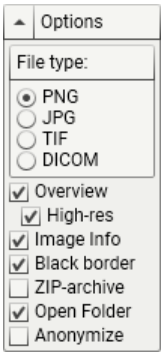
Individual Exam images are selected using the checkbox in the upper-left corner of each image. The checkboxes can be toggled on/off, and by default, all images will be selected when the Export View opens.

All images can be selected by using the keyboard shortcut CTRL+A.



Export Options

Before the exam images are exported, the user will be able to select between a series of ***Export Options***. These options select the format of the exported files and which kind of information is included in the export.



FILE TYPE OPTIONS

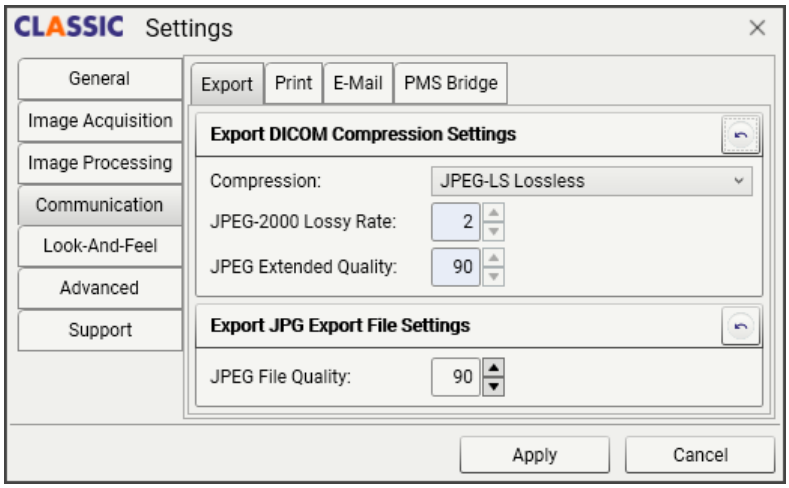
It is possible to select the image file format that will be used when the images are being exported. Each format has its own advantages and disadvantages, so it is important to choose the correct file format.

The following image file formats are currently supported during export:

File type	Extension	Description
PNG	.png	Portable Network Graphics. ***Lossless*** bitmap image format with support for transparency via separate alpha-channel. This format preserves all image details without image quality loss.
JPG	.jpg	Joint Photographic Experts Group. **Lossy** compressed file format. The higher the compression rate, the lower the image quality will be.
TIF	.tif	Tagged Image File Format. Typically used with **lossless** LZW compression to achieve optimal image quality in relatively small image files.
DICOM	.dcm	DICOM images support a wide variety of both lossless and lossy compression settings. It is possible to create high quality images with very high compression rates. The images will utilize the DICOM metadata to store basic patient information as well as Teeth number information.

It is important to note that the JPG file format is based on a Lossy compression algorithm. The same might be the case for the DICOM file format – depending on which Compression algorithm is chosen in the compression settings. The higher the compression rate, the more image quality loss should be expected.

The compression settings for JPG and DICOM files can be configured in the ***Settings*** Window under the ***Communication->Export*** tab:



DICOM COMPRESSION SETTINGS

The DICOM file format supports a wide variety of compression settings:

- None
- JPEG-2000 Lossy
    - Adjustable Compression Rate [0..8]
- JPEG-2000 Lossless
- JPEG-LS Lossy (Near Lossless)
- JPEG-LS Lossless
- JPEG Lossless, Non-Hierarchical, First-Order Prediction
- JPEG Lossless, Non-Hierarchical (Process 14)
- JPEG Extended
    - Adjustable Quality Setting [0..100]

JPEG QUALITY SETTING

The JPG file format supports adjustment of the Quality setting between 0 and 100, where 100 provides the best image quality but the largest file size. The default setting of 90 yields a compression ratio of around 1:2.8.

OVERVIEW OPTION

Besides the image file format, it is also possible to select whether the exported image files will include an Exam Overview and whether the images will include detailed image information.

If the Overview option is checked, then an exam overview image will be generated and included in the image export folder/archive.

The overview image (if selected) will be named:

<Last Name>^<First Name>_overview_<YYYY><MM><DD><hh><mm><ss>

,where:

- <Last Name> is the patients Last Name
- <First Name> is the patients First Name
- <YYYY> is 4-digit export Year [2023..]
- <MM> is 2-digit export Month [01..12]
- <DD> is 2-digit export Day [01..31]
- <hh> is 2-digit export Hour [00..23]
- <mm> is 2-digit export Minute [00..59]
- <ss> is 2-digit export Second [00..59]


The <Last Name> and <First Name> might be omitted if the Export is **Anonymized** by selecting the Anonymize option, as explained below.

Example: Exported overview image with **Image Info** option enabled:

If the High-res option is selected, then the Overview image will be 8000 pixels wide instead of the standard 1600 pixels wide.

IMAGE INFO OPTION

If the Image Info option is checked, all images will include information about the Exam type as well as the date and time when the exam was performed.

The image information will be placed inside a white border that surrounds all the exported images. If this option has not been selected, then no white border will be added to the images!

The image information might also include the name of the Patient – unless the Anonymized option has been selected.

Example: Exported image with **Image Info** option enabled:


Exam: 2023-02-10, 11:52 AM, #: 1,2,3,30,31,32
Patient: Demo^Demo

The individual images will be named:

<Last Name>^<First Name>_image_<Image#>_<YYYY><MM><DD><hh><mm><ss>

,where:

- <Last Name> is the patients Last Name
- <First Name> is the patients First Name
- <Image#> is the 2-digit image number [01..nn]
- <YYYY> is 4-digit export Year [2023..]
- <MM> is 2-digit export Month [01..12]
- <DD> is 2-digit export Day [01..31]
- <hh> is 2-digit export Hour [00..23]
- <mm> is 2-digit export Minute [00..59]
- <ss> is 2-digit export Second [00..59]

The <Last Name> and <First Name> might be omitted if the Export is **Anonymized** by selecting the Anonymize option, as explained below.

BLACK BORDER OPTION

If this option is selected, then the exported images will have a black background instead of the default white background.

ZIP-ARCHIVE OPTION

It is also possible to compress all the exported images into a single zip archive, so it is easier to handle.

OPEN FOLDER OPTION

When this option is selected, then Classic will automatically open the Export Folder selected by the user and hence make it easier to locate the exported files after the Export has completed.

ANONYMIZE OPTION

Finally, it is possible to remove all references to the Patients in the exported images. The file names will all be anonymized, and the Image Info details will not include the Patient name if this option is selected.

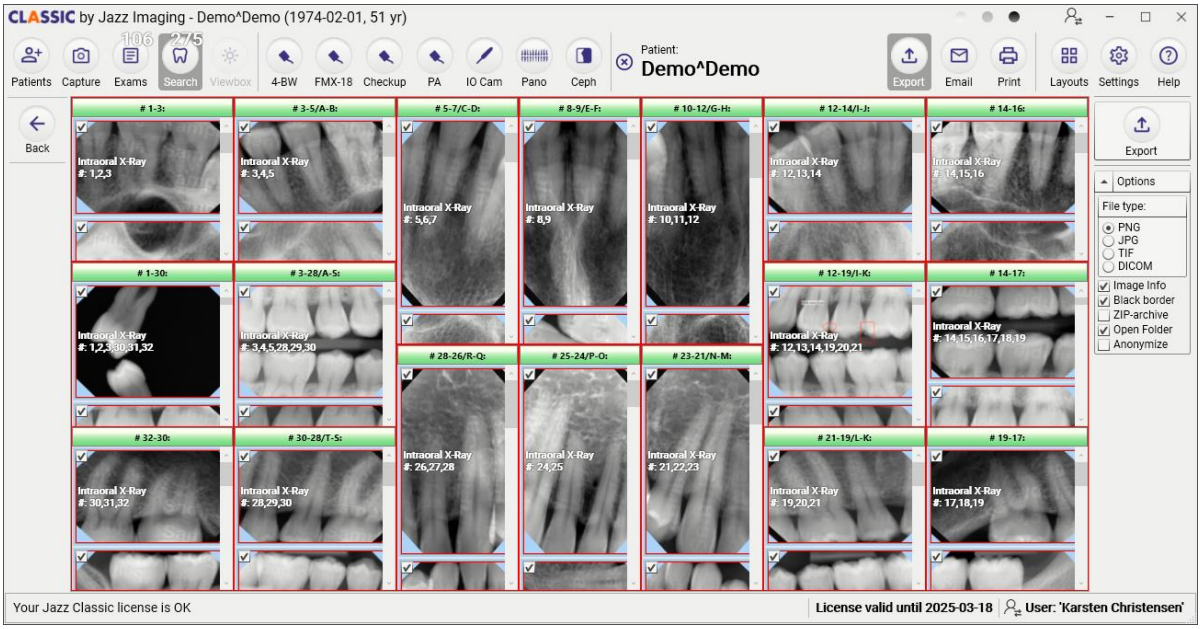
All Export Option selections will automatically be saved and will persist when Classic is restarted.

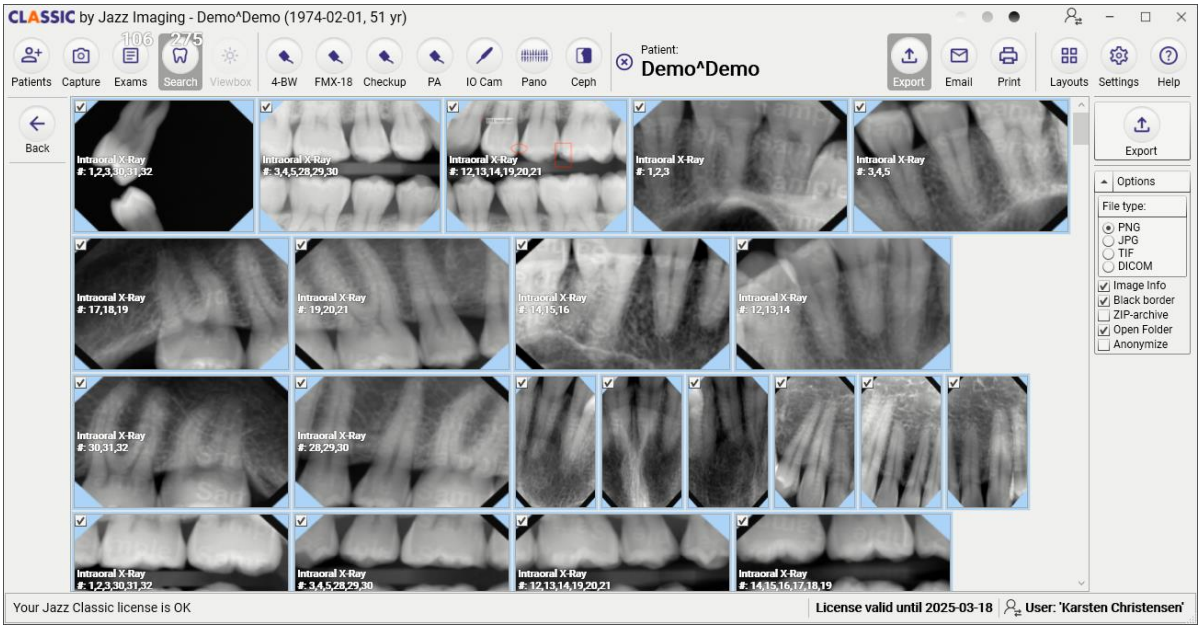
Exporting Teeth Search Images

When exporting images from a Teeth Search, the functionality is basically the same as when an Exam is being exported.

The only difference is that the selected images are displayed as either an anatomical view or as a simple list of images, depending on the view chosen in Teeth Search View. Additionally, it's not possible to export any Exam Overview since no specific Exam has been selected.

The following two images show the Teeth Search Export View presented using either the Anatomical view or the Image List view formats:



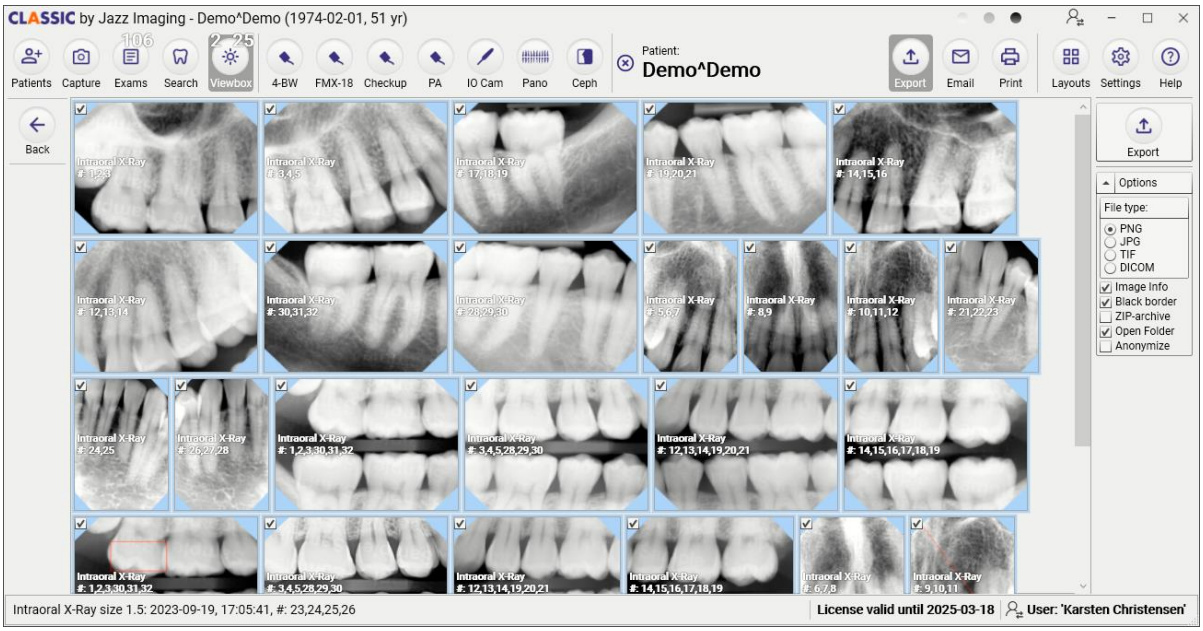


The rest of the Export options are identical to the Exam Export options described previously.

Exporting Viewbox Images

When exporting images from Viewbox, the functionality is basically the same as when an Exam is being exported.

The only difference is that the selected images are shown as a simple list of images and that it's not possible to export any Exam Overview since no specific Exam has been selected.



The rest of the Export options are identical to the Exam Export options described previously.

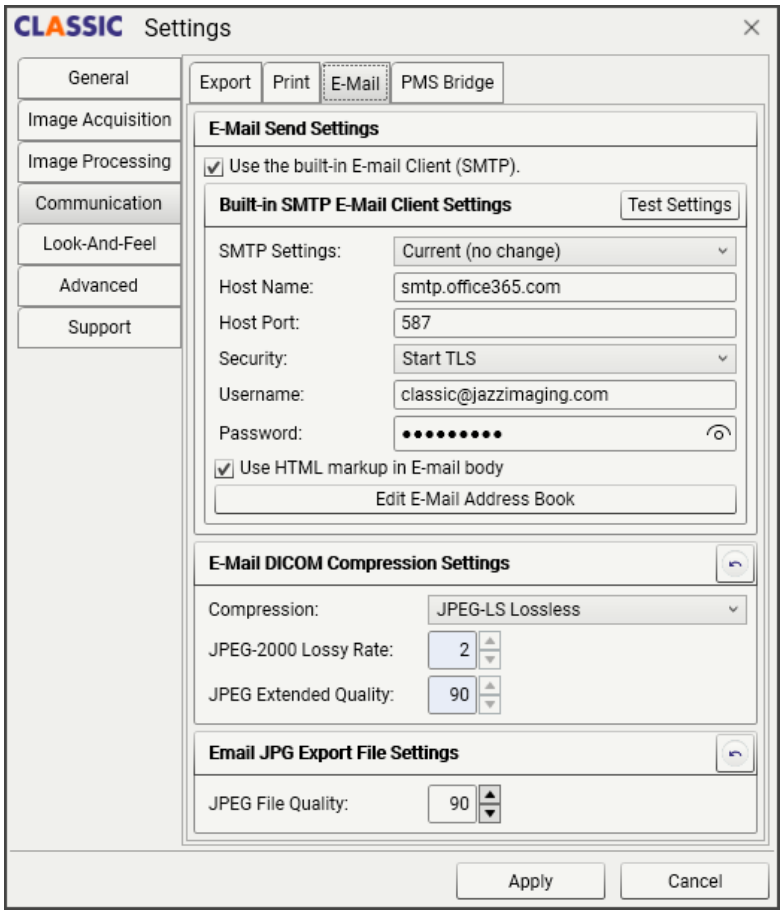
Emailing Images

Jazz Classic simplifies the process of emailing Exam images and Layouts for easy sharing. Individual images are exported and attached to a new email, which is then created either using the ***default*** email application configured for the system or using the built-in E-mail Client.

To use the ***default*** email application option, you must ensure that an email application has been installed (for instance the full featured Microsoft Outlook from the Microsoft Office/Office365 suite) and that it has been configured correctly beforehand as the ***default application*** for sending emails (configured in Windows 10/11 in Settings->Default apps).

The default email application must support the Simple-MAPI protocol in order for it to work with Classic.

The built-in E-mail Client is a standard SMTP client, and it must be configured before it can be used by Classic. This is done using the ***Communication->E-mail*** Settings tab in the Settings Window:



You must collect and type in the SMTP server settings provided by your current email service provider and type in your username (typically your email address) and the correct password.

Use the Test button to verify the SMTP server connection details are correct and that the username and password works. See the E-mail settings chapter for more details.

After selecting the Exam images that need to be emailed, simply press the ***Email*** button 

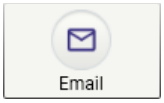
on the main toolbar to open the Email View.

The Email View will look slightly different depending on the type of image selection (Exam, Teeth search, or Viewbox selection) so each type will be described separately.

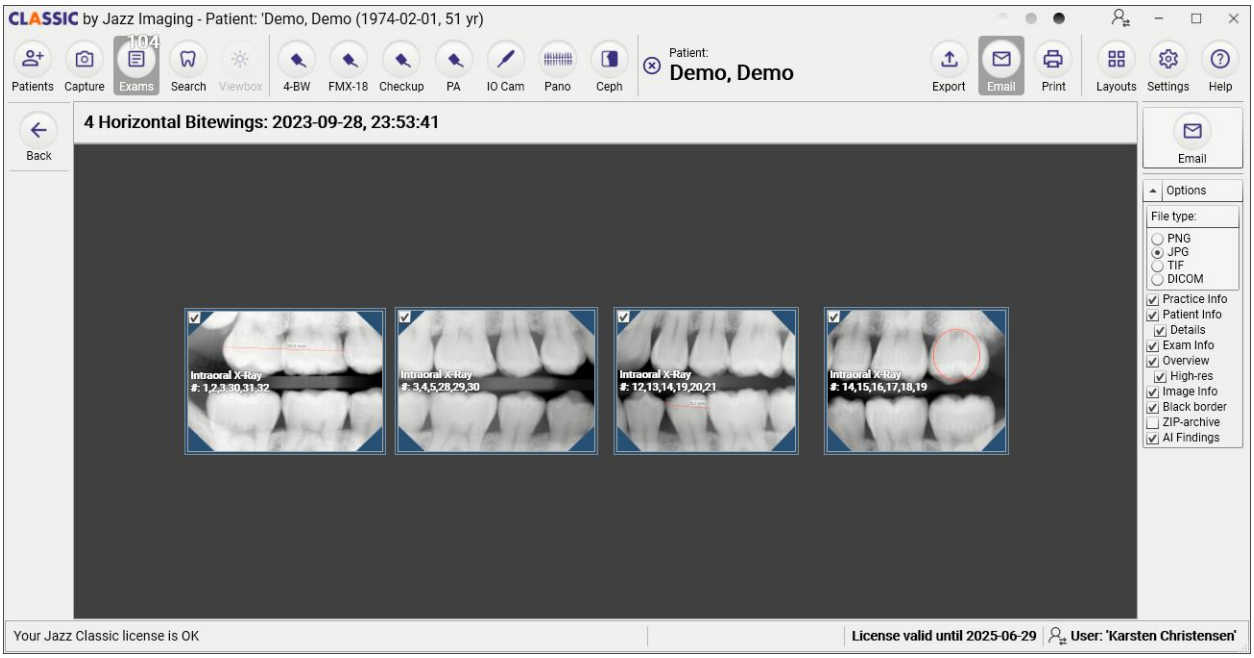
Emailing Exams Images and Layouts

When an Exam has been selected, it's possible to email the Layout overview and as all the selected individual images.

To start emailing, click the Email button:



This will email the Layout overview as well as all the individual selected exam images.

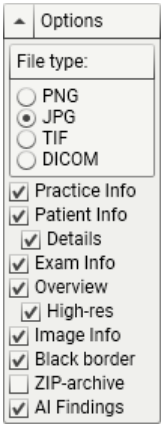


The individual Exam images can be selected using the checkbox in the upper-left corner of each image. The checkboxes can be toggled on/off, and by default, all images are selected when the Email View opens.

All images can be selected by using the keyboard shortcut CTRL+A.

Email Options

It is possible to specify the image file format used when the images are being emailed.

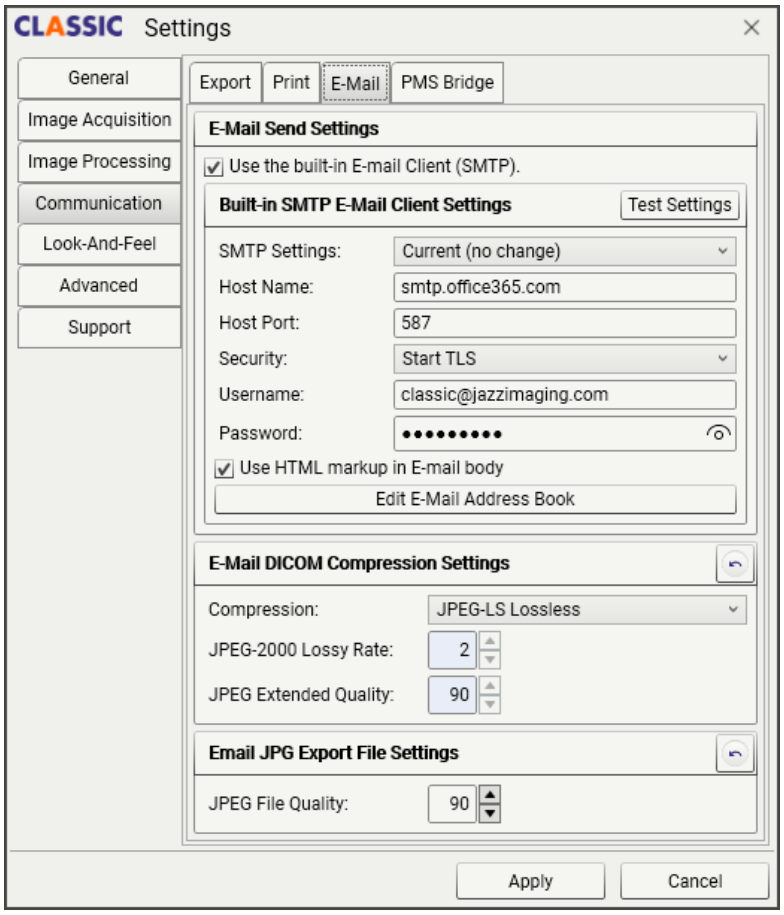


The following image file formats are currently supported during email:

File type	Extension	Description
PNG	.png	Portable Network Graphics. ***Lossless*** bitmap image format with support for transparency via separate alpha-channel. This format preserves all image details without image quality loss.
JPG	.jpg	Joint Photographic Experts Group. **Lossy** compressed file format. The higher the compression rate, the lower the image quality will be.
TIF	.tif	Tagged Image File Format. Typically used with **lossless** LZW compression to achieve optimal image quality in relatively small image files.
DICOM	.dcm	DICOM images support a wide variety of both lossless and lossy compression settings. It is possible to create high quality images with very high compression rates. The images will utilize the DICOM metadata to store basic patient information as well as Teeth number information.

All Email Option selections will automatically be saved and will persist when Classic is restarted.

The compression settings for JPG and DICOM files can be configured in the ***Settings*** Window under the ***Communication->E-mail*** tab:



DICOM COMPRESSION SETTINGS

The DICOM file format supports a wide variety of compression settings:

- None
- JPEG-2000 Lossy
    - Adjustable Compression Rate [0..8]
- JPEG-2000 Lossless
- JPEG-LS Lossy (Near Lossless)
- JPEG-LS Lossless
- JPEG Lossless, Non-Hierarchical, First-Order Prediction
- JPEG Lossless, Non-Hierarchical (Process 14)
- JPEG Extended
    - Adjustable Quality Setting [0..100]

JPEG QUALITY SETTING

The JPG file format supports adjustment of the Quality setting between 0 and 100, where 100 provides the best image quality but the largest file size. The default setting of 90 yields a compression ratio of around 1:2.8.

Email Content

When the new email is created, the **Subject** line will include information about the Exam capture date and what type of images it includes (Radiographs/Photos/…).

The default Subject line for Exams is:

Radiographic examination captured on <Date and Time of the Exam>

It is possible to configure what type of information will be included in the email body text:

- Practice Information
- Patient Information
    - Name and Identifier
    - Detailed patient information
- Exam Information

Besides the image file format and Email Body text, users can also select whether the exported image files will include the Exam Overview and whether the images will include detailed image information.

Exported images can be compressed into a single zip archive, which will be attached to the email instead of the individual images.

The attached overview image (if selected) will be named:

<Last Name>^<First Name>_overview_<YYYY><MM><DD><hh><mm><ss>

,where:

- <Last Name> is the patients Last Name
- <First Name> is the patients First Name
- <YYYY> is 4-digit export Year [2023..]
- <MM> is 2-digit export Month [01..12]
- <DD> is 2-digit export Day [01..31]
- <hh> is 2-digit export Hour [00..23]
- <mm> is 2-digit export Minute [00..59]
- <ss> is 2-digit export Second [00..59]

Example: Email overview image with **Image Info** option enabled:

The individual images will be named:

<Last Name>^<First Name>_image_<Image#>_<YYYY><MM><DD><hh><mm><ss>

,where:

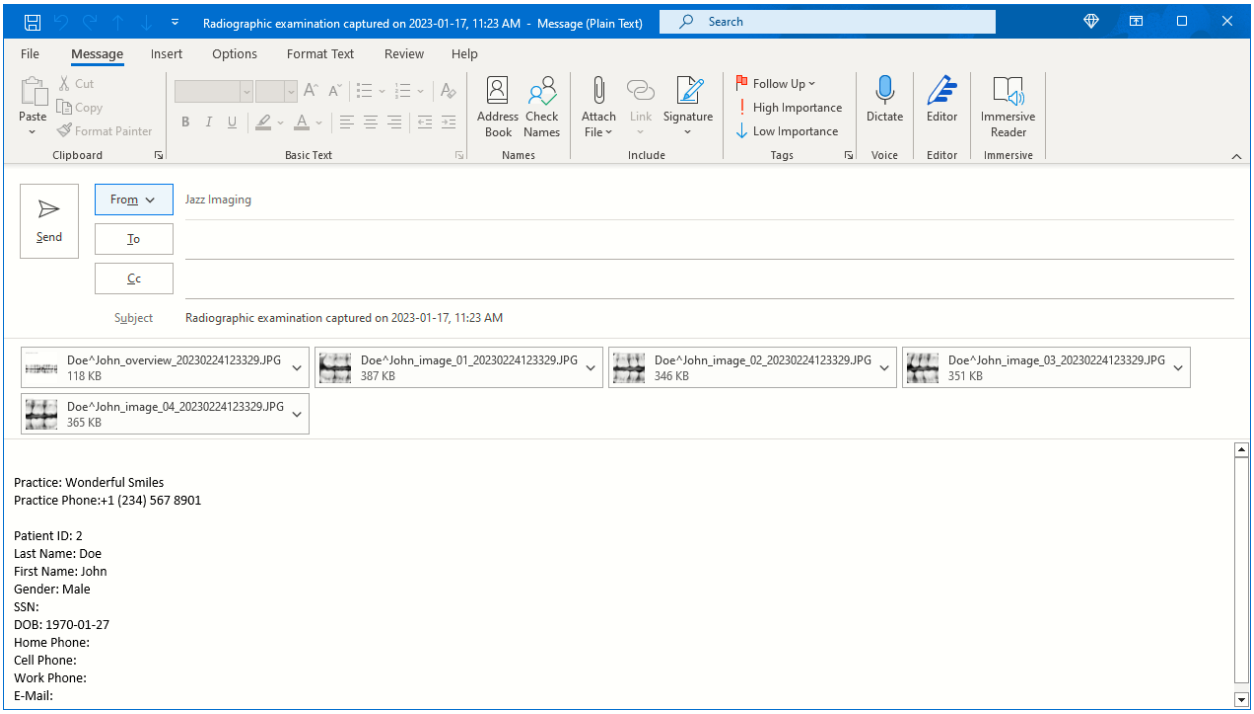
- <Last Name> is the patients Last Name
- <First Name> is the patients First Name
- <Image#> is the 2-digit image number [01..nn]
- <YYYY> is 4-digit export Year [2023..]
- <MM> is 2-digit export Month [01..12]
- <DD> is 2-digit export Day [01..31]
- <hh> is 2-digit export Hour [00..23]
- <mm> is 2-digit export Minute [00..59]
- <ss> is 2-digit export Second [00..59]

Example: Emailed image with **Image Info** option enabled:

Example: Emailed image with both **Image Info** and **AI Findings** options enabled:

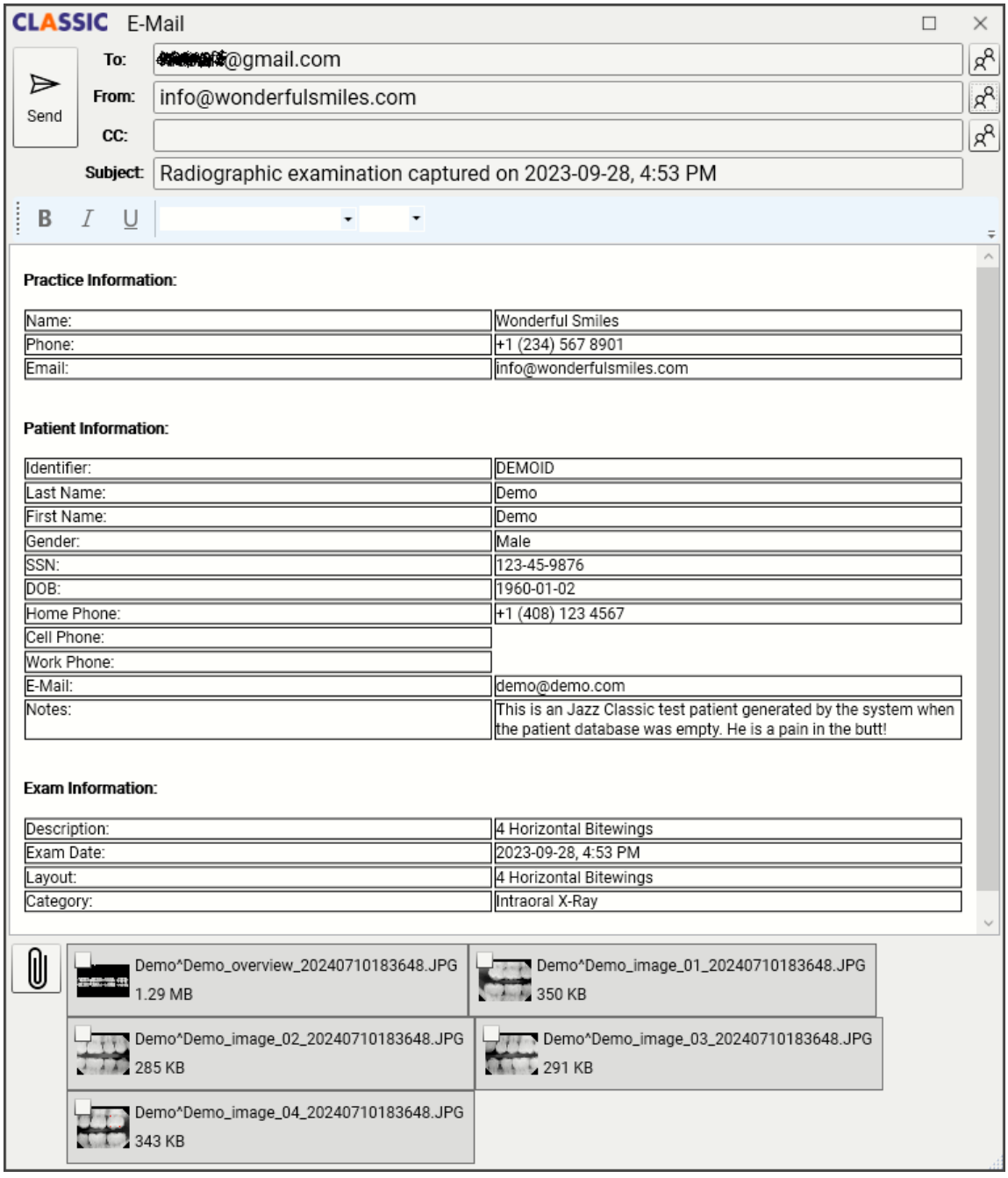
EMAIL USING THE WINDOWS DEFAULT EMAIL APPLICATION

The following example shows a new email created in Microsoft Outlook, where all optional information has been included:



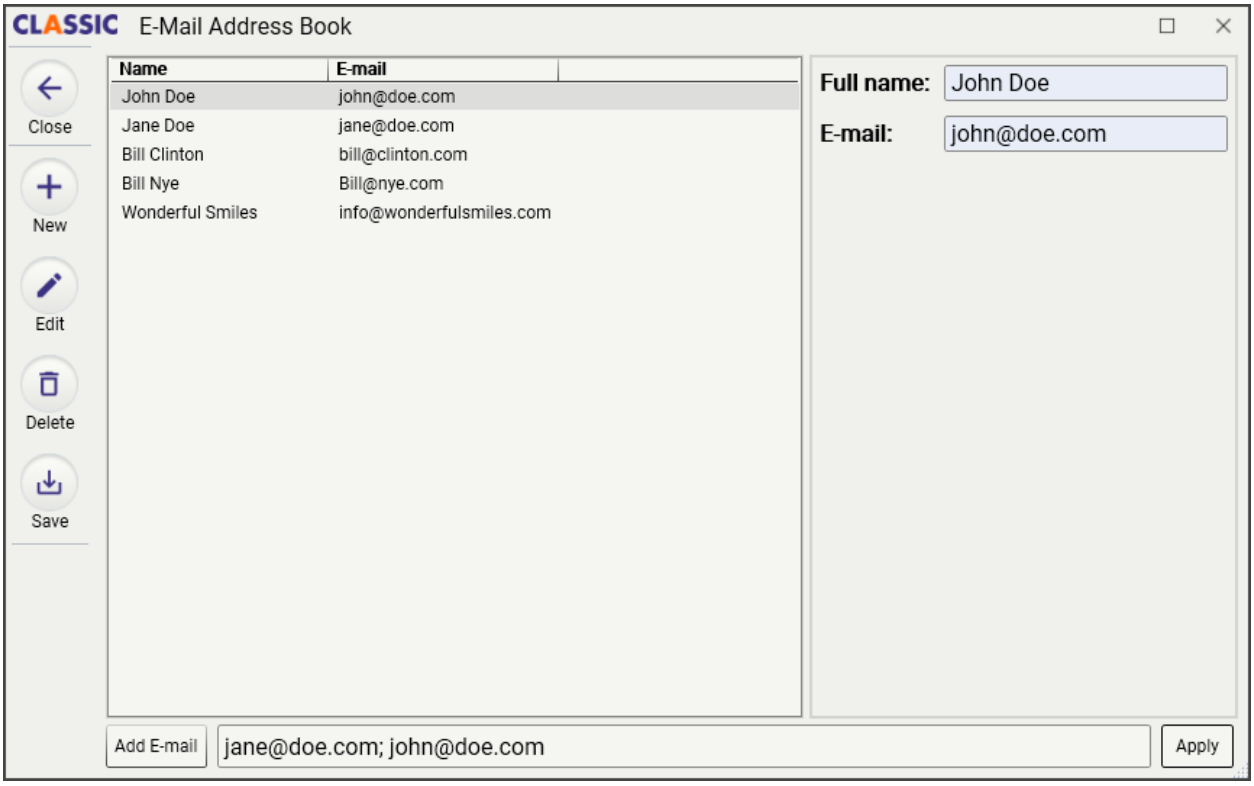
USING THE BUILT-IN EMAIL CLIENT

The following example shows a new HTML email created using the built-in e-mail client, where all the optional information has been included:



The email addresses of one or more recipients can be manually added to the **To:** field. If more than one recipient is added, the individual email addresses must be separated by either a ';' or a ','.

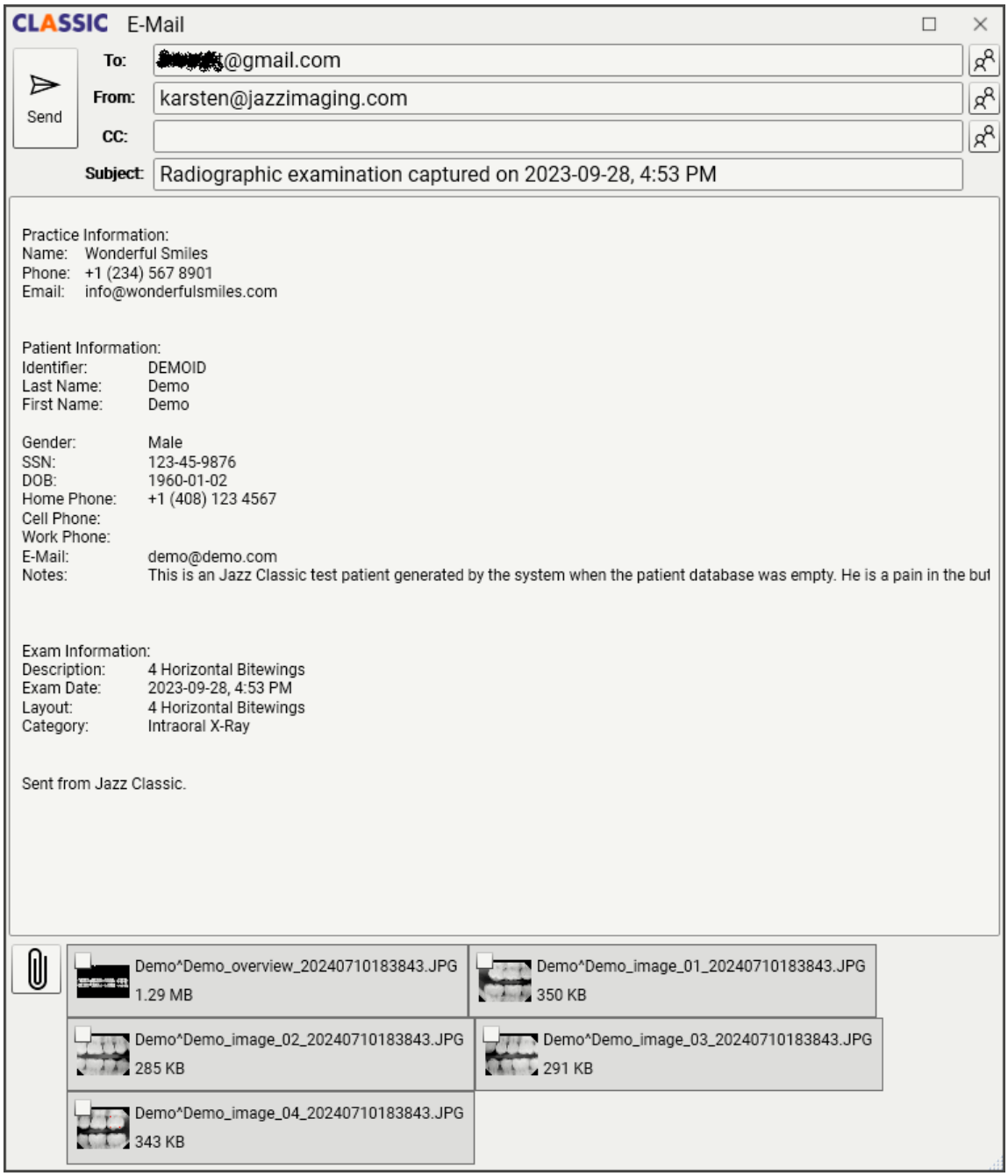
The list of recipient email addresses can also be created/edited using the built-in Email Address Book which is opened using the  buttons:



The **From:** field contains the email address of the sender (typically the Practice email address), and the **Cc:** field is optional and can contain one or more additional recipients. If more than one recipient is added, the individual email addresses must be separated by either a ‘;’ or a ‘,’.

The contents and subject of the email can manually be edited before sending out the email.

It is also possible to use plain text email format instead of the HTML format, and the same email would in this case look like this:

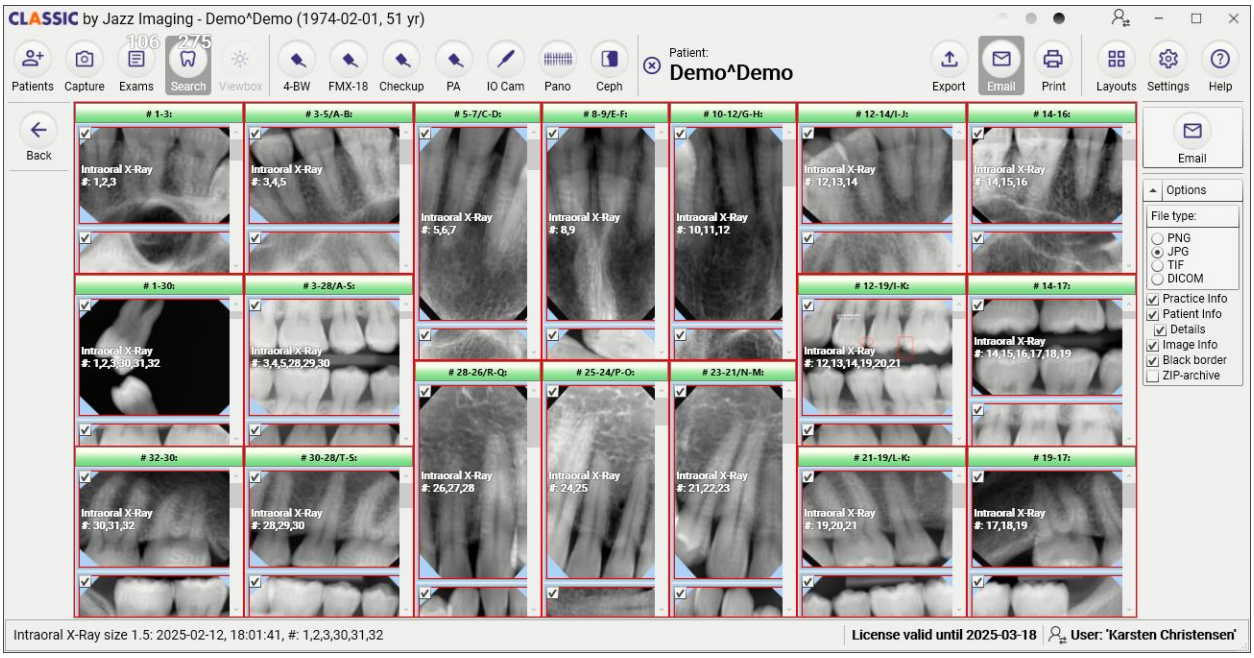


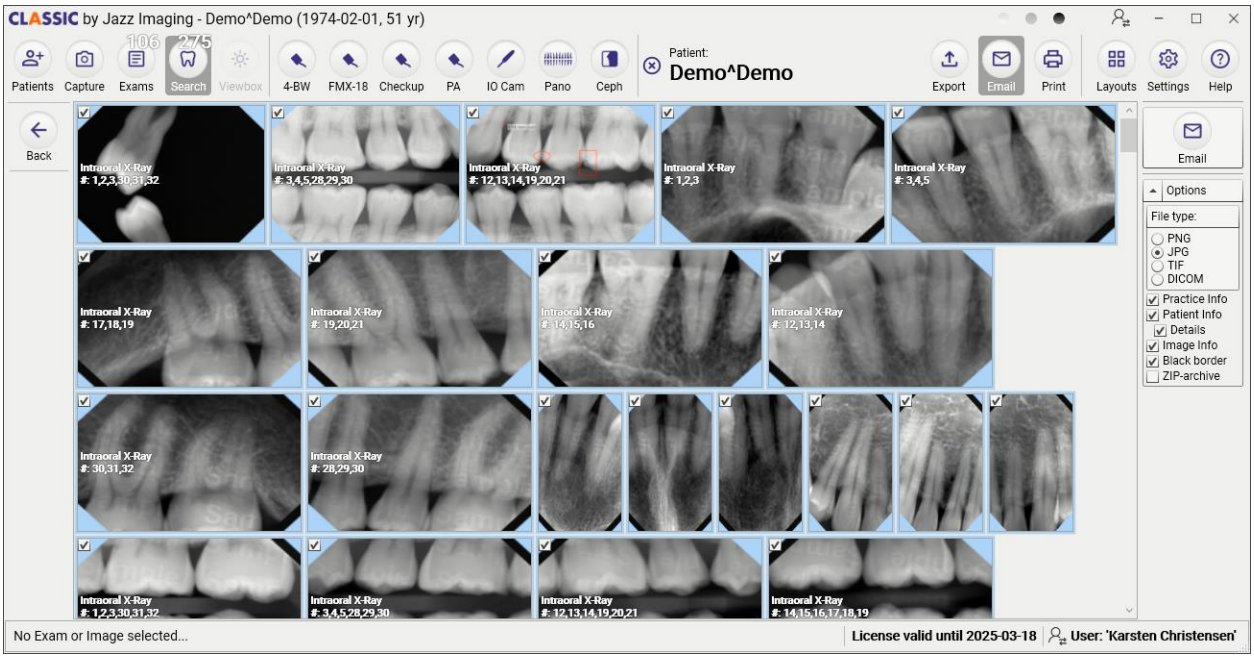
Emailing Teeth Search Images

When emailing images from a Teeth Search, the functionality is basically the same as when an Exam is being emailed.

The only difference is that the selected images are displayed as either an anatomical view or a simple list of images (as selected in the Teeth Search View). Additionally, it's not possible to export any Exam Overview since no specific Exam has been selected.

The following two images show the Teeth Search Email View presented using either the Anatomical view or the Image List view formats:



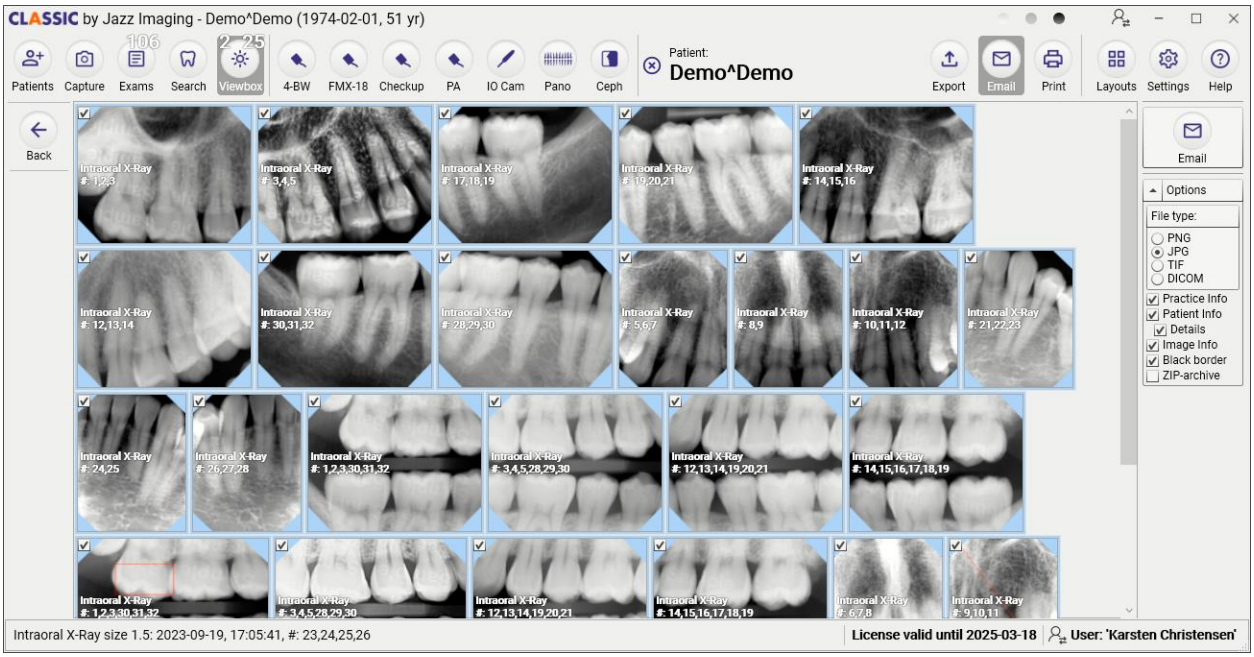


The rest of the Email options are identical to the Exam Email options described previously.

Emailing Viewbox Images

When emailing images from the Viewbox, the functionality is basically the same as when an Exam is being exported.

The only difference is that the selected images are shown as a simple list of images and that it's not possible to email any Exam Overview since no specific Exam has been selected.



The rest of the Email options are identical to the Exam Email options described previously.

Printing Images

Jazz Classic makes it easy to Print Exams so they can be shared with others.

After selecting the Exam that needs to be printed, click the ***Print*** button 

on the main toolbar. This opens the Print view.

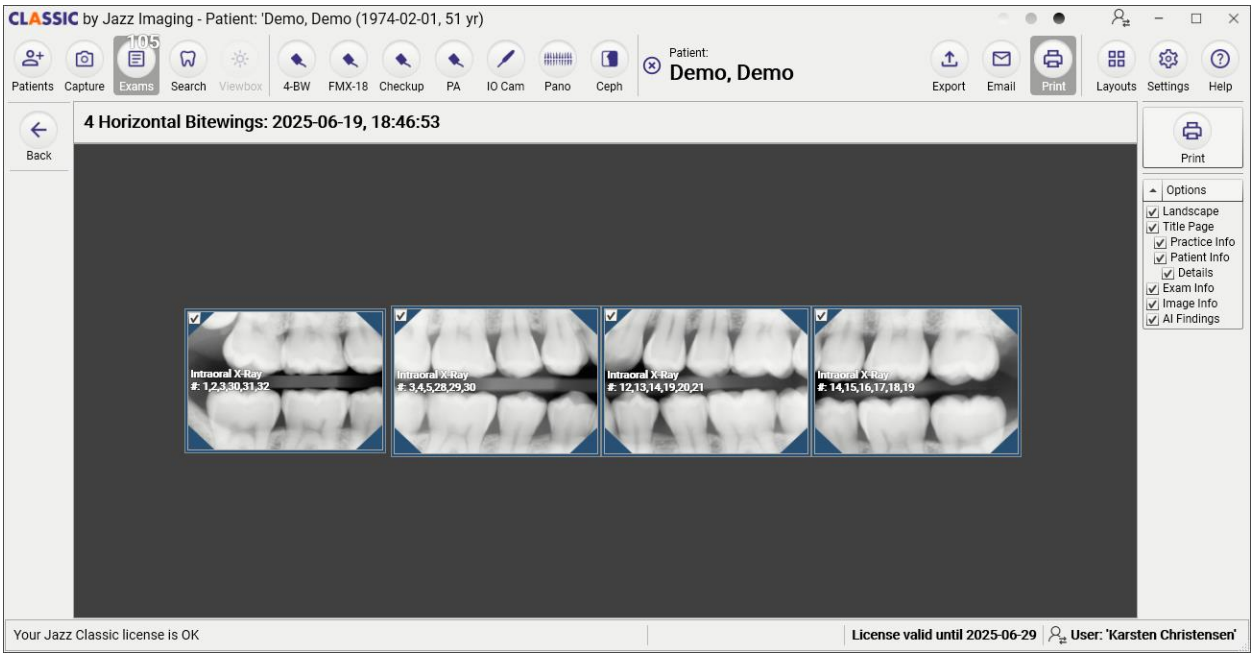
The Print View will look slightly different depending on the type of image selection (Exam, Teeth search, or Viewbox selection) so each type will be described separately:

Printing Exams

When an Exam has been selected, users can choose to print the Exam Overview as well as all individual images.

To start the print operation, click the Print button:

This prints the Layout overview as well as all the individual selected exam images.

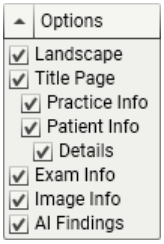


The individual Exam images are selected using the checkbox in the upper-left corner of each image. The checkboxes can be toggled on/off, and by default, all images will be selected when the Export View opens.

All images can be selected by using the keyboard shortcut CTRL+A.

Print Options

It is possible to specify the print orientation and page content used when the images are being printed.



PAGE ORIENTATION

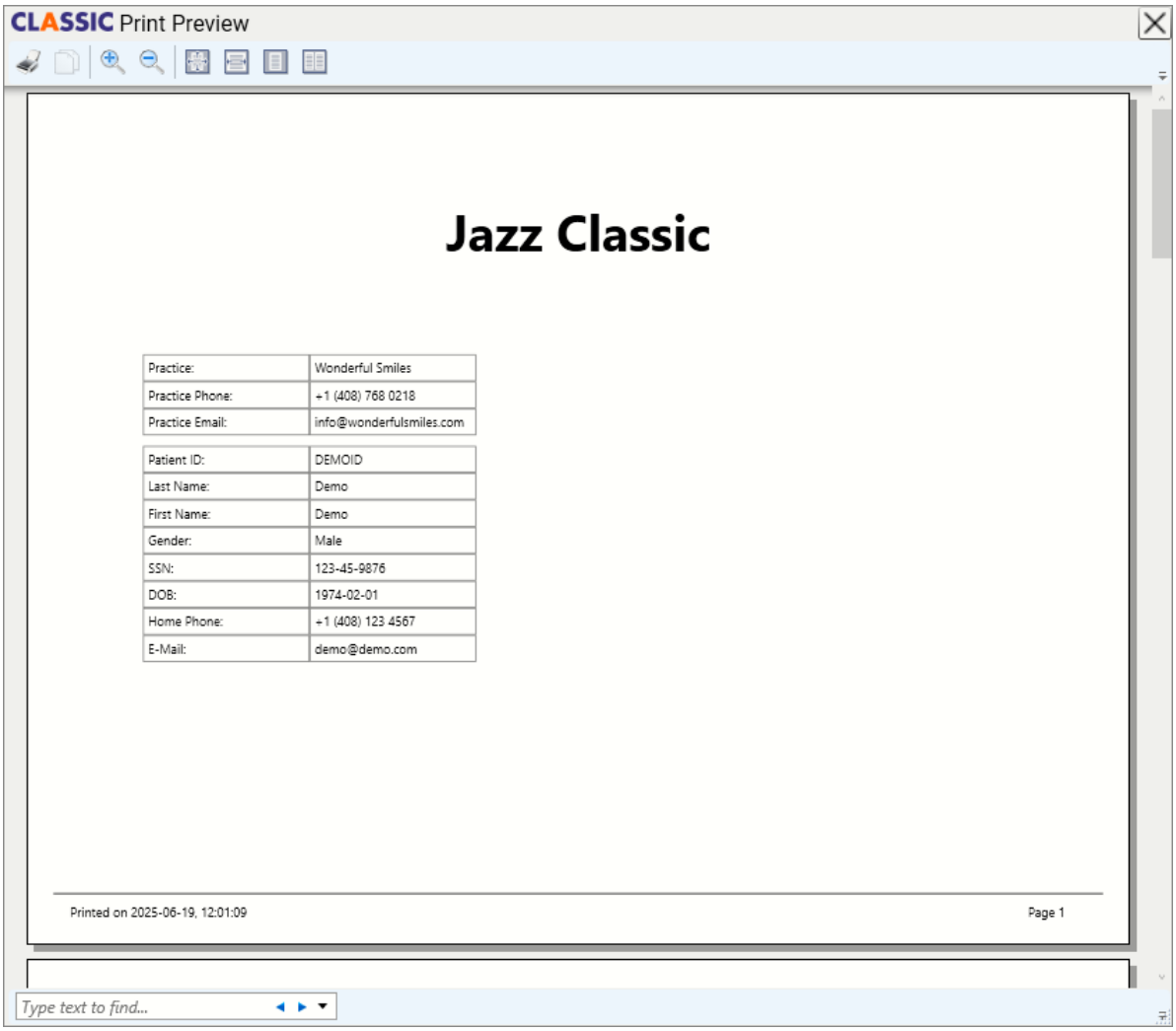
The paper orientation can be selected before printing the Exam.

Landscape orientation works well when printing the Exam overview and Exams like horizontal bitewings.

Portrait orientation works well for Cephalometric exams.

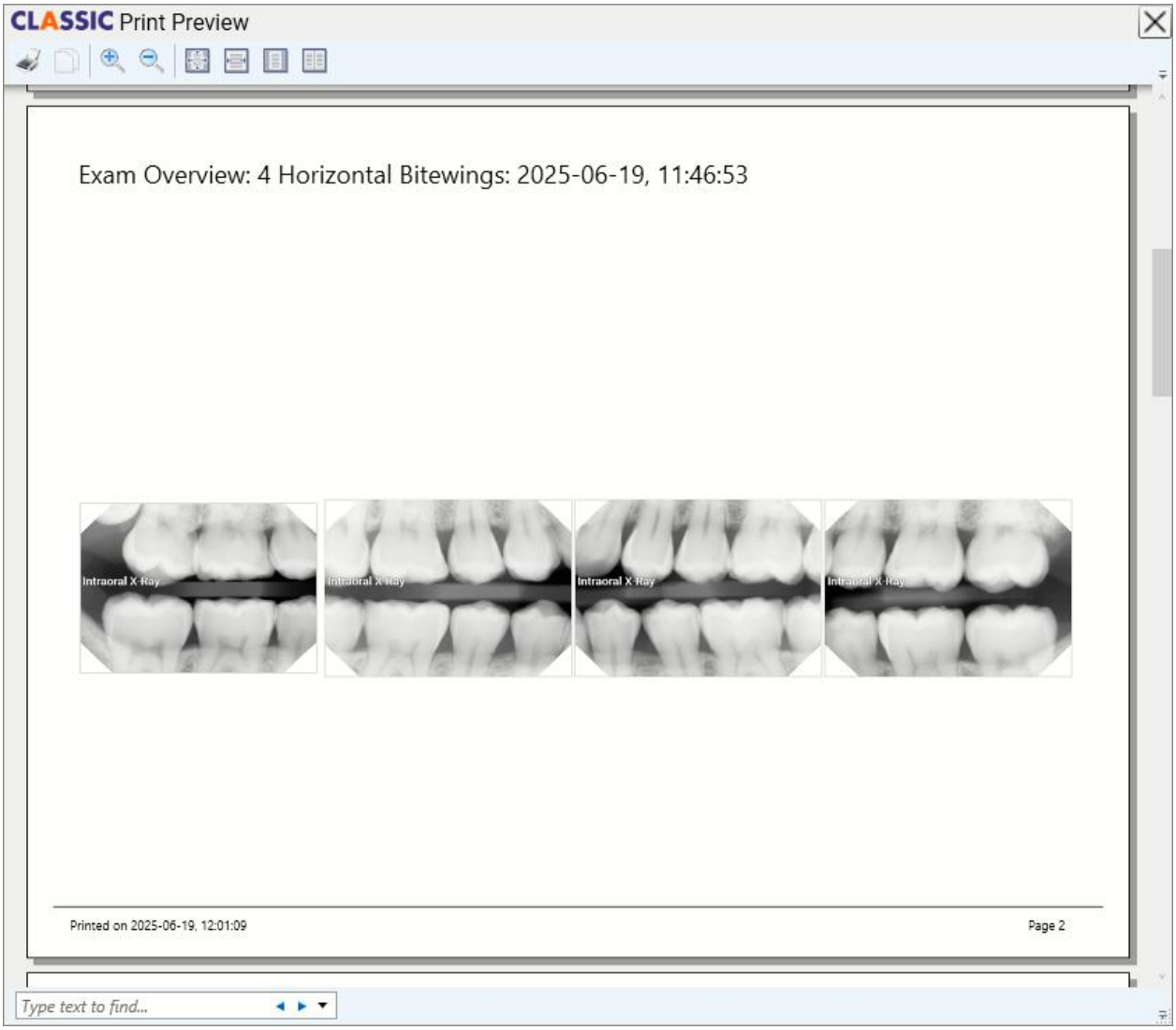
ADDING A TITLE PAGE

You can add a title page with the Practice information and Patient information.



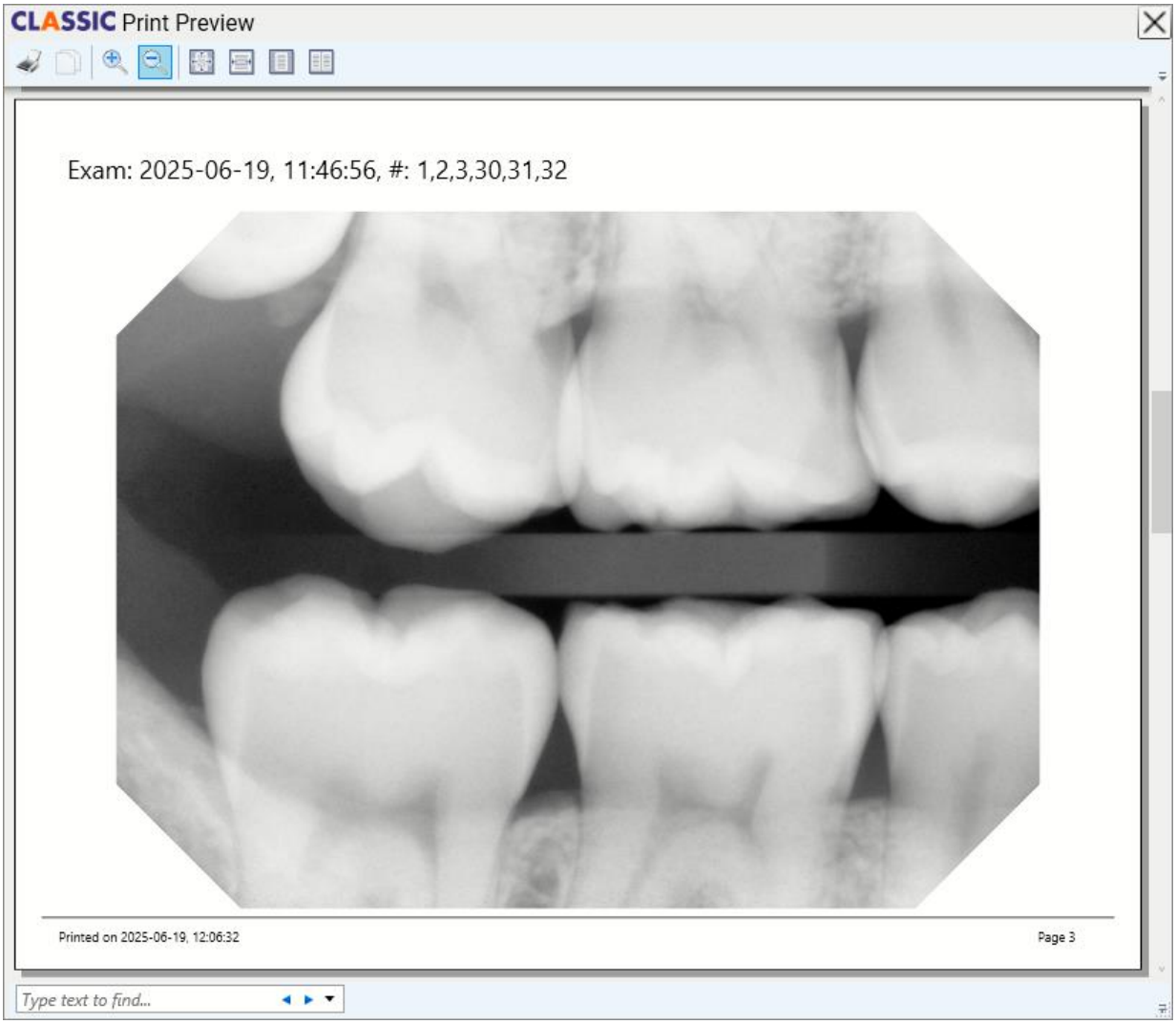
ADDING AN EXAM OVERVIEW

You can also add an Exam Overview page with detailed Exam information such as Layout type and the Exam date.



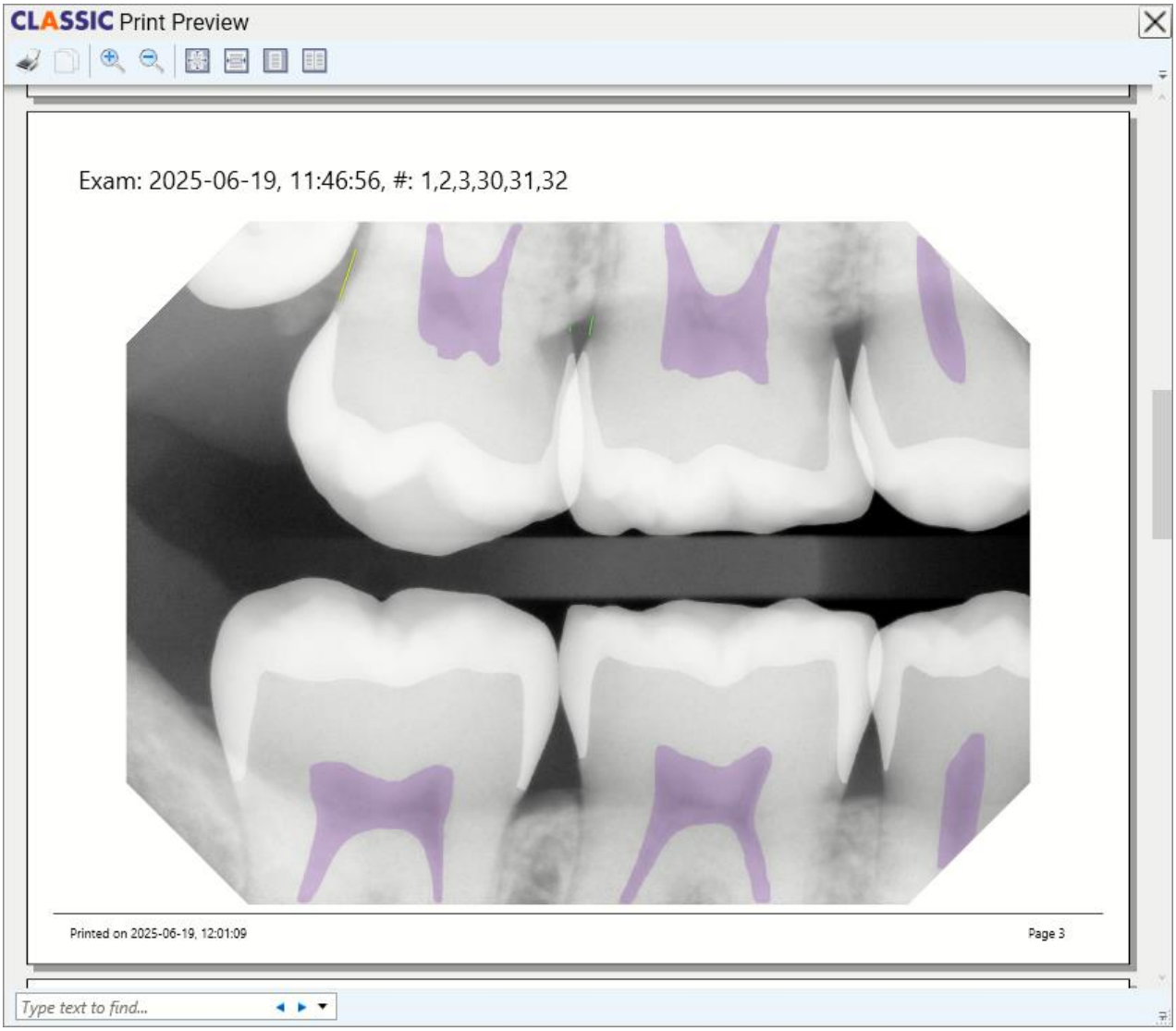
ADDING IMAGE INFORMATION

You can include image information such as Capture date and the associated teeth numbers together with the individual images.



ADDING AI FINDINGS

Finally, you can include AI Findings overlay to the printed images. However, this requires the AI Feature to be enabled and an active AI Provider subscription.

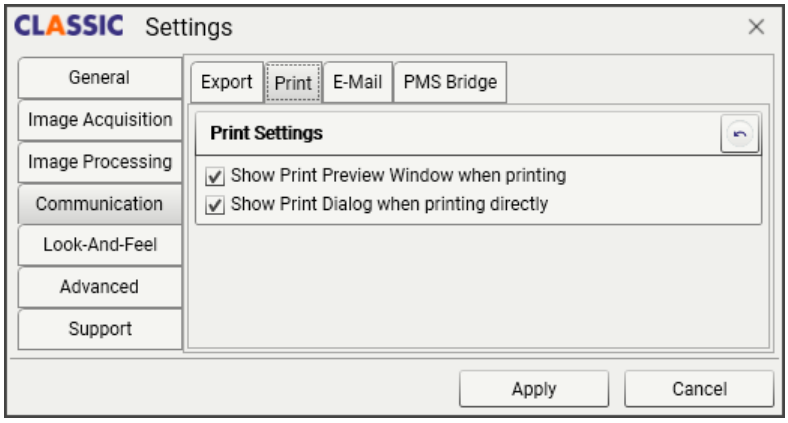


Selecting the Print user interface

When printing images and exams from Classic, the following user interface options are available:

- Print preview
- Standard Print Dialog
- No user interface (direct print using the Windows default printer)

The Print user interface is selected in the ***Communication->Print*** tab in the Classic Setup window.



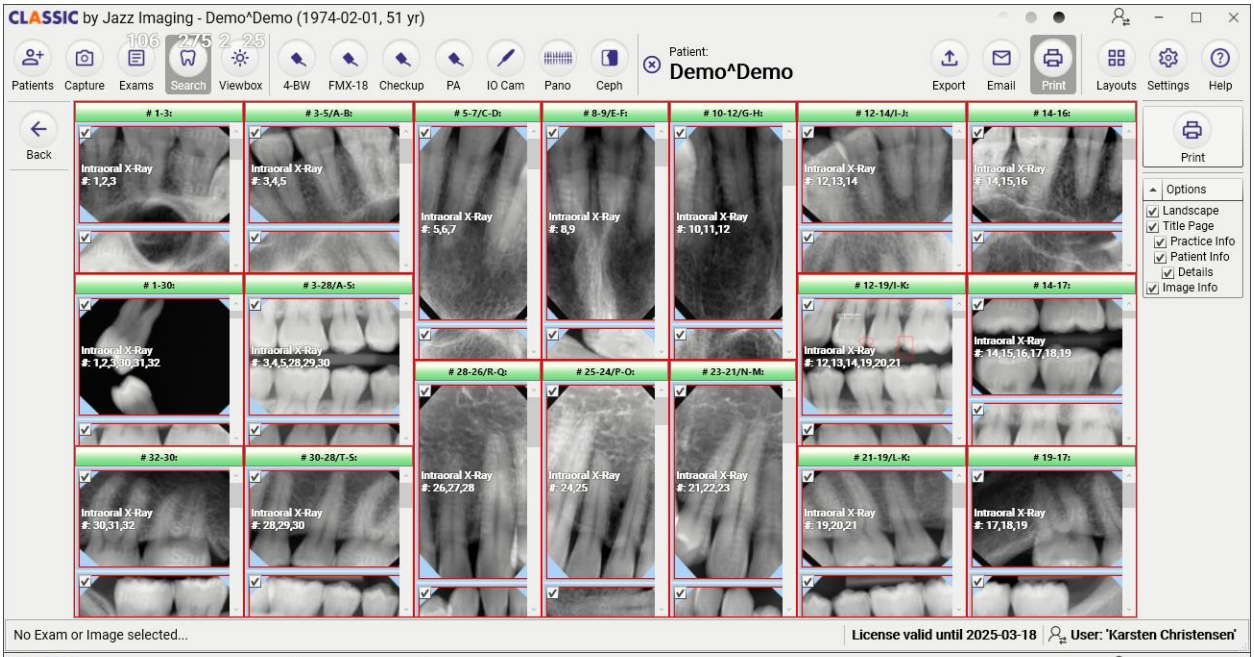
The Print Preview windows give the user a chance to view the contents being printed before it is being sent to the printer. It also enables you to search within the document and has various viewing formats.

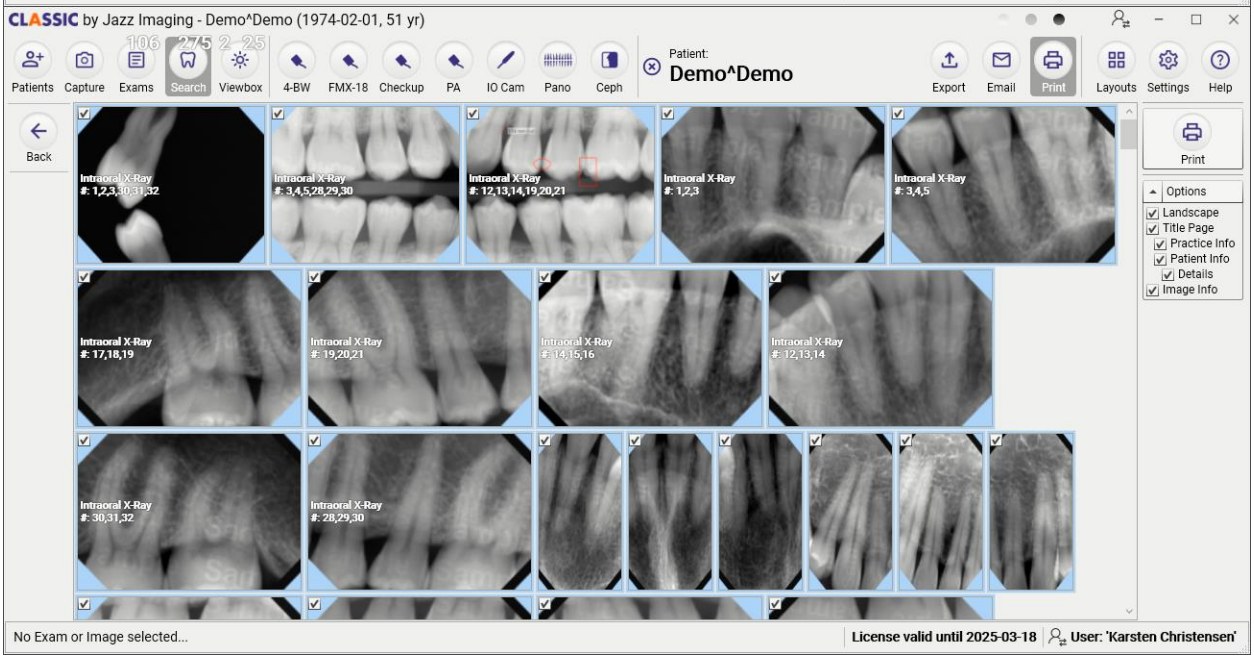
Printing Teeth Search Images

When printing images from a Teeth Search, the functionality is basically the same as when an Exam is being printed.

The only difference is that the selected images are shown as either an anatomical view or as a simple list of images (as selected in the Teeth Search View). Additionally, it's not possible to print any Exam Overview since no specific Exam has been selected.

The following two images show the Teeth Search Print View presented using either the Anatomical view or the Image List view formats:



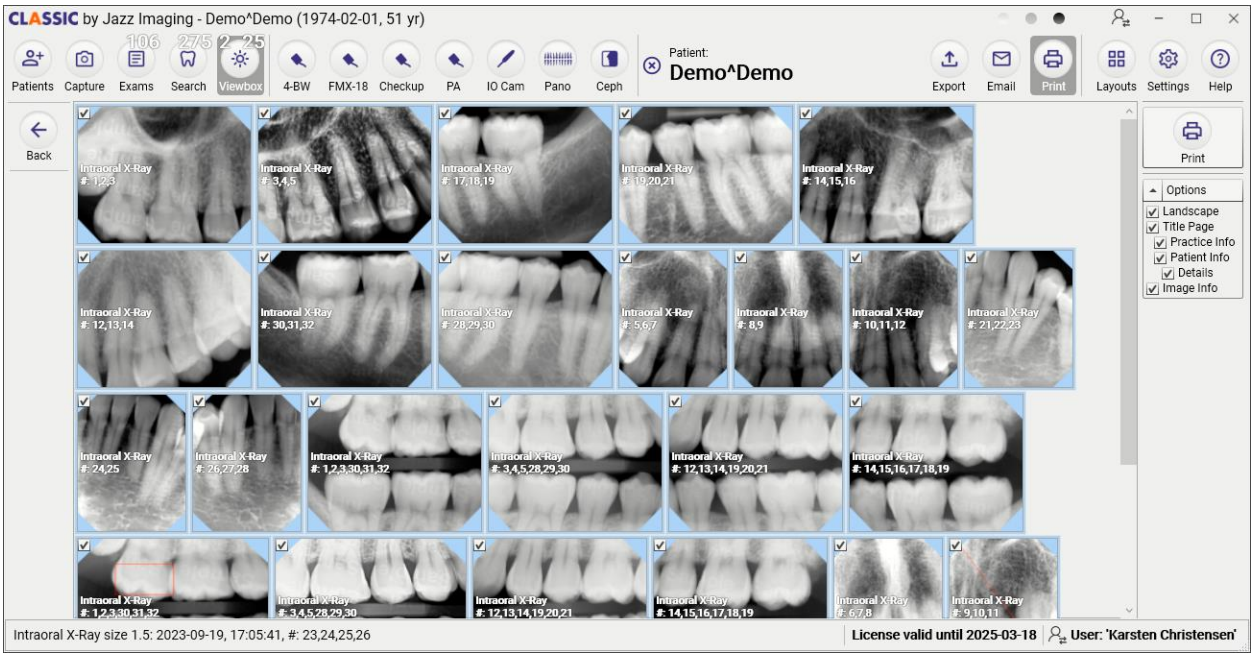


The rest of the Print options are identical to the Exam Print options described previously.

Printing Viewbox Images

When printing images from the Viewbox, the functionality is basically the same as when an Exam is being exported.

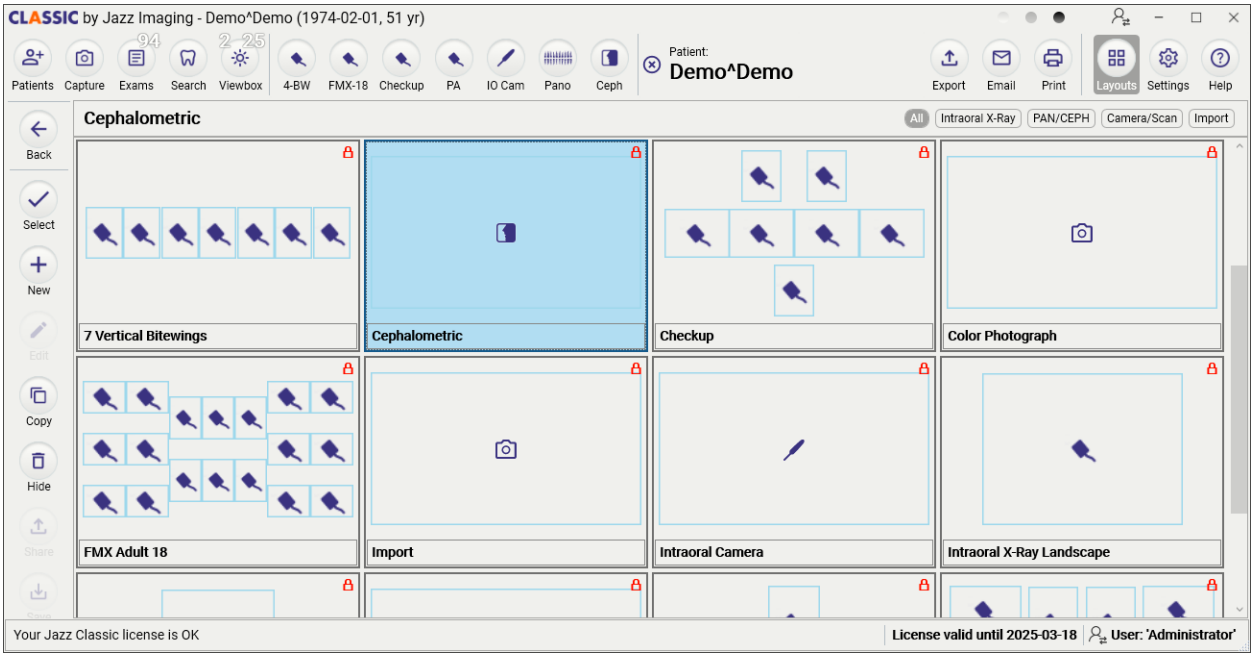
The only difference is that the selected images are shown as a simple list of images and that it's not possible to print any Exam Overview since no specific Exam has been selected.



The rest of the Print options are identical to the Exam Print options described previously.

Editing Layouts

Jazz Classic comes with a set of general-purpose Layouts that will work for most offices. These default layouts are “read-only” (marked with padlock icons) and cannot be edited and customized.



However, Classic makes it easy to either copy and modify an existing Layout or to create a new custom layout from scratch.

It is recommended to copy an existing layout as a starting point for a new layout if one of the existing layouts is similar to the new layout. This simplifies the task, allowing you to focus on the differences.

Creating a New Layout from Scratch

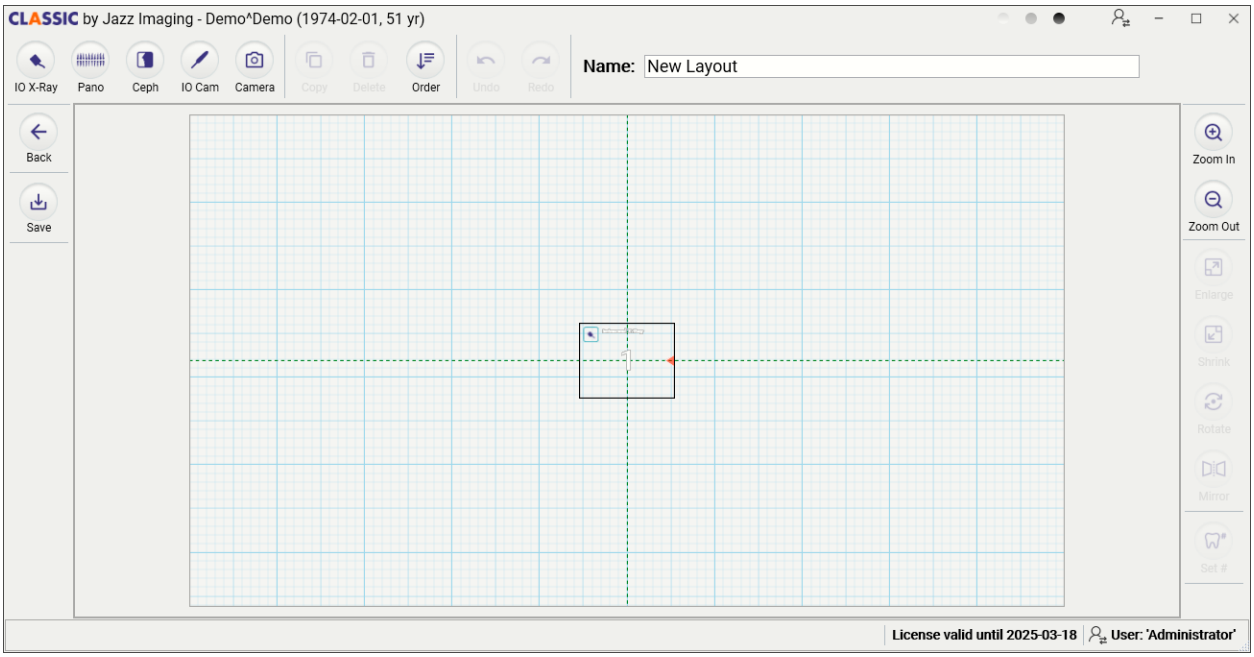
To create a new empty Layout, simply press the ***New*** button 

on the left-hand toolbox.

This will open the Layout Edit View.

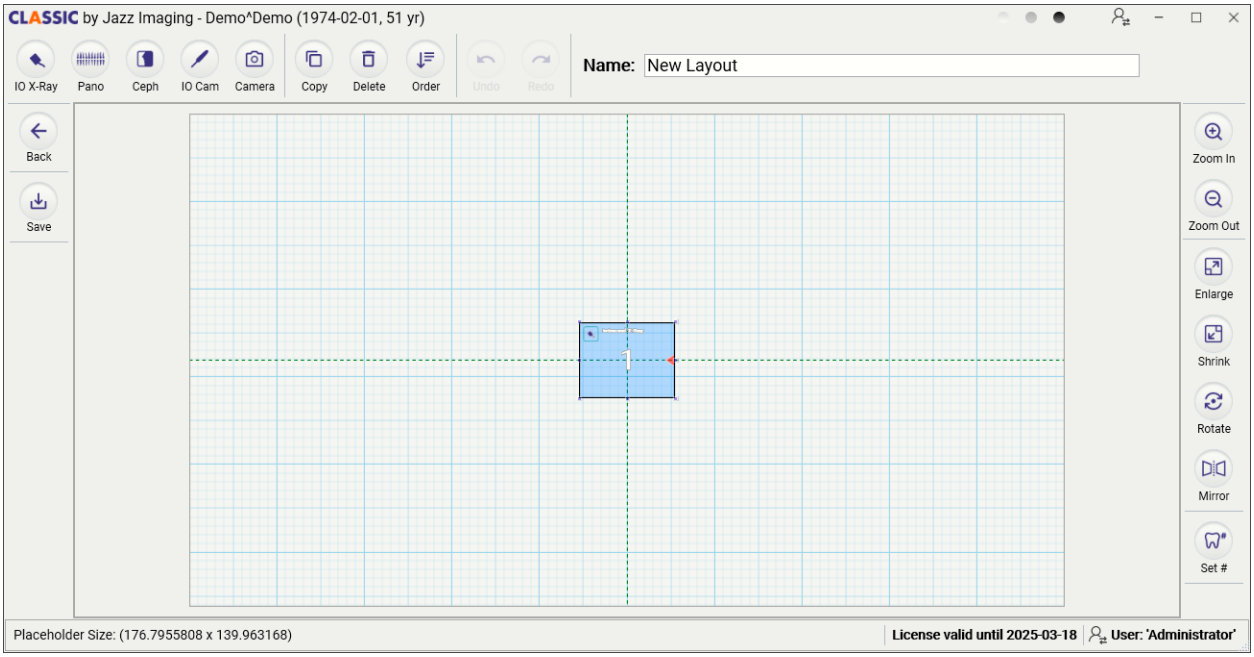
The new layout comes with a single Intraoral X-ray tile in the center. This tile can be selected by clicking it with the mouse cursor, allowing you to either copy or delete the tile using the main toolbar buttons.

The Layout Editor window makes it possible to zoom in on the layout details, but it is recommended to switch Classic to full-screen mode to utilize the full resolution of the computer monitor while editing the layouts.



Adding New Tiles to the Layout

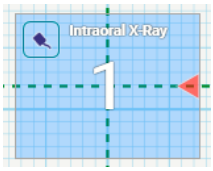
New tiles can easily be added to the template by dragging and dropping any of the device type buttons from the main toolbar or clicking a tile type button to add a new tile in the center of the new layout.



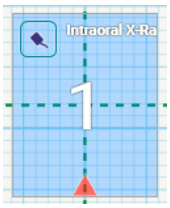
The last added tile will automatically be selected, showing resize-adorners on the sides and corners of the selected tile. Now you can move the tile to any location by dragging the tile using the mouse.

Adding Intraoral X-ray Tiles

Intraoral X-ray tiles have a triangle on one side to indicate their orientation. The triangle is located on the edge where the cable comes out of the X-ray sensor.



The tile can be rotated clockwise by pressing the Rotate button on the right-hand side toolbar. Each click of the button will rotate the tile 90 degrees.



The relative size of the currently selected tile can be adjusted using the ***Enlarge*** button 

or the ***Shrink*** button 

. Additionally, the image content can be mirrored by pressing the ***Mirror*** button 

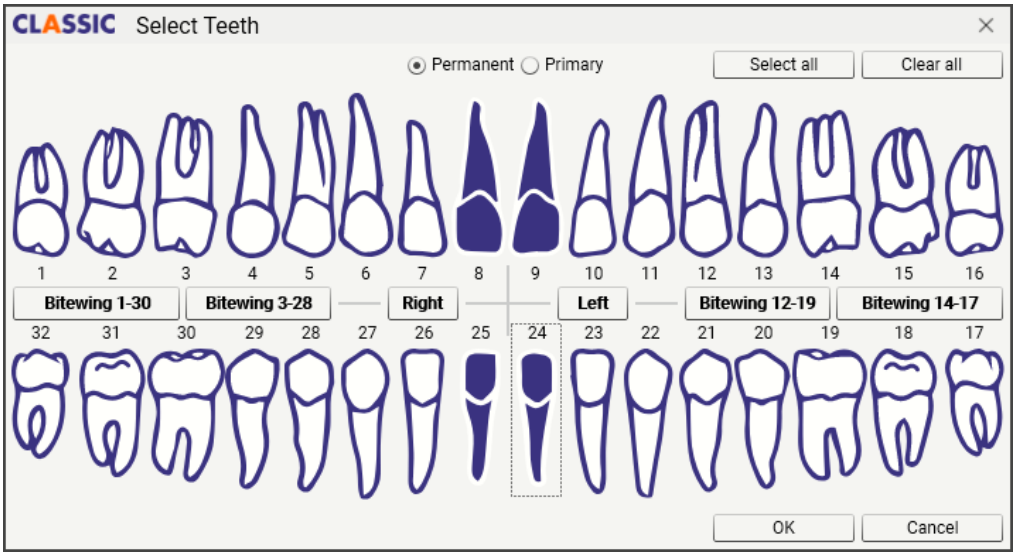
.

Using image rotation in a layout is not recommended, as mirroring (if needed) should be applied during the image capture inside the acquisition plugins. This ensures the layout remains "generic" and usable for any device, and any needed rotation is then only applied to the specific device that needed it. This is, for instance, the case for the Schick acquisition plugin.

Assigning Teeth Numbers

It is recommended to associate teeth numbers with every individual tile so the resulting exams will automatically have the teeth numbers assigned during image capture.

To assign teeth numbers to the selected tile, simply click the **Set #** button and select the correct teeth numbers in the ***Select Teeth*** window:



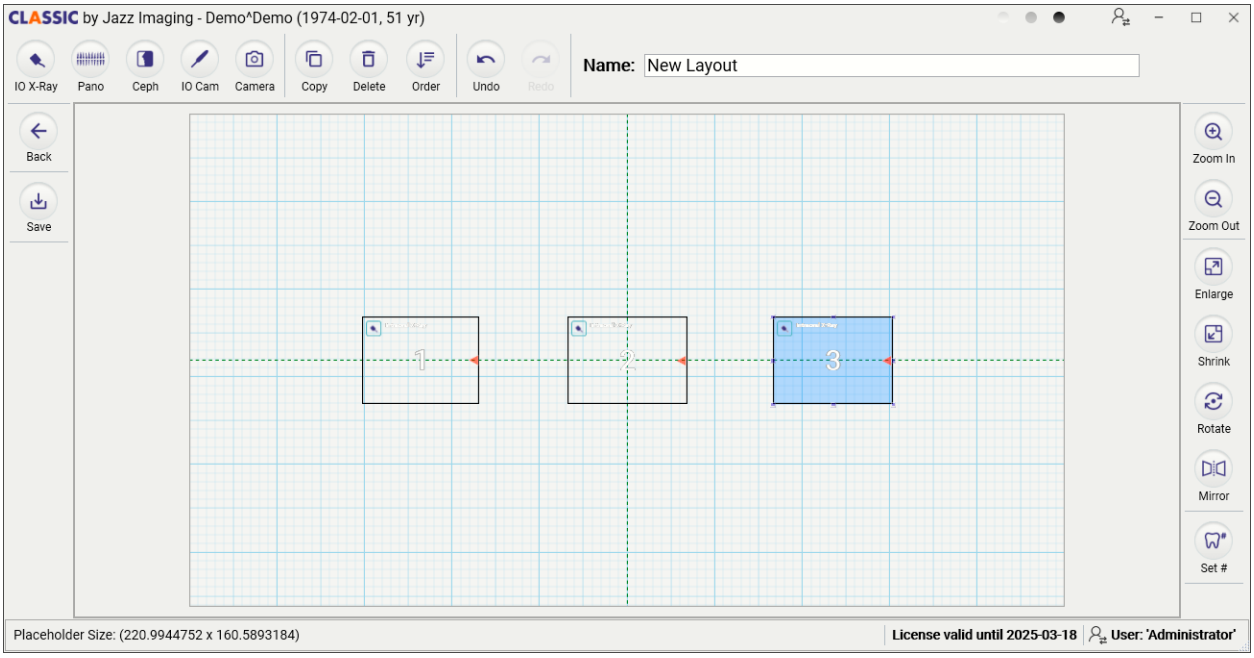
The associated teeth numbers can either be Permanent or Primary teeth numbers, or even mixed dentition if needed.

Changing the Capture Order Numbers

The final recommended step is to set the capture order number of the tiles. This determines the order in which the images are captured when the Auto Capture acquisition mode is being used. This allows the Auto Capture function to determine which image to capture next and eventually determine when the complete exam has been captured.

To start reordering tiles, simply click the **Order** button 

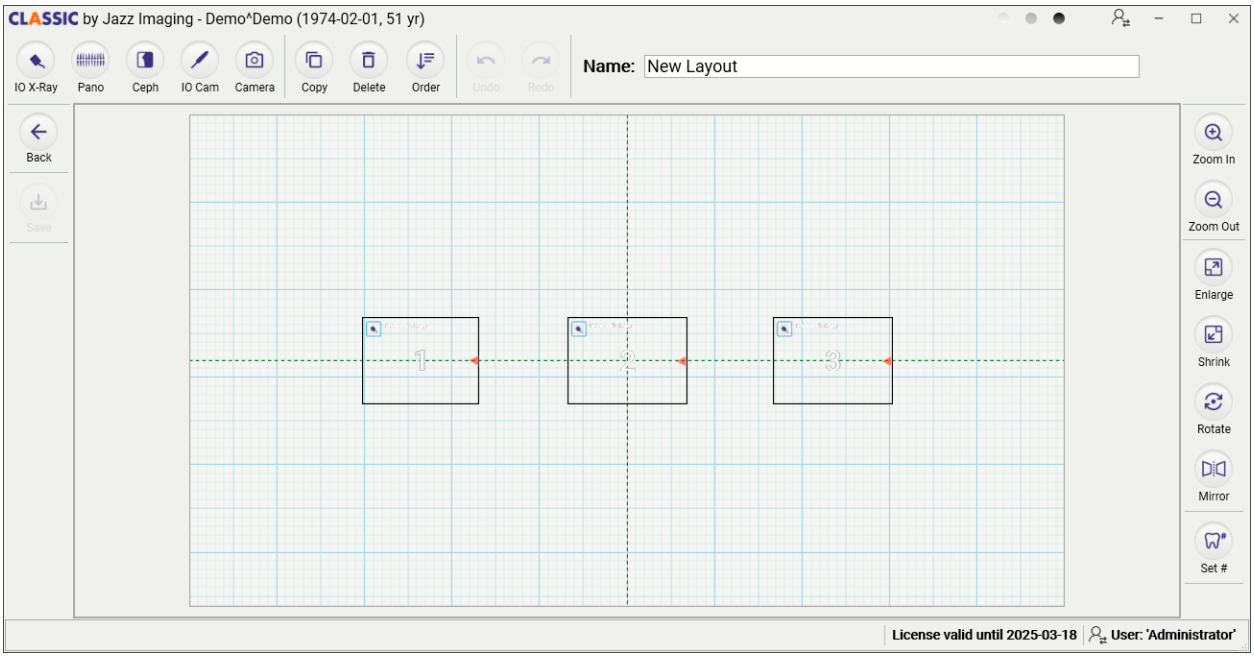
in the main toolbar and click each individual tile in the desired order. When an order number has been assigned to the tile, it will be displayed as text in the center of the tile:



Saving the New Layout

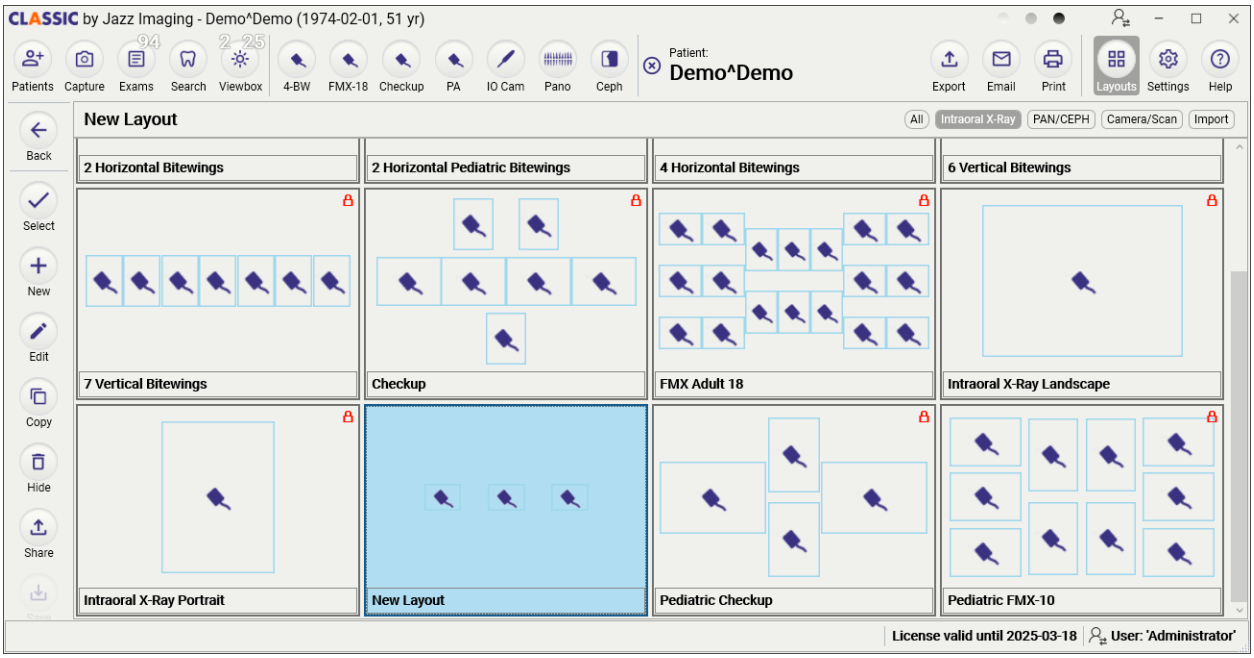
Once the layout is finalized, simply assign a unique name in the main toolbar, and click the Save button 

.



This will open a file save window where you can select the name of the custom layout file.

After the new layout has been saved, it will now appear in the list of layouts when initiating a new capture.



The layout type is automatically determined based on the tile types used within the layout. It is recommended to keep all tiles the same type within a layout. This ensures the layout sorting functionality will work as intended. If the tile types are mixed, then the first tile type will determine the layout type!

Hiding or Permanently Deleting Layouts

In Jazz Classic it is possible to choose whether to ***permanently delete*** layouts or ***hide*** then from being displayed to normal users.

When a layout has been hidden, it will be possible to "unhide" the layout later without losing any data. However, if the layout is permanently deleted, the layout will be permanently lost unless a backup has been made prior to the layout being deleted.

To hide layouts:

To hide an existing layout, simply select the layout and click the ***Hide*** button 

. Confirm your decision to hide the selected layout when prompted by Jazz Classic.

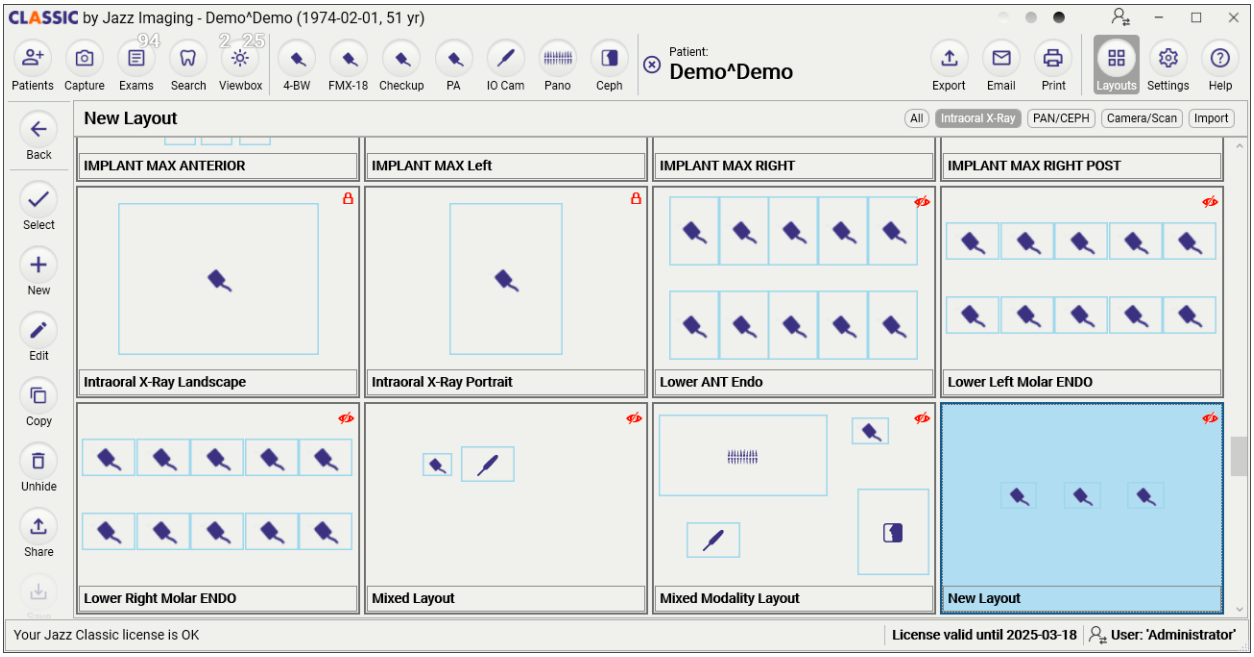
To unhide layouts:

As expected, hidden layouts will, not be displayed to the normal user during layout selection. However, you can include all hidden layouts in the layout list by pressing and holding the ***CTRL+ALT*** keys on the keyboard while the layout selection is performed!

The following steps will demonstrate how to display a complete layout list that includes both visible and hidden layouts, and then unhide any of the previously hidden layouts:

1) Press and hold the ***CTRL+ALT*** keys on the keyboard while clicking the ***Layout Edit*** button on the toolbar.

The Layout Selection View appears, and all hidden layouts will now be included. Hidden layouts can easily be identified by the "hidden" icon displayed in the corner of the layout, as shown below.



2) Select the hidden layout from the list and click the ***Unhide*** button and confirm your decision to unhide the selected layout when prompted by Jazz Classic.

3) After the selected layout has been successfully unhidden, a new “standard” search will be automatically performed, and none of the currently hidden layouts will be shown.

To Permanently Delete Layouts:

It is possible to delete layouts, but it is important to understand that this cannot be undone, and all the information will be lost forever if the layout is deleted.

To permanently delete an existing layout, simply select the layout and press and hold the SHIFT key while simultaneously clicking the ***Delete*** button 

.

If you want to permanently delete hidden layouts, perform the hidden layout search as described above in the previous section. Then, select any of the hidden exams from the list and follow the delete instructions above.

Classic Settings

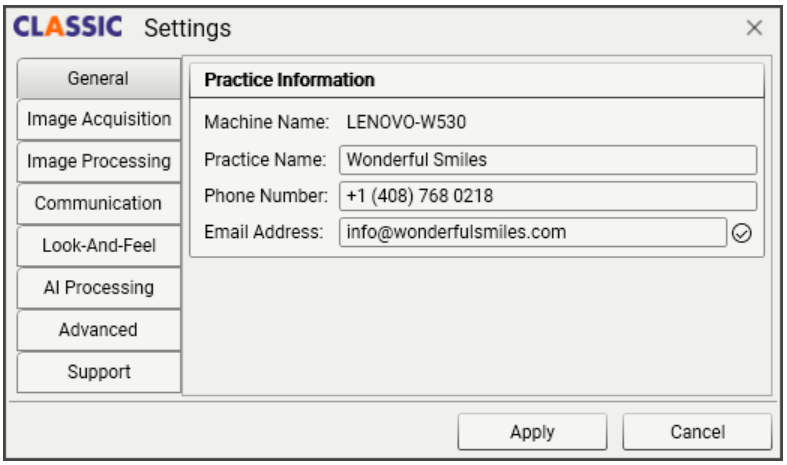
The Jazz Classic application settings can be adjusted by clicking the ***Settings*** button 

in the main toolbar. This will open a tab-control that contains multiple tab pages, each dedicated to a specific group of settings. Each group will be described in separate sections.

Depending on the User Role assigned to the current user, some settings may not be available. In general, the user will have to be a System Administrator to change advanced system settings. And only Administrator accounts will be able to perform User Administration tasks such as adding, editing, and deleting users.

General Settings

General settings contain contact information for the Dental Practice such as the name, phone number and E-mail address.



Practice Information Section

The Practice information is primarily used for the licensing of Jazz Classic. Additionally, this information can be included when E-mailing images or on the cover page when printing images.

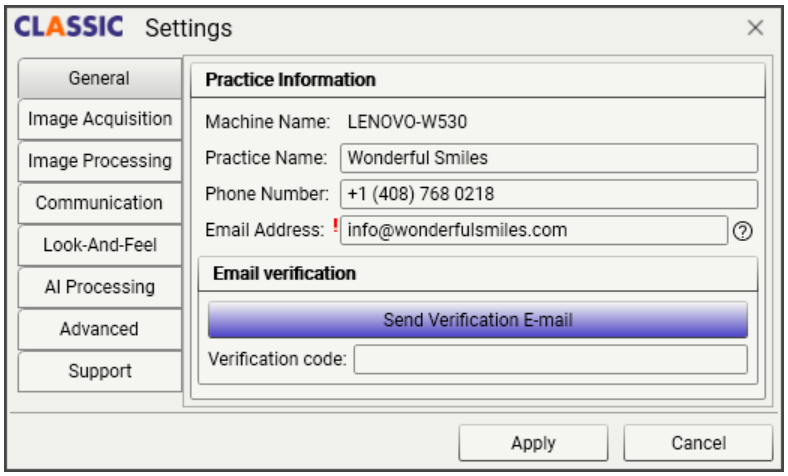
The format of the Practice Name, Practice phone number and Email address will be validated, and the value won't be saved unless all fields are valid.

If the Practice E-mail address is changed, then the new E-mail address will have to be Verified or else it will not be possible to use Classic.

Practice E-mail Verification

Classic will verify the Practice E-mail by sending a Verification Code to the Practice E-mail address, and the user will in turn have to type in this Verification code in order to proceed.

To send the Verification code, click the ***Send Verification E-mail*** button and wait for the E-mail to arrive in the Practice's E-mail Inbox.

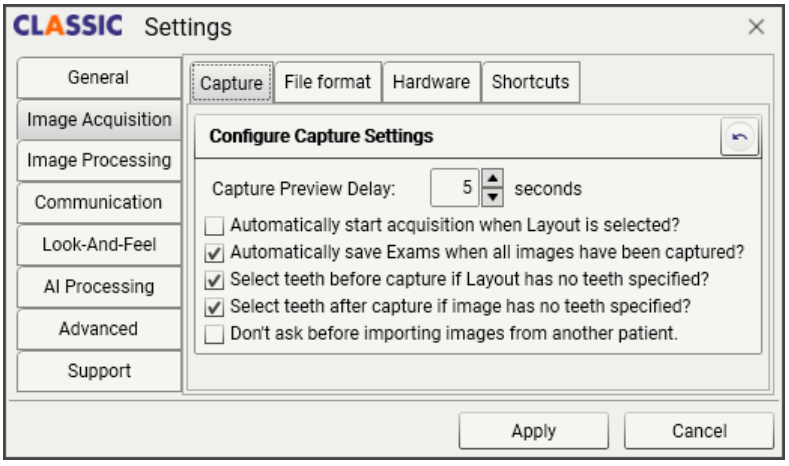


If the Verification E-mail isn't received shortly in the Practice's Inbox, then make sure to check that the E-mail address is correct and also check any Spam folder associated with the E-mail account.

The Verification code is a one-time code, and it will not work at a later date. A new Verification Code will be generated every time the ***Send Verification E-mail*** button is pressed, and only the latest code will be valid.

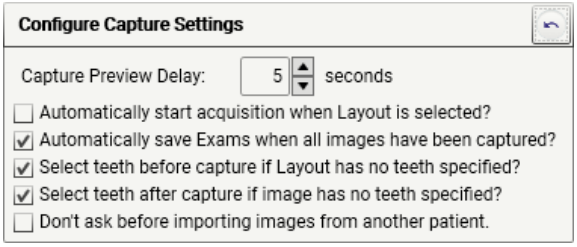
Image Acquisition Settings

The capture settings can be configured in the Image Acquisition section:



Capture Settings

The user interface behavior during image capture can be customized as well.



Setting Image Capture Preview Delay

After an image has been acquired into a Layout tile, it will be displayed for a configurable duration before proceeding to capture the next image in the Layout.

The Capture Preview Delay can be set to a value between 0 and 60 seconds (default is 5 seconds).

The image preview can be terminated by the user at any time before the end of the Preview Delay period by pressing the ESC key on the keyboard.

Automatic Capture

It is also possible to select whether the acquisition will automatically start immediately after a Layout has been selected. If this option is selected, manual capture into individual layout tiles won't be possible, as the Automatic Capture will begin right away and enforce the capture order. Nonetheless, you can still cancel any of the acquisitions and proceed manually from there.

Automatic Exam Save and Display

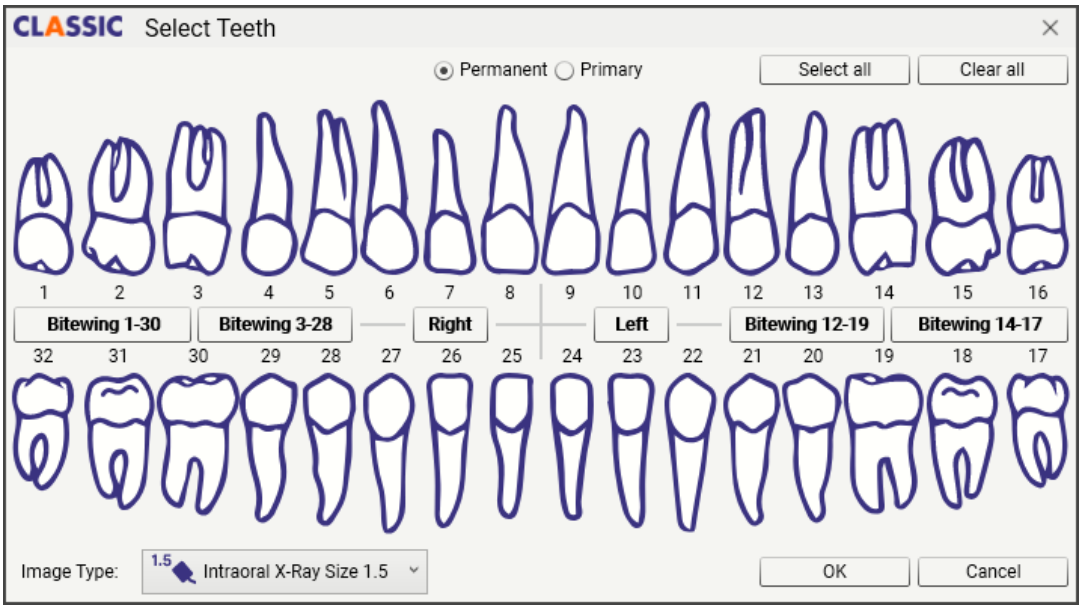
When all images within a layout have been captured, Classic can automatically save the completed Exam and go into the Exam View, where the images can be viewed and edited.

If this option is unchecked, users will have to manually click the Save Exam button after all images have been captured.

Automatic Teeth Number Request

Users can configure when they are prompted to specify tooth numbers if no tooth numbers are already assigned in the Layout tile before the capture begins. This usually occurs during an Intraoral X-ray PA capture where the Layout doesn't have any tooth numbers associated with the single image tile.

So, before the IO X-ray acquisition starts, the ***Select Teeth*** window appears:

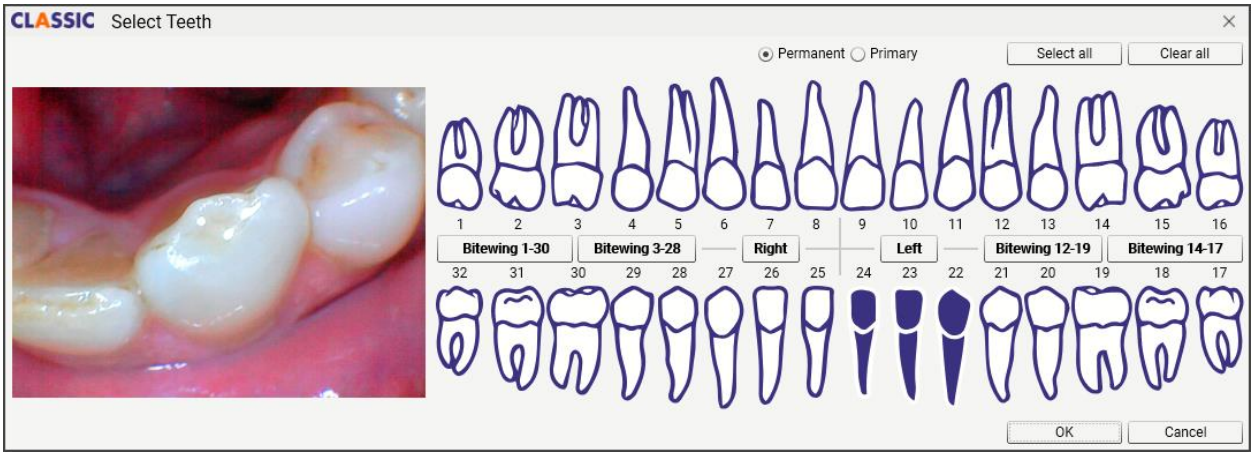


The second option is to select whether to prompt the user to specify the tooth numbers after an exam capture, but only if no teeth have previously been assigned (either from the Layout or by the user ahead of the capture).

However, this selection is not limited to Intraoral X-ray captures but applies to any modality.

Typically, this will be the case for Intraoral Camera captures, Extraoral captures, or even during image import, where the total number of images might even be unknown before the capture is started.

The main difference here is that the captured image will be shown to the user while the tooth numbers are being assigned:

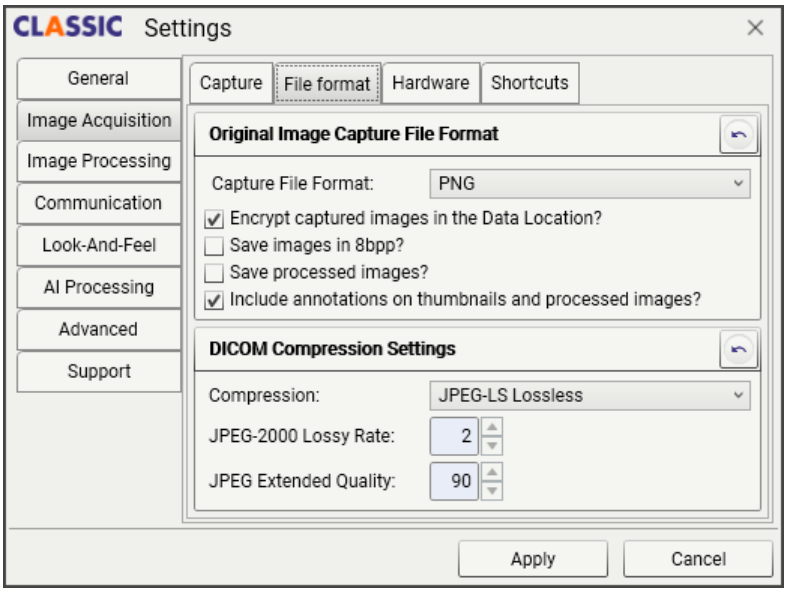


If the exam contains multiple images and the user doesn't want to assign any tooth numbers at all to any of the images, the user can press the Cancel button once to skip the tooth number assignment for the rest of the images in the exam.

Finally, you can choose whether to display a warning when an image is being imported from another patient (based on First and Last name information extracted from the images).

Image File Format Settings

It is possible to configure the image file format that is being used when storing the ***Original*** images in the data location.



The following internal image storage file formats are supported:

- PNG (default)
- TIF
- DICOM

Each file type has its own advantages, typically related to the physical file size for a given image quality. Both the default PNG file format and the TIF file format utilize lossless compression of the image files, so they will both preserve all image details while still having a relatively small image file size.

Image Encryption

It is also possible to select whether the images are Encrypted when they are being stored in the Data Location. By disabling Image Encryption, a Cybersecurity Event will be generated by Classic. Please see Cybersecurity Event Handling for more details.

> Jazz Imaging highly recommends that **Image Encryption** is enabled as it's a crucial part of the Cybersecurity measures implemented to protect against unauthorized access to sensitive data, such as captured images! For more information, please refer to the

Cybersecurity Control Recommendations section later in this document.

Reducing Image Size

To minimize the image size on the disk even further, ***Original*** images can be saved in 8-bit pixel formats instead of the default 16-bit formats. This can reduce the image file size in the Data Location considerably, typically by at least a factor of 2. However, this will reduce the image quality while simultaneously making the post-processing filters less effective as less data/information is available for each individual pixel in the images!

Saving fully processed copies of images

Classic will normally only store the original image files in the file systems, so when the full-size image is being displayed inside Classic, all image processing will be applied right when the image is presented to the users. This allows the users to select the desired processing is being done without altering the original image. So, the users are then able to "view" the captured images using any combination of image processing filters without harming the original images in any way.

However, Classic can save a copy of the last processed images that were viewed by the users. These processed image copies can be accessed by 3rd party applications that want to display the fully processed images outside of Classic. This feature is commonly used by advanced Practice Management applications that integrate with imaging applications such as Jazz Classic.

Enabling this feature will significantly increase the required storage disk space and result in larger backup files.

Include annotations on thumbnails and processed images

The user can choose whether annotations are visible on thumbnails and processed images.

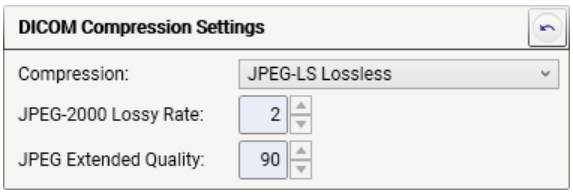
DICOM Compression Settings

The DICOM file format allows for modifying the Compression settings, making it possible to utilize Lossy compressions that give even smaller image file sizes at the expense of image quality.

The DICOM file format supports a wide variety of compression settings:

- None
- JPEG-2000 Lossy
    - Adjustable Compression Rate [0..8]
- JPEG-2000 Lossless
- JPEG-LS Lossy (Near Lossless)
- JPEG-LS Lossless
- JPEG Lossless, Non-Hierarchical, First-Order Prediction
- JPEG Lossless, Non-Hierarchical (Process 14)
- JPEG Extended
    - Adjustable Quality Setting [0..100]

Some of the Lossy/Near-Lossless compression settings are still usable since the loss of image quality is negligible if the compression settings are configured optimally.



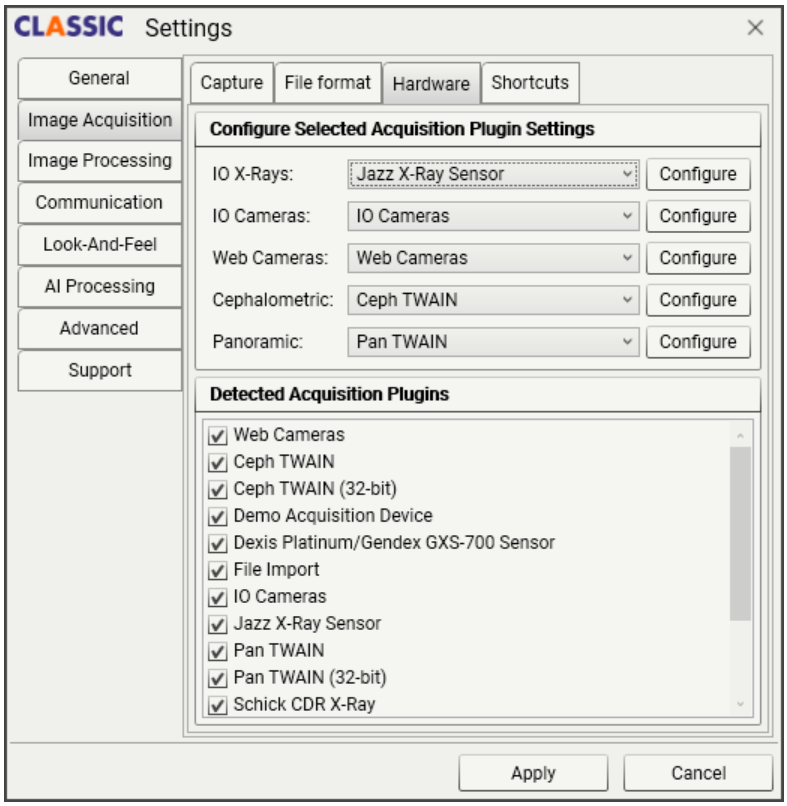
The default compression settings for the JPEG-2000 Lossy and JPEG Extended compression algorithms preserves the image quality while still rendering very small image files.

Compression algorithm	**Typical compression rate**	**Comment**
None	No compression	Not recommended. Use any lossless instead
JPEG-2000 Lossy	~1:2.66 @ Rate=2 ~**1:4** @ Rate=3	Rate values higher than 4 will increase the compression rate from 1:5 up to 1:26, but the image quality deteriorates quickly
JPEG 2000 Lossless	~1:2.4	Image quality is preserved
JPEG-LS Lossy (Near Lossless)	~**1:4.4**	High compression rate with only minor loss in image quality
JPEG-LS Lossless	~1:2.4	Image quality is preserved
JPEG Lossless, Non-Hierarchical, First-Order Prediction	~1:2.4	Image quality is preserved
JPEG Lossless, Non-Hierarchical (Process 14)	~1:2.4	Image quality is preserved
JPEG EXTENDED	~1:2.8 @ Quality=90 ~1:3.2 @ Quality=85	Quality values lower than 80 will increase the compression rate from 1:3.4 up to 1:4.7, but the image quality deteriorates quickly

Hardware Settings

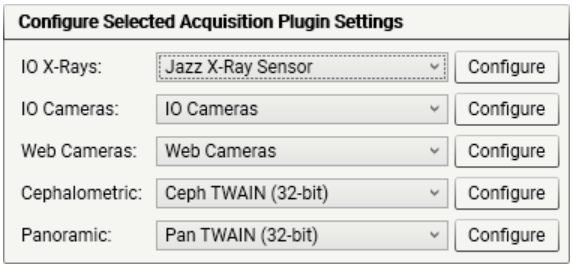
Jazz Classic utilizes an Acquisition Plugin system where the supported acquisition device types can easily be extended.

Each modality will automatically keep track of the last selected acquisition device type, but it's also possible to choose which device types to allow being selected for each modality.



Selecting Acquisition Plugins

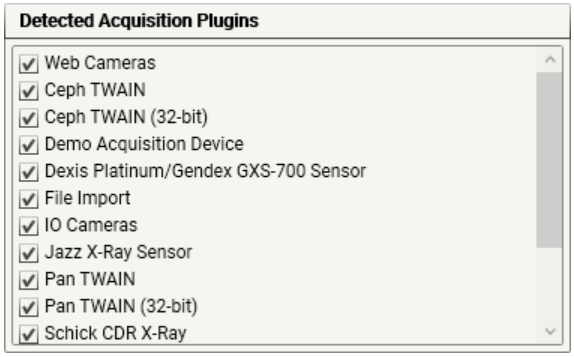
It is possible to select which acquisition device type to use next as well as configure the individual acquisition plugins.



Simply select the device type from each of the modality drop-down lists shown above and click the Configure button.

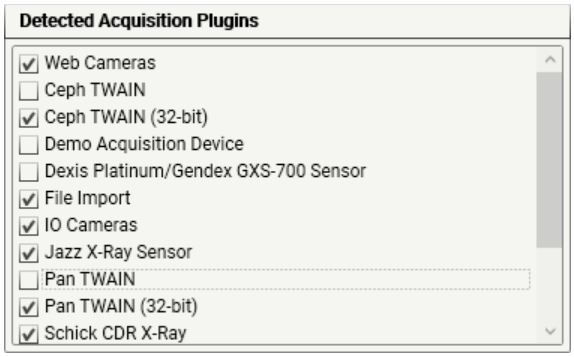
Enabling Acquisition Plugins

The Hardware settings include a complete list of all detected acquisition plugins:



Each of these plugins can be hidden by unchecking the individual checkboxes. This removes them from each of the modality device selection lists, making the list easier to navigate.

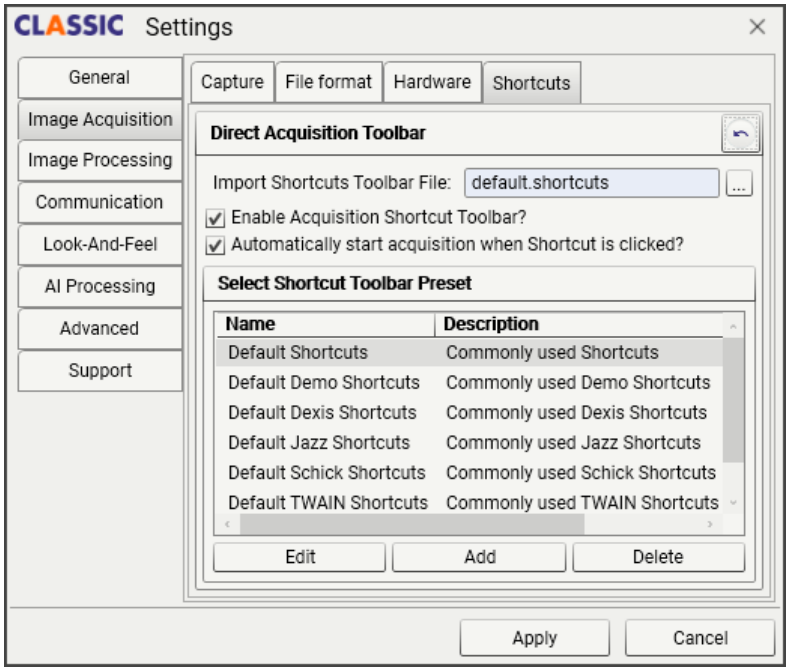
In the example below, the 64-bit TWAIN drivers, the Dexis Platinum/Gendex GXS-700 and the Demo device have been removed:



If the underlying device drivers are not detected by the individual acquisition plugins, the plugins will appear greyed out in the list and automatically unselected.

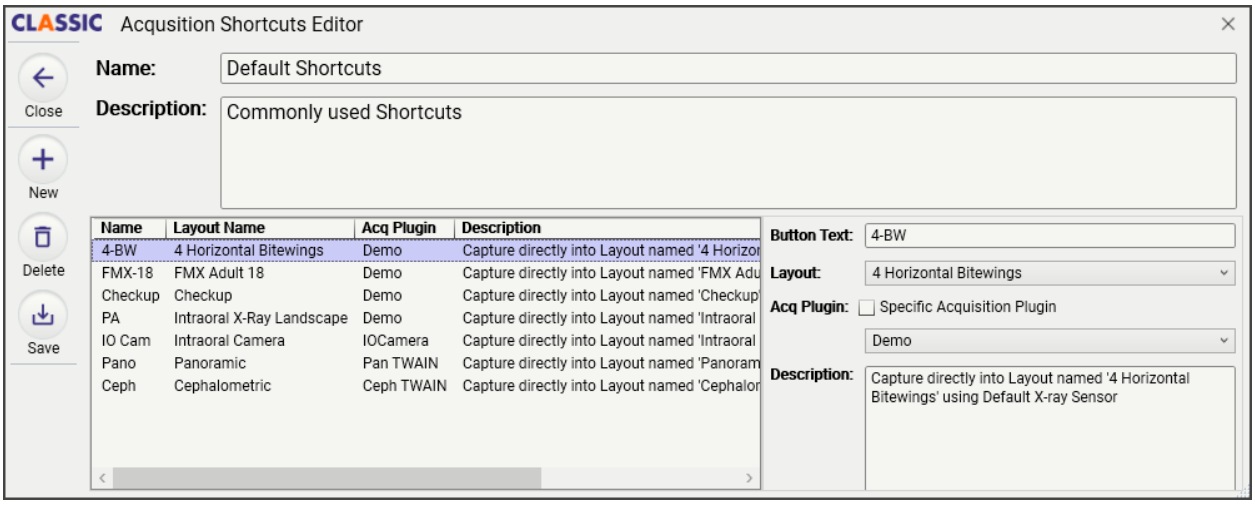
Acquisition Shortcut Settings

In the Acquisition Shortcut settings, you can select whether to display the Shortcut toolbox items and which toolbar to use when it's enabled.



The Shortcut Toolbar presets are selected directly from the list.

You can edit existing presets by clicking the ***Edit*** button. This will open the Acquisition Shortcut Editor window:



Each Shortcut Toolbar file can hold up to 10 different shortcut buttons.

It is recommended to keep the ***Button Text*** as short as possible.

It is possible to either select a specific Acquisition Plugin for the shortcut button or simply use the last selected plugin instead. The latter makes the shortcut preset usable across multiple device types.

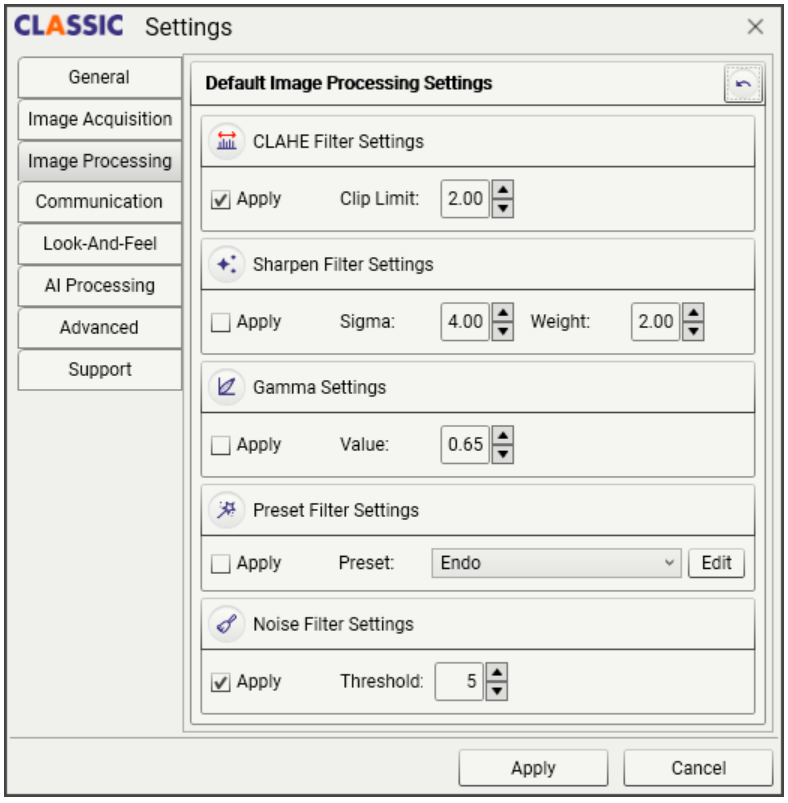
After the Acquisition Shortcut preset has been completed, simply click the Save button on the left-hand side toolbar. This will save the changes and close the editor.

Image Processing Settings

When images are captured in Jazz Classic, the individual Acquisition Plugins will typically perform some image processing on the "raw" images from the devices. This typically involves noise filtering and some form of Normalization. After this ***Acquisition Pre-processing*** is applied, the images are then stored in the Image Data Location as the ***Original*** images.

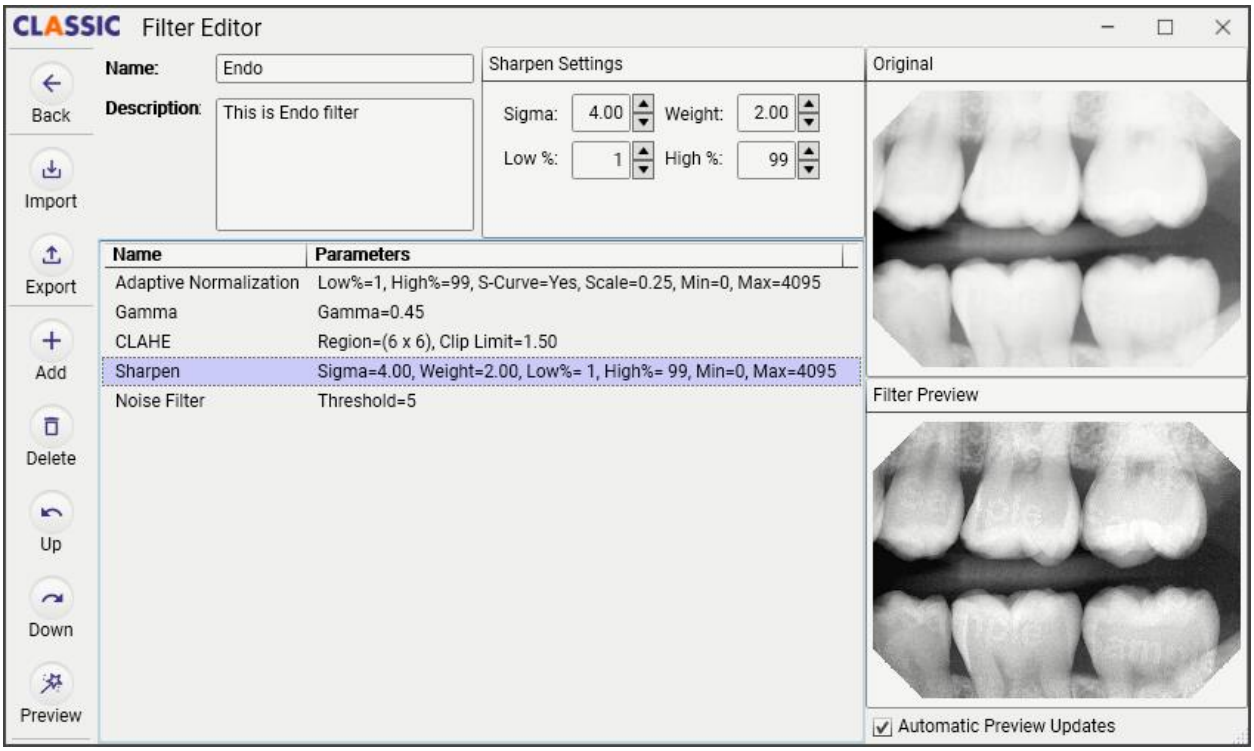
However, after the original images are captured and the user reviews these captured images for the first time, Classic can now apply a Post Processing View Filter of your choice when the images are being presented.

The Image Processing Settings section selects which Post Processing filters will be selected when the images are displayed ***for the first time***. However, these filters can be changed at any time and the new filter selections and settings will be stored in the Classic Database.



Editing Image Processing Preset Filters

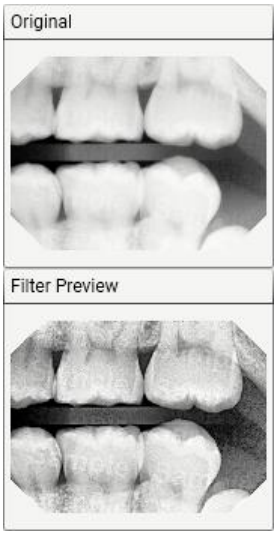
The four Preset Filters can be modified by pressing the Edit button. This will open the Filter Editor window:



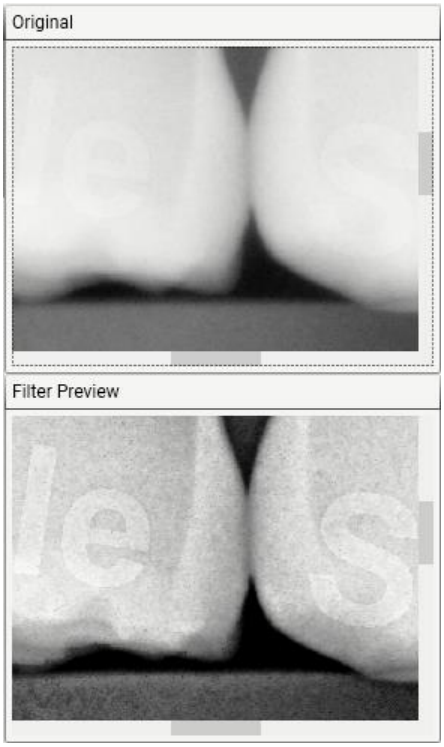
Each Image Processing Filter contains a list of ***processing steps***. Each step will be performed in the order they are specified in the list.

The order of the processing steps is very important since the output from the previous step will be fed into the processing of the next step.

On the right-hand side of the editor window, an original unprocessed sample image is shown and the preview of the resulting image after the image filter is processed and displayed below.

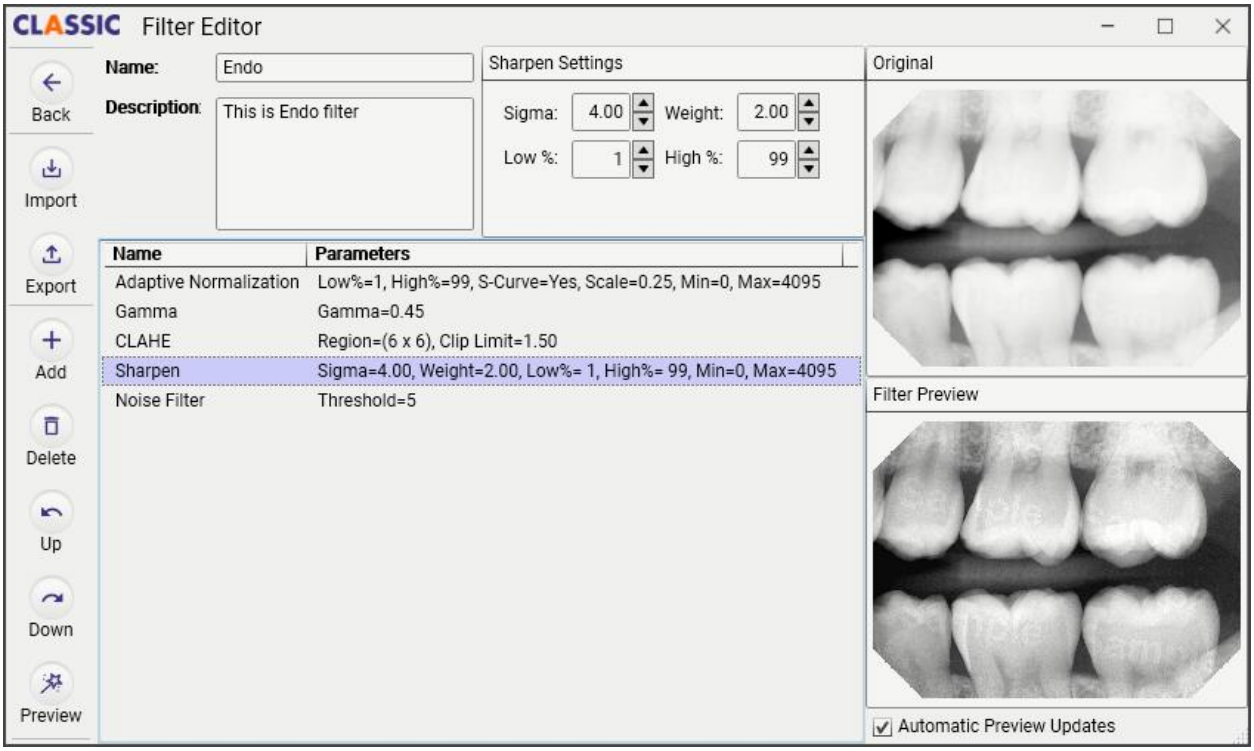


It is also possible to zoom into the preview image using the mouse scroll wheel to get a closer look at the filter results. The zoom level and pan location for both the Original and the Filter Preview images are synchronized to easily compare the fine details.



Changing Filter Step Parameters

When a processing step is selected from the list, the parameters for the step will be displayed, as illustrated below:



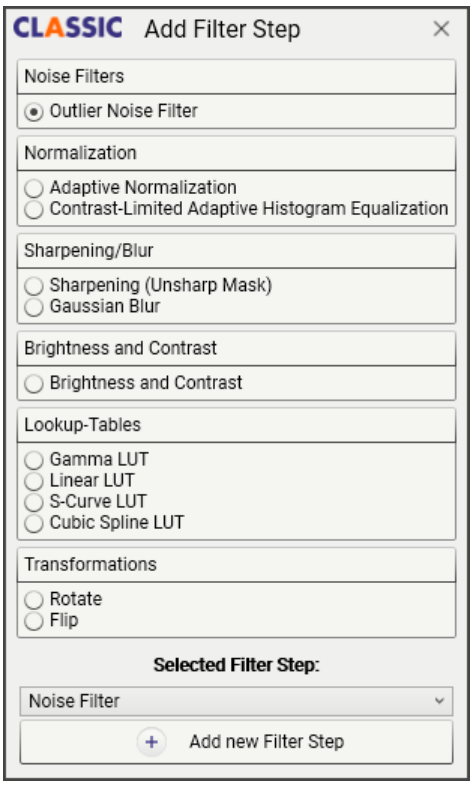
If you change any of the filter step parameters, the Filter Preview image on the lower right can be updated either by pressing the Preview button 

. It can also be updated automatically if the Automatic Preview Updates is checked.

The individual order of the processing steps can be changed using the Up and Down buttons on the left-side toolbar.

Adding New Filter Steps

It is also possible to add new predefined filter steps by clicking the Add button. This will open the Add Filter Step window:



The same filter step can be added to the filter list multiple times at multiple step locations.

The available filter steps include both traditional image processing steps as well as image transformations such as flip and rotate.

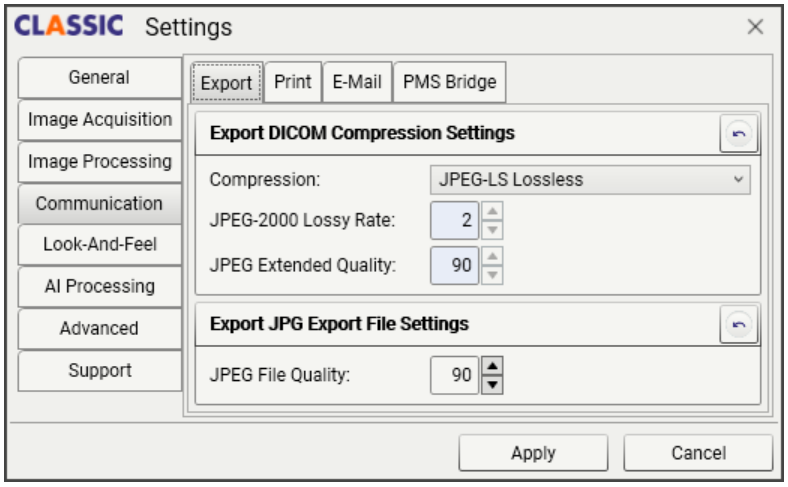
Finally, it is possible to remove individual filter steps by simply selecting the step in the list and clicking the Delete button.

Communication Settings

The Communication settings tab configures the Export, Print and E-mail features in Classic, as well as the Practice Management Bridge behavior.

Export Settings

When exporting images, you can configure the compression settings for both DICOM and JPG image files. All other image file formats have non-configurable settings.

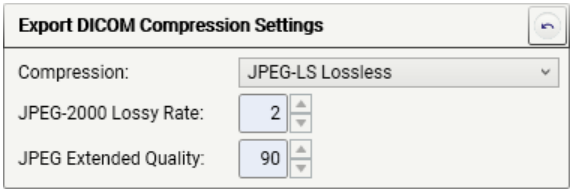


EXPORT DICOM COMPRESSION SETTINGS

The DICOM file format supports a wide variety of compression settings:

- None
- JPEG-2000 Lossy
    - Adjustable Compression Rate [0..8]
- JPEG-2000 Lossless
- JPEG-LS Lossy (Near Lossless)
- JPEG-LS Lossless
- JPEG Lossless, Non-Hierarchical, First-Order Prediction
- JPEG Lossless, Non-Hierarchical (Process 14)
- JPEG Extended
    - Adjustable Quality Setting [0..100]

Some of the Lossy/Near-Lossless compression settings are still usable since the loss of image quality is negligible if the compression settings are optimally configured.



The default compression settings for the JPEG-2000 Lossy and JPEG Extended compression algorithms preserve the image quality while still rendering very small image files.

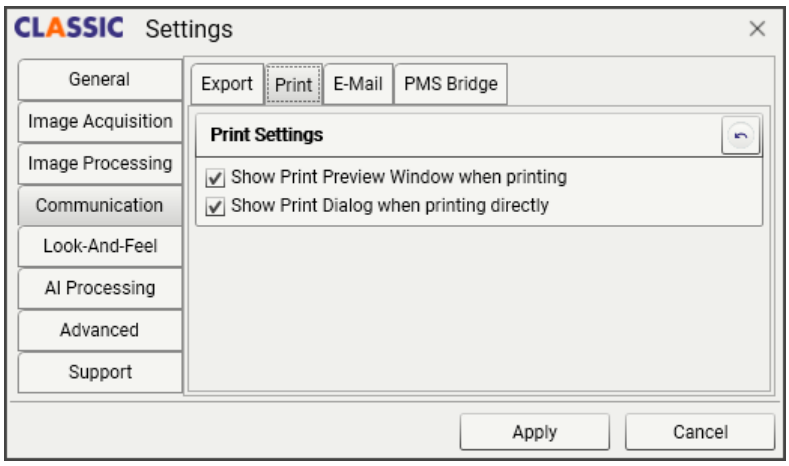
Compression algorithm	Typical compression rate	Comment
None	No compression	Not recommended. Use any lossless instead
JPEG-2000 Lossy	~1:2.66 @ Rate=2 ~**1:4** @ Rate=3	Rate values higher than 4 will increase the compression rate from 1:5 up to 1:26, but the image quality deteriorates quickly
JPEG 2000 Lossless	~1:2.4	Image quality is preserved
JPEG-LS Lossy (Near Lossless)	~**1:4.4**	High compression rate with only minor loss in image quality
JPEG-LS Lossless	~1:2.4	Image quality is preserved
JPEG Lossless, Non-Hierarchical, First-Order Prediction	~1:2.4	Image quality is preserved
JPEG Lossless, Non-Hierarchical (Process 14)	~1:2.4	Image quality is preserved
JPEG EXTENDED	~1:2.8 @ Quality=90 ~1:3.2 @ Quality=85	Quality values lower than 80 will increase the compression rate from 1:3.4 up to 1:4.7, but the image quality deteriorates quickly

JPEG QUALITY SETTING

The JPG file format supports adjustment of the Quality setting between 0 and 100, where 100 provides the best image quality but the largest file size. The default setting of 90 yields a compression ratio of around 1:2.8.

Print Settings

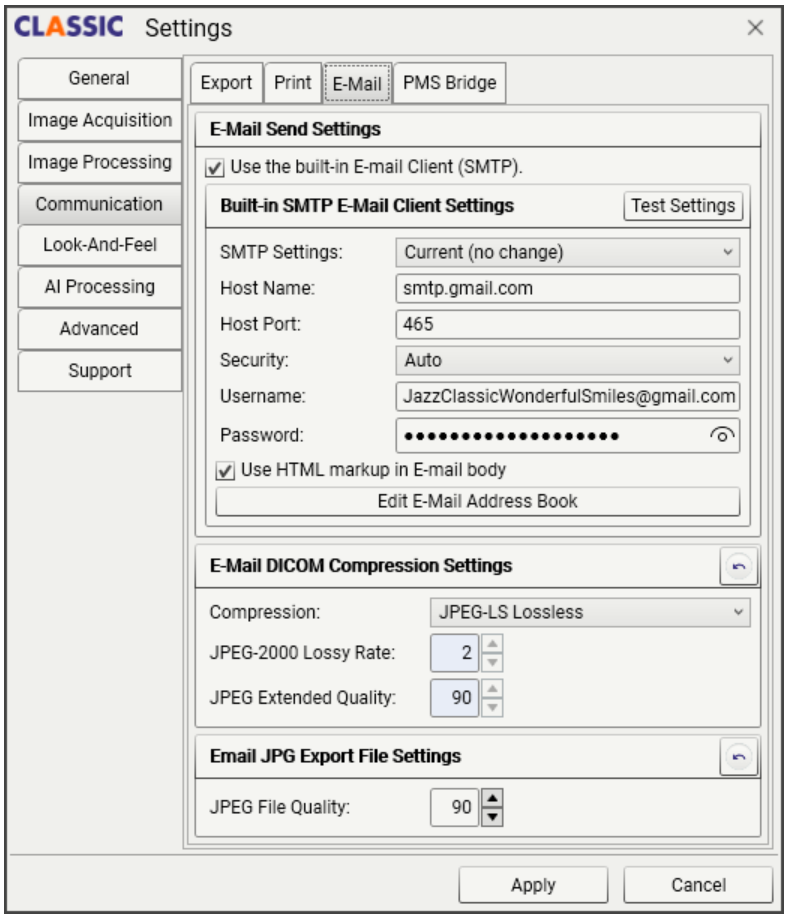
When printing images and exams, you can configure the user interface displayed during the printing operation.



The Print Preview window lets the user check the document before it is being sent to the printer.

E-Mail Settings

When E-mailing images and exams, you can configure which E-mail Client to use as well as adjust compression settings for DICOM and JPEG files.



E-mail Send Settings

Classic support two different ways for emailing images and exams:

- Compose and send E-mails using Windows Default Email application via Simple-MAPI protocol
- Compose and send E-mails using built-in SMTP Email client

Both options have their pros and cons, so it is up to the system administrator to configure the E-mail system the preferred way.

Selection between the Default email application and the built-in email client is done by checking/unchecking the "**Use the built-in email client (SMTP)**" checkbox.

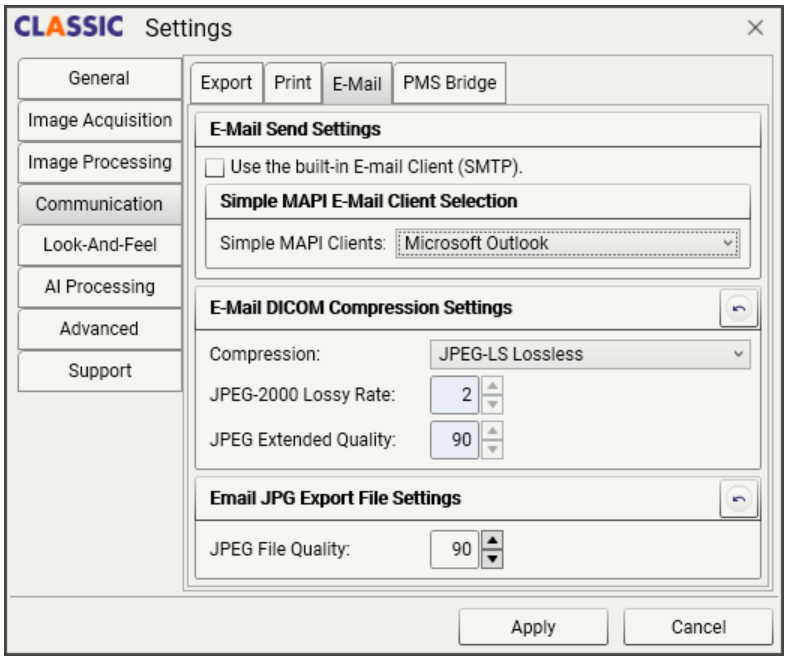
USING THE WINDOWS DEFAULT EMAIL APPLICATION

The primary benefit of using the Default Windows E-mail Client application is that everything will work exactly the same way as when any other E-mails are being sent by the users.

The selection of the Default Windows E-mail Client Application will depend on which 3rd party E-mail applications have been installed in Windows, and whether the installed applications support the "Simple MAPI" protocol or not.

The Default Email application will most likely have to be purchased and installed prior to using it in Classic. And the Windows administrator will either have to select this 3rd party e-mail application as the ***Default*** email application in the ***Default apps*** section inside Windows Settings, or to select it directly in Classic.

In the Classic settings window, it is possible to see which Simple MAPI compliant application has been installed in the system as well as see which one has been selected as the Default Simple MAPI E-mail Client.

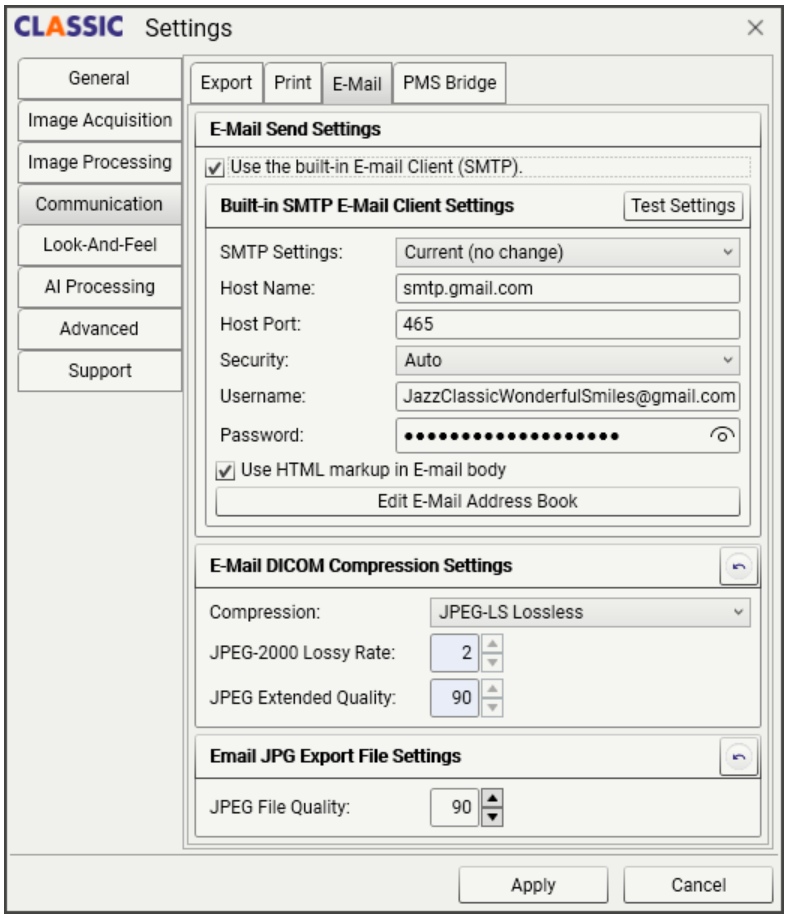


Since the Default E-mail Client must be installed as a separate application in Windows, then the list of Simple MAPI Clients might be empty in your system! If this is the case, then it is recommended to use the built-in E-mail Client instead!

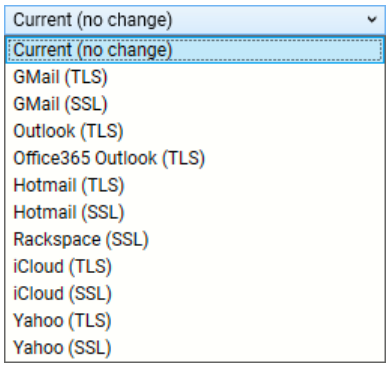
USING THE BUILT-IN EMAIL CLIENT

If no Simple-MAPI compliant email application has been installed in Windows, then the users will be able to use the built-in email client instead. However, this must be enabled in the settings by checking the "Use the built-in E-mail Client (SMTP)" checkbox or else you will get an error message when trying to send an email.

This built-in email client uses the standard SMTP communication protocol for sending out email messages, so the email service provider SMTP settings must be configured correctly before it can be used!


CLASSIC Settings
General
Image Acquisition
Image Processing
Communication
Look-And-Feel
AI Processing
Advanced
Support
Export
Print
E-Mail
PMS Bridge
E-Mail Send Settings
Use the built-in E-mail Client (SMTP).
Built-in SMTP E-Mail Client Settings
Test Settings
SMTP Settings:
Current (no change)
Host Name:
smtp.gmail.com
Host Port:
465
Security:
Auto
Username:
JazzClassicWonderfulSmiles@gmail.com
Password:
Use HTML markup in E-mail body
Edit E-Mail Address Book
E-Mail DICOM Compression Settings
Compression:
JPEG-LS Lossless
JPEG-2000 Lossy Rate:
2
JPEG Extended Quality:
90
Email JPG Export File Settings
JPEG File Quality:
90
Apply
Cancel

Typically, the SMTP server settings are consistent for the most common email service providers, so Classic provides a list of “presets” that would work in most cases.



These presets contain typical settings for:

- SMTP host name
- SMTP host IP port number
- SMTP Secure Socket option

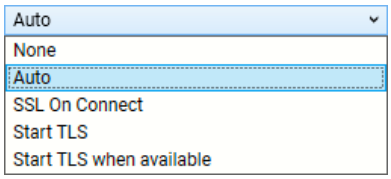
So, if you use any of the listed email service providers, then you simply select it from the list and then just enter the username (typically the email address) as well as the associated password and you will be good to go.

If you use Gmail, then the typical security setting for your Gmail account will prohibit you from using your normal email password to login to the SMTP server. Instead, you will have to create a dedicated application password withing you Google account and then use that password instead in Classic. See (https://support.google.com/mail/answer/185833?hl=en) for more details!

CUSTOM SMTP SETTINGS

If you don’t find your email service provider in the “preset” list, then you will have to contact them and get the necessary SMTP server details about the host name, host port and the secure socket option.

The Secure Socket option can be one of the following:



Some email service providers might not work with the SMTP client in Classic, so in that case you might have to purchase and install a Simple-MAPI compliant e-mail application instead.

The validity of the SMTP Server settings can easily be verified by simply pressing the “Test Settings” button.

E-mail compression settings

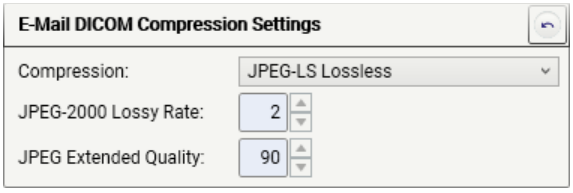
When images are being emailed it is possible to configure the compression settings for DICOM and JPEG.

E-MAIL DICOM COMPRESSION SETTINGS

The DICOM file format supports a wide variety of compression settings:

- None
- JPEG-2000 Lossy
    - Adjustable Compression Rate [0..8]
- JPEG-2000 Lossless
- JPEG-LS Lossy (Near Lossless)
- JPEG-LS Lossless
- JPEG Lossless, Non-Hierarchical, First-Order Prediction
- JPEG Lossless, Non-Hierarchical (Process 14)
- JPEG Extended
    - Adjustable Quality Setting [0..100]

Some of the Lossy/Near-Lossless compression settings are still usable since the loss of image quality is negligible if the compression settings are configured optimally.



The default compression settings for the JPEG-2000 Lossy and JPEG Extended compression algorithms preserve the image quality while still rendering very small image files.

Compression algorithm	Typical compression rate	Comment
None	No compression	Not recommended. Use any lossless instead
JPEG-2000 Lossy	~1:2.66 @ Rate=2 ~**1:4** @ Rate=3	Rate values higher than 4 will increase the compression rate from 1:5 up to 1:26, but the image quality deteriorates quickly
JPEG 2000 Lossless	~1:2.4	Image quality is preserved
JPEG-LS Lossy (Near Lossless)	~**1:4.4**	High compression rate with only minor loss in image quality
JPEG-LS Lossless	~1:2.4	Image quality is preserved
JPEG Lossless, Non-Hierarchical, First-Order Prediction	~1:2.4	Image quality is preserved
JPEG Lossless, Non-Hierarchical (Process 14)	~1:2.4	Image quality is preserved
JPEG EXTENDED	~1:2.8 @ Quality=90 ~1:3.2 @ Quality=85	Quality values lower than 80 will increase the compression rate from 1:3.4 up to 1:4.7, but the image quality deteriorates quickly

JPEG QUALITY SETTING

The JPG file format supports adjustment of the Quality setting between 0 and 100, where 100 provides the best image quality but the largest file size. The default setting of 90 yields a compression ratio of around 1:2.8.

Bridge Settings

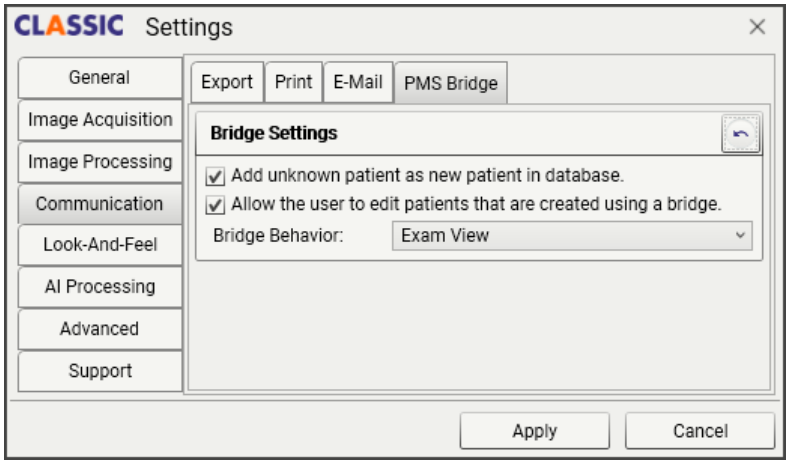
Users can configure the Bridge interface behavior for Jazz Classic.

The Bridge interface will always transfer the following patient details to Classic:

- **First Name**
- **Last Name**
- **Patient Identifier**

The Bridge interface includes an optional Bridge Action parameter that is specified along with Patient details:

- **Acquisition** Layout selection View will appear, and a Capture will be performed next.
- **Exam** Exam selection View will be displayed.
- **Latest Exam** Latest Exam will be displayed directly.



When the bridge interface tries to select an unknown patient, users can configure whether Classic automatically creates the patient in the Classic database (based on the transferred Last Name, First Name and Patient Identifier) or ignores the Bridge request.

Users can also choose the ***default*** bridge behavior if the bridge action is not directly specified via the Bridge interface.

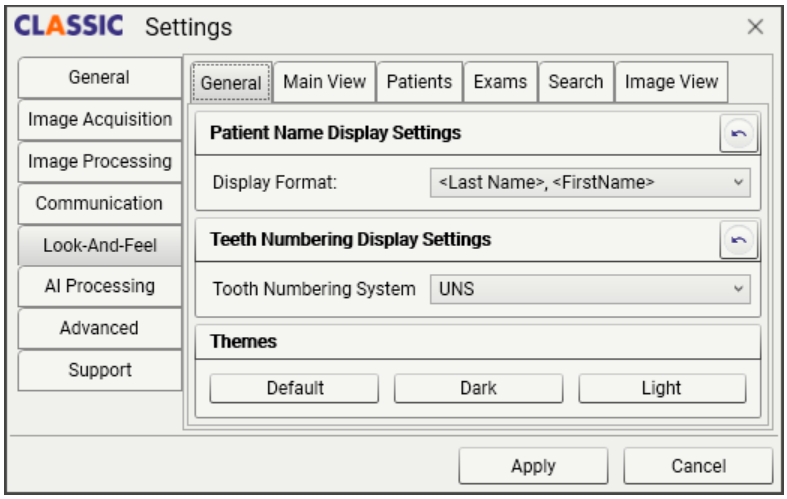
Look-And-Feel Settings

The Look-And-Feel tab contains settings for customizing the appearance of various views in Classic.

Each section will be covered separately below.

General look-and-feel Settings

The General look-and-feel settings make it possible to customize the Patient Name format and the Teeth Numbering used throughout Classic. Only users with system administration privileges will be able to change these settings.



Patient Name Display section

The Patient Name display format can be configured using the following formats:

- <Last Name>^<First Name> (default)
- <Last Name>, <First Name>
- <First Name> <Last Name>

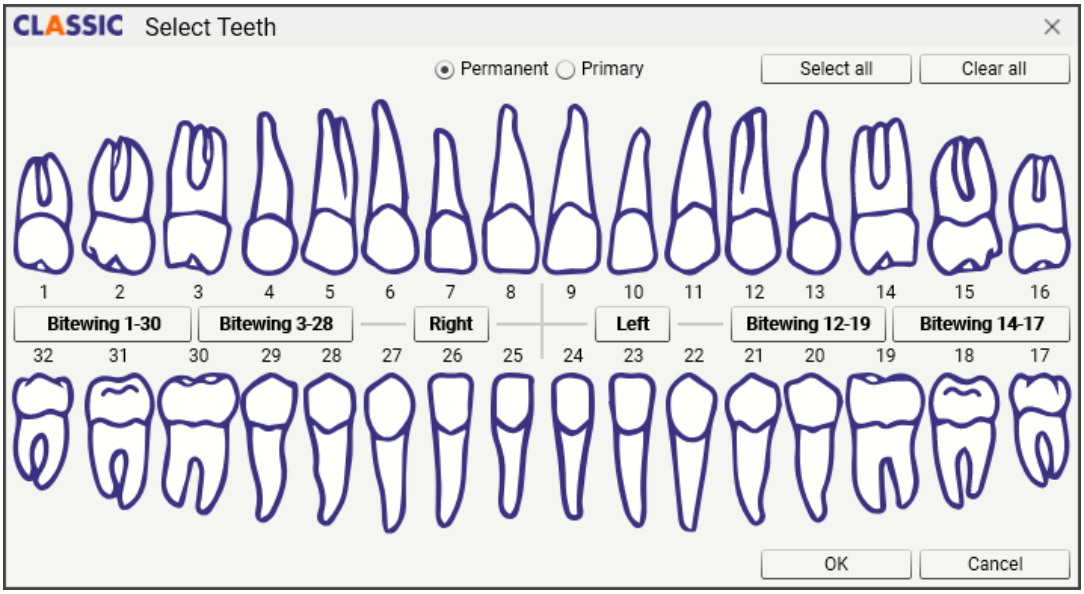
Teeth Numbering Display section

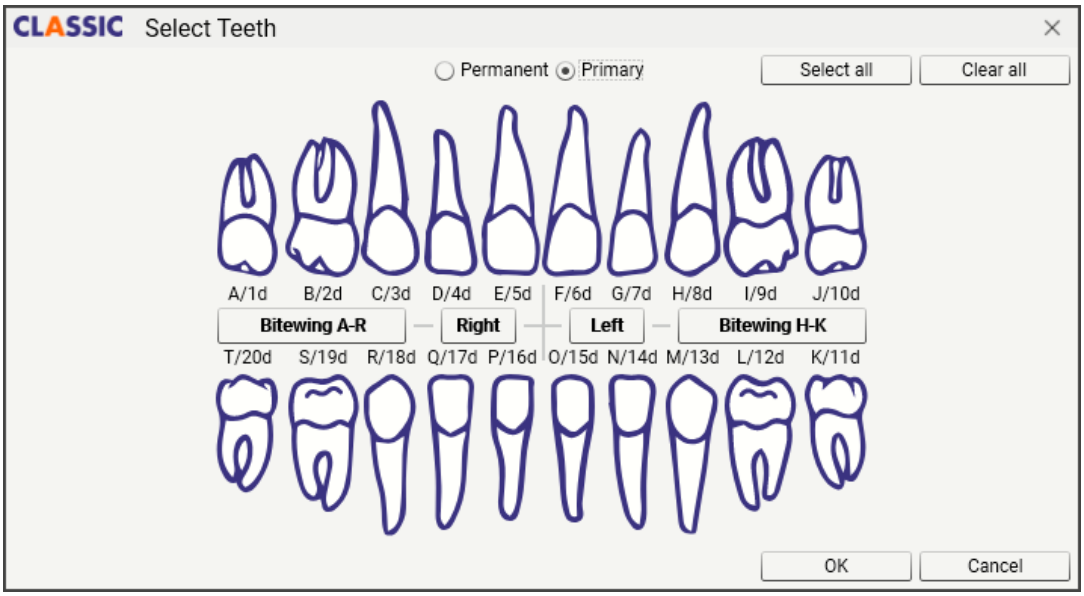
Users can choose which tooth numbering system (notation) will display throughout the Classic User Interface. The following four notations are currently supported by Jazz Classic:

- UNS (default)
- FDI ISO-3950
- Alphanumeric
- Haderup (Danish)

UNS:

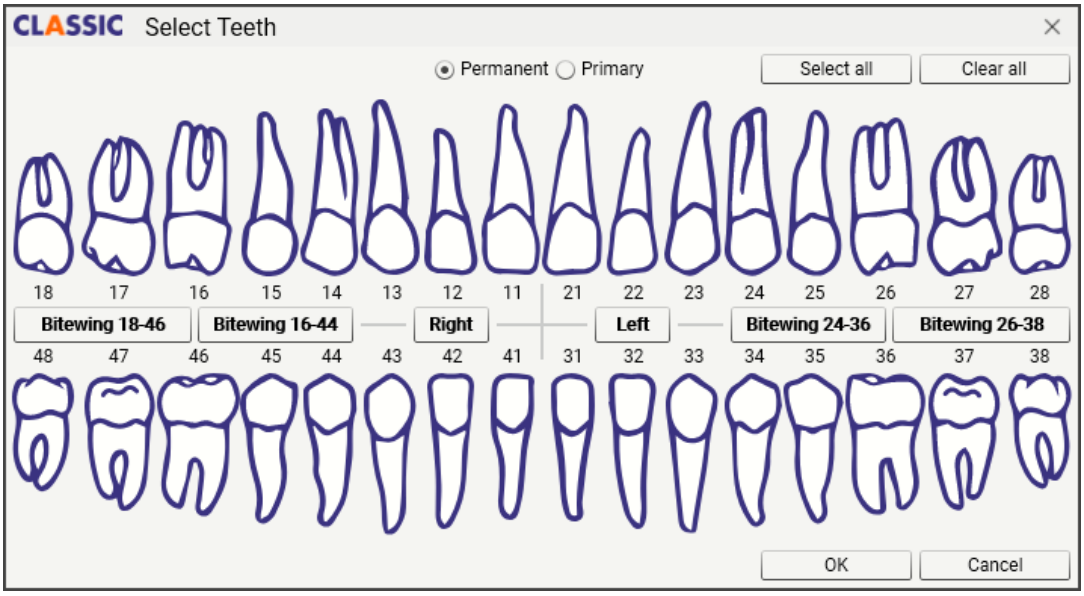
American Dental Association **U**niversal **N**umbering **S**ystem (AKA American System).

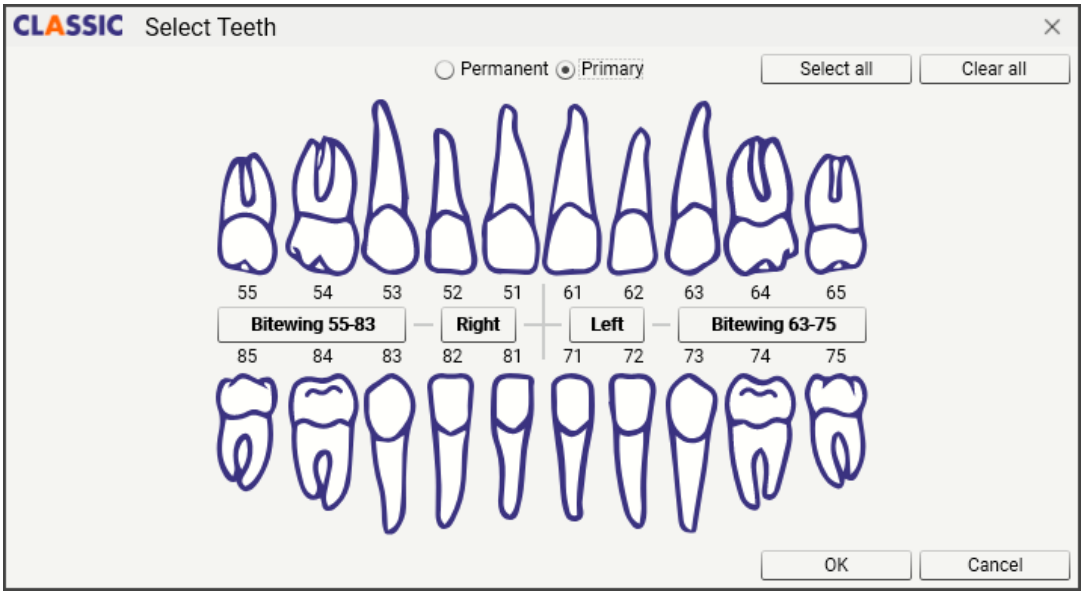




FDI ISO-3950:

The FDI World Dental Federation notation is the world's most used dental notation (tooth numbering system). It is used in most countries of the world except the United States, which uses the UNS.

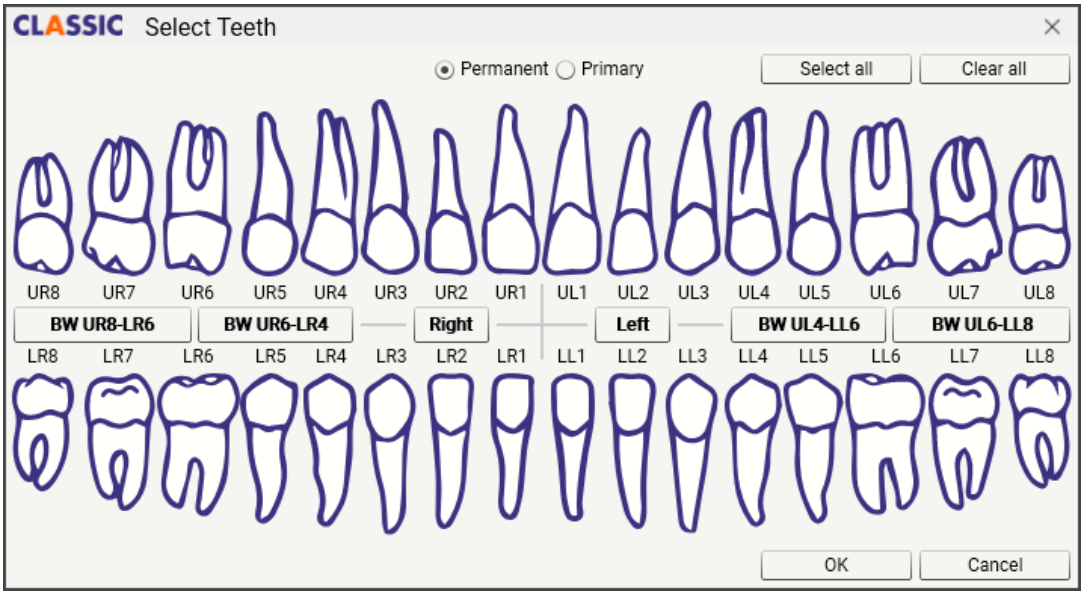


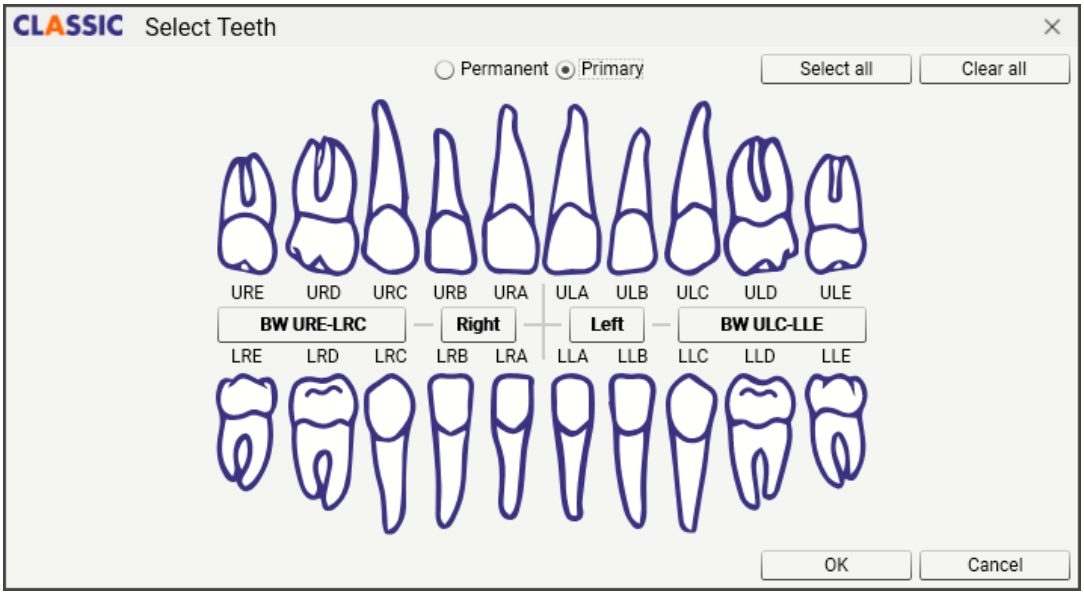


ALPHANUMERIC:

In Alphanumeric notation (or "Letters and numbers system"), the four quadrants are designated as:

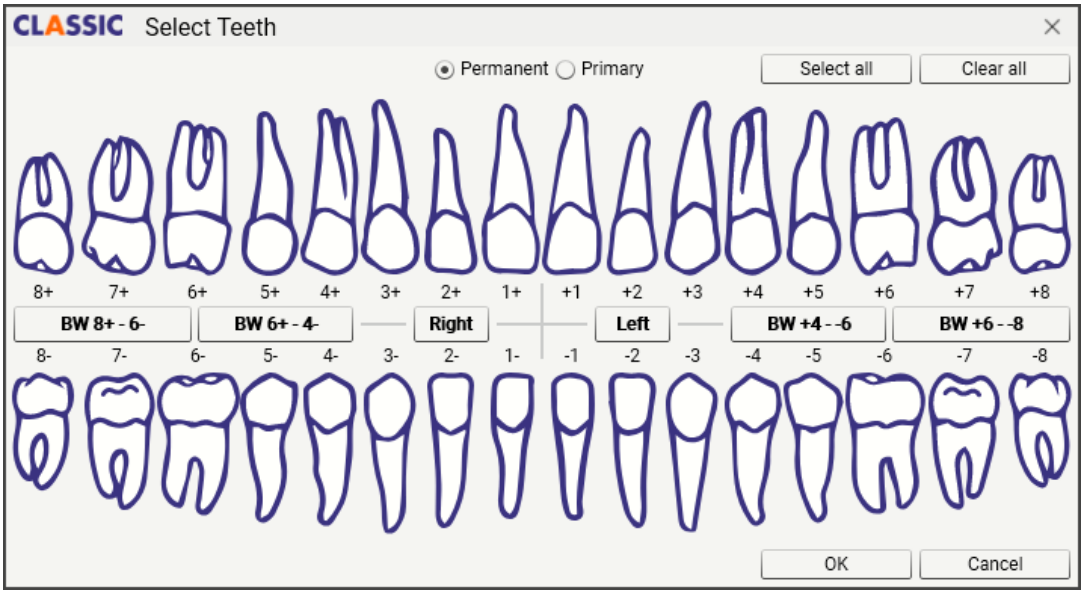
- UR – upper right
- UL – upper left
- LR – lower right
- LL – lower left

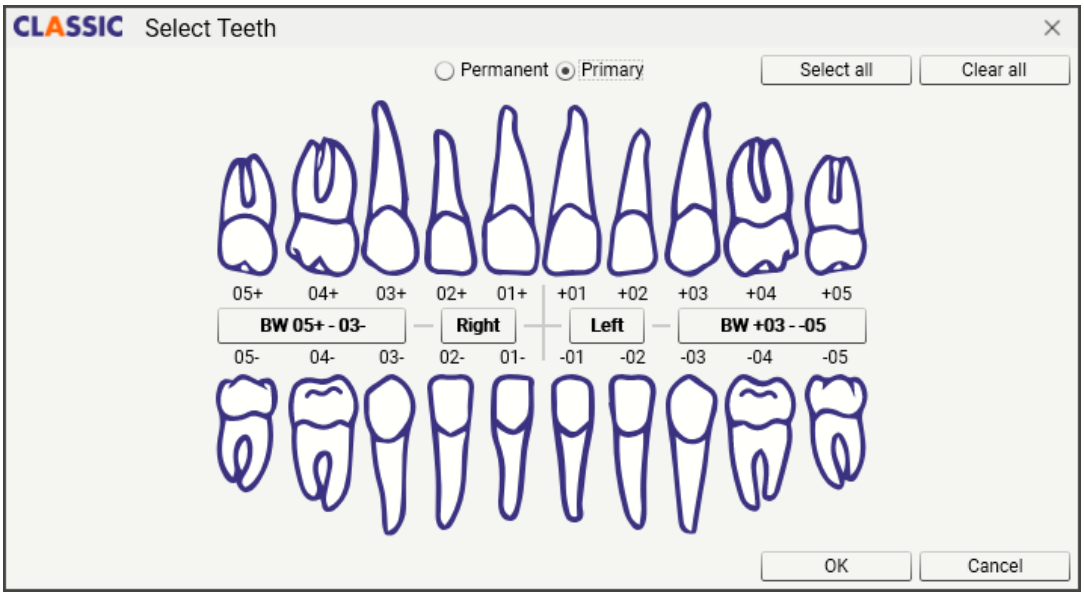




HADERUP (DANISH):

The Victor Haderup notation (Danish alternate system).

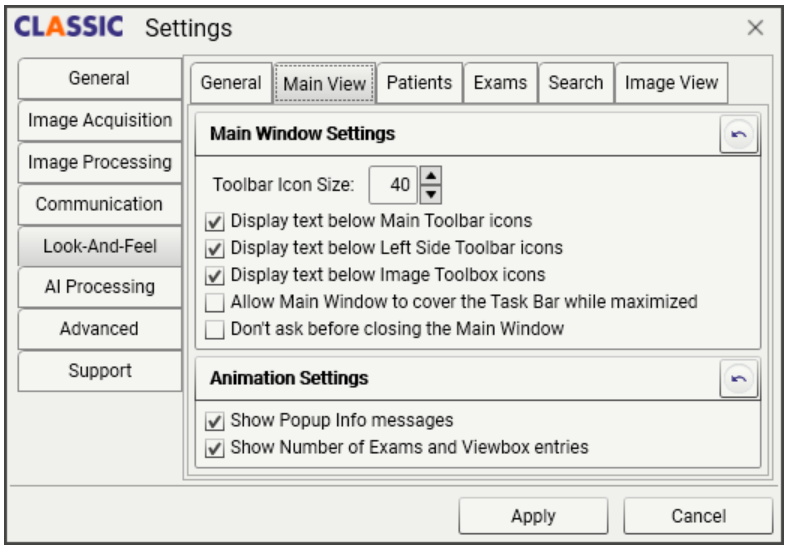




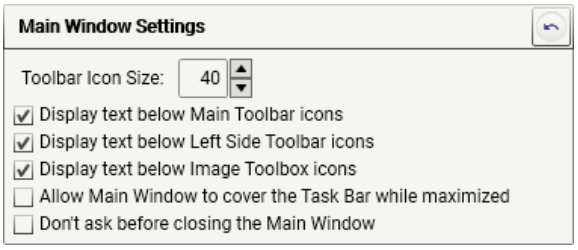
Classic stores teeth numbering in a generic format internally, so it is possible to switch between these teeth numbering formats at any time without risking the numbering being corrupted.

Main View look-and-feel Settings

The Main View look-and-feel settings make it possible to customize the behavior of the Main View area in Classic.

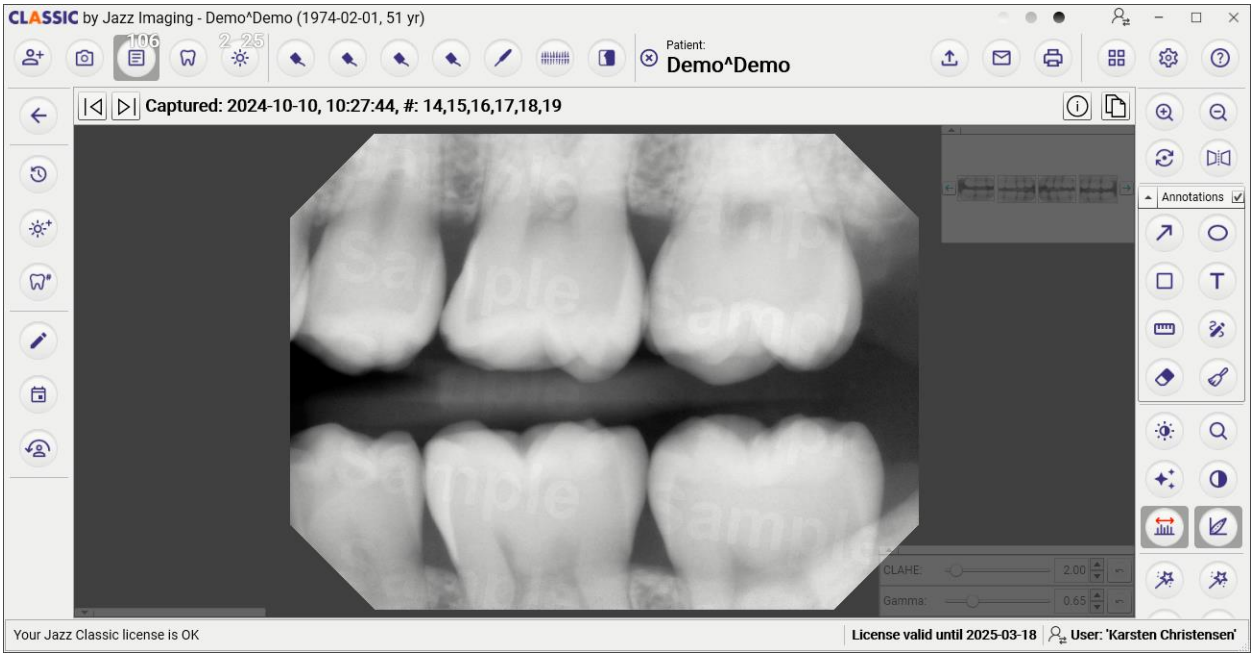


MAIN WINDOW SETTINGS



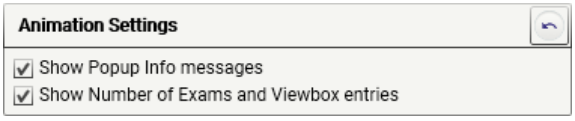
In the Main Window Settings section, you can change the size of all toolbar button icons and choose whether to display or hide text underneath the toolbar buttons. This makes it possible to customize the amount of screen space allocated to the toolbar buttons.

The following figure shows the Classic UI without text under the tollbar buttons:

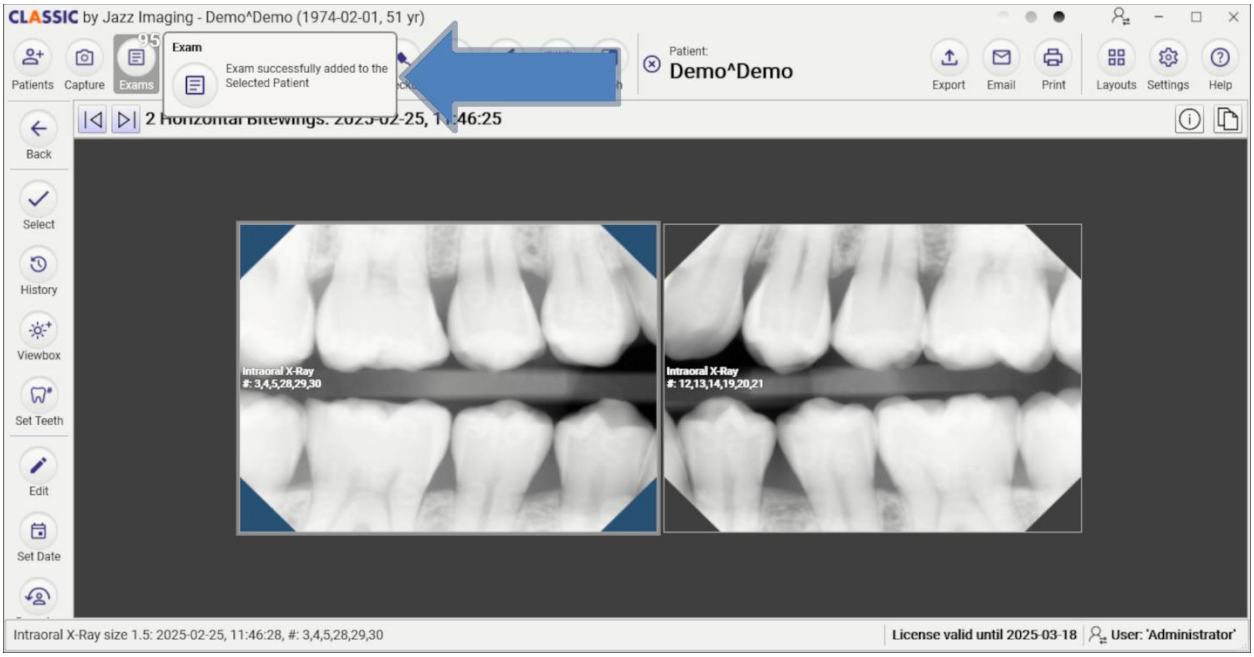


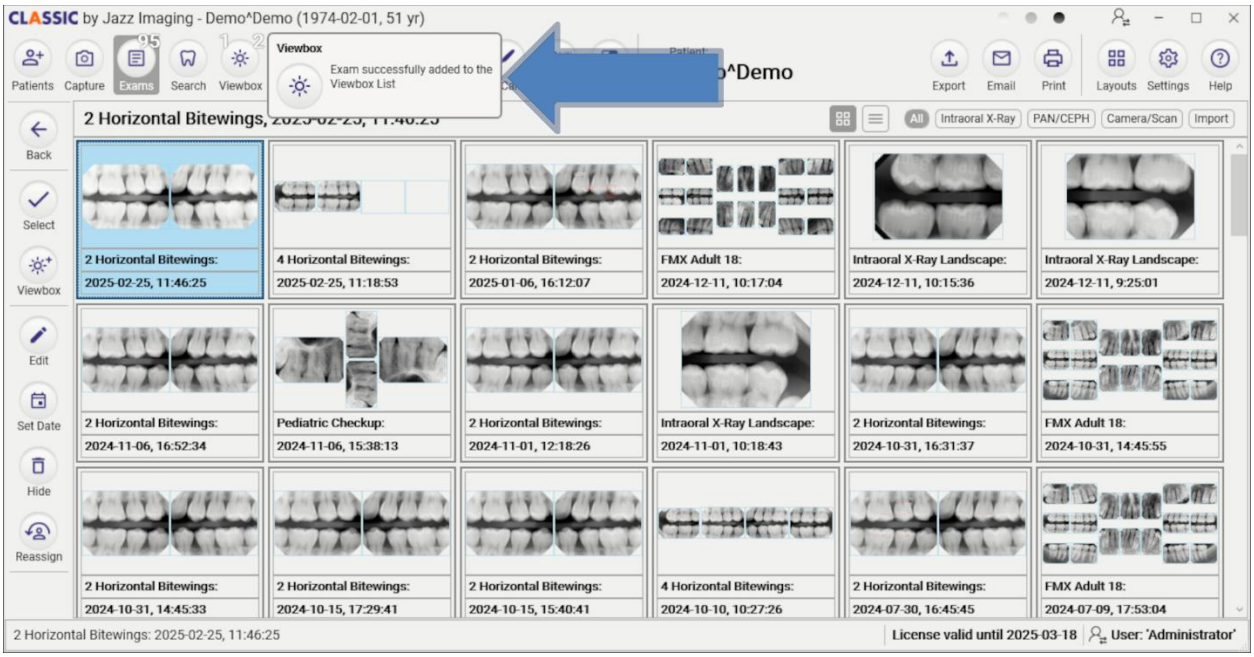
If Classic will be used on a system with touch screen, it is recommended to increase the size of the toolbar button icons. This makes it easier to interact with button when tapping them your fingers.

Animation Settings



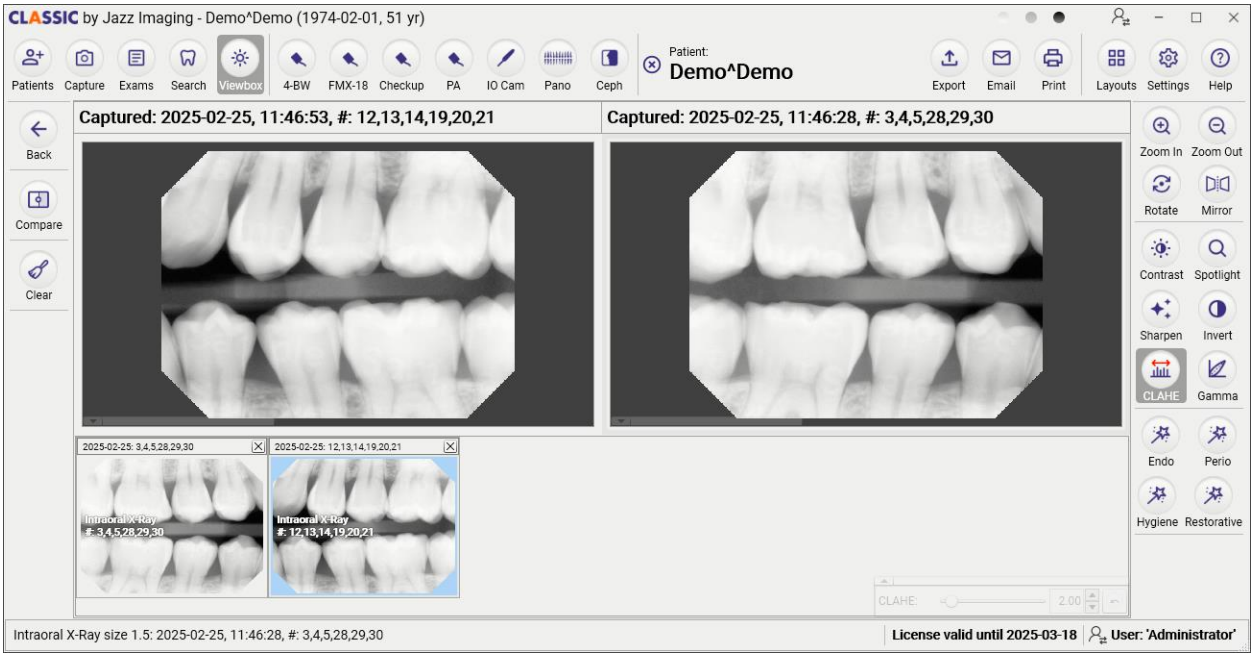
When a new Exam has been successfully created, Classic will display a Popup dialog. This popup can be suppressed by unchecking the “Show Popup Info messages” option. The same is the case when an image is selected for the Viewbox.



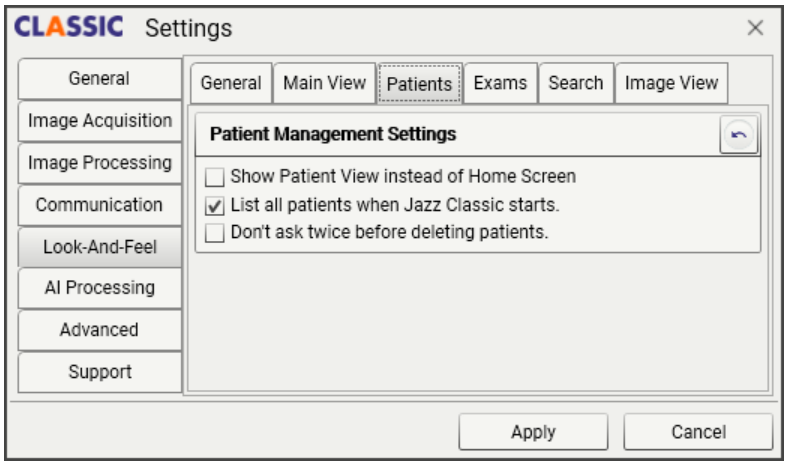


Additionally, you can choose to display or hide the total number of exams and images in the Viewbox.

The following figure shows the Classic UI without the exam and Viewbox image count displayed:



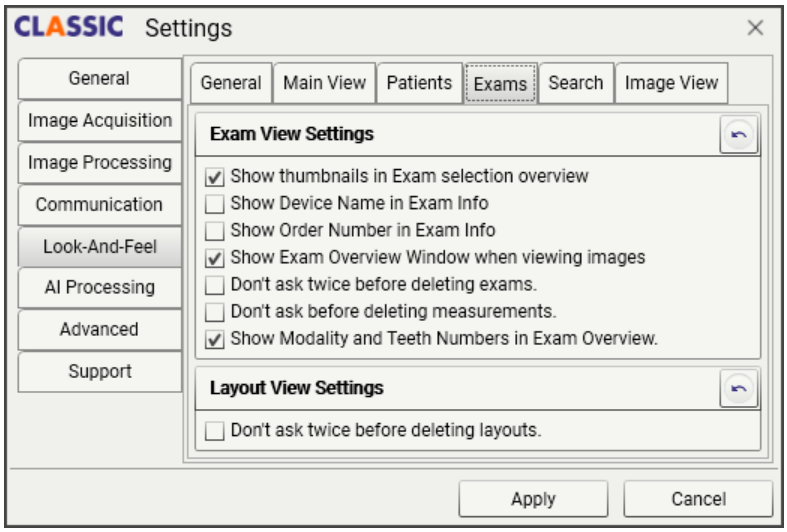
Patients Settings



In the Patient Management Settings section, you can choose whether Classic displays the Home screen or the Patient management view upon startup.

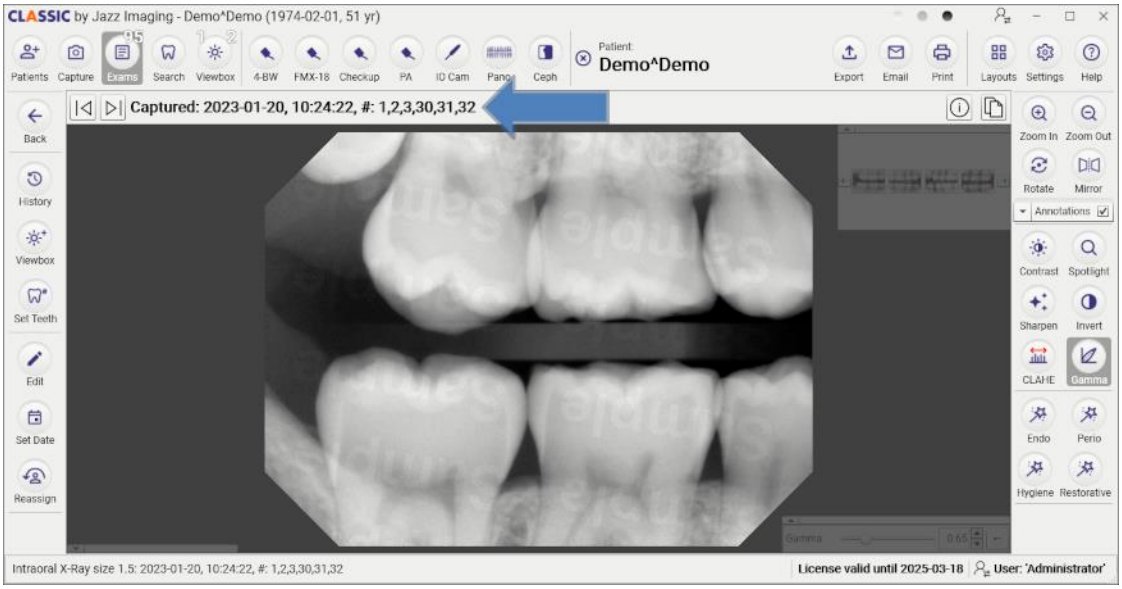
Additionally, you can customize whether all Patients are listed when Classic starts, or if the user list remains empty, requiring a Patient search to select the patient.

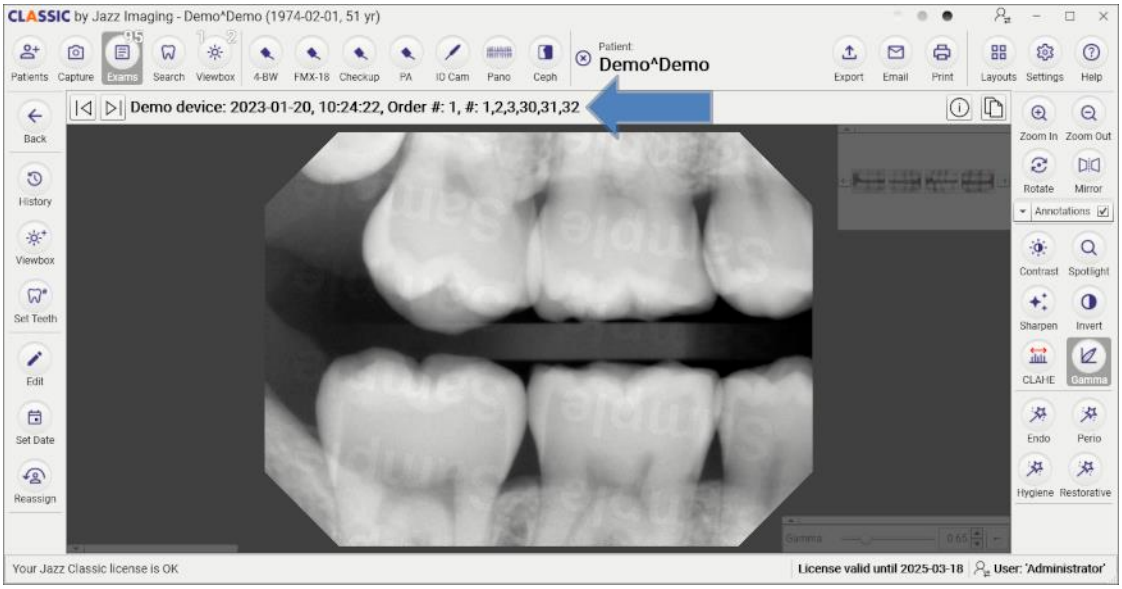
Exams Settings



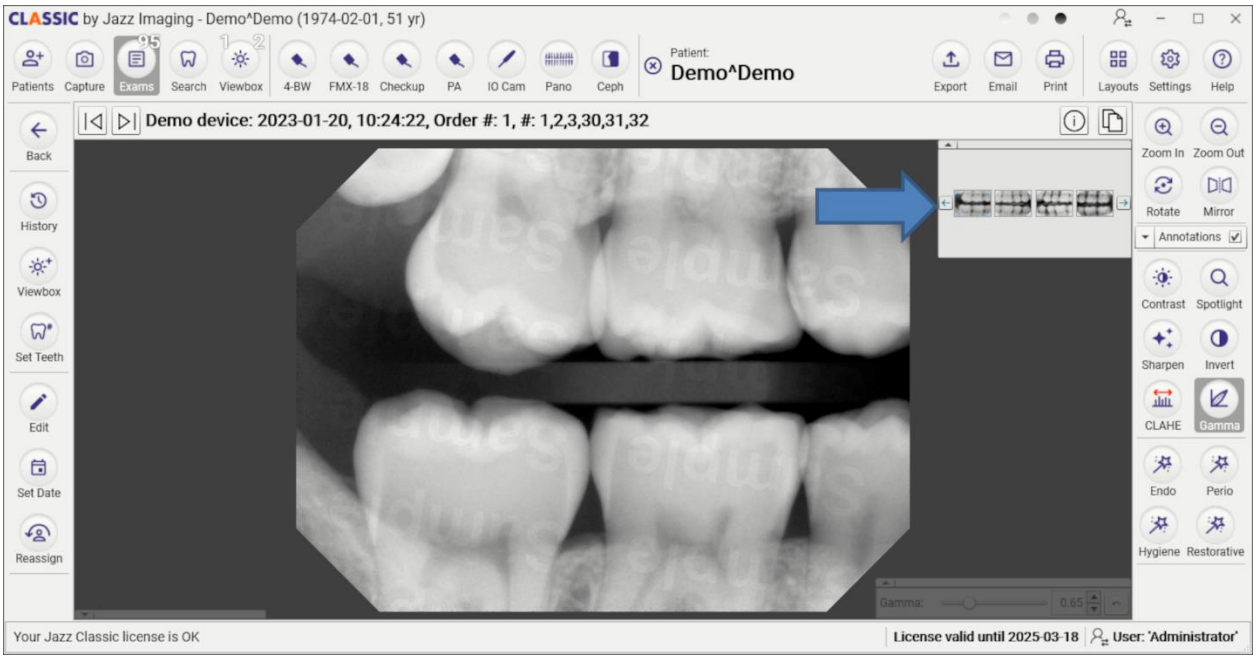
In the Exam View Settings sections, you can configure the Exam selection view to display or hide thumbnails in Exam selection overviews. This can be used to speed up the display of exams if the number of exams is high.

The Device Name and the Order Number display can be customized as well. The following two figures show the Exam information without and with the Device Name and Order Number (default).

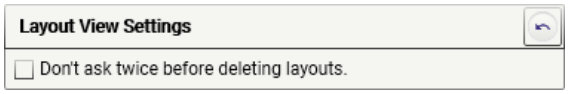




Finally, it's possible to hide/show the Exam Overview when images are being viewed. The exam overview enables users to quickly switch between images within the exam.



LAYOUT VIEW SETTINGS

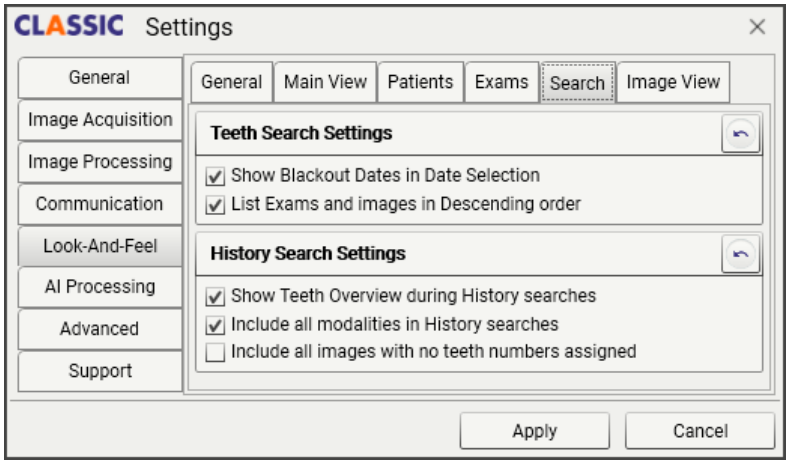


It is possible to select whether Classic will ask twice to confirm before deleting any layouts in the Layout selection view:

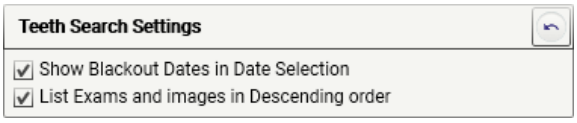
Since deleting layouts is an operation that cannot be undone, Classic will always ask at least once before the layout is deleted.

Search Settings

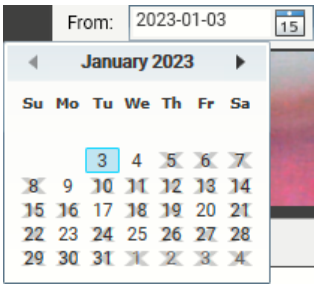
The Search settings allow users to customize the UI behavior for the various search windows:



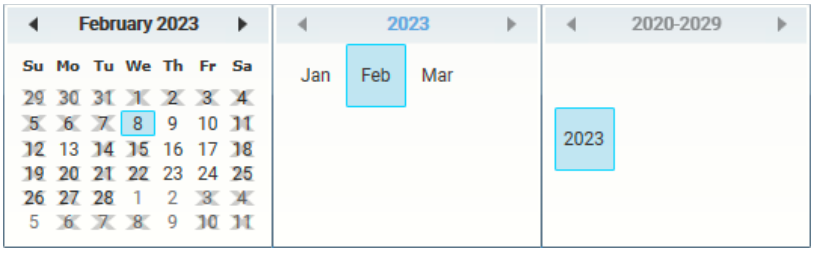
Teeth Search View Settings



When a Teeth Search is performed, it is possible to configure whether only dates with exams are accepted as selections for the ***From:*** or ***To:*** date. Enabling the **Show Blackout Dates in Data Selection** options will disable the section of dates where no exams have been taken within the Date picker control:



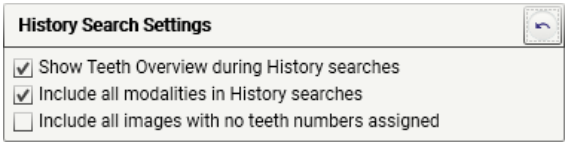
Users can Zoom in and out in the Date Picker control by clicking the header. If the **Show Blackout Dates in Data Selection** option is checked, only dates that have exams will be selectable. In the following example, the selected patient only has exams from January, February, and March of 2023:



The second option chooses whether the Exams and Image lists are sorted in ascending or descending order when they are retrieved from the Classic database.

If the **List Exams and images in Descending order** option is checked, the newest Exam and/or Image will be displayed at the top of the lists.

History Search View Settings



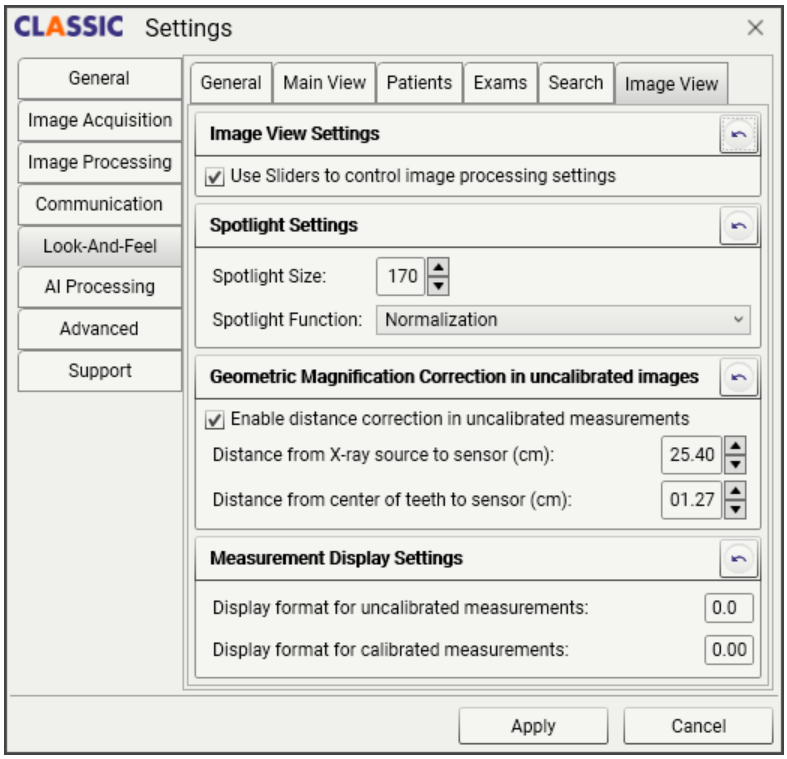
When performing history searches, you can choose whether to perform the search **across** modalities or only within the same modality of the selected image that is the basis for the search.

This means that you can, for instance, have the History Search include IO Camera images even if the reference image is an IO X-ray image.

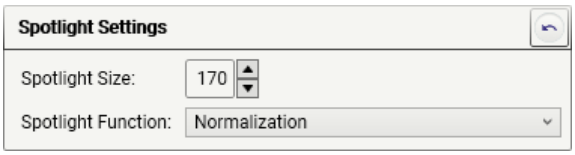
The second option allows you to include all images without associated tooth numbers in the search results as well. This is helpful if there are images in the database without the proper tooth numbers assigned.

Images Settings

The Images section allow users to customize the UI behavior for the various Views and windows:



Spotlight Settings



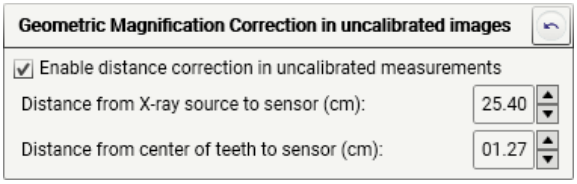
The spotlight tool can be configured in this tab. The first selection is the diameter of the spotlight tool (in pixels), and second option selects the Spotlight Function:

- Sharpen — The spotlight will enhance the local contrast and sharpen the image.
- CLAHE — The spotlight will enhance the local contrast using CLAHE filter.
- Invert — The spotlight will invert the image.
- Normalization — The spotlight will normalize the image data.

Geometric Magnification Correction settings

When using the built-in measurement tool, Classic will try to correct for the Geometric Magnification as described in Appendix A: Measurement accuracy and Calibration. The correction will only be applied in uncalibrated images where the pixel size/pitch is known.

The Geometric Magnification Correction depends on prior knowledge about the distance from the X-ray point-source (bulb) to the surface of the internal scintillator inside the IO X-ray sensor, as well as the distance from the "object" being measured and to the surface of the scintillator inside the IO X-ray sensor. See illustration in Accurate measurements in uncalibrated images for more details:



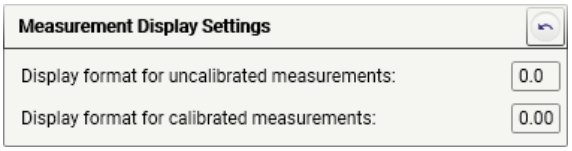
It is possible to disable this correction altogether, as well as to adjust the distance values so it better fits the actual geometry used in the dental office.

The default values are typical values for a wall mounted X-ray sources and the typical distance from the teeth when the X-ray sensor is used with IO sensor holders.

Measurement Display settings

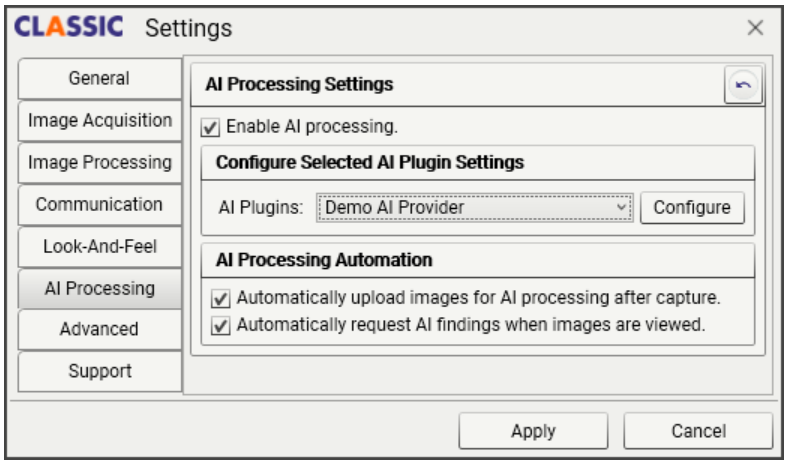
The accuracy of uncalibrated measurements depends on how precisely the pixels size/pitch and the distances used by the geometric magnification correction are determined. And the accuracy of the calibrated measurements depends on the accuracy of the calibration steps made by the users as explained in the Measurement Calibration section.

In general, measurements in calibrated images are more accurate than measurements in uncalibrated images, so Classic will as default display the ***calibrated*** measurement distances with higher precision (2 digits after the decimal point) than the uncalibrated. However, it is possible to change the display format for both types of measurements, so it better reflects the real accuracy of the measurements.



AI Processing Settings

The AI Processing Settings tab configures the Dental AI processing feature in Classic.

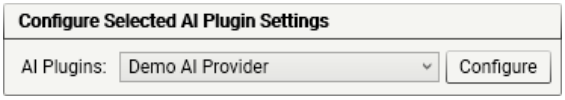


The AI feature in Classic integrates with 3rd party Dental AI Providers and will typically require a paid subscription directly with the AI Provider.

Classic implements the AI functionality via a Plugin interface that makes it possible for the user to select between a list of supported AI providers.

Configuring AI Plugin settings

The AI Processing plugin interface makes it possible to select between all the currently supported AI Providers. The number of supported AI Providers is planned to expand with the Dental AI market so the list of supported AI Providers will be extended accordingly.



Once the AI Plugin has been selected, the user will have to configure the selected plugin with the necessary credentials and additional information that comes as part of the AI Provider subscription. The format of the credentials and information depends on the individual AI Provider, so please contact the selected AI Provider and ask for the subscription details specific to the individual AI Provider.

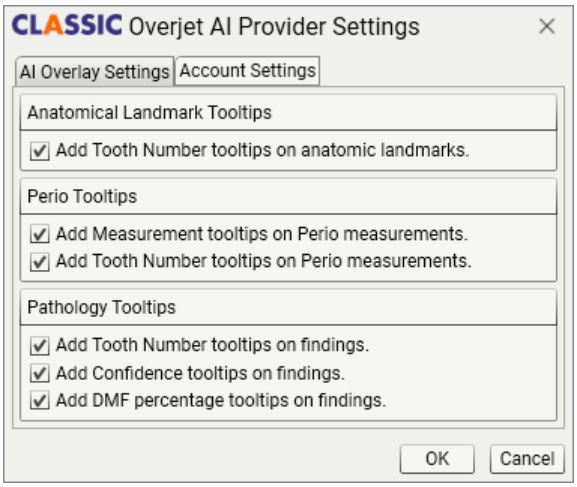
Jazz Classic currently supports the following Dental AI Providers:

- Overjet (see https://overjet.com)
- Velmeni (see https://velmeni.ai)

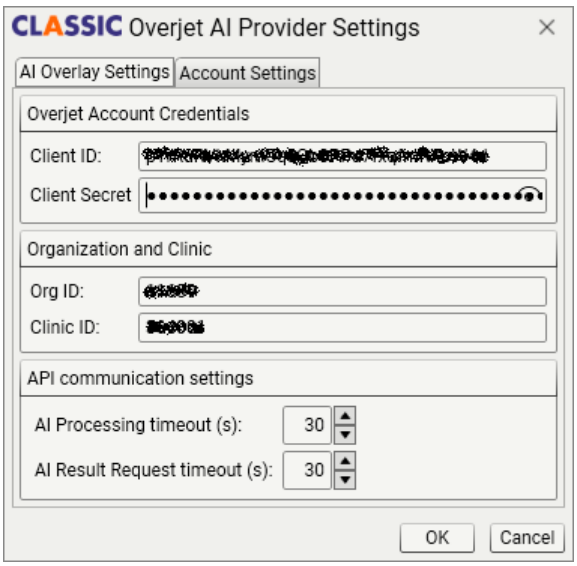
To configure the selected AI Plugin, simply click the Configure button. This will in turn open the plugin settings editor specific to the selected plugin.

Configuring the Overjet AI Plugin

The AI Overlay Settings tab lets the user configure the look-and-feel of the Tooltips associated with the AI graphical overlay:

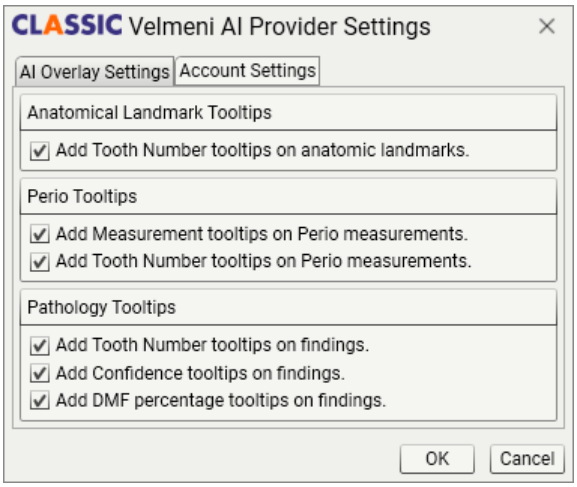


The Account Settings tab is where the user must enter the Overjet AI account credentials as well as information about the individual clinic. This information will be provided after subscribing to the Overjet AI product.

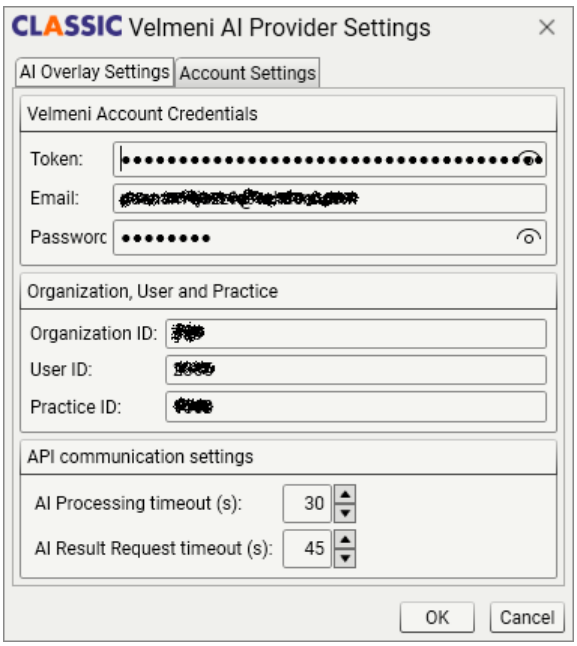


Configuring the Velmeni AI Plugin

The AI Overlay Settings tab lets the user configure the look-and-feel of the Tooltips associated with the AI graphical overlay:

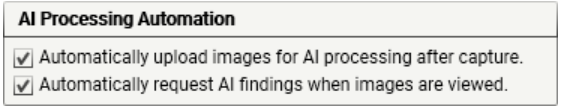


The Account Settings tab is where the user must enter the Velmeni AI account credentials as well as information about the individual clinic. This information will be provided after subscribing to the Velmeni AI product.



AI Processing Automation

It is possible to configure whether Classic automatically uploads images to the AI provider's portal upon capture, and whether it automatically retrieves the corresponding AI findings.

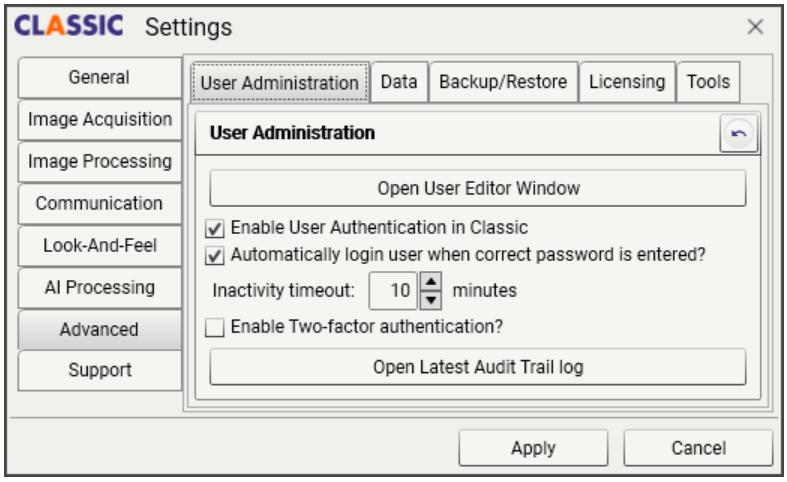


Advanced Settings

The Advanced settings tab configures the User Administration, Data Connection, Licensing settings in Classic.

User Administration Settings

The ***Advanced->User Administration*** tab contains all settings related to User Administration in Classic. It gives the User Administrator access to the User Editor Window.



It is possible to Enable/Disable the User Authentication feature within the system by checking/unchecking the ***Enable User Authentication in Classic*** selection. By disabling the User Authentication, a Cybersecurity Event will be generated by Classic. Please see Cybersecurity Event Handling for more details.

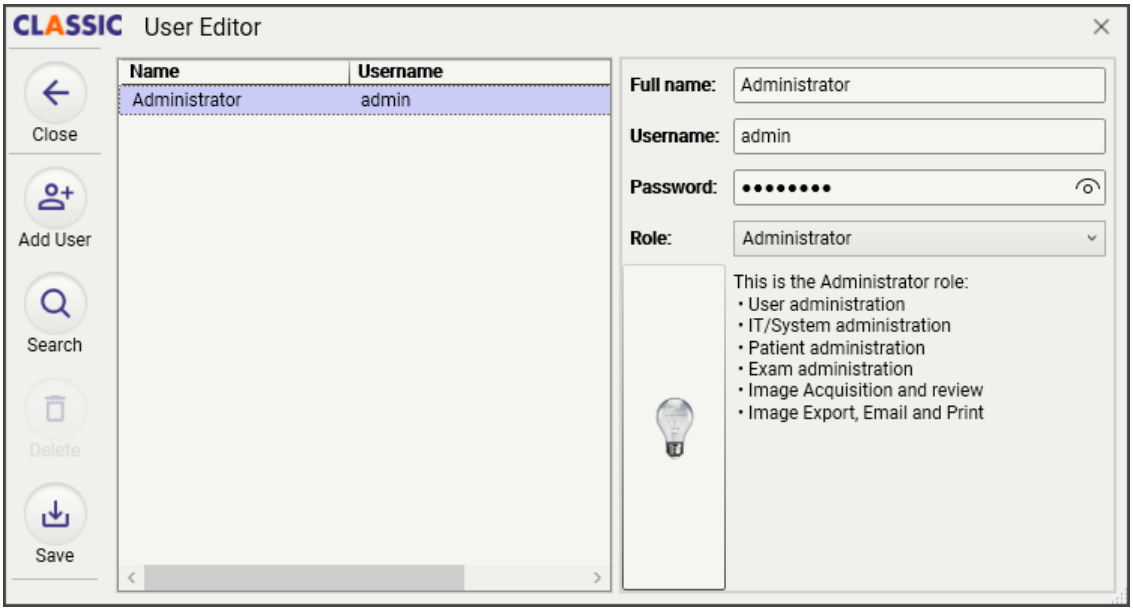
Jazz Imaging highly recommend that **User Authentication** is enabled as it's an important part of the cybersecurity measures put in place to protect against unauthorized access to sensitive data like personal patient information and images! For more information, please see the Cybersecurity Control section later in this document.

Users can choose whether Classic automatically logs in when the correct password is entered. Enabling this feature streamlines the login process, making it quicker and easier.

Finally, it is possible to view the Audit Trail log file that is generated by Classic. This log file contains records for when users log in or log out, as well as when Patients and Exams are managed (add/edit/delete/hidden).

User Administration Editor

The User Administration Editor displays a list of all defined users, showing the details for the selected user in a separate area. When Classic is installed, only a single Administrator user is defined:



Each of the account settings can be edited in the User Editor window.

Only Classic Users that have been assigned the **Administrator** Role can perform the Classic User Administration described in this section.

USER TYPES

The User Authentication in Classic supports two distinct ***types*** of users:

- Local Classic Users. These are user accounts that are created and maintained inside Classic, and the Classic Administrators add users as needed and these user credentials are only used inside Classic.
- Windows Users (either Domain users or Local PC workgroup users). These users are already defined within the Windows system and Classic will be able to automatically login these users into Classic since these users have already been authenticated by the Windows OS during the initial login to Windows.

The two user types basically give the Classic users access to exactly the same functionalities, however the Classic Users that are ***referencing*** the Windows User accounts won't have to be authenticated by Classic whenever Classic starts, and this will make the end-user experience much simpler:

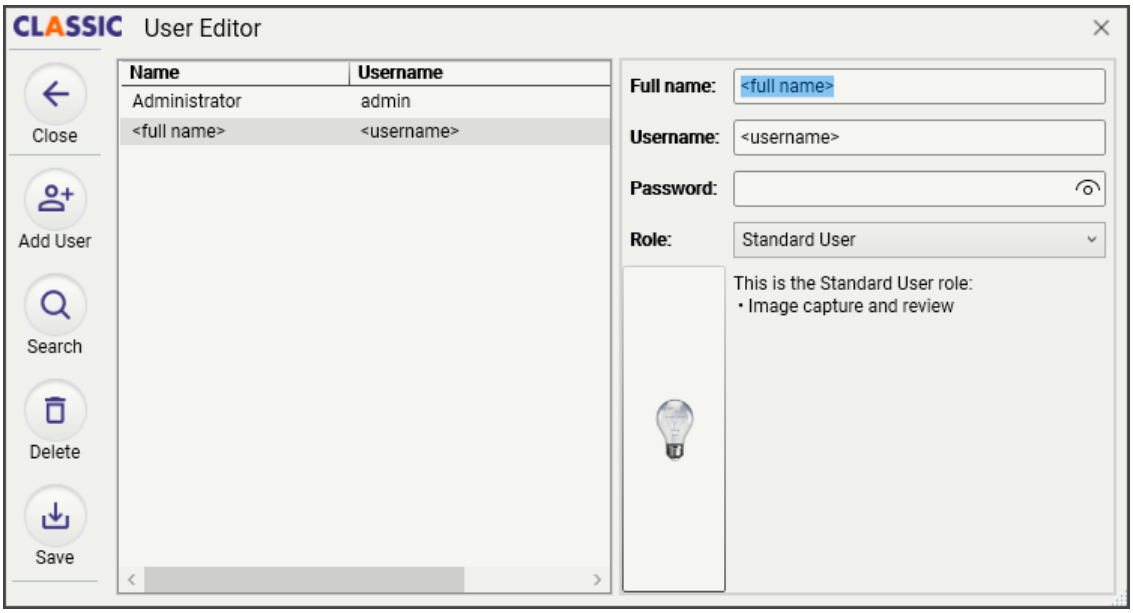
Whenever Classic is being started, it will fetch the ***username*** for the current Windows user, and if this Windows User has already been added to the Classic user list using the User Editor Window, then Classic will automatically select this Classic User and login to Classic ***without*** prompting the user for any credentials.

It is important to note that Classic won't require Windows Users added to the Classic User database to neither enter their username nor their password before being able to operate Classic! This is because it is assumed that the user has already been successfully Authenticated during the Login to the Windows OS prior to starting Classic.

ADD LOCAL CLASSIC USERS

To add a new Local Classic user, simply click the ***Add User*** button 

. This will create a new entry in the user list. The Full name, Username, Password, and Role must now be assigned to the new user:



The following restrictions apply to the Local Classic user settings:

- **Full name** is only used to identify the currently logged in Classic user in the status bar. If it is left empty, the username will be displayed instead.
- **Username** is the text displayed and used in the Classic Login window.
- **Password** cannot be an empty string for local users. It is recommended that secure passwords are used.

To assign a new user role, select one from the drop-down list of defined roles. For more information on User Roles, click the Lightbulb button ( ), which displays a table detailing the restriction for each role.

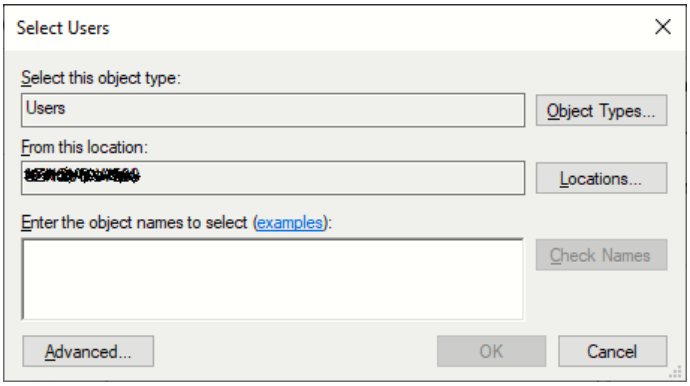
CLASSIC User Roles

User Role Name	User Admin	System Admin	Patient Admin	Exam Admin	Patient Details	Export Images	Email Images	Print Images	Capture Images	Backup Data	Restore Data
Administrator	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IT/System Administrator	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
Dentist	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Office Manager	✗	✗	✓	✓	✓	✓	✓	✓	✗	✓	✓
Hygienist	✗	✗	✓	✗	✗	✓	✓	✓	✓	✓	✗
Standard User	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗

ADD WINDOWS USERS

To add a new Windows User to the Classic user database, simply click the ***Search*** button 

. This will open the standard Windows **Select Users** window where one or more Domain and Local Windows users can easily be entered.



The Windows usernames are composed of two parts:

1) The Windows ***Domain*** or local **Machine name**
2) The Windows Username

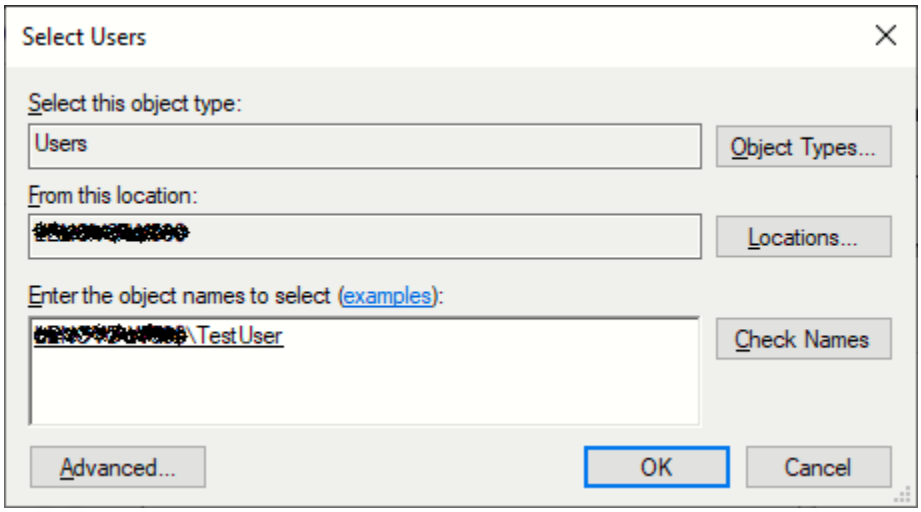
The two parts are separated by a '\' (backslash character).

Examples:

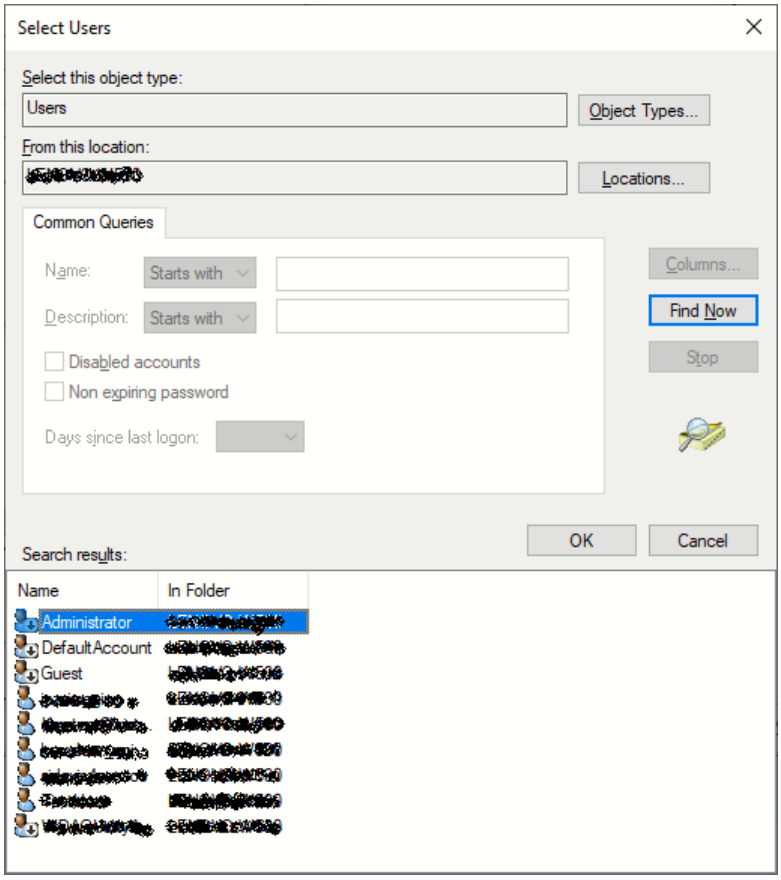
```
MY_DOMAIN\John Doe

MY_WIN11_PC\Jane Doe
```

You can either manually enter one or more usernames in the list and click the ***Check Names*** button to verify that all the usernames are correct, or you can utilize the Advanced search window shown below.

When all the new usernames have been checked, then simply click the OK button to add the users to the Classic user database:



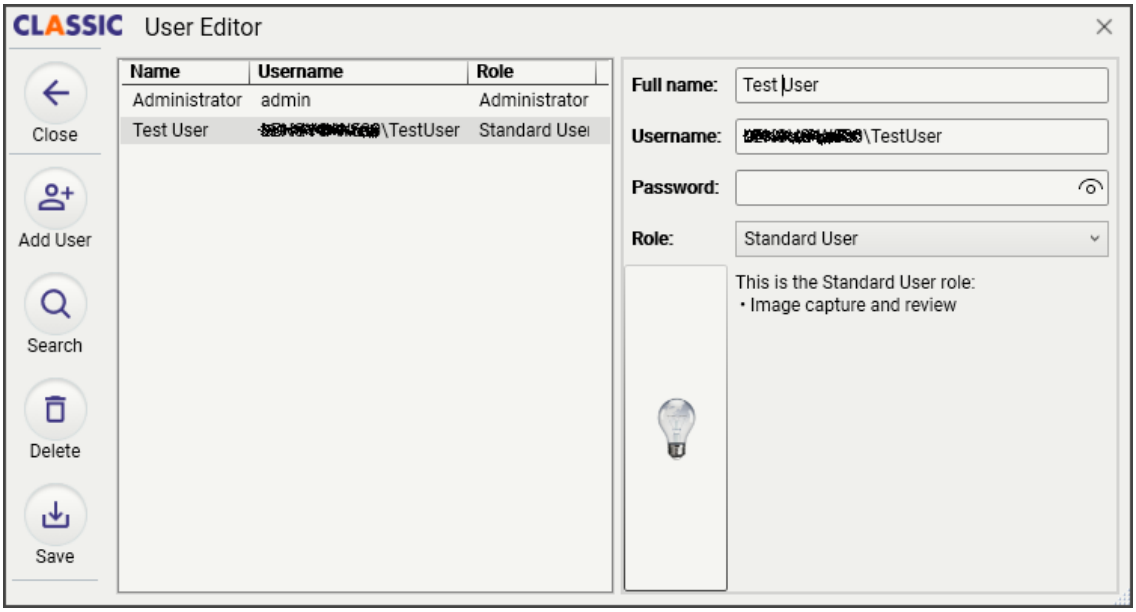
If the usernames are not known in advance, then simply click the ***Advanced…*** button to easily perform a search for the Windows users using the following ***Select Users*** window:



To get a list of all users, simply click the ***Find Now*** button.

Now, select one or more users from the search results and click the OK button. The selected users will then be added to the main Select Users window, where they can be added to the Classic User database by clicking the OK button. Existing users will not be re-added.

All the Windows Users will be assigned the Standard User role. If the user needs to be assigned another role, then simply select the user from the list and change the role using the Role selection box.



The following restrictions apply to the Windows User settings:

- **Full name** is only used to identify the currently logged in Classic user in the status bar. If it is left empty, the username will be displayed instead. When a user is selected using the Select Users standard windows as shown above, this field will automatically be assigned the ***Full Name*** defined for the Windows User in the Windows system.
- **Username** is the Windows username selected using the Select Users window.
- **Password** is either an empty string, or a Classic specific password that can be used when switching between Classic users (using the Logout/Switch User feature). It is recommended that secure passwords are used. If the password is left empty, then it wont be possible to switch to this Windows user unless the user logs off Windows and then login again into Windows as this new user.

To assign a user role, select one from the drop-down list of defined roles. For more information on User Roles, click the Lightbulb button ( ), which displays a table detailing the restriction for each role.

CLASSIC User Roles

User Role Name	User Admin	System Admin	Patient Admin	Exam Admin	Patient Details	Export Images	Email Images	Print Images	Capture Images	Backup Data	Restore Data
Administrator	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IT/System Administrator	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
Dentist	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Office Manager	✗	✗	✓	✓	✓	✓	✓	✓	✗	✓	✓
Hygienist	✗	✗	✓	✗	✗	✓	✓	✓	✓	✓	✗
Standard User	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗

Once all new users have been added to the list, simply click the **Save** button 

to save the new users and close the User Administration Editor window.

DELETING CLASSIC USERS

To delete the user from the User List, simply select one or more users and click the **Delete** button 

.

Be aware that the User Editor does not allow deletion of the current Classic User and if the current user is among the selected users, then the user deletion will be ignored.

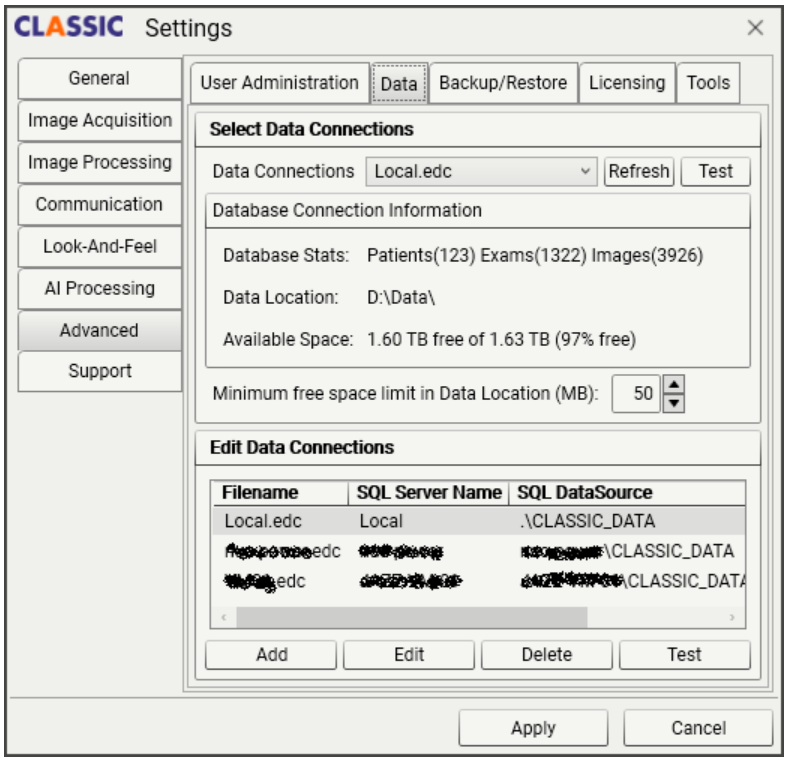
It is also possible to use the Delete key on the keyboard to delete the selected users. And to add a new Local Classic user, the Insert key will work as well.

Data Settings

The Data Settings section makes it possible to configure which database to connect to and which data location to use for image storage.

Data Connection Settings

The Data Connection settings are extremely important to configure correctly, especially when using Jazz Classic in Client/Server mode where the SQL Server and the Data Storage folders are accessed over a Local Area Network.



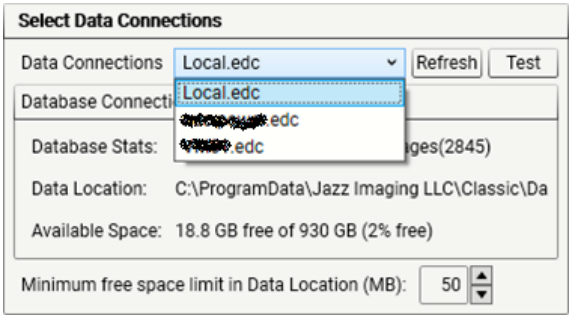
A ***Data Connection*** consists of the combination of a SQL Server Database connection and a Data Location. ***These two settings will always have to be treated as a "pair". If one is changed, the other setting most likely also must be changed accordingly!***

Switching Between Data Connection Settings

Jazz Classic makes it easy to switch between Data Connection settings that have been created by the System Administrator.

Initially, when Classic is started for the first time, a Data Connection settings file name “Local.edc” will automatically be created and saved in the system.

If the System Administrator adds additional Data Connection setting files using the Data Connection Editor described below, they will all show up in the Data Connection selection control:



The Data Connection can now be changed by simply selecting one of the settings from the drop-down list.

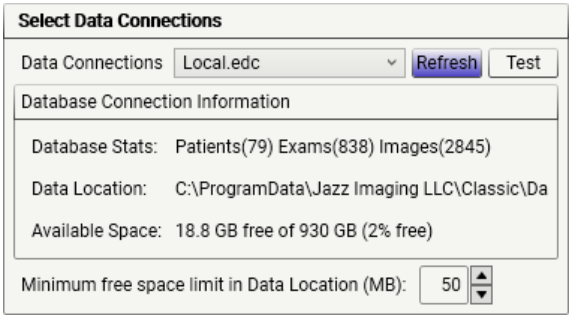
When a new Data Connection is selected, the Data Connection information will be updated with information about the number of Patients/Exams/Images found in the selected database, as well as the selected Data Location and the amount of available disk space in the Data Location.

The selected Data Connection will not become active until the user presses the Apply button in the Settings Window! If the user closes the Settings Window by pressing Cancel or closing the Window, the previously selected Data Connection settings will still be the active setting.

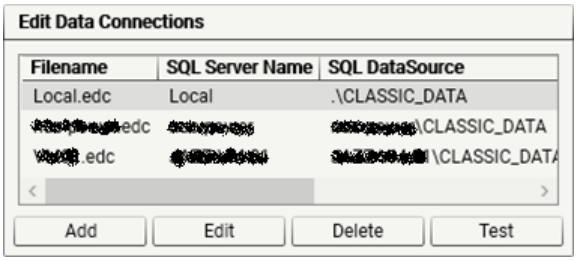
Finally, it is possible to adjust the minimum free space limit for when Classic will stop being able to capture more images. The typical image size (in the Data Location) from a Jazz SOLO sensor is around 3.5MB when the default PNG file format is being used.

Data Connection Editor

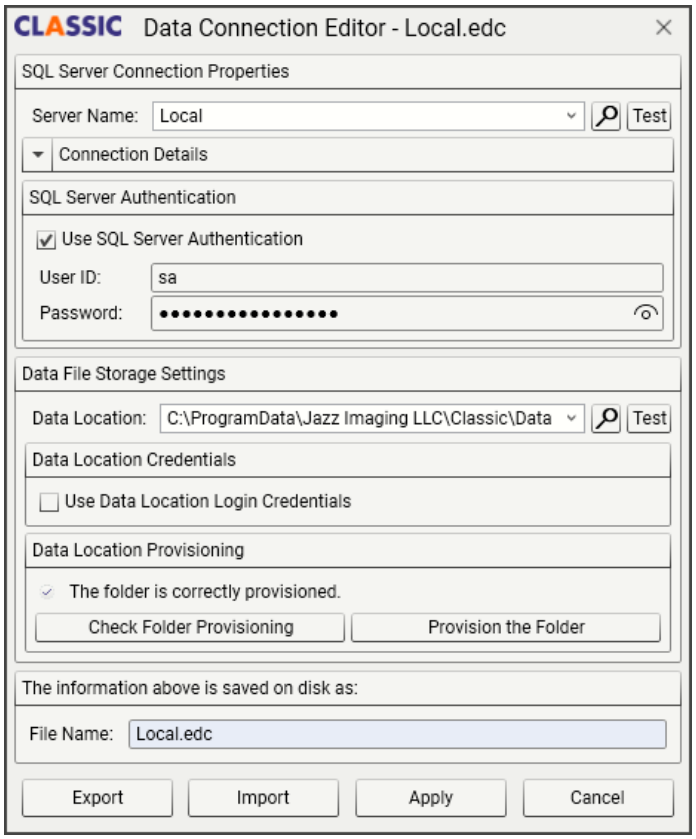
All ***Data Connections*** are edited using a built-in ***Data Connection Editor***. Classic will automatically list all Data Connection files in the list box below the Data Connection selection area. However, it is also possible to manually refresh the list by clicking the Refresh button next to the selection box.



To open the Data Connection Editor, select one of the Data Connection files from the list and press the ***Edit*** button.



This will open the Data Connection Editor shown below:



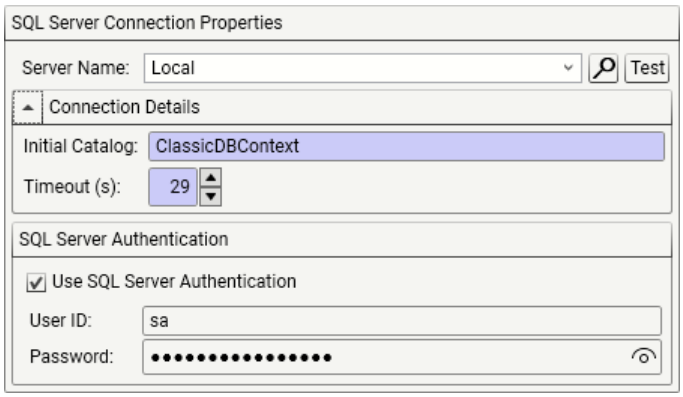
All **Data Connections** consist of two parts:

- The SQL Server connection Settings
- The Data File Storage Settings

The SQL Server database holds all Patient information as well as information about all Exams and detailed information about the individual images. However, the database does not contain any of the image files. The image files (including thumbnails) are stored in the Data File Storage location (referred to as the ***Data Location***) described later in this chapter.

SQL Server Connection Properties

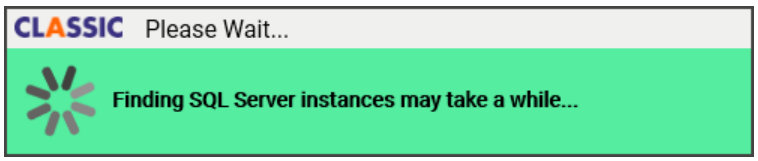
The first part of the **Data Connection Editor** configures the connection between Jazz Classic and the SQL Server Database.



The SQL Server connection consists primarily of the specification of a ***Server Name***. If the **SQL Server Authentication** is used (as opposed to **Windows Authentication**), the SQL Server **User ID** and **Password** will have to be entered as well.

The Mixed Mode SQL Server authentication is enabled as the default mode by the installer, and the SQL Server system administrator (sa) password is preconfigured with the default password ***`ClassicImaging!2`***. ***Please make sure to choose your own password when using the SQL Server system administrator account!*** You will also have to use this new password when you configure the Data Connection settings for Classic.

It is possible to search for Classic SQL Server instances on the network by pressing the search button ( ). This may take a while, and once the search is completed, the Server Name selection list will be populated with all the detected Server Names.



After all the relevant SQL Server Properties have been configured, a connection test can be performed by clicking the Test button.

The SQL Server connection test result display in a separate window:

LOCAL WORKSTATION INSTALLATION

If the SQL Server is running locally on the PC that runs Classic, the **Server Name** should be set to the default value '**`Local`**' and ***Use SQL Server Authentication*** checkbox should remain unchecked.

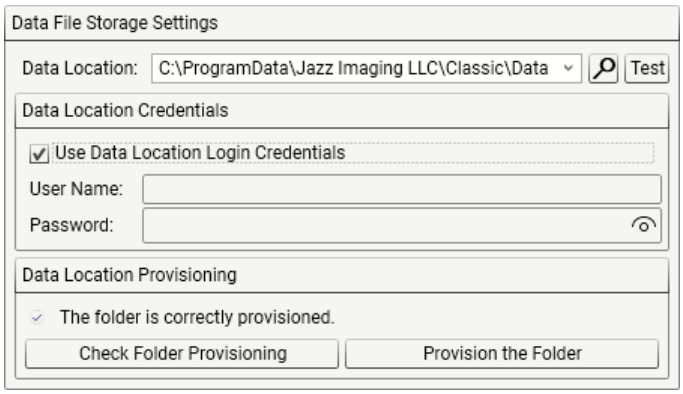
CLIENT/SERVER INSTALLATION

However, if the SQL Server is running on another PC that is accessible over the local area network, then the **Server Name** will have to be configured accordingly!

If all the Client PC's and the Server PC has all users defined (like in a local Domain), the Windows Authentication should always be used. However, if the Client PC's *Windows* users aren't created on the server, the SQL Server Authentication will have to be used instead. The SQL Server User ID and Password is configured when the Microsoft SQL Server is being installed on the Server PC. See Installation for more details.

Data File Storage Settings

The second section of the Data Connection Editor defines the location of the image data being stored by Classic.



LOCAL WORKSTATION INSTALLATION

The Data Location used on a standalone Workstation system uses the default folder:

`C:\ProgramData\Jazz Imaging LLC\Classic\Data`

This is the root folder where all images will be stored when they are captured by Classic.

CLIENT/SERVER INSTALLATION

However, any network location/share can be used as well, so even in a standalone system when the SQL Server runs locally on the same PC as Classic, the image data can be placed on a network data storage area.

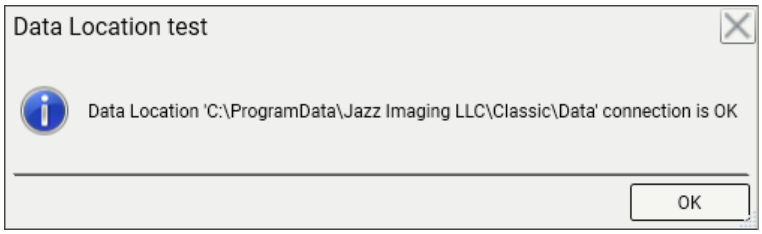
The typical format of a network share is:

`\\<computer name>\<share name>`

If all the Client PC's and the File Storage server have all *Windows* users defined (like in a local Domain), the Windows Authentication will be used. However, if the Client PC's users aren't created on the file server, the Data Storage Login Credentials will have to be used instead.

After all the relevant Data Location settings have been configured, it is now possible to test the Data Location connection by pressing the Test button.

The Data Location connection test result will be shown in a separate window:

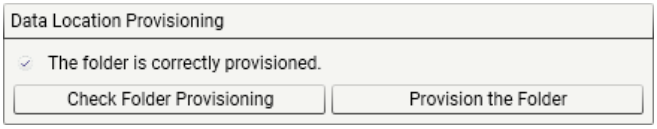


DATA LOCATION PROVISIONING

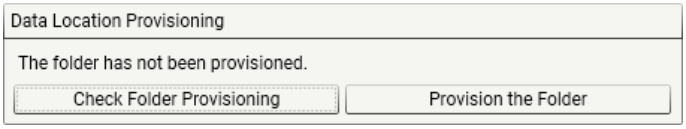
Since the SQL Server Database and the Data Location content ***must*** be accessed as a pair, it is necessary to ***Provision*** the Data Location so it becomes permanently ***Linked*** to the Database.

So, if the user selects another Classic Database, the Data Connection system will verify that the selected Data Location matches the Database by use of the Provisioning system.

If the selected Data Location is correctly linked to the selected SQL Data Source, the following will be displayed:



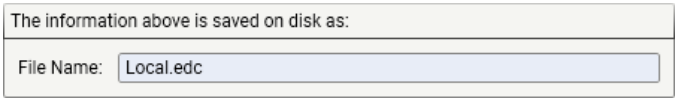
If the Data Location is not correctly provisioned, the following information will be displayed:



When the Database is empty (no Exams have been created), it is possible to Provision a new empty folder as the Data Location.

SAVING THE DATA CONNECTION SETTINGS

When both the SQL Server Data Source and the Data Location has been successfully configured, the full Data Connection can be saved by pressing the Apply/Save button in the Data Connection Editor window. The file name used is shown in the section below:



IMPORTING AND EXPORTING DATA CONNECTION SETTINGS

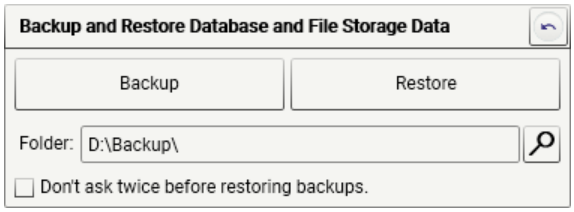
In large systems with many Classic client PC's, it is possible to exchange the Data Connection settings across multiple PC's.

From the Data Connection Editor, it's easy to export Data Connection settings from one Client PC and then import these settings into the rest of the Client PCs in the system.

Use the ***Export*** button to save a copy of the current Data Connection and then use the ***Import*** button on another Classic Client to load the exported file.

Data Backup and Restore

The Data Settings section also includes the **Backup** and **Restore** features for all Jazz Classic data. This allows for manual backup and restoration of the SQL Database that holds all patient, exam, and image information, as well as all image files.



Backup Types Explained

In order to be able to handle the backup of a substantial amount of patient, exam and image data, Jazz Classic supports multiple types of backups. There are advantages and disadvantages to each type of backup, so it is important to fully understand these before selecting which backup type to utilize.

Jazz Classic supports the following backup types:

FULL BACKUP:

Includes all database and image data in a single file. These backup files could become very large!

DIFFERENTIAL BACKUP:

Includes all changes from the previous ***Full*** Backup file. If multiple consecutive Differential backups are created, they all depend on the same (latest) Full backup file, so they will become relatively larger and larger until a new Full backup is created.

INCREMENTAL BACKUP:

Includes all changes from the previous backup file. The previous backup file could be a Full, Differential or Incremental Backup. So, if many consecutive "intermediate" backups are created, they would all depend on each other. To restore such a backup, all dependencies must be available, extending back to the Full backup file that preceded the "chain" of backup files. Despite this requirement, this approach offers the most efficient use of disk space for backups.

The following table summarizes the pros and cons for the various Backup Types:

Backup Type	Pros	Cons	Comments
Full	Simple since every backup file is self-contained and does not rely on other files	Creates very large backup files since that contain all database and data location data. Takes a long time to create since all data will have to be archived.	Should be used regularly, and the intermediate backups in between these Full backup files should be either Differential or Incremental to save disk space and backup time.
Differential	Relatively simple since it only relies on a single Full backup file. Typically,	Size of Differential backups will get larger and larger until the next Full	Good balance between keeping the dependencies low (simplicity) and at the same

	much shorter backup time than Full backups.	backup is created.	time save backup disk space and backup time. Requires that Full backups are performed regularly.
Incremental	Smallest backup file size because it only holds the differences since the previous backup. Relies on one or more previous backup files of all types	The backup file hierarchy can become complex since the number of dependencies can be large (unless Full backups are performed often)	This is the correct choice if the amount of backup disk space and backup time must be kept at a minimum.

Backing Up Classic data

The Backup feature makes it possible to create a complete backup of all Classic data – both the SQL Server Database contents as well as all the image files that are stored in the Data Location.

The backup will create a Classic backup file that is stored in the Backup folder:

`C:\ProgramData\Jazz Imaging LLC\Classic\Backup\`

The backup file will be named:

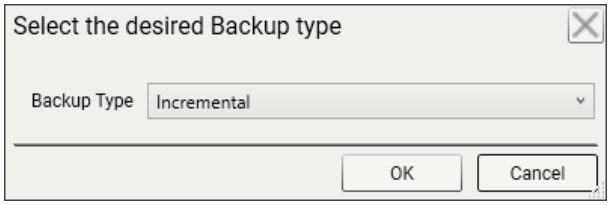
`<Machine name>_<YYYY><MM><DD>_<hh><mm><ss>.<type>`

,where:

- <Machine name> is the name of the PC running the backup
- <YYYY> is 4-digit backup Year [2023..]
- <MM> is 2-digit backup Month [01..12]
- <DD> is 2-digit backup Day [01..31]
- <hh> is 2-digit backup Hour [00..23]
- <mm> is 2-digit backup Minute [00..59]
- <ss> is 2-digit backup Second [00..59]
- <type> is the type of backup. Classic currently supports the following backup types:
    - **`.abac`** for Full Backup files
    - **`.dbac`** for Differential Backup files
    - **`.ibac`** for Incremental Backup files

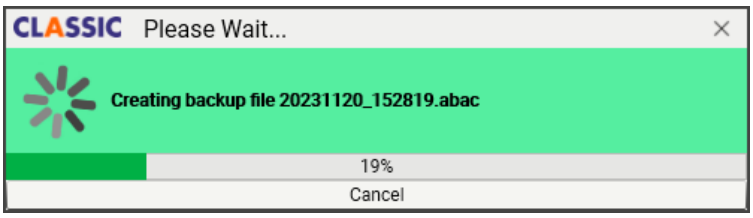
Start the Backup operation by Clicking the ***Backup*** button.

The user will then be asked about which Backup Type to use for the backup operation:

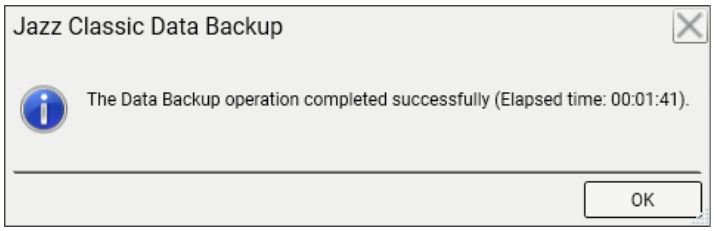


If you click OK, the Backup operation starts by backing up the SQL Server database.

Next, all data files are analyzed and compressed into the backup file:



If the Data Backup operation succeeds, the following confirmation will be displayed:

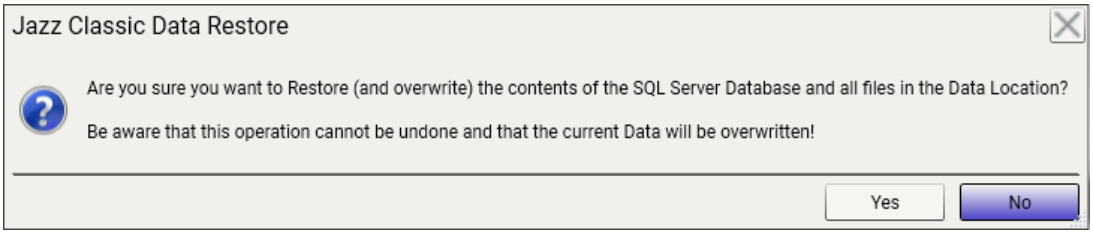


Restoring an Existing Classic Backup File

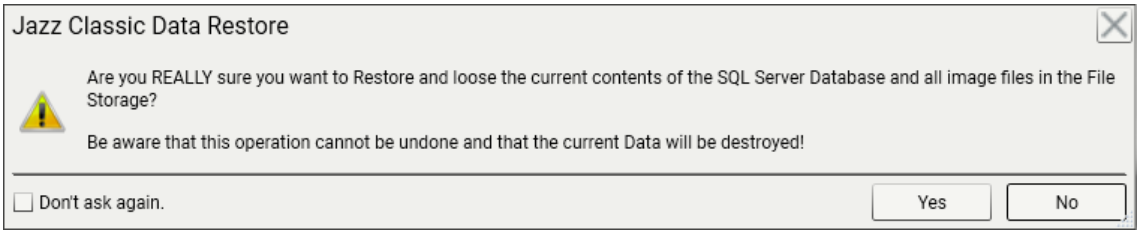
If one or more Classic backup files have been previously created, it's possible to Restore the SQL Server database and all image data from any of these files using the Restore feature.

Start the Restore operation by Clicking the ***Restore*** button.

The user will be prompted to decide whether to start the Restore operation or not:

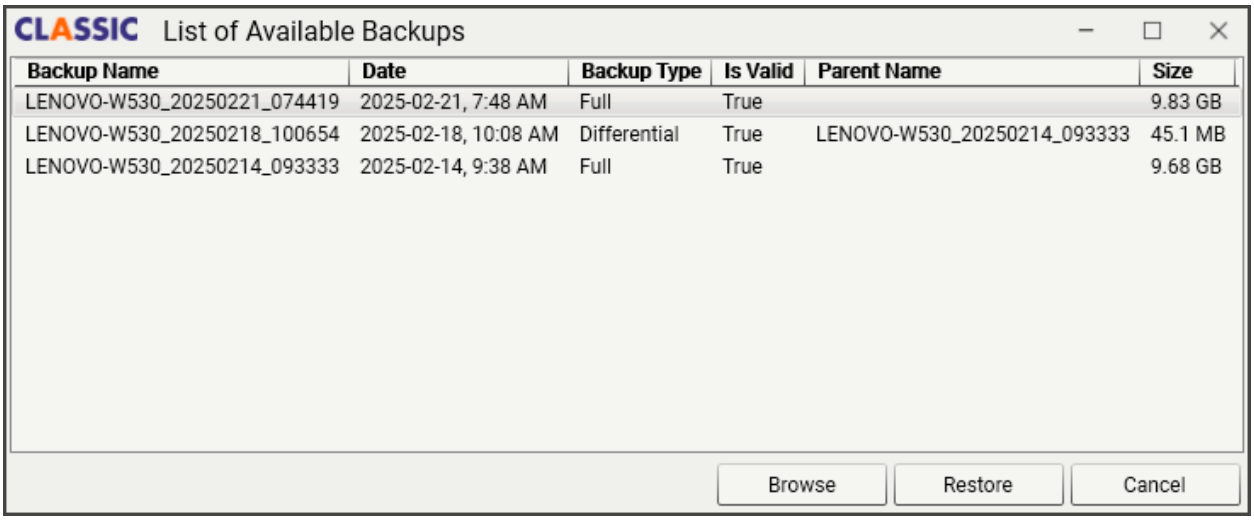


Since this operation could potentially result in irreversible loss of data, you will be asked a second time to confirm that you really want to proceed with the data restore operation!



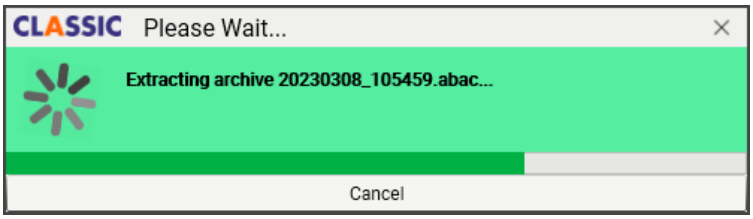
It is very important to understand that a Data Restore operation will OVERWRITE and REPLACE all Classic Data – both the SQL Server database content as well as all files in the Data Location! The restore operation will NOT try to merge the restore data with the current data content, so all the existing data will be lost and replaced with the content from the Classic Backup file!

Next is to select which Classic Backup file to restore from the following list of available backups:

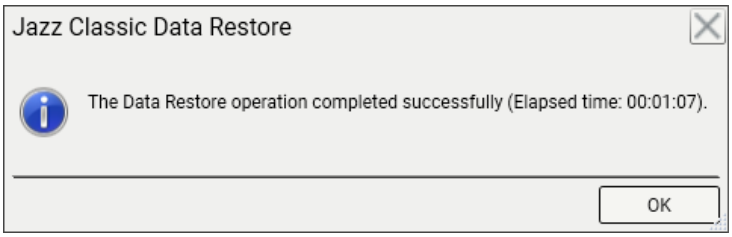


The list of backup files is sorted by backup time, where the latest backup is at the top of the list.

Finally, click the ***Restore*** button to start the restore operation:



If the Data Restore operation succeeds, the following confirmation will be displayed:



Licensing Settings

Jazz Classic supports two types of Licensing:

1) A ***Demo License*** that will be created when a new Classic Workstation is added to the system
2) A ***Subscription License*** that will be created/extended every time an X-ray is captured using any ***Jazz*** X-ray sensor

Demo Licenses

When you install Classic on a new PC, a 30-day Demo License will automatically be created when you start Classic for the first time, and this license will allow you to use Classic without any limitations while the license is valid.

Demo Licenses are linked to the individual Classic Workstation hardware, so if you add a new Workstation PC, then a new Demo Licenses will be issued. If the PC has already received a Demo License earlier on, the Demo License may not be valid anymore and you will have to transition to a Subscription License instead.

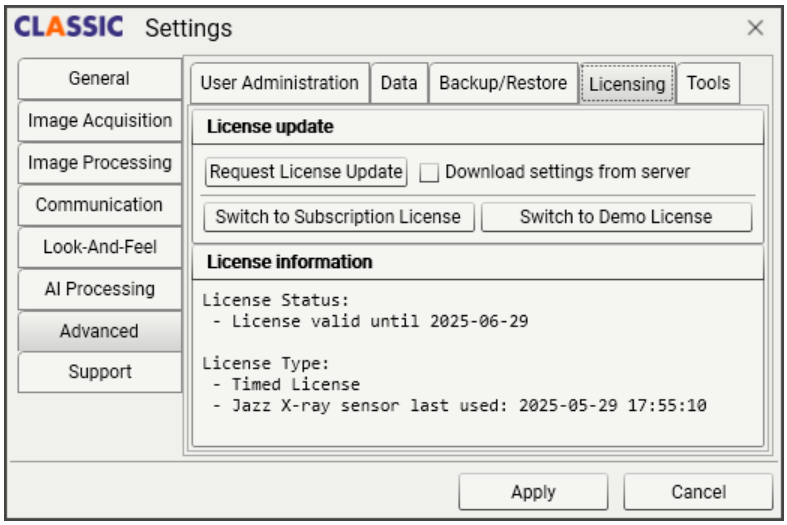
Subscription Licenses

When you capture an X-ray images from any Jazz X-ray sensor, a ***Subscription License*** will automatically be created and this now allows you to use Classic for 30 days. And every time a new X-ray is captured from a Jazz X-ray sensor, then the Subscription License will be extended accordingly.

The Subscription License will apply to ***all*** Classic Workstations within the system, so as long as any Classic Workstation on the network captures an X-ray from any Jazz X-ray sensor, then all Classic Workstations will be licensed for 30 days from the time of the X-ray capture.

When you request a license update from the License Server, the License Information window will show you the current License Status as well as details like Expiration Data and License type.

Classic will periodically renew the license from the License Server, so normally the user will not have to manually interact with the licensing.



If the License expires, all the existing Exams and images will still be available for review by the user.

To reactivate an expired license, simply capture an X-ray using any Jazz X-ray sensor.

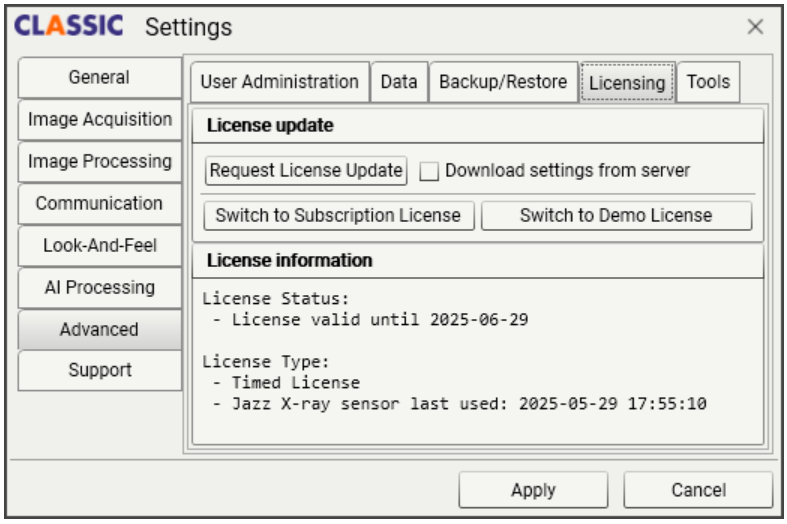
Switching to Jazz Sensor Subscription Licensing

If you have purchased or licensed a Jazz SOLO or Jazz Minor sensor and are actively using the sensor on the PC, then you will be switched automatically to a “Subscription License” instead of the Demo license. Jazz Classic will then stay licensed as long as any Jazz sensors are being licensed and used for X-ray captures.

If you are using Jazz SOLO or Jazz Minor sensors, you will be granted a 30-day Subscription license from the last time you captured an image.

To manually switch to the Subscription License scheme, simply click the Switch to Subscription License button. Classic will then try to determine whether any images have been captured using Jazz sensors.

If a Jazz sensor has been used within the last 30 days, then Classic will be fully licensed with a 30 day license from the last image capture time.



However, if no images have been captured yet, then the Subscription License will be considered “Expired”.

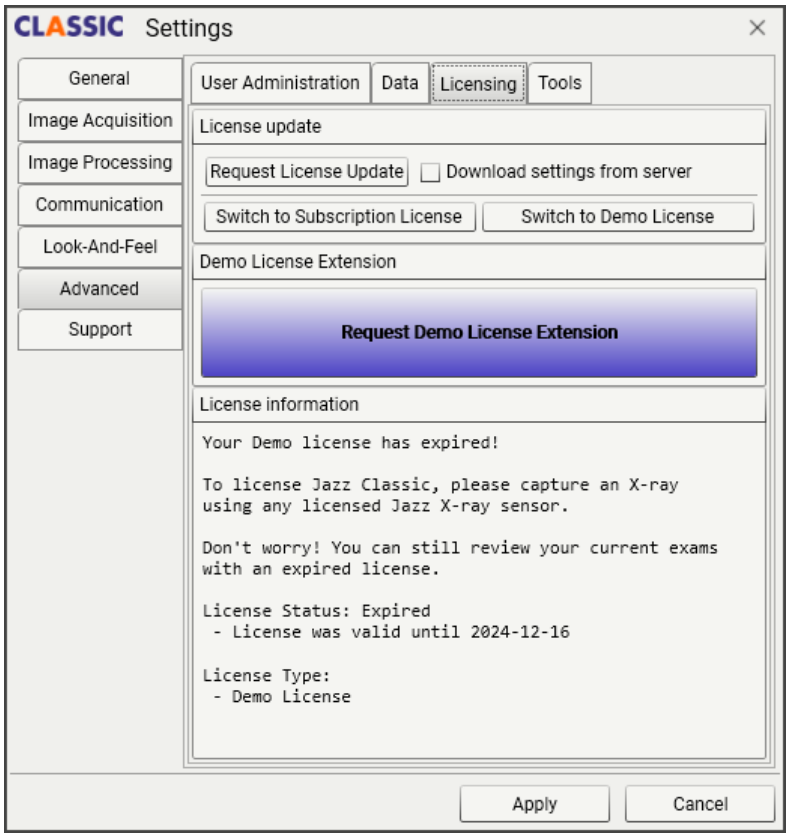
In order to renew the Subscription License then you will need to capture an image again using the Jazz sensor, so this might involve switching back to the Demo License and request an update Demo license from Jazz Imaging Support!

Switching to Demo Licensing

You can at any point switch to a “Demo License” instead of the standard purchased license or the Subscription License.

To switch to the Demo Licensing scheme, simply click the Switch to Demo License button.

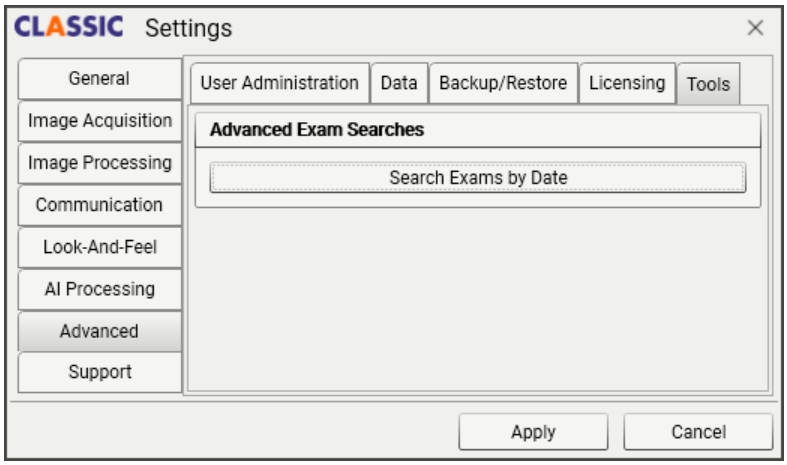
If the Demo license has expired, you will have to request a Demo License Extension.



Another option is to switch to the Subscription License by simply capturing an X-ray image with a Jazz X-ray sensor and you'll be fully licensed again for 30 days.

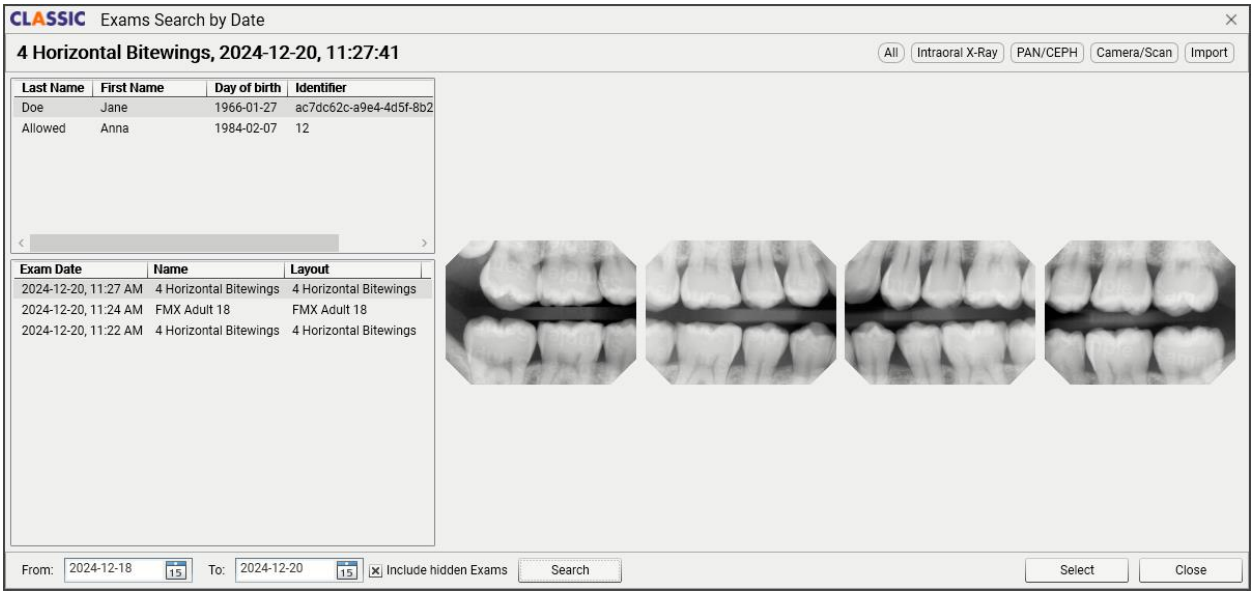
Advanced Tools

The Advanced Tools settings tab contains allows the user to search for Exams from specific dates across all patients.



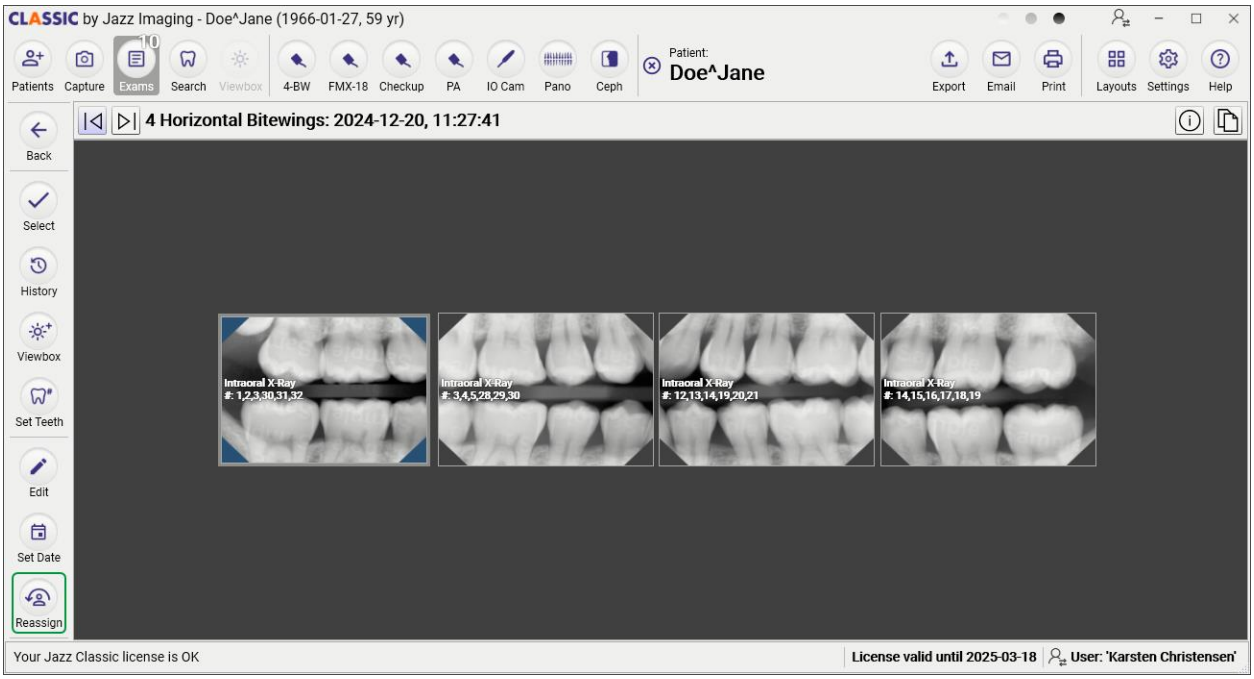
Search Exams by Date

In some cases, it is necessary to search for specific exams across multiple patients. This is typically the case if exams and images are accidentally captured into the wrong patient so they need to be reassigned to the correct patient.



To search for all exams across patients, simply select the ***From*** and ***To*** dates, and click the ***Search*** button. The search results will then populate the list view with all exams fitting the search criteria.

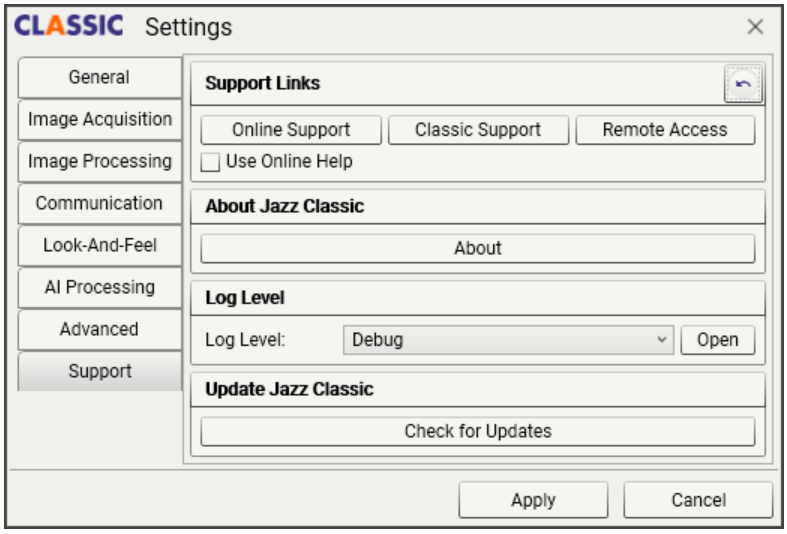
The patient and exam can now easily be opened by simply selecting the exam from the list and clicking the ***Select*** button:



And from the Exam View it is now possible to reassign the exam to another patient using the ***Reassign*** button.

Support Settings

The Support tab provides access to various support resources and allows you to select the debug logging level.



The Support Links section provides easy access to the following support resources:

- **Online Support:** Opens the Jazz Imaging online support homepage.
- **Classic Support:** Opens the Jazz Classic online manual and support homepage.
- **Remote Access:** Opens the remote access homepage.

The second section gives you access to the About Window. Here you'll find detailed version information about Classic as well as all loaded assemblies.

The Log Level setting can be used for selecting the appropriate logging level details, and the latest log file can be opened by clicking the Open button.

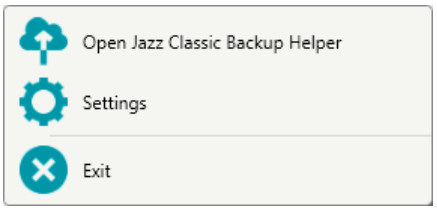
Finally, the Update Jazz Classic section allows admin users to check whether new versions of Jazz Classic are available for download. If a download is available, the admin user will be able to perform the update of Jazz Classic.

Automated Backup

Jazz Classic comes with a helper application that lets you easily schedule automatic backups of all the system data. When installing Jazz Classic, the ***Jazz Classic Backup Helper*** application will automatically be installed in the system. The Helper runs in the background independent of the Jazz Classic application, making it possible to set up an automatic backup schedule that will perform the backup operation without requiring human intervention.

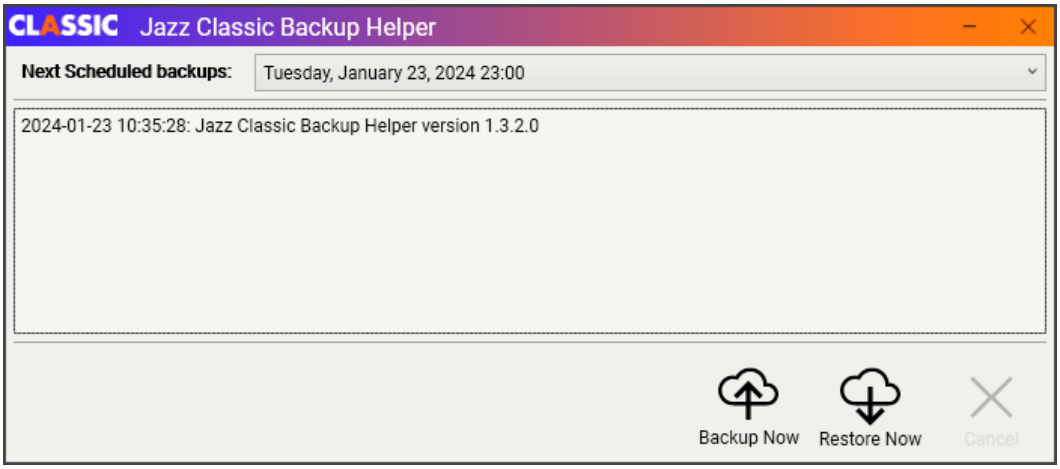
The Backup Helper application runs in the background as a "tray icon" application and can be accessed via its tray icon () found in the Windows task bar.

Right clicking the mouse over the Backup Helper tray displays the context menu:



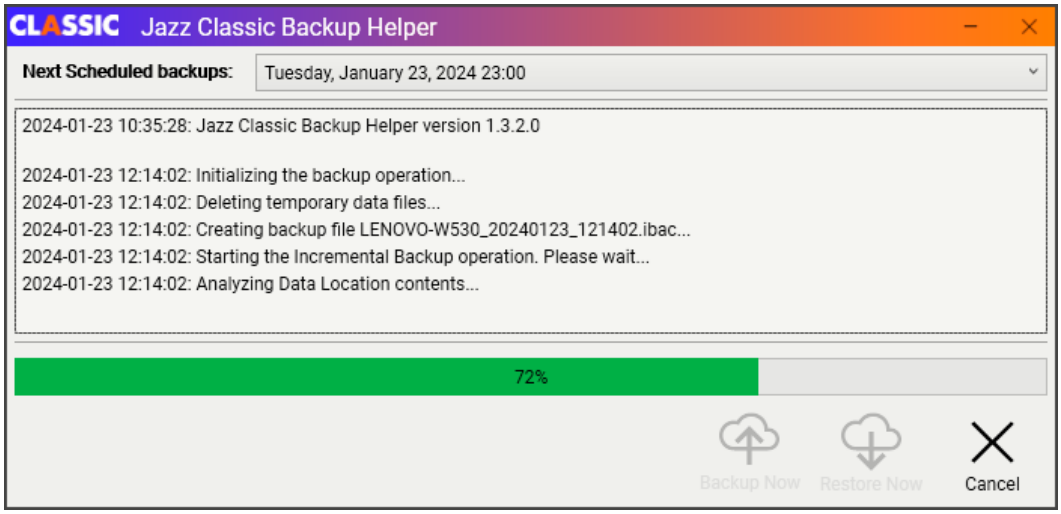
Backup Helper Main Window

The first context menu item opens the main backup helper window where you can view the status of the scheduled automatic backup operations:



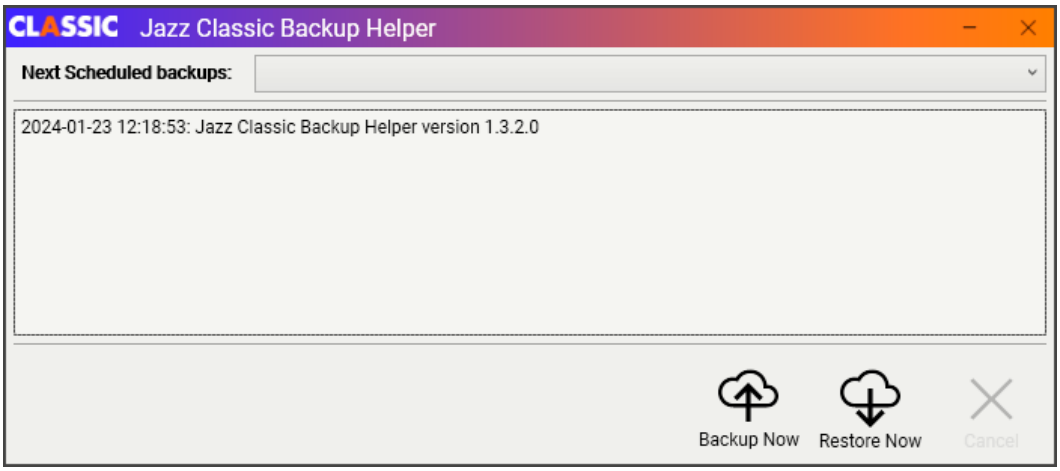
The date and time for the next scheduled backup will display at the top of the window. Below that, a log window will show the activities Backup Helper, including recent and ongoing operations.

See the following example of an ongoing Incremental backup operation:



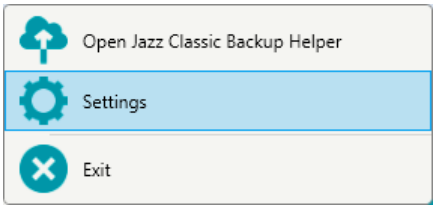
This window lets you start a new manual backup operation or restore a backup file that was created previously. The ***Backup Now*** and ***Restore Now*** buttons work the same way as the ***Backup*** and ***Restore*** buttons in Jazz Classic as described in the Data Settings chapter.

Leaving the backup schedule undefined will display the text “Next Scheduled backup” in the main window:



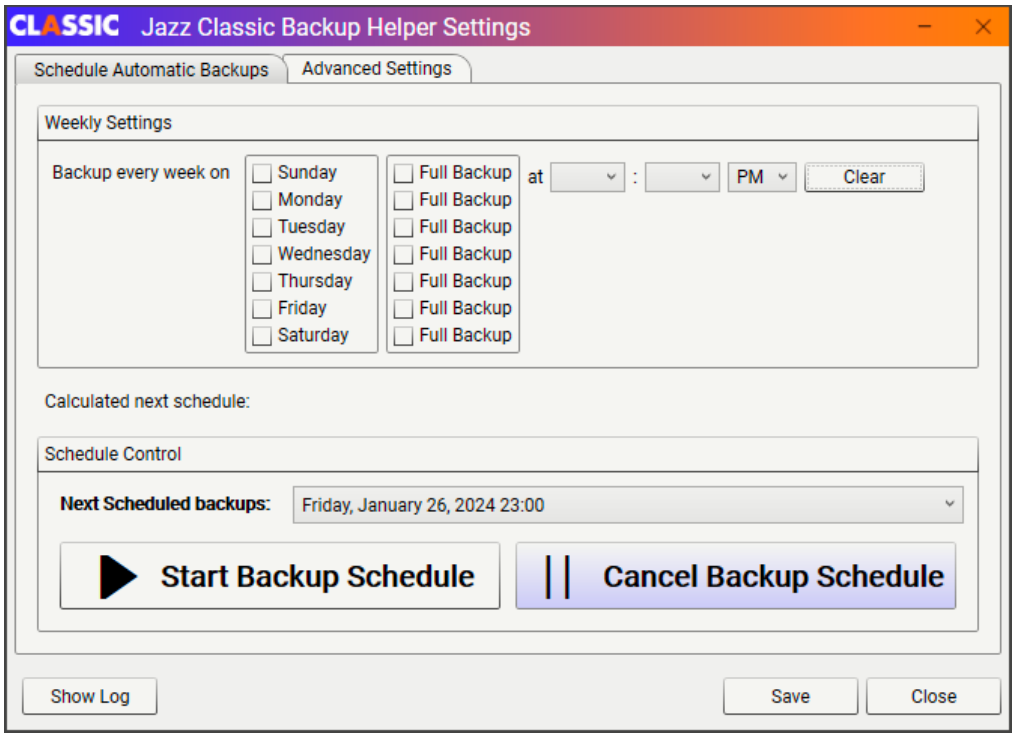
Backup Helper Settings

The second context menu item will open the Backup Helper Settings window where the automatic backup schedule can be configured and started.



Automatic Backup Schedule

The first tab contains the ***Weekly*** backup schedule settings:



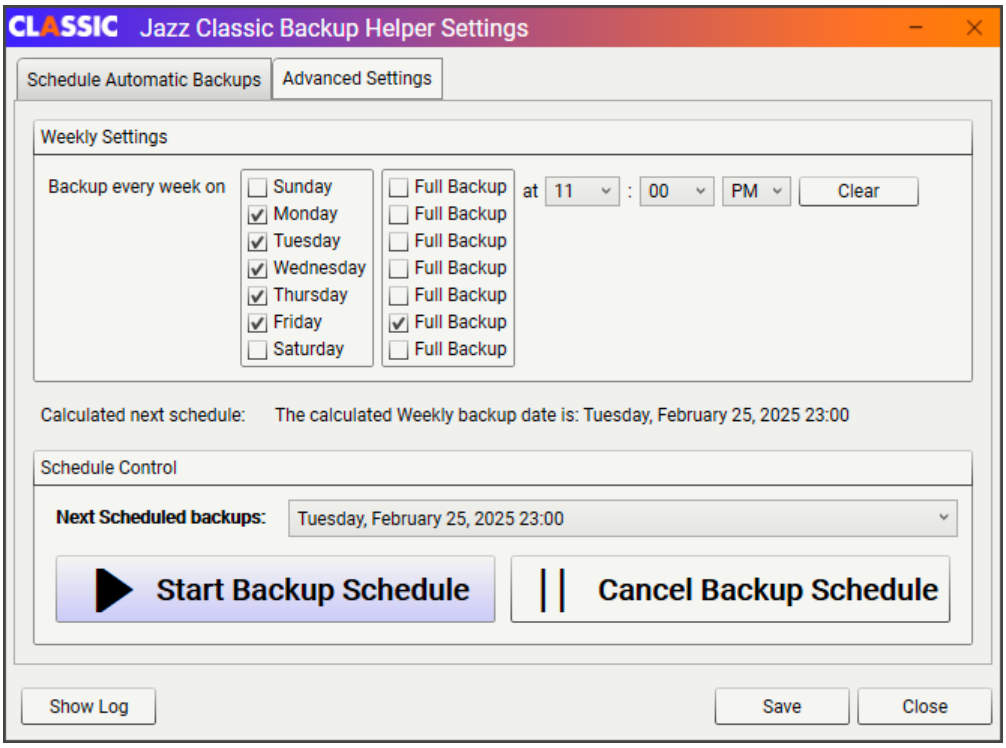
Here you can select which days are included in the backup schedule as well as the time of day when the scheduled backups run. You can also schedule which day(s) to run a ***Full*** backup as opposed to an intermediate ***Differential*** or ***Incremental*** backup.

We recommend allocating at least one day in the schedule for a Full backup, especially if Differential backups are being used as the intermediate backup type

The schedule repeats indefinitely until it is cancelled by the user.

If the weekly schedule is modified, you must restart the backup schedule by first cancelling any existing schedule, and then starting the new backup schedule instead.

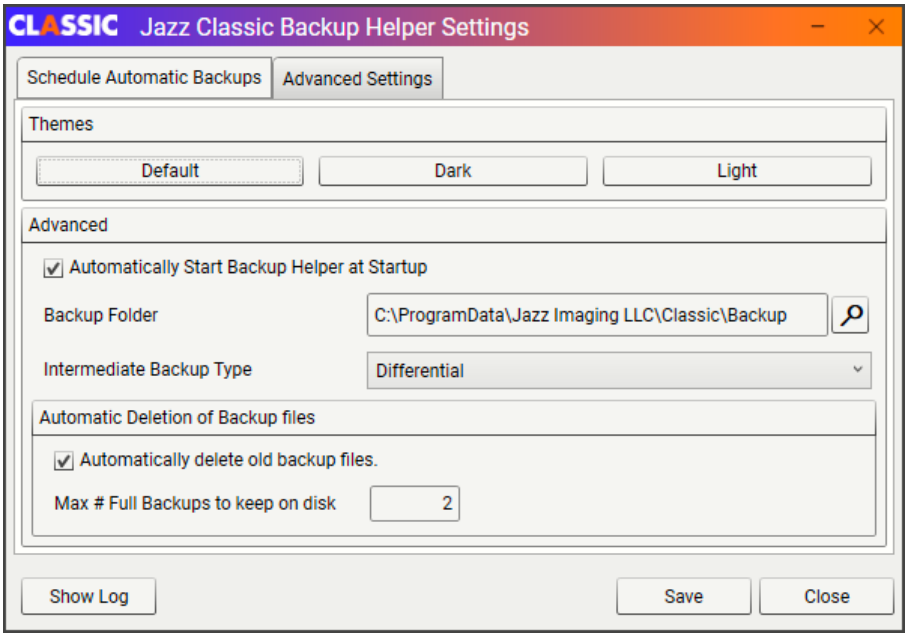
In the following example, backups are scheduled for all weekdays from Monday through Friday at 11:00 PM, and a Full backup will be created every Friday when the backup is run:



A grayed-out ***Start Backup Schedule*** button indicates that the schedule is currently running. The current schedule can be stopped by pressing the ***Cancel Backup Schedule*** button.

Advanced Settings

The second tab holds all Advanced settings:



The first setting determines whether the Backup Helper Application will start automatically when Windows starts. This checkbox should always be used if the user wants to utilize the automatic backup scheduling feature!

The second setting lets you select the Backup Folder location where all the backup files are written to. By default, the backups are located in:

`C:\ProgramData\Jazz Imaging LLC\Classic\Backup\`

The Backup folder location can easily be changed so that the backup files are directly written to a shared network that is automatically backed up (to, for instance, cloud storage) along with other data that is handled by the IT administrator for the complete computer system at the dental office.

The third setting determines the ***Backup Type*** used in between Full backups during the automatic backup schedule. Full backups will be created based on the Weekly backup schedule when the Full Backup flag has been selected for the individual days of the week. The days without the Full Backup flag will use this intermediate Backup Type selection.

 If the first scheduled backup to run happens to be one of the intermediate backup types, it will automatically be changed to a Full Backup instead, since no Full backups will be present in the backup folder. All intermediate backup types require an existing Full backup to be present.

The next section controls whether older backup files are automatically deleted to prevent the backup files from filling up hard disk space.

The automatic backup feature can be enabled/disabled with the checkbox named ***Automatically delete old backup files***.

Enabling automatic backup deletion lets you select how many ***Full*** backups (and their dependent intermediate backups) will be stored in the backup folder. This setting helps you avoid filling up the disk drive that contains the backup files by automatically deleting older backup files once a new ***Full*** backup has been created.

Installation

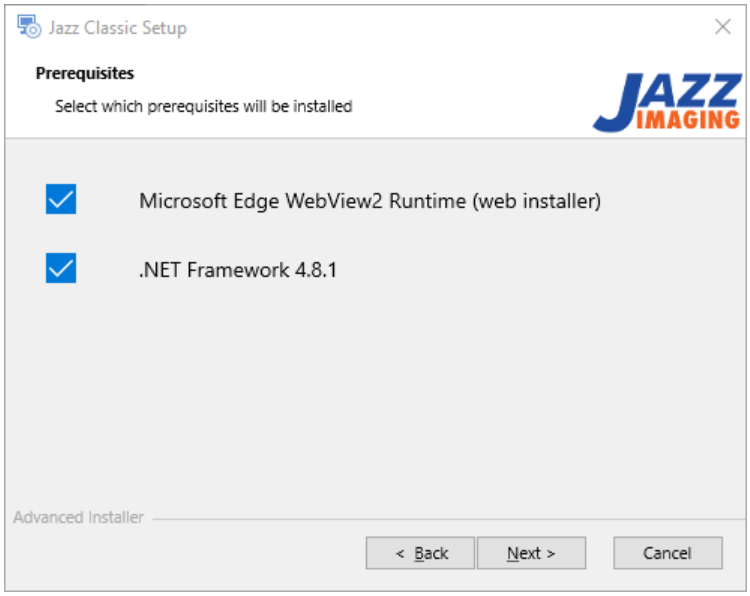
The Jazz Classic Setup installer implements a typical Windows application installation wizard. The Installer will guide you step-by-step throughout the installation process.

Installing Prerequisites

Jazz Classic depends on two prerequisites that must be installed ahead of the actual installation process.

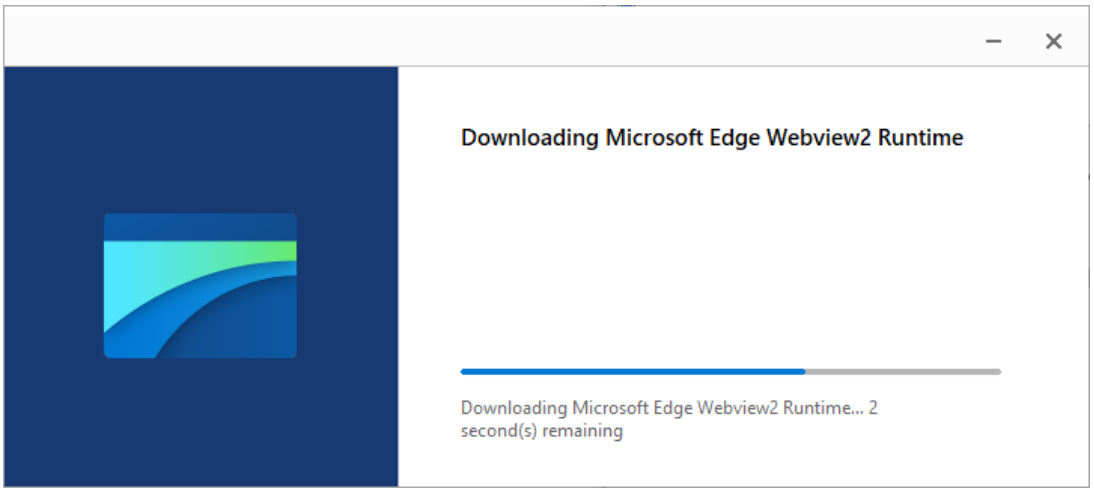
If the prerequisites have already been installed, the Prerequisites steps below will automatically be skipped by the installer.

The Install wizard will automatically determine if the prerequisites have already been installed on the PC. If not, it will prompt you to install them before proceeding with installing Classic.



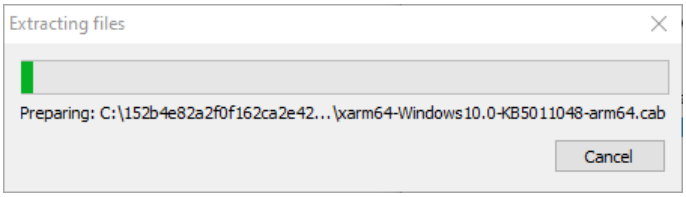
Installing Microsoft Edge WebView2 Runtime

Microsoft Edge Web View is an embedded Web Browser component used by Jazz Classic to present context-sensitive help from the User Manual installed alongside the software.



After the WebView2 installation files have been downloaded, the following dialog will appear.

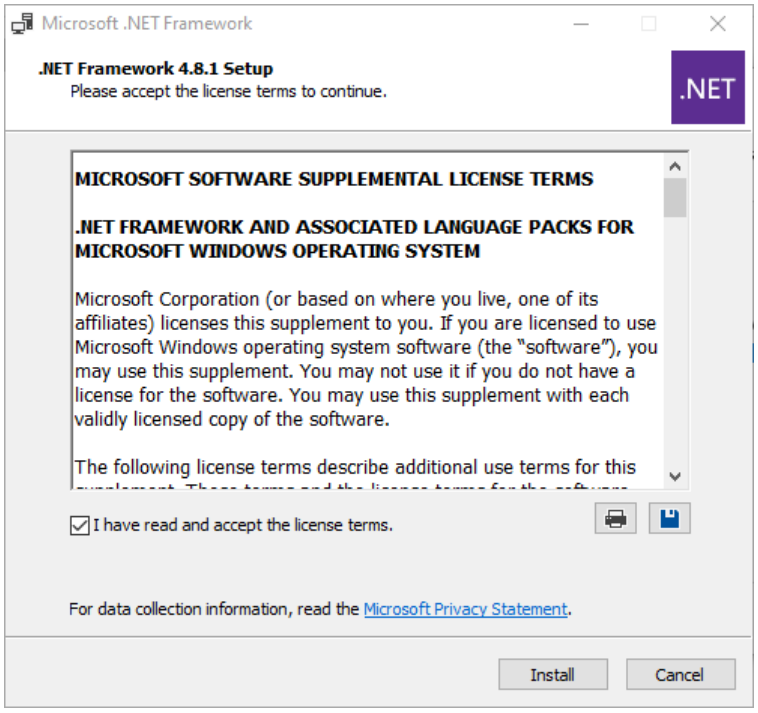
Please **do not** cancel the extraction of the files!



Please make sure to use the default selections throughout the installation of Microsoft Edge WebView2 Runtime prerequisite!

Installing Microsoft .NET Framework

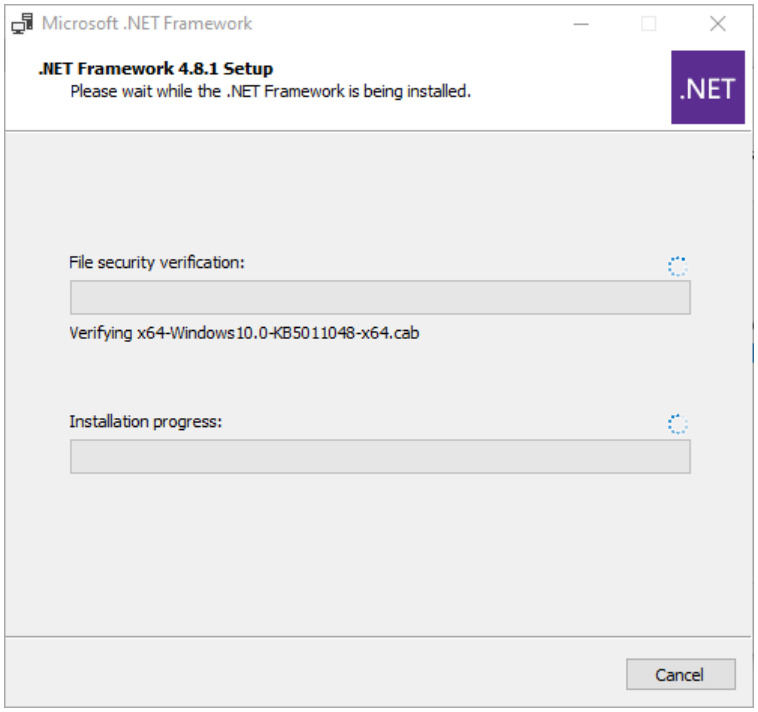
The second redistributable is the Microsoft .NET Framework. This prerequisite will ask the user to read and accept the license terms in order to proceed with the installation process.



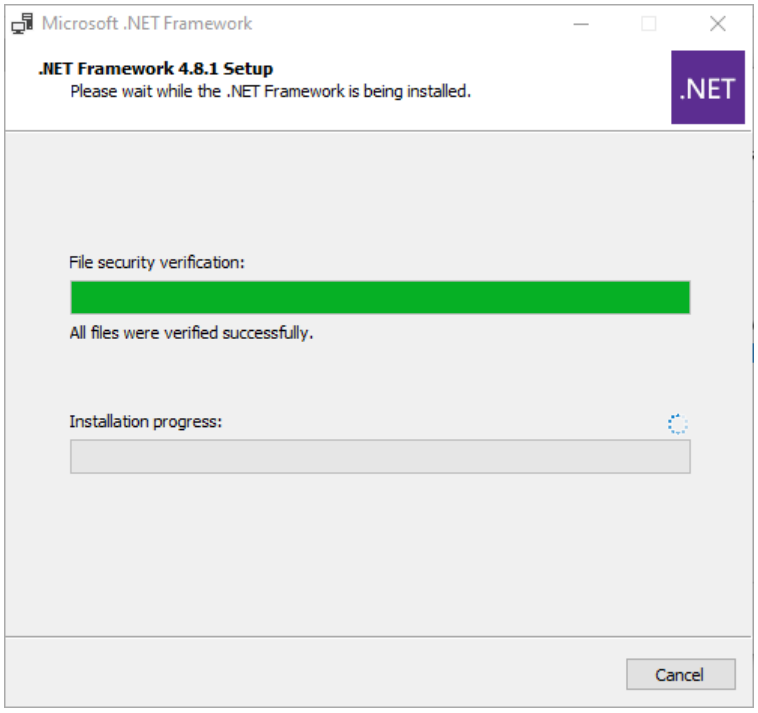
Accept the license terms by clicking the check box and click the Install button to proceed.

The .NET Framework installer will now go through various steps before continuing with the Classic installation.

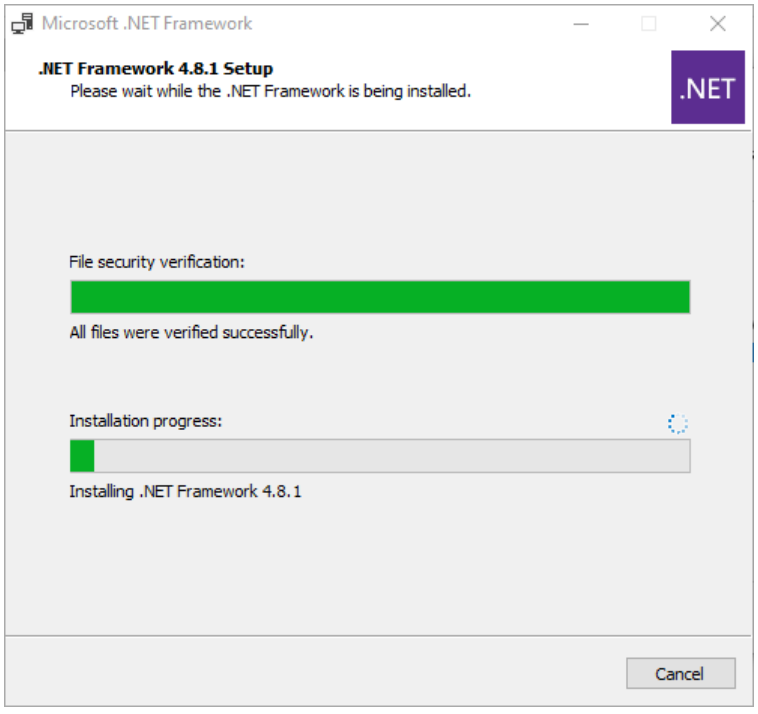
Downloading the .NET Framework installation files:



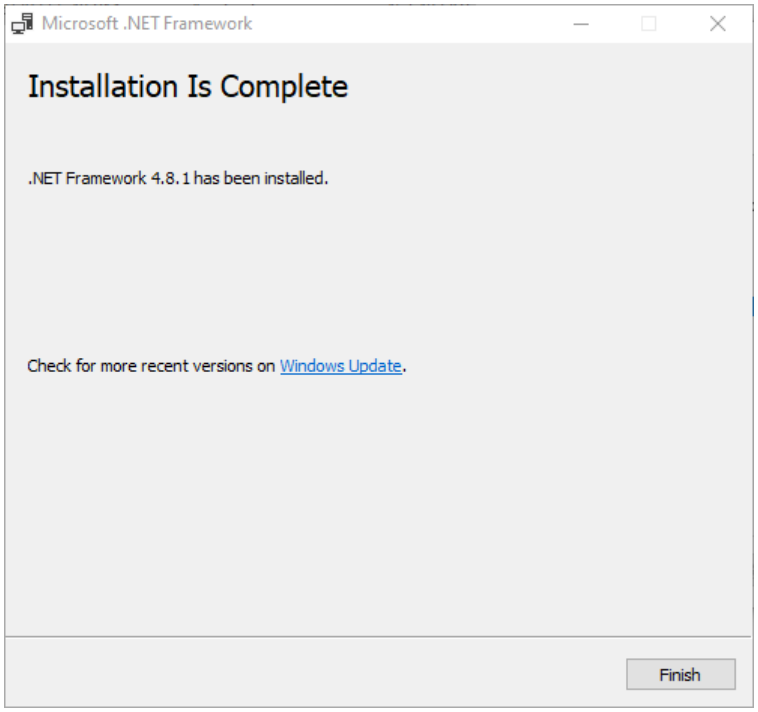
Verifying the .NET Framework installation files:



Installing all the components:



Finalizing the installation:



Click the ***Finish*** button to proceed with the installation of Jazz Classic.

Installing Jazz Classic

After the Jazz Classic Setup Wizard is done with all preparations, click the **Next >** button to proceed.

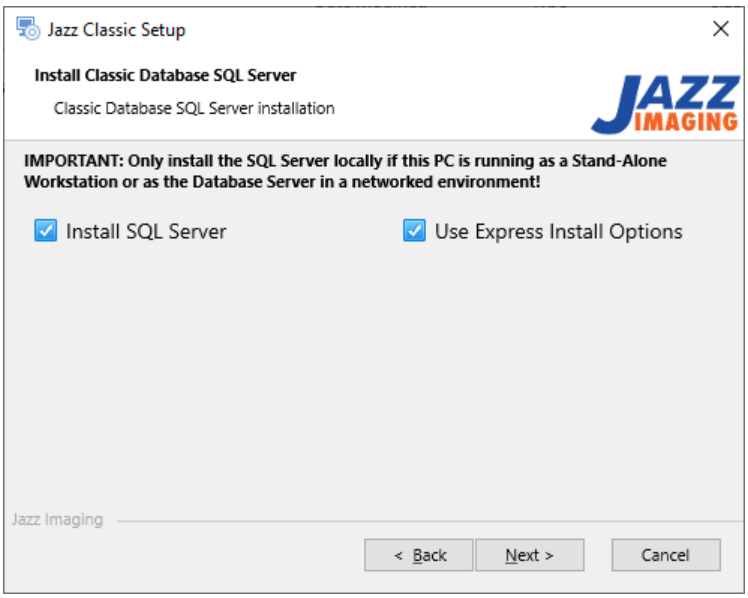
The preparations may take a while before you can proceed!

Click the **Next >** button to proceed to the SQL Server installation step.

If the SQL Server has already been installed with the Jazz Classic database instance, the installer will proceed directly to the End User License Agreement step below.

Installing the Jazz Classic SQL Server Database instance

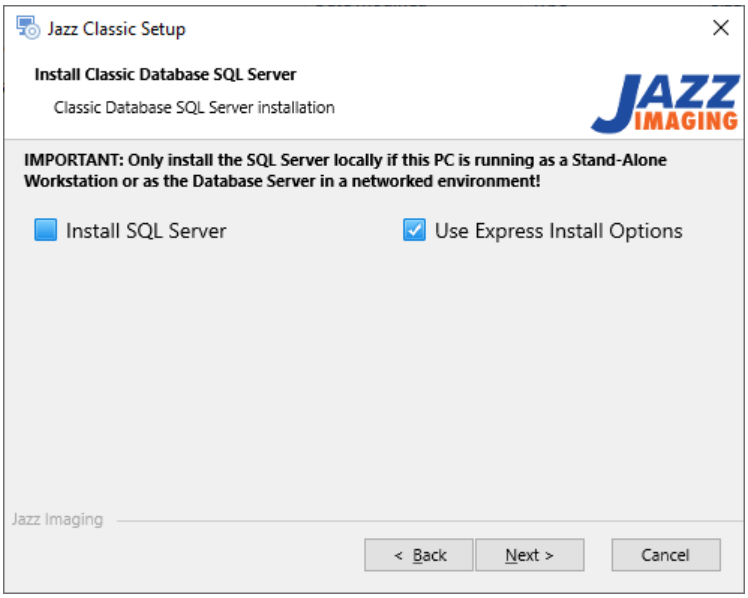
If the Jazz Classic Setup Wizard fails to detect the Jazz Classic database on the PC, you will be given the option to install the SQL Server locally on this PC.



If this PC will be running as a Stand-alone Jazz Classic workstation, or the PC will be hosting the SQL Server database for other Jazz Classic Clients over the network, it's important to check the **Install SQL Server** option!

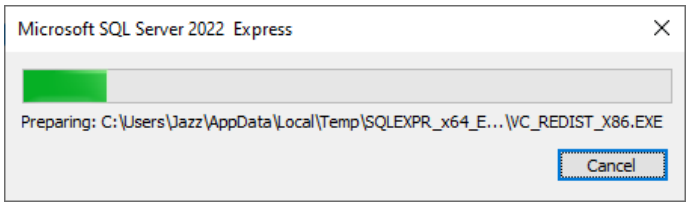
If this PC will only be used as a Jazz Classic Client (connecting to a SQL Server database over the network), the installation of the local SQL Server instance can be skipped. However, the system would be able to work even if the SQL Server gets installed locally.

To skip the local SQL Server installation, simply uncheck the **Install SQL Server** option and proceed with the installation. This will take you directly to the End User License Agreement step below.

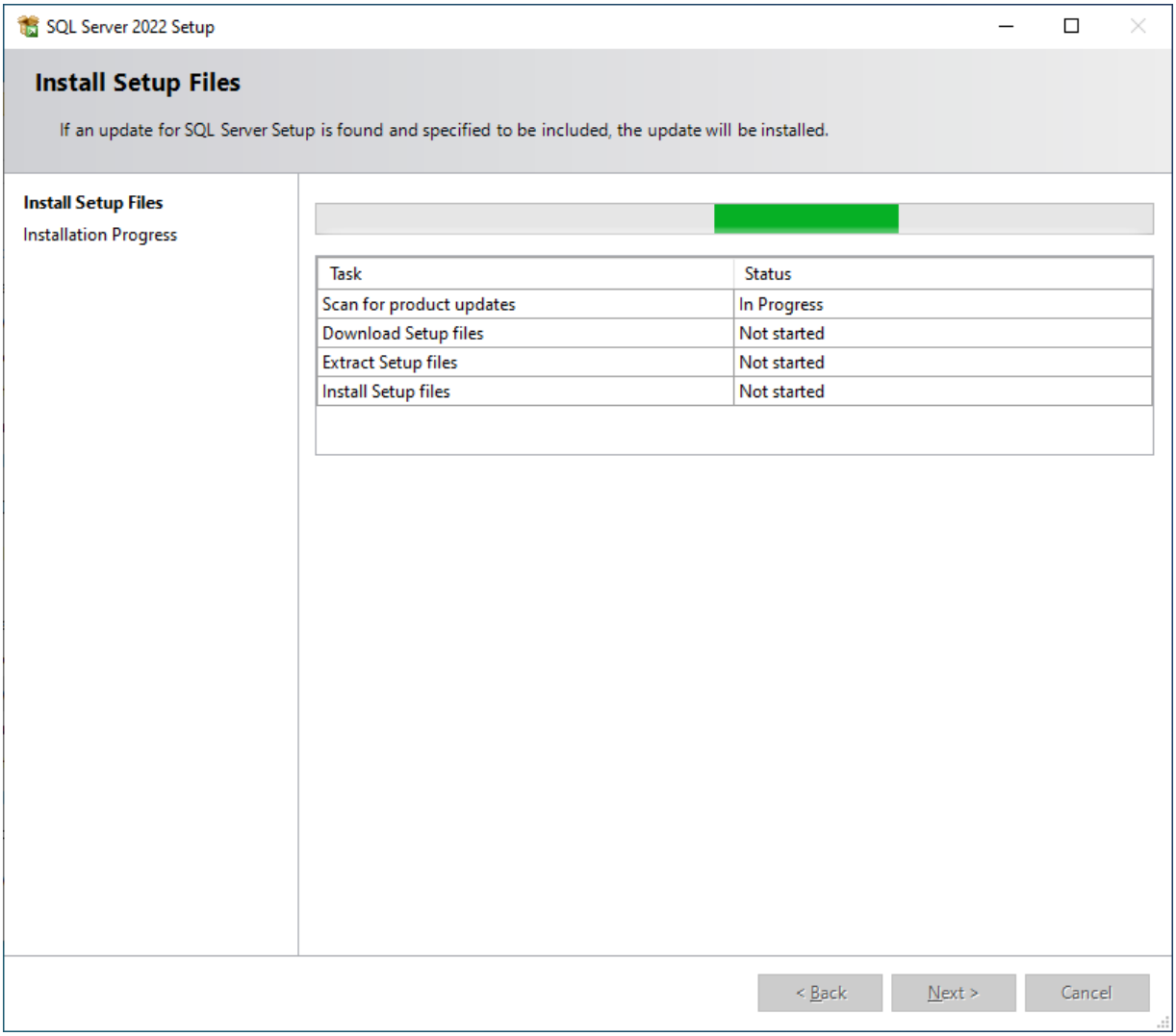


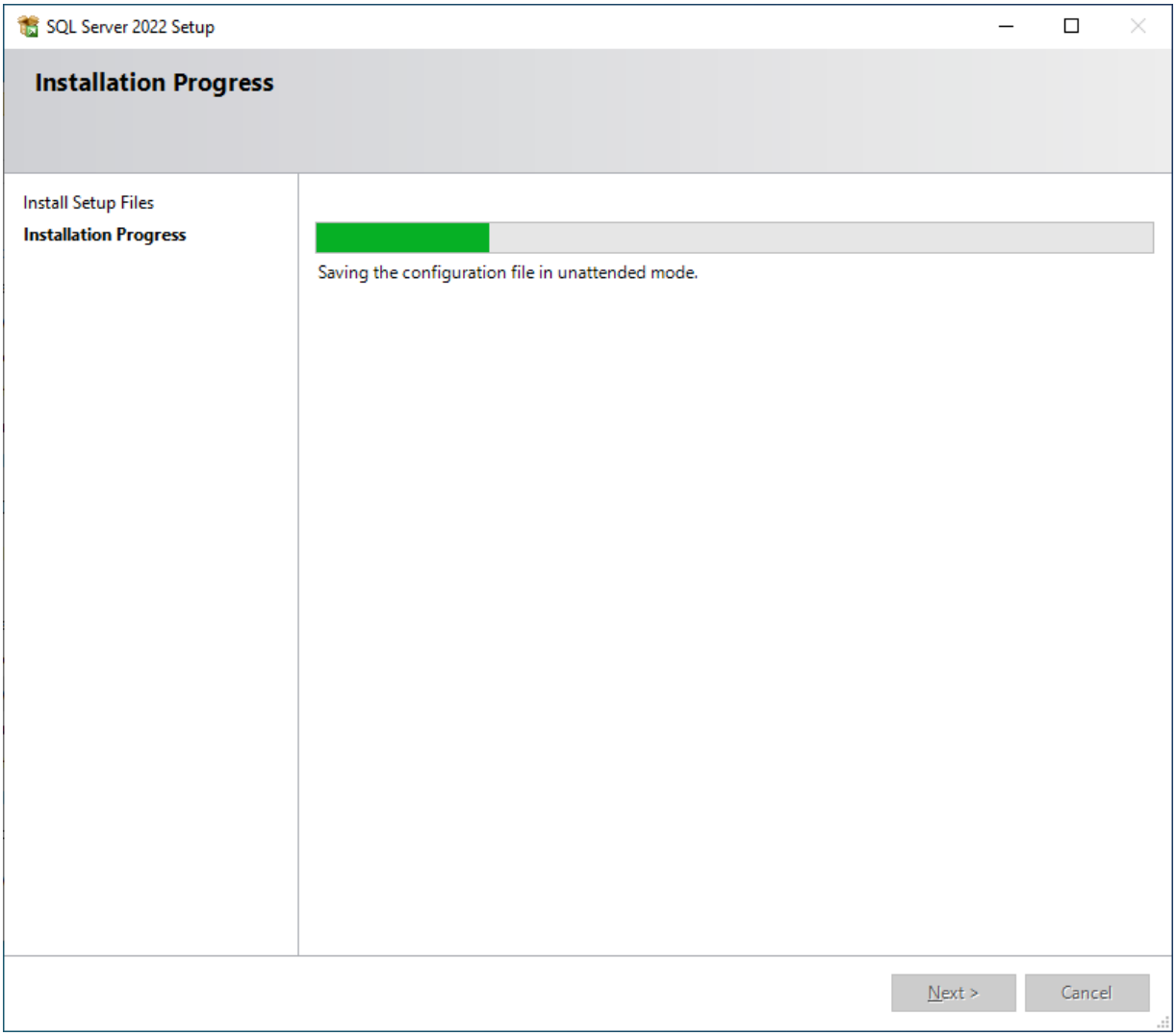
Express Microsoft SQL Server Installation Steps

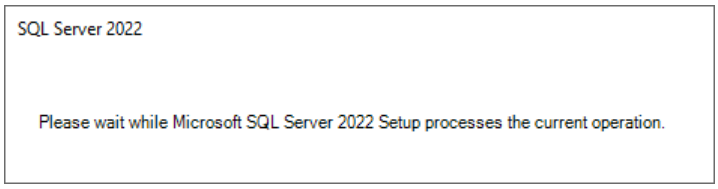
The ***Express/unattended*** installation of the Microsoft SQL Server database engine uses default settings for the SQL Server database instance and requires limited interaction by the user. However, if system specific settings are needed, then you must use the Advanced installation steps below so you will have full control over all the settings for the SQL Server instance!



During the installation the following windows will be shown, but no user interaction is needed unless the installation fails for some reason.


SQL Server 2022 Setup
Install Setup Files
If an update for SQL Server Setup is found and specified to be included, the update will be installed.
Install Setup Files
Installation Progress
Task
Status
Scan for product updates
In Progress
Download Setup files
Not started
Extract Setup files
Not started
Install Setup files
Not started
< Back
Next >
Cancel



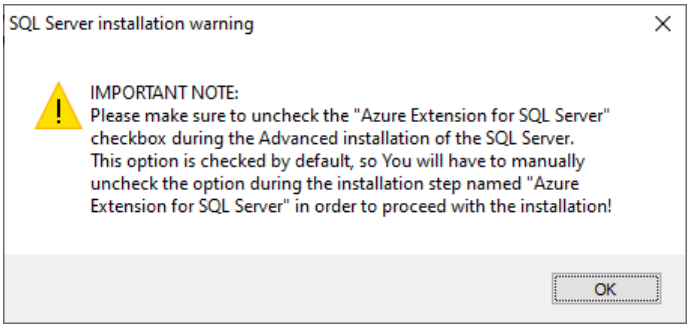


When the SQL Server installation is completed, the installation of Classic proceeds automatically without any user interaction.

Advanced Microsoft SQL Server Installation Steps

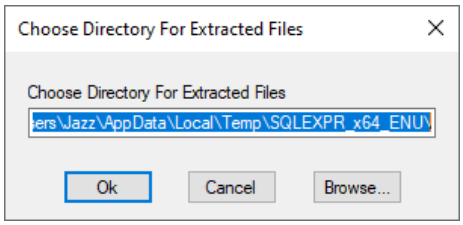
The ***Advanced*** installation of the Microsoft SQL Server database engine and the installation of the Jazz Classic database instance involves multiple steps.

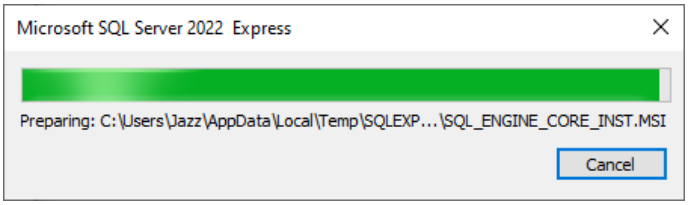
Before the installation begins, the following Warning will be displayed:



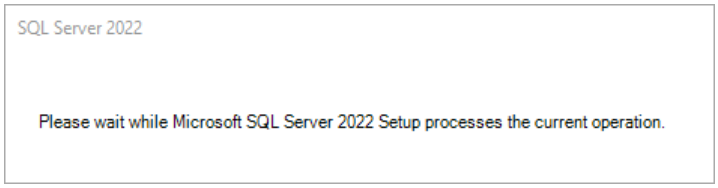
The mentioned checkbox is the only selection the user will have to make in order to install the SQL Server using default settings!

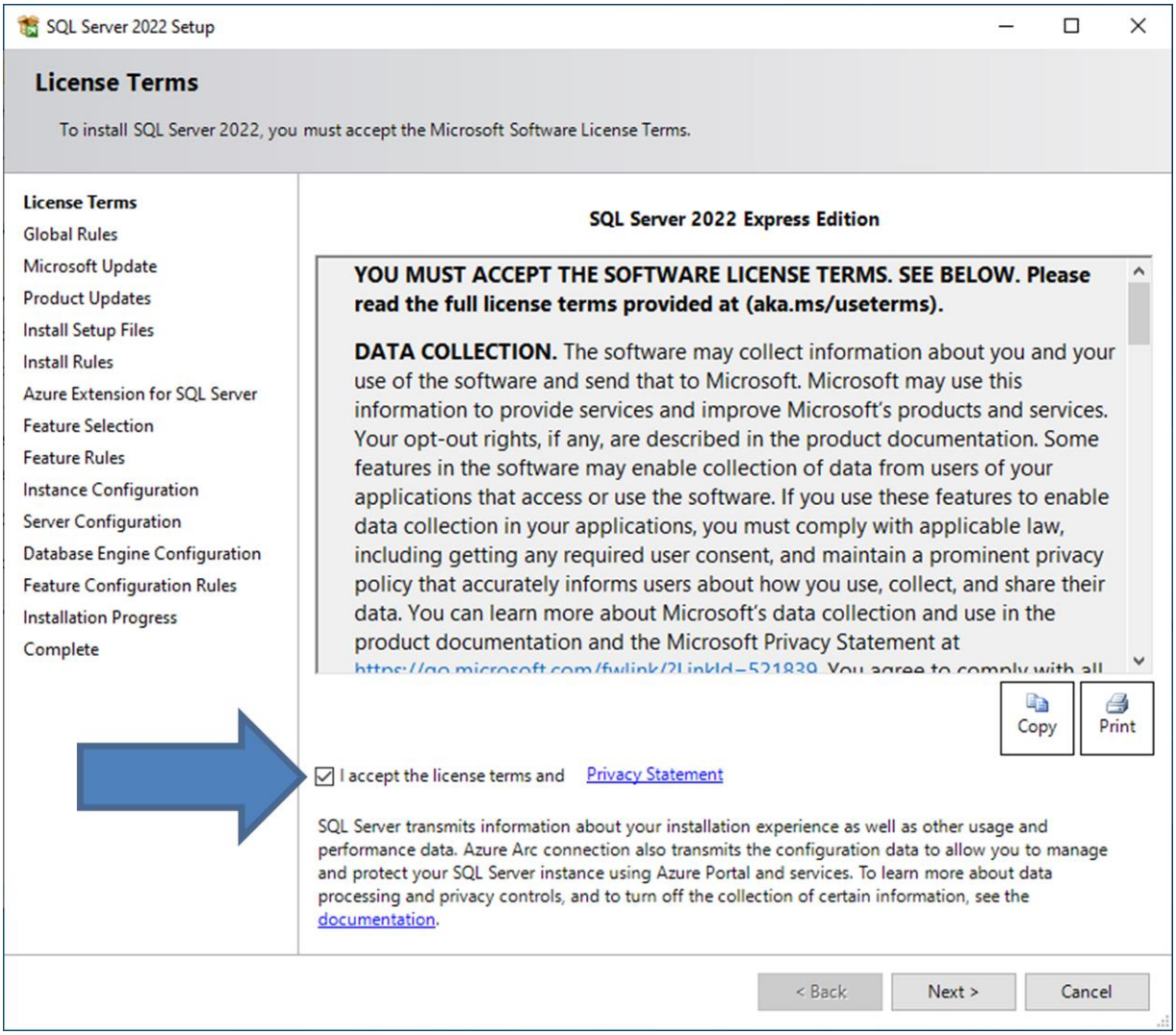
1. The installation starts by extracting the SQL Server installer embedded within the Jazz Classic installer:





When the extraction of the Microsoft SQL Server installer completes, the installation will automatically start:

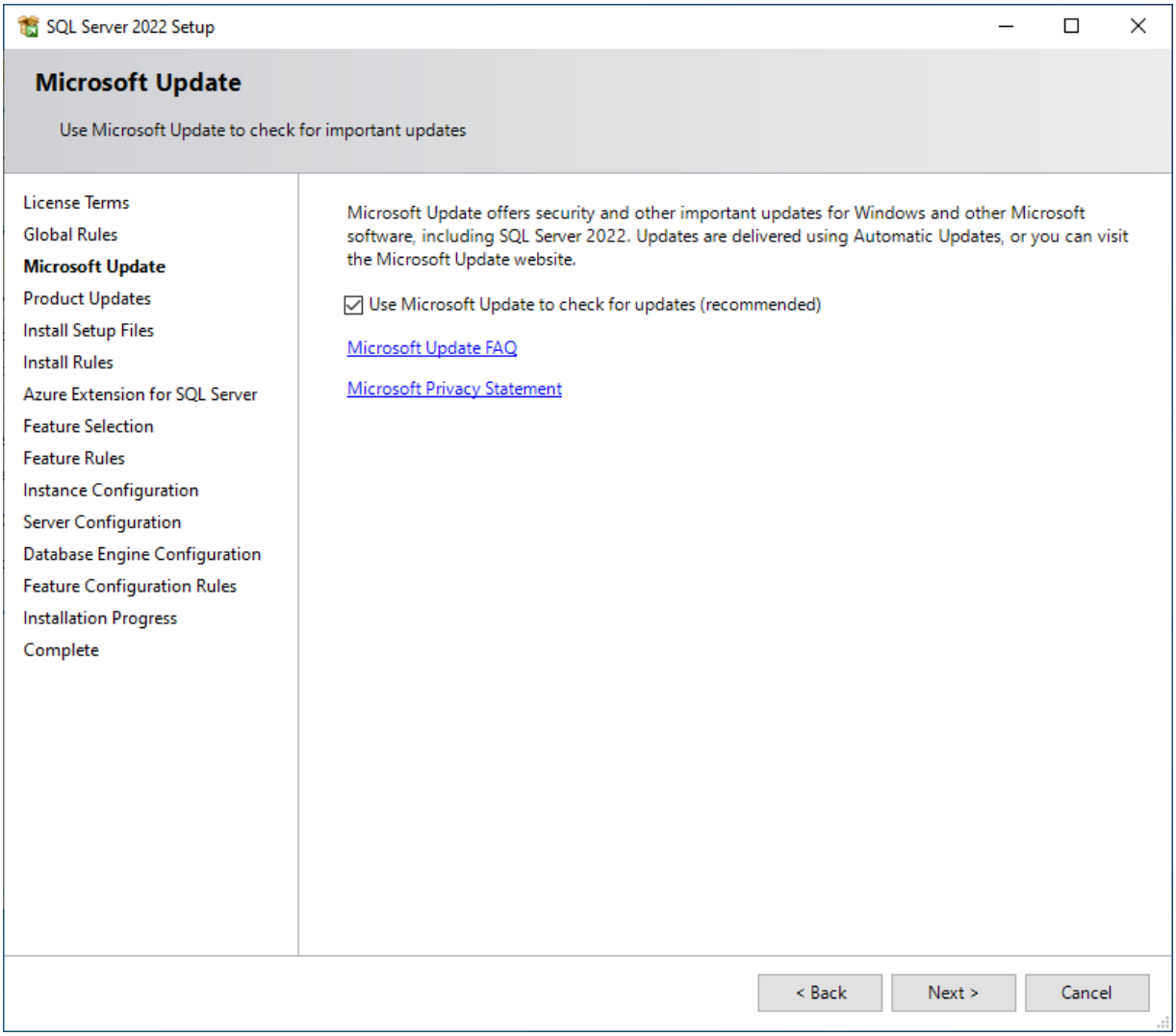




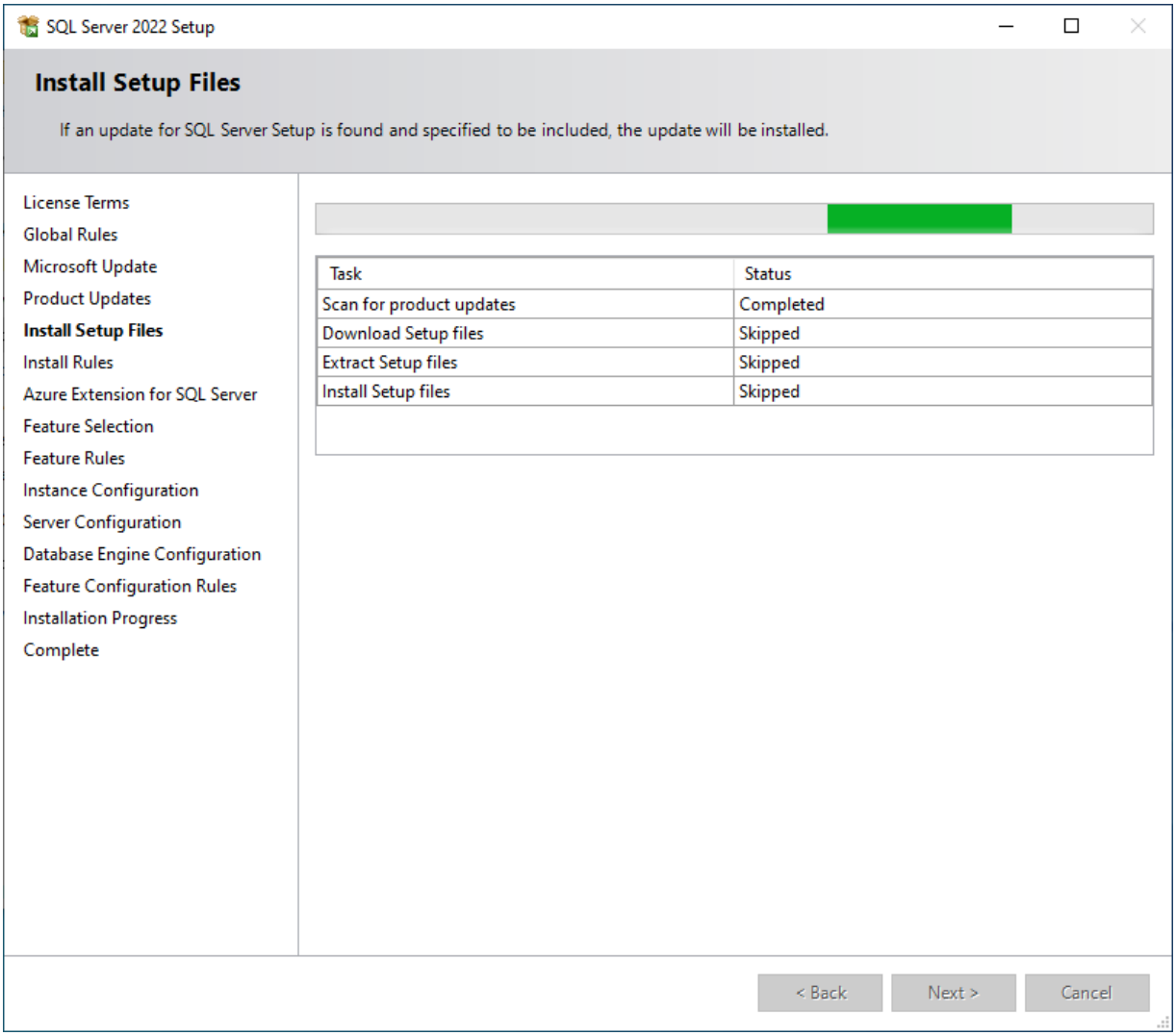
2. Accept the Microsoft Software License Terms for the SQL Server:

Check the "**I accept the license terms"** box and click the ***Next >*** button.

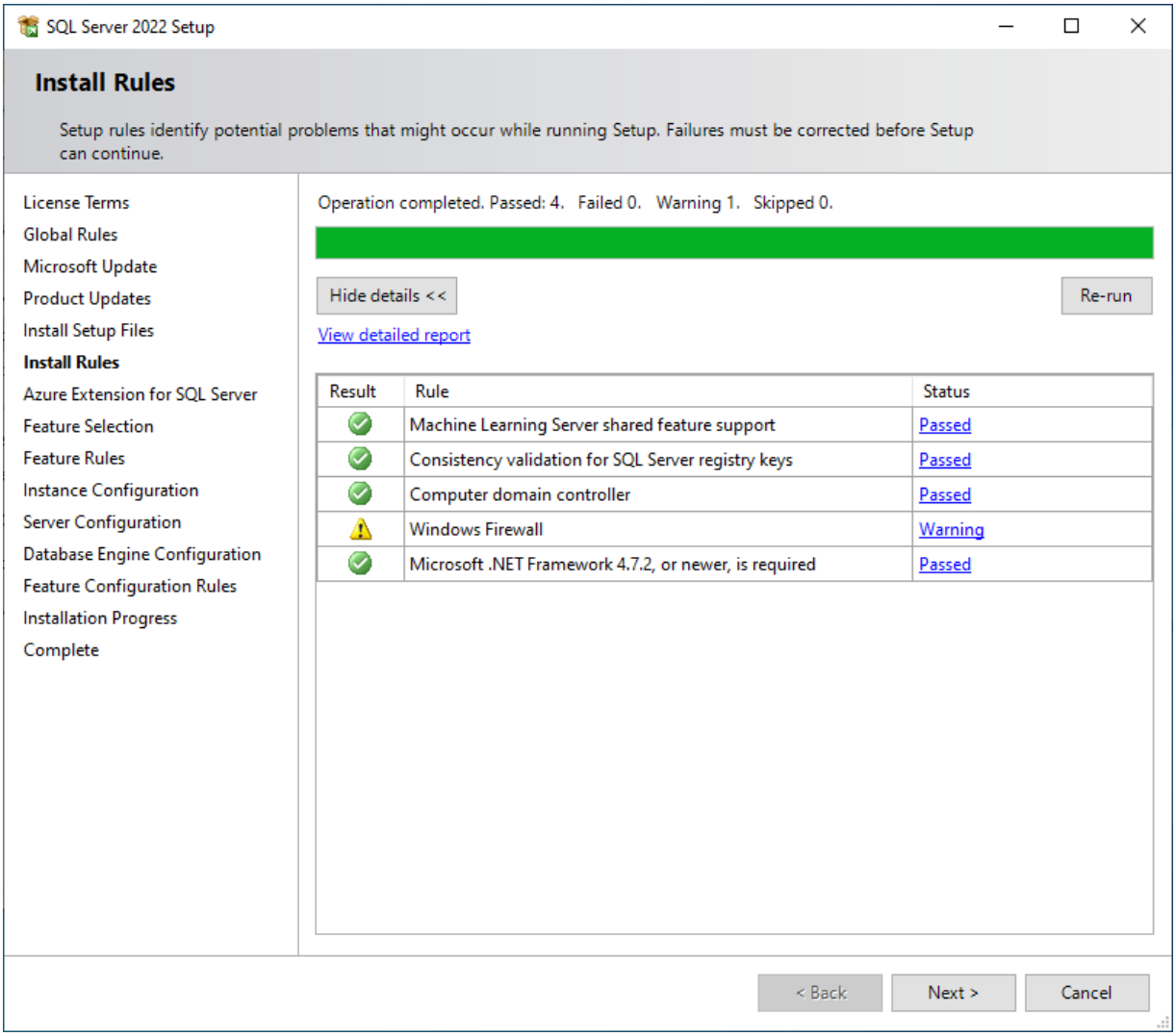
This will open the Microsoft Update page where you can have the installer check for any updates to Microsoft SQL Server product over the internet.


SQL Server 2022 Setup
Microsoft Update
Use Microsoft Update to check for important updates
License Terms
Global Rules
Microsoft Update
Product Updates
Install Setup Files
Install Rules
Azure Extension for SQL Server
Feature Selection
Feature Rules
Instance Configuration
Server Configuration
Database Engine Configuration
Feature Configuration Rules
Installation Progress
Complete
Microsoft Update offers security and other important updates for Windows and other Microsoft software, including SQL Server 2022. Updates are delivered using Automatic Updates, or you can visit the Microsoft Update website.
Use Microsoft Update to check for updates (recommended)
Microsoft Update FAQ
Microsoft Privacy Statement
< Back
Next >
Cancel

3. The installer will verify the installation and decide whether to download updates or not.



4. After the checks, the installer will attempt to detect any potential problems.

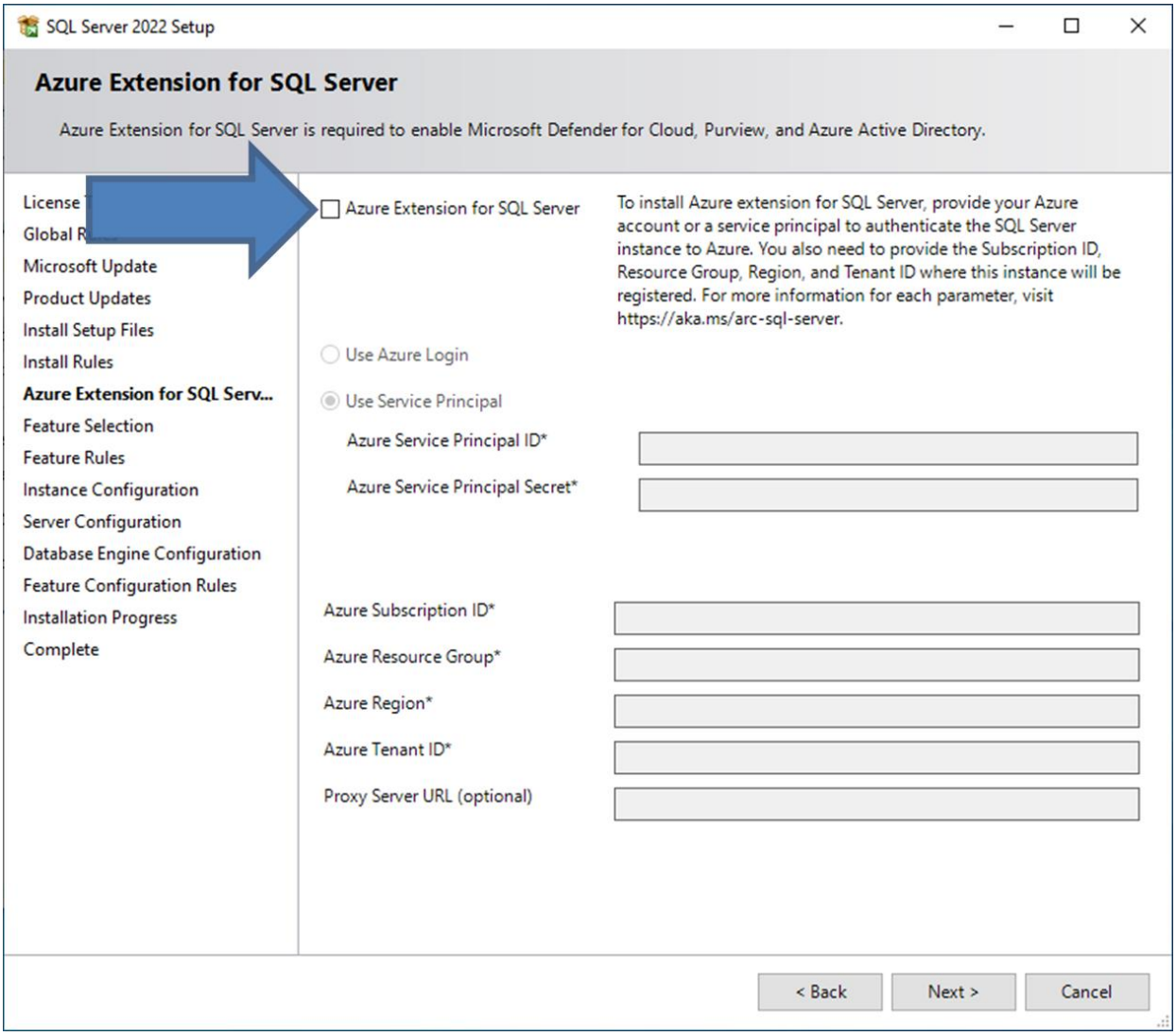


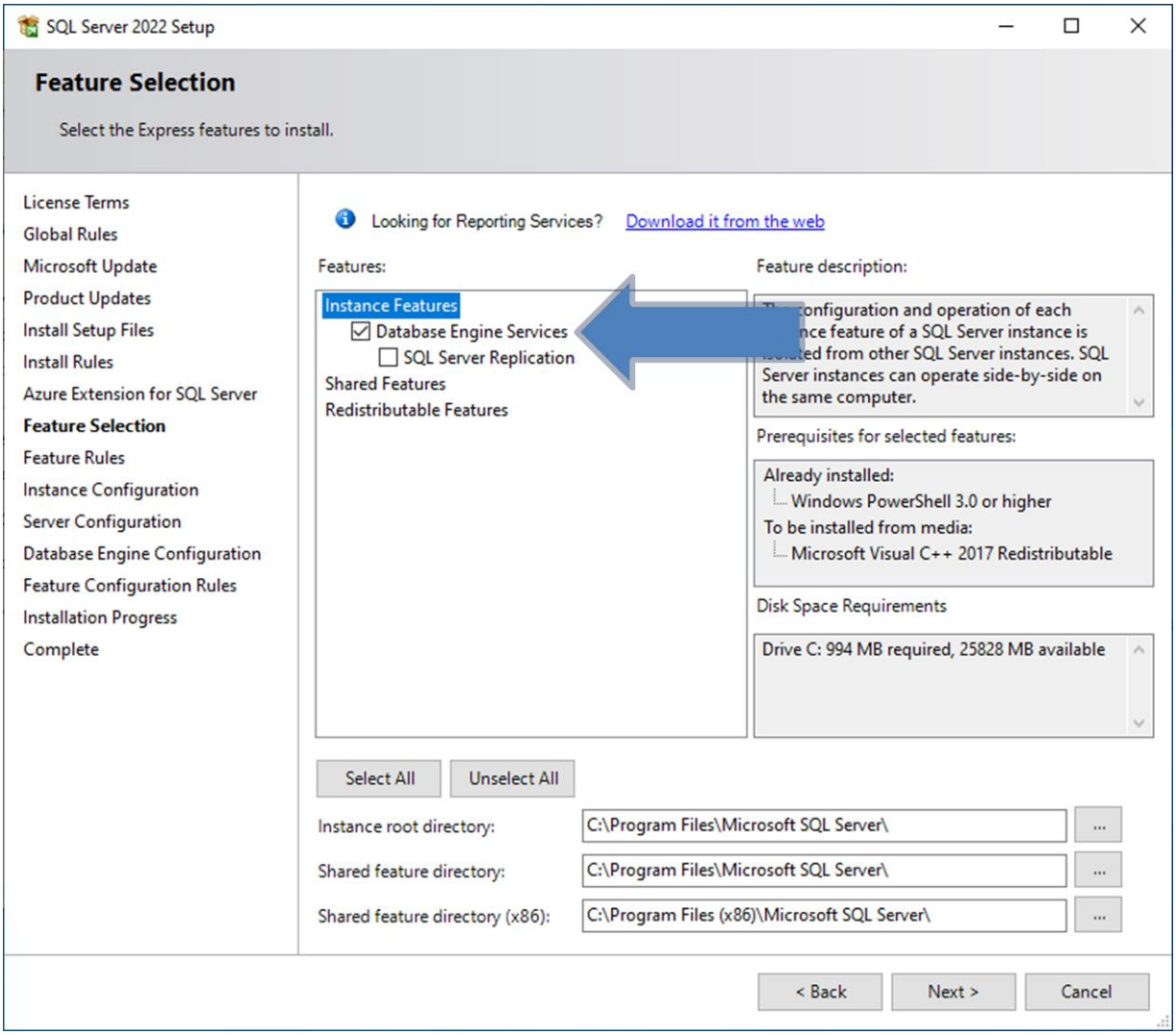
The most common issue is a pending reboot on the PC. If that is the case, the installation will need to be aborted, and the PC must be rebooted before proceeding with the installation.

Another common warning indicates that the Windows Firewall needs to be configured differently in order to allow the network communication to work correctly on the PC. ***This warning can normally be ignored.***

5. Select which SQL Server instance features to install. The only mandatory feature is the **Database Engine Service**, so please make sure to select this option before proceeding!

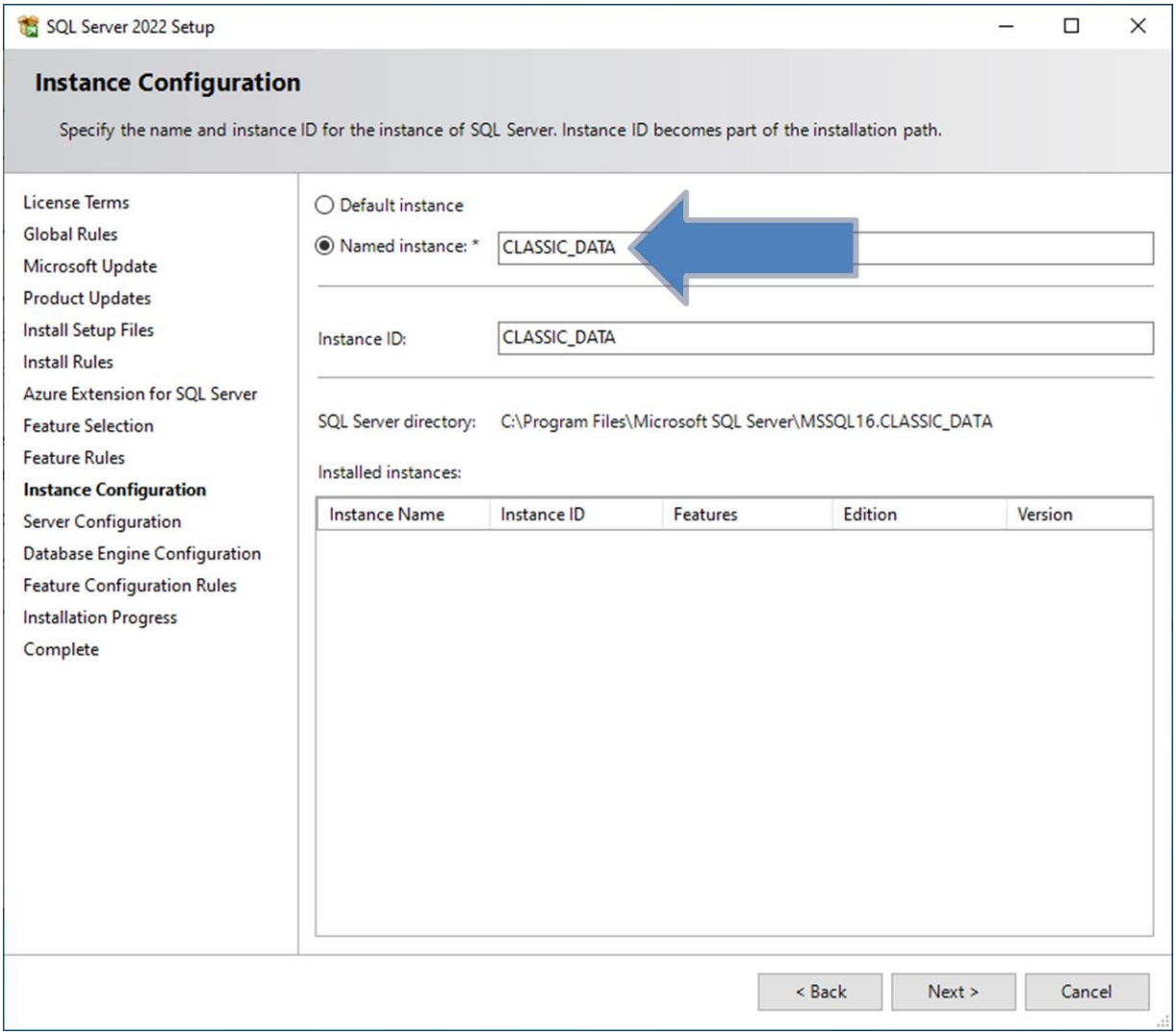
6. You'll have the option to install the **Azure Extension for SQL Server**. This feature is currently not utilized by Jazz Classic, so please make sure to ***uncheck*** the selection before proceeding with the installation.





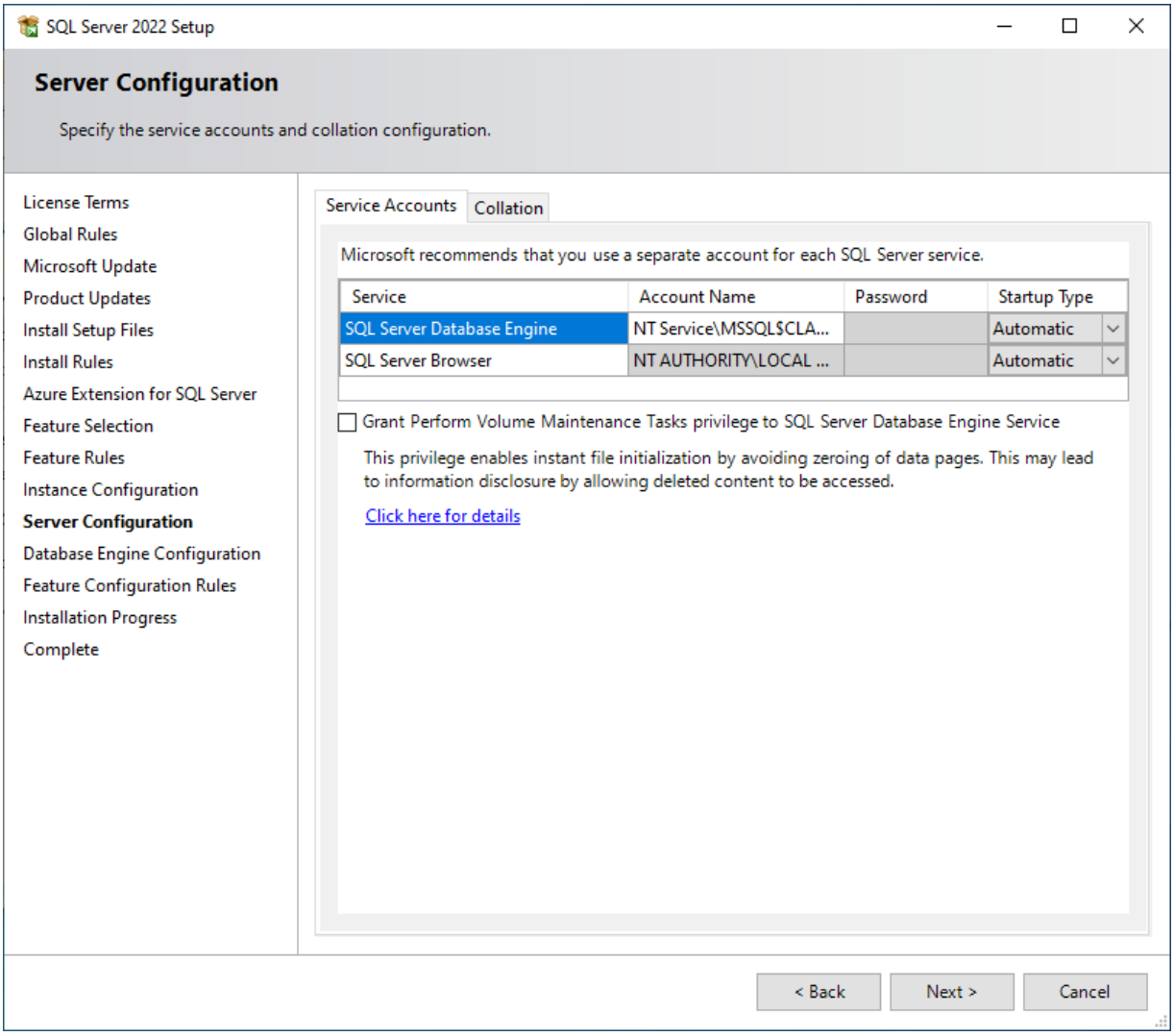
7. Choose which features to install for the SQL Server instance.

Only the **Database Engine Services** feature is required by Jazz Classic. Proceed by clicking the **Next** button.



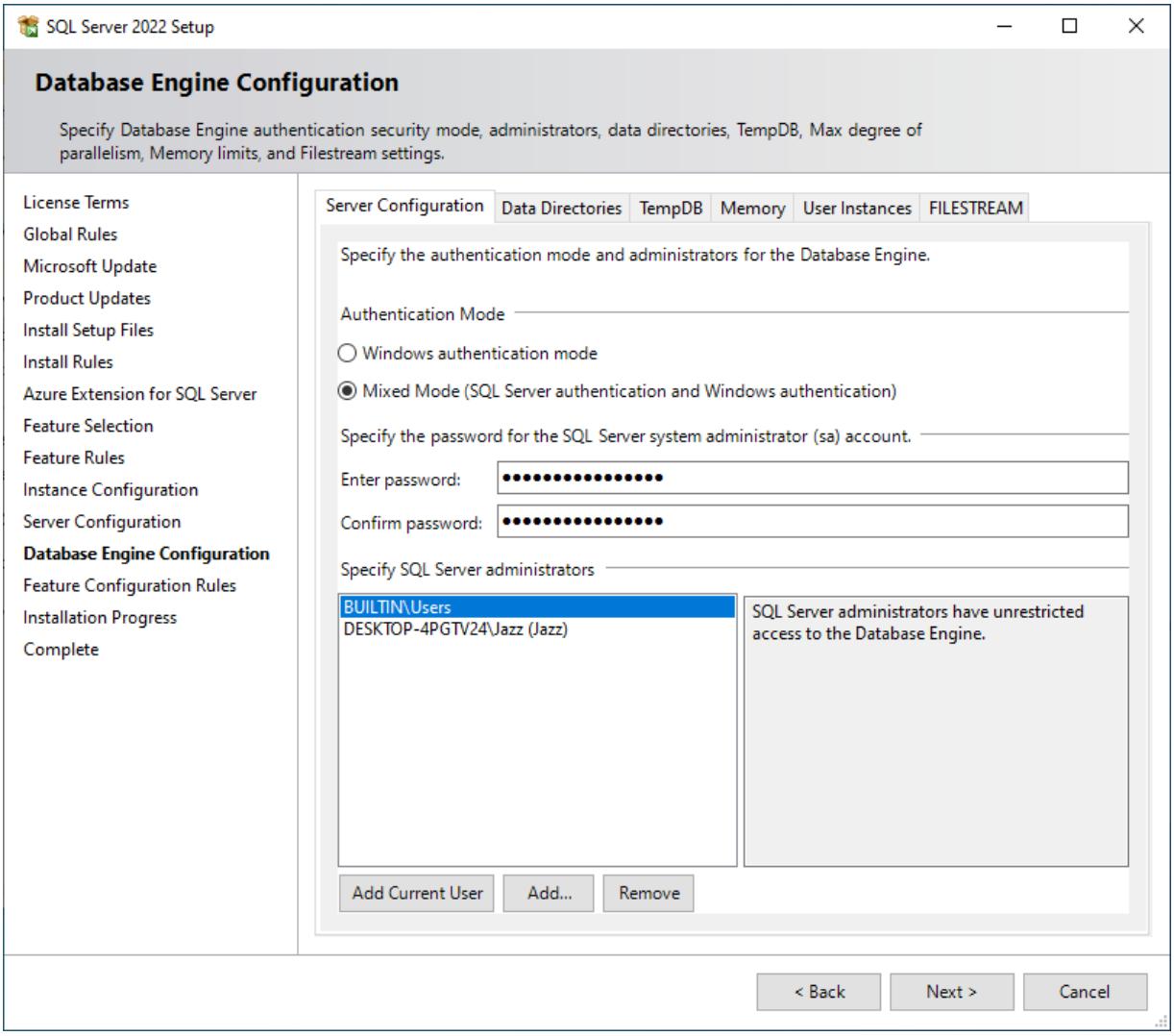
8. Select the SQL Server Instance Name and ID. Note that Jazz Classic requires the SQL Server to have a ***Named Instance***.

Ensure that the ***Named Instance*** and ***Instance ID*** are set to ***CLASSIC_DATA***. Proceed by clicking the ***Next >*** button.



9. This step specifies the service accounts and the database collation settings.

Please keep the default values and click the ***Next >*** button to proceed!



10. Configure the ***Authentication Mode*** that we allow the SQL Server Named instance to use:

SQL Server Authentication Mode Settings

The ***SQL Server Authentication Mode*** is very important with respect to security of the system. *It's crucial to review and understand the following section to maintain the cybersecurity of the Jazz Classic system!*

The SQL Server installer sets ***Mixed Mode*** authentication as the default authentication mode. This enables both ***Windows Authentication*** as well as the ***SQL Server Authentication***, utilizes the SQL Server system administrator ***sa*** account along with a dedicated ***sa*** account password.

In most cases, selecting ***Windows Authentication mode*** is recommended. This allows Jazz Classic to connect directly to the SQL Server database using the Window credentials (username and password) of currently logged-in user on the ***computer***. If the PC running the SQL Server engine has the same user account defined, the authentication will occur automatically "behind the scenes", with the security handled by the standard user account handling of the Windows PC's. This setup applies even when

Classic operates as a stand-alone system with only a single PC running both the SQL Server engine and the Classic application.

However, if your Jazz Classic software operates as a ***networked system***, with the SQL Server running on a separate PC where the Jazz Classic user accounts have ***not*** been created, then SQL Server authentication can be used, and Mixed Mode authentication should be selected.

The Mixed Mode authentication is enabled as the default mode by the installer, and the SQL Server system administrator (sa) password is preconfigured with the default password ***`ClassicImaging!2`***. ***Please make sure to choose your own password when using the SQL Server system administrator account!*** You will also have to use this new password when you configure the Data Connection settings for Classic.

Summary of Authentication Recommendations

System type	Windows Authentication	Mixed Mode Authentication
Stand-alone (only 1 PC)	X	
Network system with all user's accounts defined across all PC's (like Domain networks)	X	
Network system where the user accounts are not configured on PC running the SQL Server engine.		X[3]

Specify SQL Server Administrators.

11. Finally, we need to specify which Windows users are granted SQL Server administrator privileges.

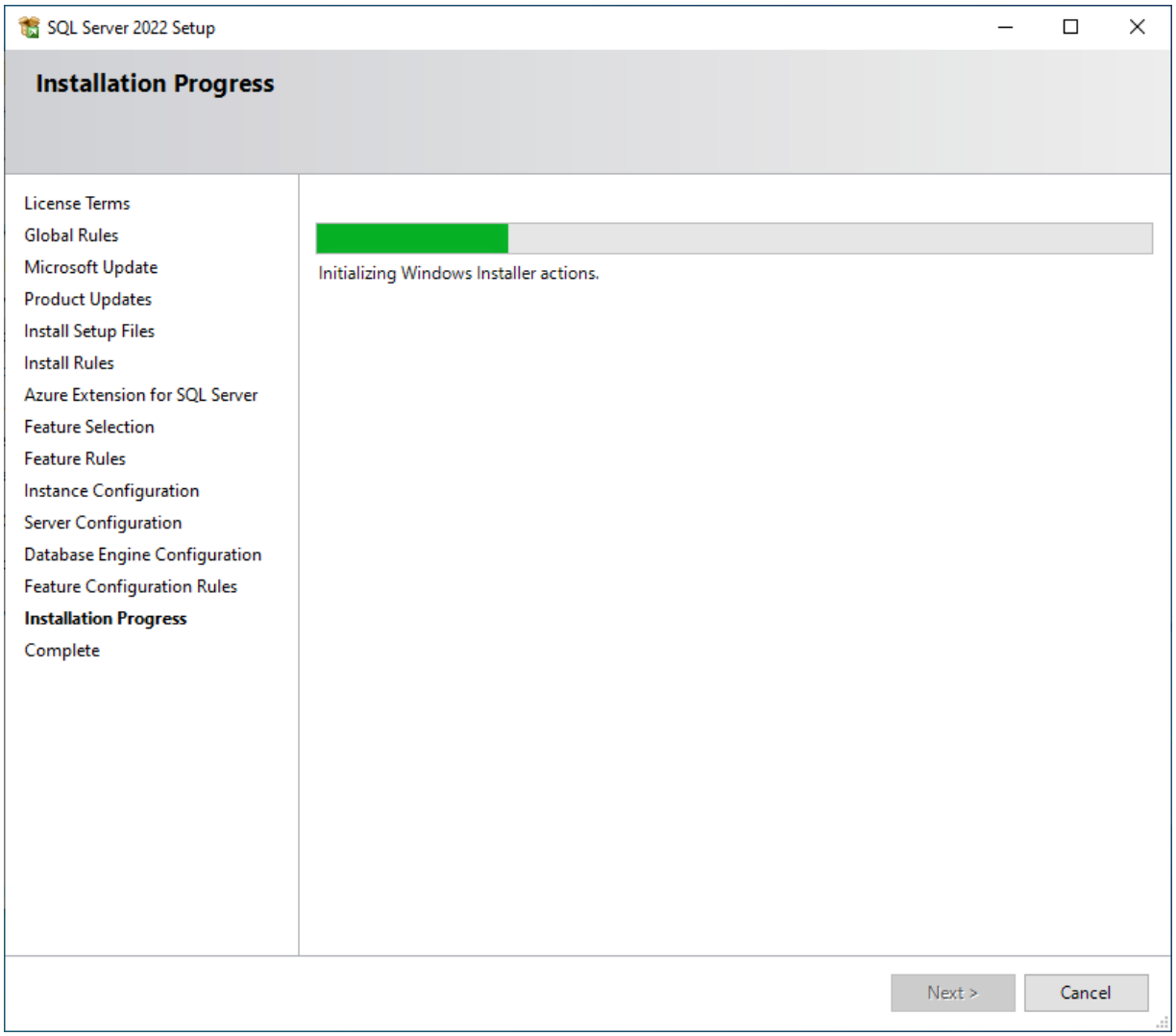
The current user will automatically be added as one of the SQL Server administrators.

It is highly recommended to only grant SQL Server administrator privileges to the dedicated system administrator users. In most cases, it's advisable to avoid or remove the ***BUILTIN\Users*** from the list to minimize the likelihood of unauthorized access!

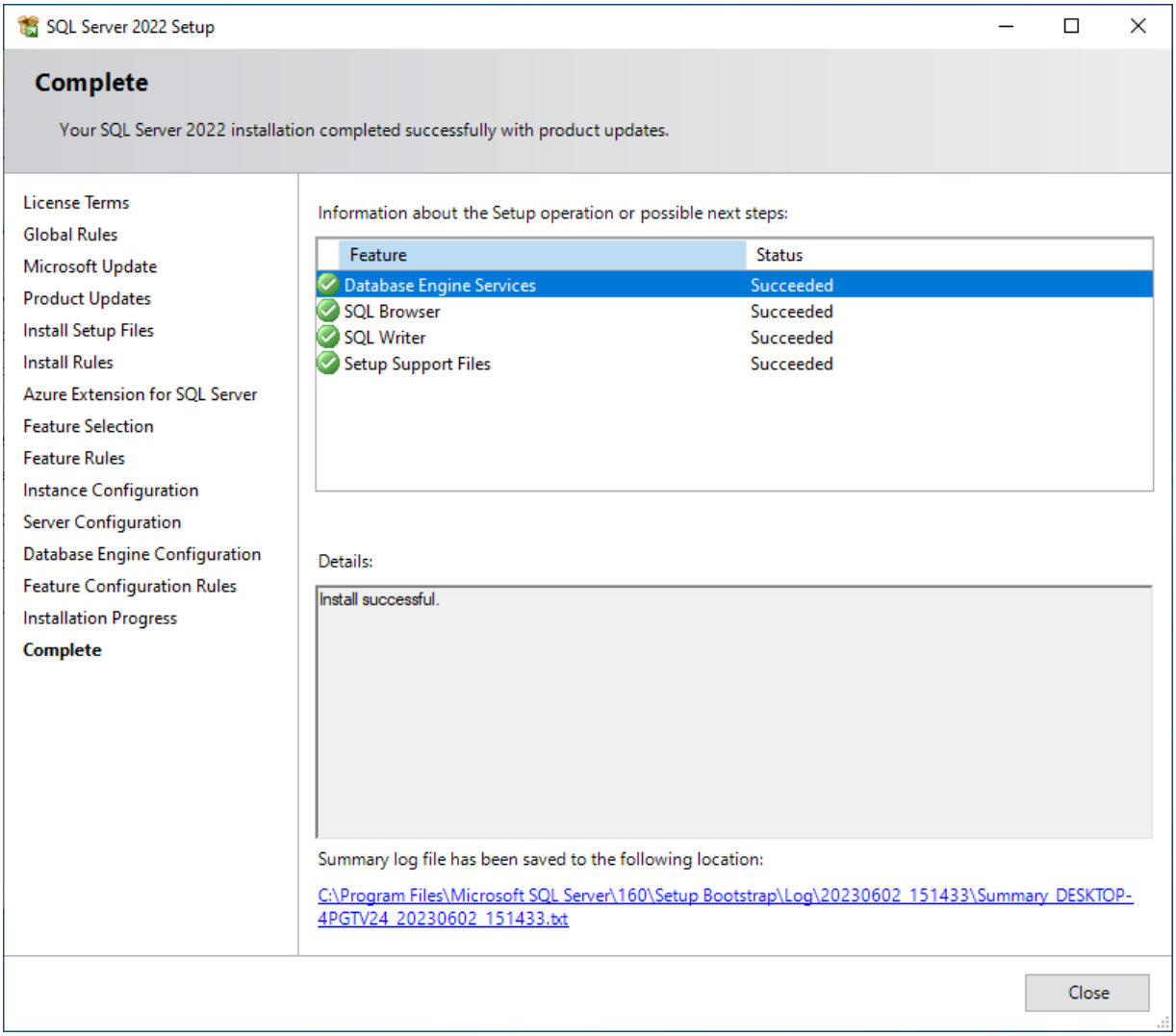
Please click the ***Next >*** button to proceed with the installation!

[3] Mixed Mode Authentication should be avoided whenever possible, and instead, the same Windows user accounts should be configured on all the Client and the Server PCs so that the Windows Authentication can be used!

The installation may take a while, so please be patient. You can monitor the installation progress through the rest of the installation.



When the installation is complete, the following status will be displayed:

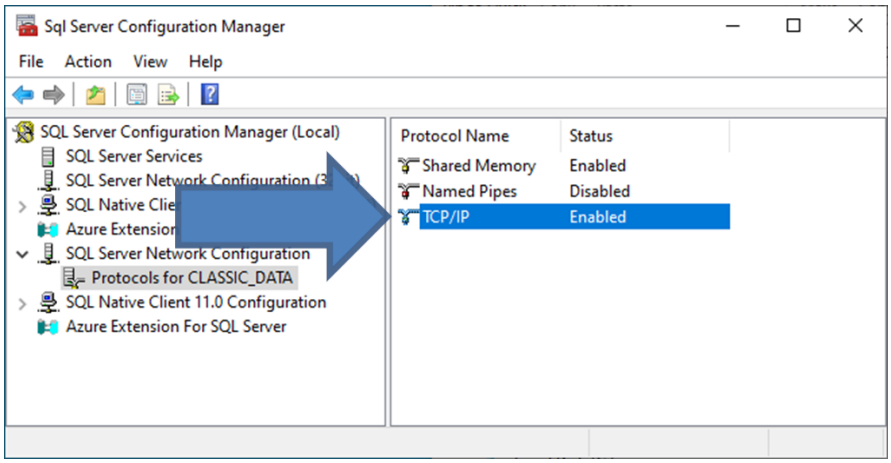


The SQL Server installation is now complete. However, the network configuration will need to be configured correctly if Jazz Classic will be connected to the SQL Server over the local area network.

SQL Server Network Configuration

After successfully installing the SQL Server, you'll need to configure the communication settings for the SQL Server using the ***SQL Server Configuration Manager,*** which is installed alongside with the SQL Server.

12. Use the Windows Start menu to open the SQL Server Configuration Manager:

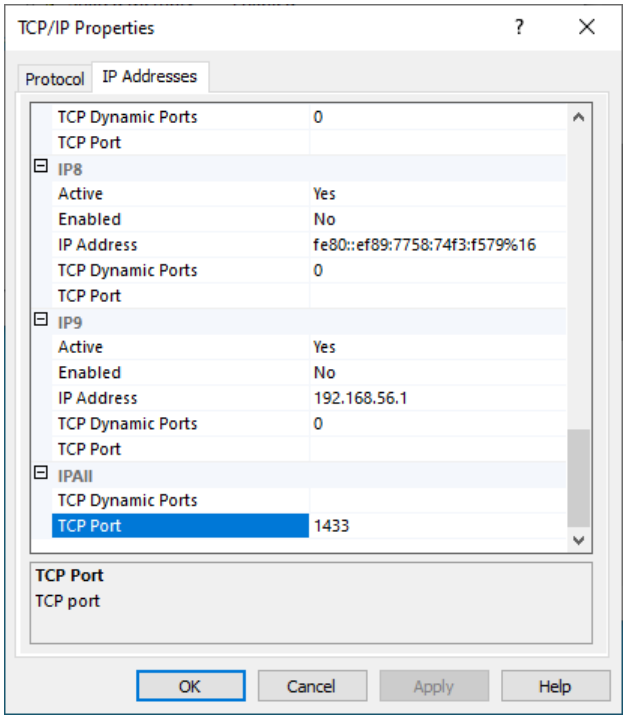


13. Navigate to SQL Server Network Configuration section and select the **CLASSIC_DATA** instance. Make sure that the TCP/IP protocol is enabled.

14. Right-click on the TCP/IP line and select the Properties for the protocol.

15. Select the IP Address tab page and scroll down to the last Category named “IPAll”.

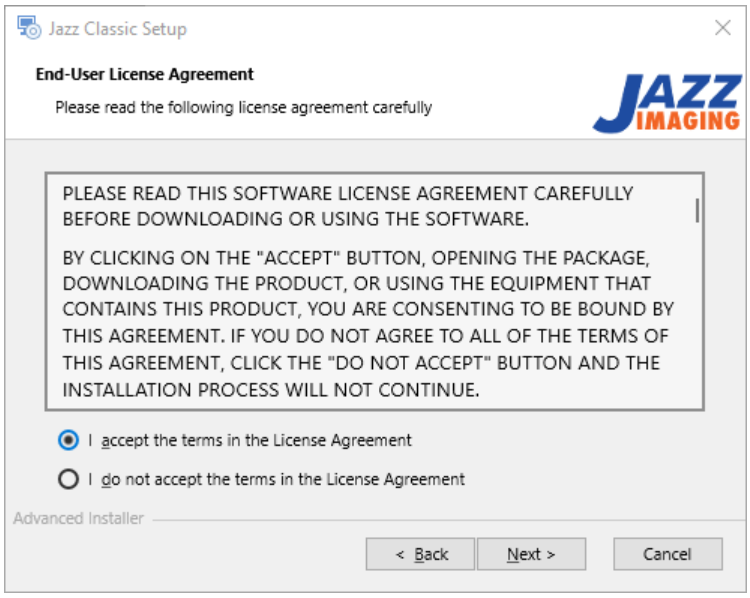
16. Remove any number in the “TCP Dynamic Ports” property and add the number **1433** in the “TCP Port” property, as shown below:



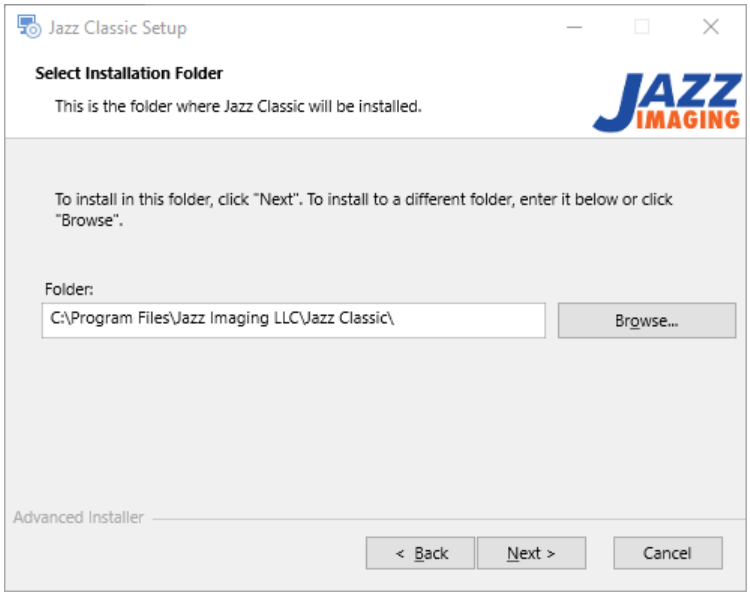
This will allow Jazz Classic Clients to connect to the SQL Server over the network by using the default IP port number 1433.

Proceeding with the Jazz Classic Installation

17. Read and the End-user License Agreement, then check the "**I accept…"** option to accept the agreement. Click the ***Next >*** button to proceed.

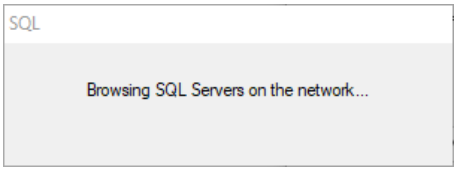


18. Select the installation folder for Jazz Classic and click ***Next >*** button to proceed.

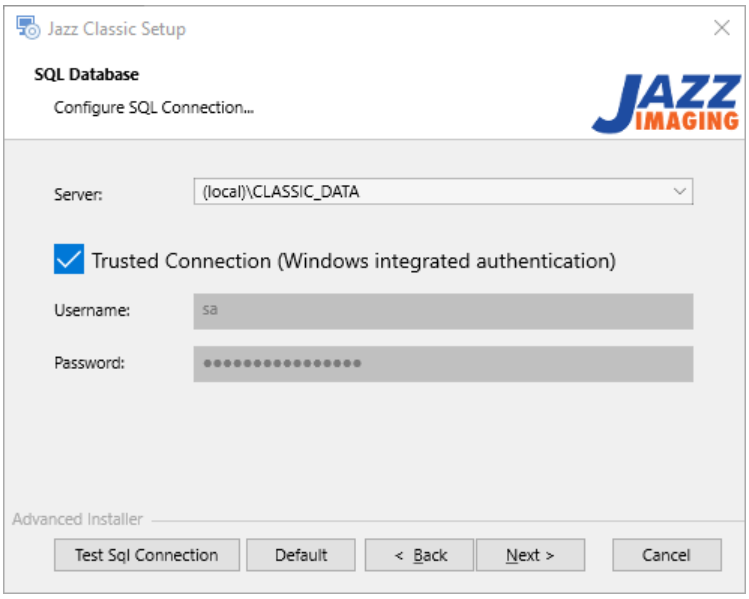


It is recommended to use the default installation location as this will make it easier during support sessions.

The installer will now search for all accessible SQL Server instances, including locally installed SQL Server instances as well as SQL Server instances that can be reached over the network:



19. Wait for the installer to find all SQL Server instances, then select the SQL Server to be used by Jazz Classic when it starts for the first time after installation.

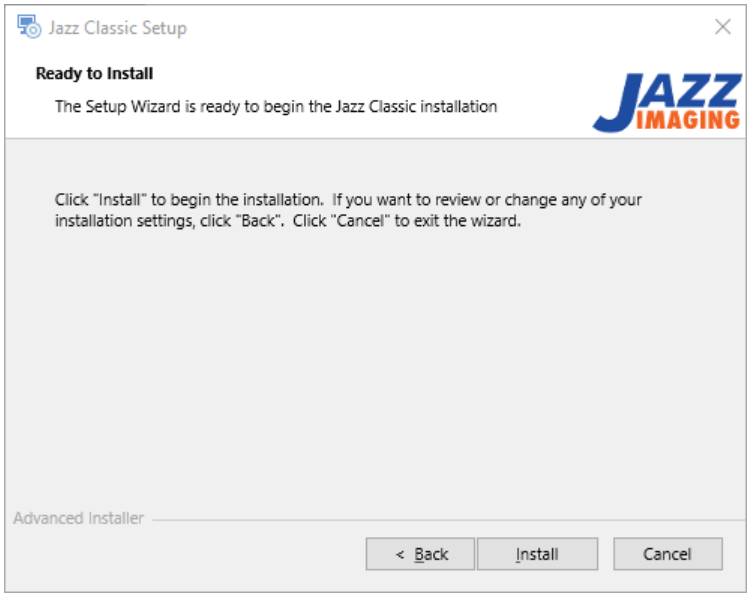


The default selection is the local instance of the Classic SQL Server database instance, but it will also be possible to select an instance running on another PC in the network if any other instances have been detected.

Additionally, the SQL Server Authentication mode used by the Jazz Classic Client needs to be selected, which must match the settings used while installing the SQL Server instance.

You can test the SQL Server connection settings by clicking the ***Test Sql Connection*** button. To restore default settings, click the ***Default*** button.

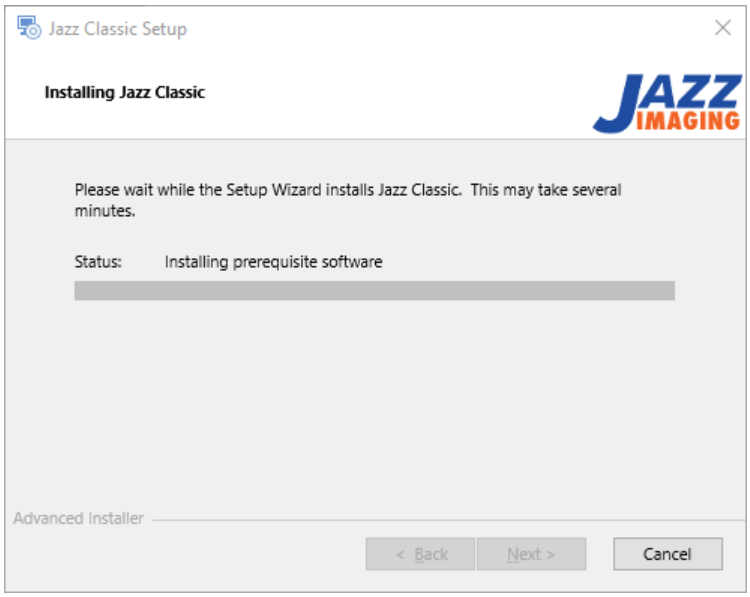
Click the ***Next >*** button to proceed to the next step.



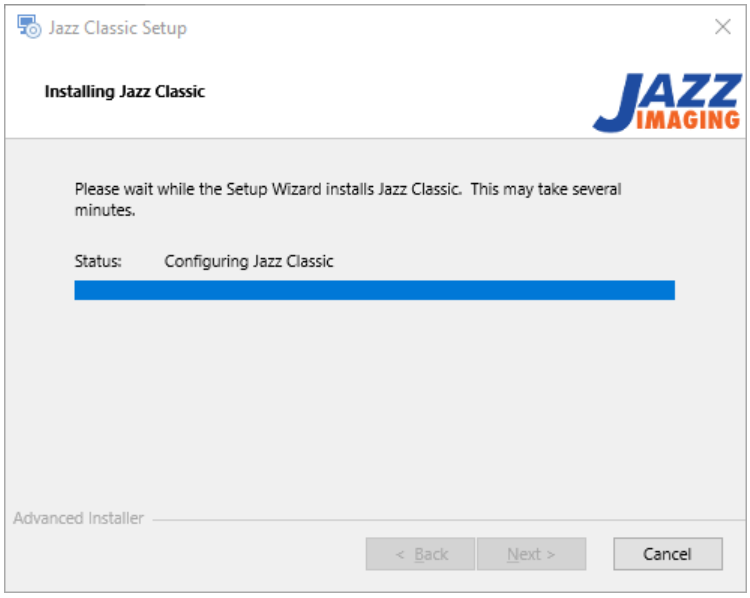
The installer is finally ready to install Jazz Classic files!

20. Click the ***Next >*** button to proceed with the installation process.

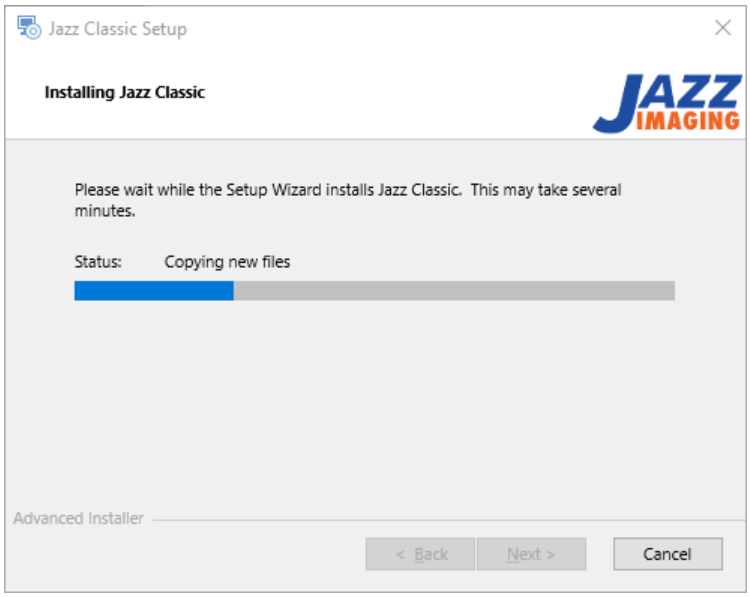
The first part installs any missing prerequisite software (C++ redistributables etc.)…



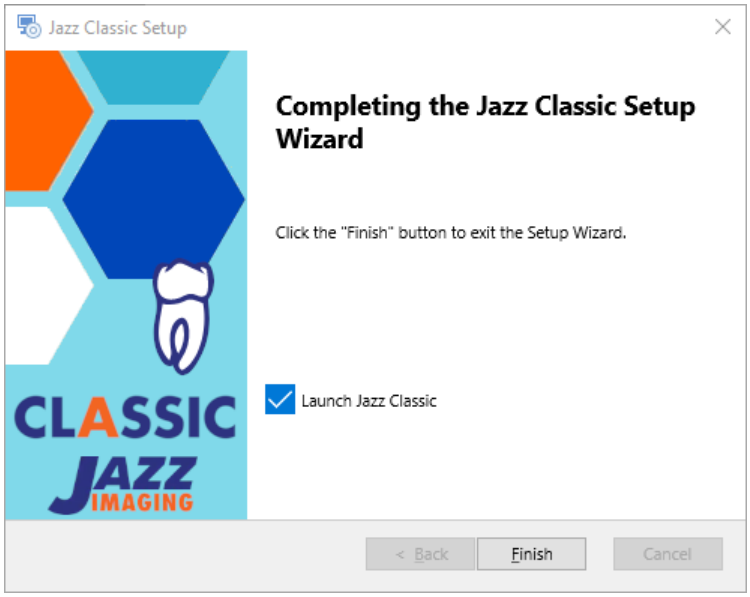
Some more configuration needs to be done…



All the new files need to be copied…



And finally, we are done with the Jazz Classic installation!



Now, select ***Launch Jazz Classic*** option and click the ***Finish*** button to open Jazz Classic for the very first time:

Shared Network Installations

In larger systems where multiple Jazz Classic clients connect to a shared Database/File Server over the network, it might become a problem to keep all the individual Jazz Classic Client installations up to date. This is especially true in cases where the Jazz Classic database is going to be updated, which necessitates updates all Jazz Classic Client installations in the system!

In this kind of "distributed" installation, it's often more manageable to maintain the system if all Jazz Clients are running the Jazz Classic application from the server over the network via a shared or mapped drive. In this case, the IT administrator will only have to update the Jazz Classic installation once on the server, ensuring all remote clients automatically run the same/new version of Jazz Classic.

However, to establish this kind of distributed Jazz Classic system, the following steps must be done on the server and all clients before it works.

Server Installation Steps

To set up a distributed network installation, the following steps will have to be performed on the server:

1) Install Jazz Classic on the Server that will typically run the SQL Server database and hold all image data in the system (as explained in the previous chapter).
    a. Run the Jazz Classic installer.
    b. Install the SQL Server.
    c. After installation, share the Data Location folder so it can be accessed over the network by all Jazz Classic client PC's. Name the share something that's easily identifiable, such as "Classic Data", and give it "Read+Write" permissions, as the Jazz Classic Client will be reading and writing data.
2) Share the Jazz Classic installation folder so it can be accessed over the network by all the Jazz Classic client PC's. Name the share something that's easily identifiable, such as "Classic Application", and only give it "READ" permissions, as this folder only holds the executable files.

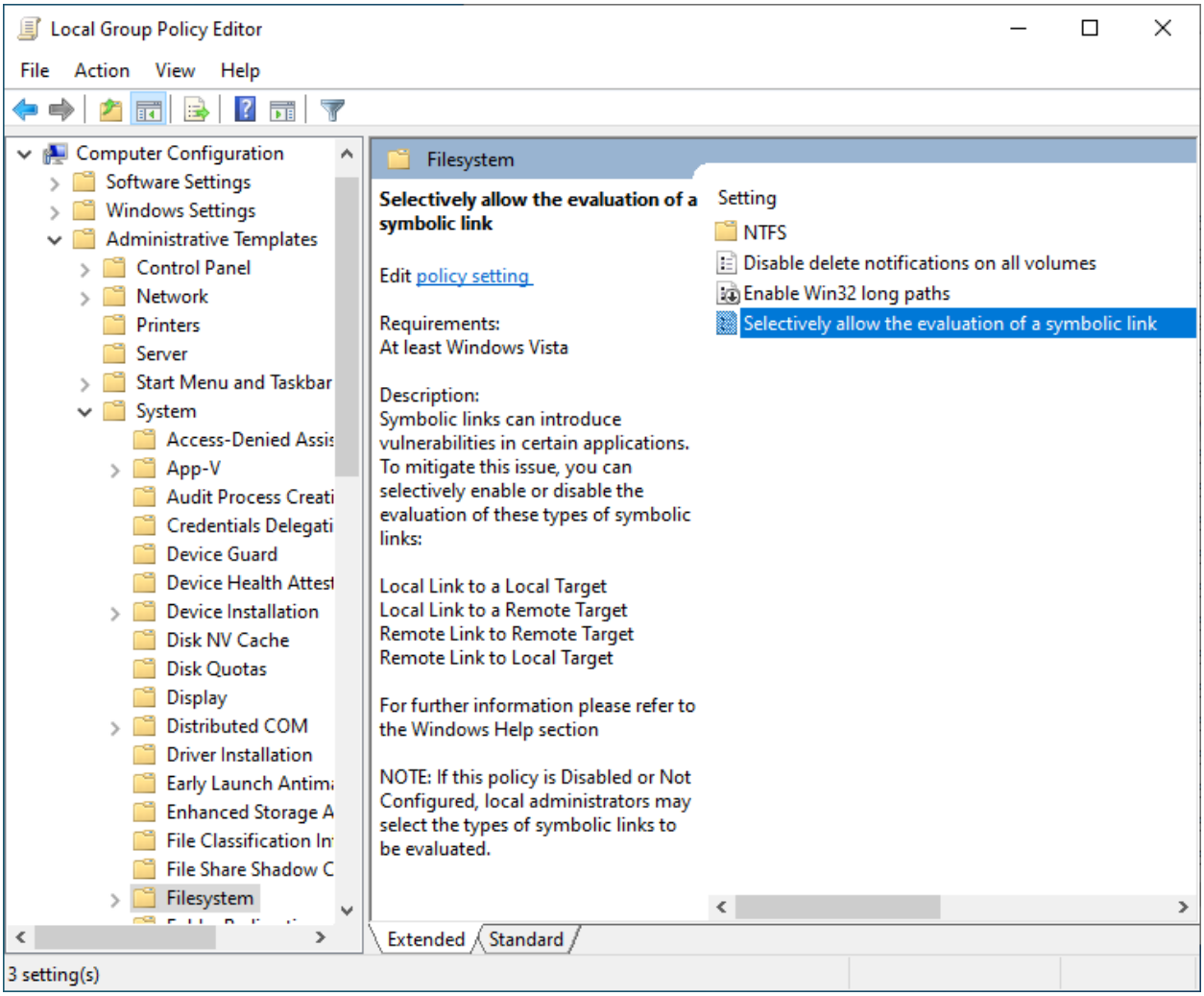
Client Installation Steps

Perform the following steps on all Jazz Classic Client PC's (***these steps will only have to be done the first time Jazz Classic Client is installed on the individual PC***):

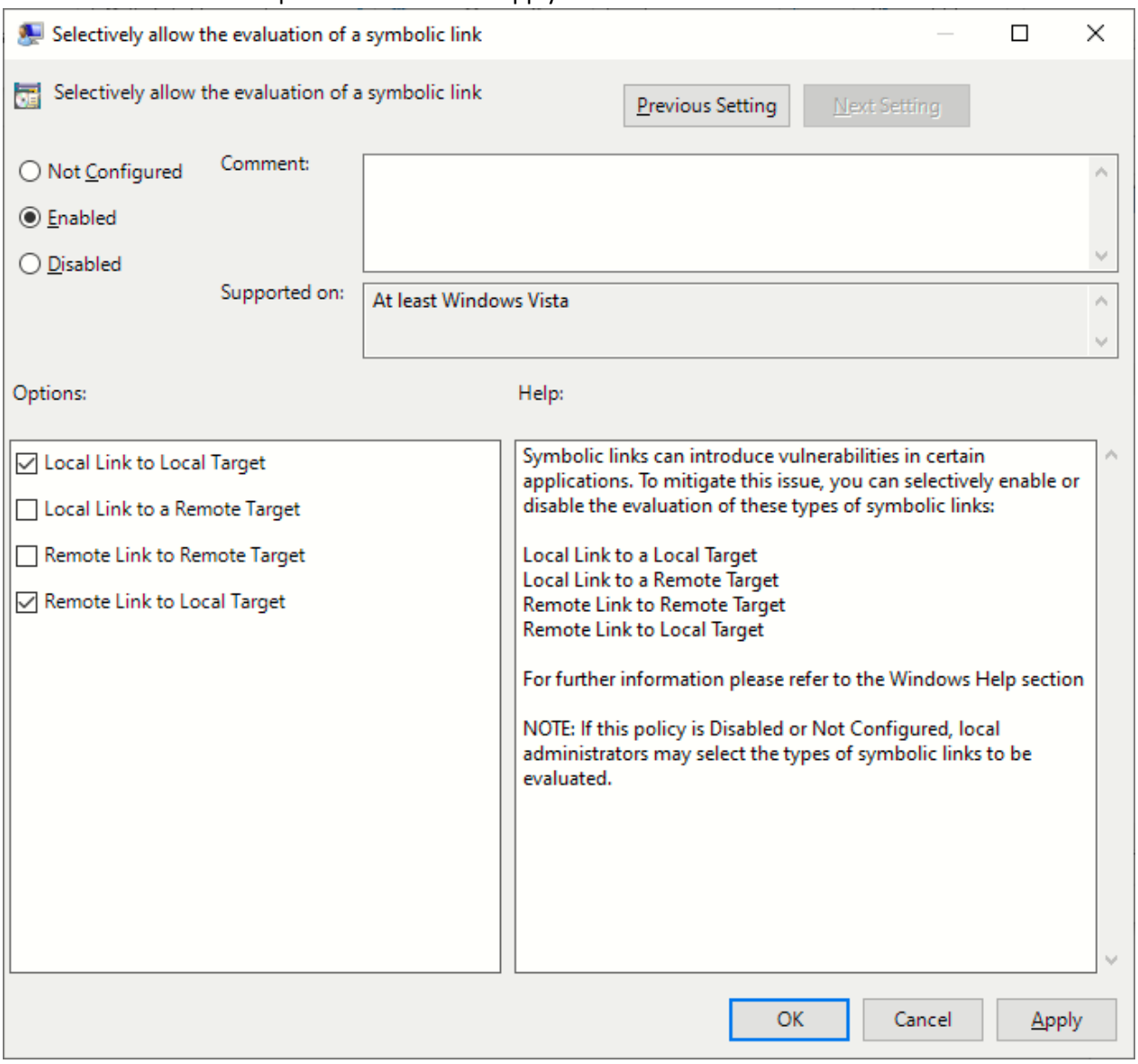
1) Install the "***Jazz Classic Remote Client***" installer, which will install all pre-requisites that are required for the Jazz Classic application to run on a PC.
2) Map the "Classic Data" and "Classic Application" shared network folder from the Server to local drives (while not strictly necessary, this often increases the overall performance of Classic reducing interference of Virus Scanners when accessing the files over the network share directly!).
3) Create a desktop shortcut to "Classic.exe" in the "Classic Application" shared folder.
4) Install all necessary Drivers for the imaging hardware will be used by the Classic Client:
    a. Install the latest Jazz Control Center. This is only needed if the users are going to be using Jazz SOLO and/or Jazz Minor sensors.
    b. Install latest Dexis Platinum legacy driver from Kavo Kerr. This is only needed if the users are going to be using Dexis Platinum and/or Gendex GXS-700 Size 1 or Size 2 sensors.

i. Remember to copy correction files for all the Dexis/Gendex sensors into the C:\DEXIS\FlashDir folder!

ii. Update the Group Policy Object that enables access to the Symbolic Links used by the Legacy Driver:
Run the Local Group Policy Editor and select the “Computer Configuration > Administrative Templates > System > Filesystem > Selectively allow the evaluation of a symbolic link” object:



iii. Enable the “Local Link to Local Target” and “Remote Link to Local Target” options and Click the Apply button:



c. Install the latest Schick CDR Elite driver. This is only needed if the users will be using Schick 33 (or Sirona XIOS XG Supreme) sensors.

d. Install all 3rd party TWAIN Data Sources for the imaging hardware that does not have a Direct Integration Acquisition Plugin in Jazz Classic. This could be TWAIN drivers for 2D imaging devices like Carestream RVG 6200 sensors, iRay sensors, or other similar products. The same is the case for 3D hardware for Panoramic and Cephalometric hardware.

If the Jazz Client is being started/opened using the Bridge interface of the Practice Management Software, the Bridge settings will have to be updated so the Remote Client executable is being called instead of the local Classic executable (typically “C:\Program Files\Jazz Imaging LLC\Classic\Classic.exe”).

Example: If the mapped drive for the Classic Application is Q:, the Bridge Settings would have to be changed from “C:\Program Files\Jazz Imaging LLC\Classic\Classic.exe” to “Q:\Classic.exe”.

First Time Startup

The first time Jazz Classic starts up on a new PC, it will need to be licensed for it to run.

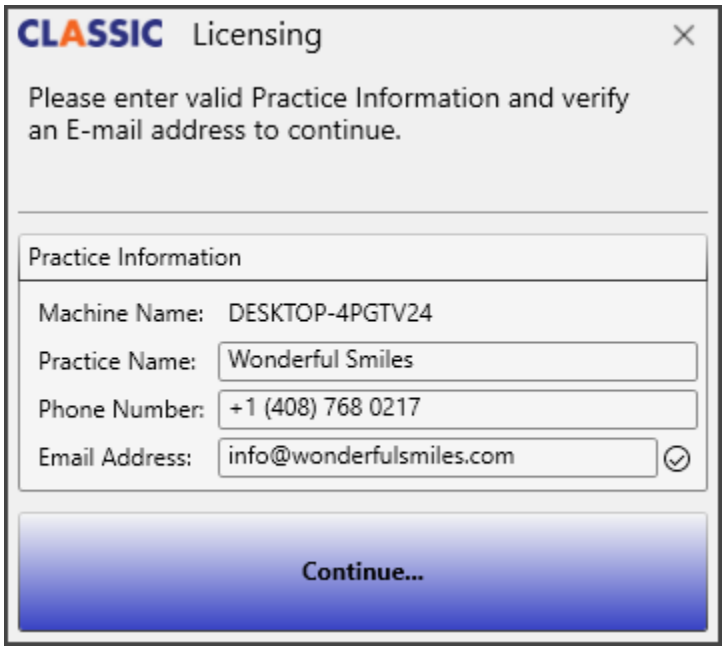
You must provide valid contact information for the dental practice and the E-mail address must be verified in order to proceed with the licensing.

After entering all the Practice Information details, press the ***Send Verification E-mail*** button.

Classic will now send an E-mail with a verification code to the Practice E-mail Address entered above.

Requesting a Demo License

When the verification code is received and entered into the ***Verification code*** field, then you will be able to request a 30-day Demo license by clicking the ***Continue*** button shown in the image below.



Congratulations!

You are now all set and ready to go!

Cybersecurity Event Handling

Jazz Classic incorporates a set of features designed to enhance the Cybersecurity of the Classic system. If any of these features are disabled by the system administrator, Classic will generate a ***Cybersecurity Event***.

The following Cybersecurity related features are currently supervised:

- *Disabling* ***User Authentication***
- *Disabling* ***Image file Encryption***

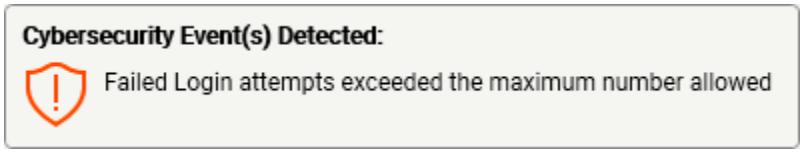
In addition to monitoring whether the cybersecurity related features are enabled, Classic can also identify other Cybersecurity-related events, including:

- When the consecutive number of failed login attempts exceeds the maximum of 5
- When a Critical update/patch is available for Jazz Classic

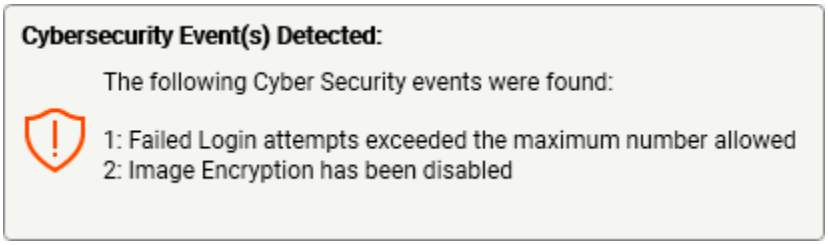
Cybersecurity Event Notification

If one or more of the Cybersecurity Events mentioned above are active, Classic will display a blinking Cybersecurity Event icon in the caption area to notify the users that something is wrong!

If the user moves the mouse cursor over the Cybersecurity Event icon, a popup window will automatically open, and a list of all active events will be displayed.



If multiple Cybersecurity Events are active simultaneously, the popup window will appear like the image below:



Cybersecurity Event Actions

When a user notices the blinking Cybersecurity Even icon, indicating an active Cybersecurity Event, they should follow these steps based on which events are active:

Event	User action required
Too many failed login attempts	Review the Audit Trail logs to determine when and why this Event was generated. Contact the Classic user with the user account where the failed login attempts happened and try to ascertain whether unauthorized personnel caused this event or if there are other valid reasons for this to have occurred.
Image Encryption disabled	Review the Audit Trail logs and determine whether this was done intentionally and by whom. Only System Administrator users have permission to disable this feature. Verify that this is permissible with regards to the Cybersecurity policies in place.
User Authentication disabled	Review the Audit Trail logs and determine whether this was done intentionally and by whom. Only System Administrator users have permission to disable this feature. Verify that this is permissible with regards to the Cybersecurity policies in place.
Critical software update available	Download and install all available security patches! This addresses potential Cybersecurity risks identified by Jazz Imaging.

System Administrators of Classic can clear the Cybersecurity Event list and remove the notification in the caption area by clicking the Cybersecurity Event icon  . This opens a new dialog where the System Administrator can click the “Yes” button to remove the Cybersecurity Event notifications until new events occur.

Cybersecurity Control Recommendations

To effectively manage security risks in Jazz Classic systems, it's imperative to consider the security of the complete IT system. The first-level security defense begins by securing the individual PC platforms where the Jazz Classic systems are running. This responsibility falls solely on the customers and is typically managed by designated IT personnel.

Please make sure to follow the best practices for Cybersecurity Control in the healthcare industry!

Cybersecurity Measures on the IT-system Level

The Jazz Classic applications will always be installed on PC equipment that is owned and operated by individual customers, and it is often the case that the PC's will be used for many purposes outside of Dental Imaging. Jazz Imaging has no control over which Cybersecurity controls are employed on these PCs by the customers and on how cybersecurity risks are mitigated daily.

However, Jazz Imaging urges all our customers to implement and maintain cybersecurity policies that are appropriate for the intended use environment.

The following list contains our recommendations for which cybersecurity control measures should be implemented, as a minimum, on all Windows systems where the Jazz Classic application is installed:

- Use of proper Windows user authentication and user authorization on all the PC's.
- Keeping the Windows OS updated with all available security patches and updates.
- Use of anti-virus/anti-malware software solutions/subscriptions that are updated regularly.
- Use of firewall is highly recommended, where only necessary ports/applications should be allowed.
- Regularly backup of the complete PC systems using 3rd party backup software so compromised systems can be restored. The backup of all patient and image data is especially important as well as securing and protecting the backup data when it is stored.

Each of these cybersecurity related controls will be described in more details below:

Windows User Authentication and User Authorization

It all starts with the user authentication on the Windows PC's! User Authentication and User Authorization is typically managed by trained IT professionals across the domain network.

It is highly recommended that the complete IT infrastructure is properly secured with user authentication for all individuals that have access to the systems. Individual users should not share credentials and passwords.

It is equally important that access to shared resources like network data shares is controlled appropriately with well-defined rules for assigning Read/Write/Modify permissions.

A few common mistakes include:

- Having multiple users utilize the same user credential and password to log into Windows.
- Granting all PC users "Full Access" to all shared resources.
- Making all PC users "local administrator".

Windows Update

It is very important to keep all PCs updated with all applicable security patches and updates. Windows 10 and Windows 11 will typically force all critical updates to be installed.

Anti-virus/anti-malware Software

We recommend that reputable anti-virus/anti-malware software is installed on all PCs in the system, and that the software is kept up to date with the latest virus and malware information.

Use of Firewall

We recommend always enabling a Firewall and allowing only necessary IP ports/applications through it. This primarily protects against cybersecurity attacks from outside of the local area network.

Scheduled System Level Backup

It is highly recommended that all systems are backed up regularly and that the backup media is securely stored, preferably off-site. This ensures limited data loss in case one or more PCs are compromised or in the event of a catastrophic hardware failure, requiring either PC replacement or system restoration after replacing hard drives.

Cybersecurity Measures Implemented in Jazz Classic

During the development of Jazz Classic, Threat Modelling and Cybersecurity hazard analysis have been conducted. As a result of these efforts, multiple Cybersecurity related features have been implemented to mitigate identified risks:

1. User authentication and authorization in Jazz Classic
2. Data Encryption.
3. Backup/restore database and image data.
4. Update/patching capabilities if vulnerabilities are discovered.

Each of these cybersecurity related features will be described in more details below:

User Authentication and Authorization in Classic

Jazz Classic utilizes role-based user authentication to primarily protect against unauthorized access to the Classic system and to control which users have access to specific features within the system.

You can ensure the User Authentication system in Jazz Classic is utilized properly by adhering to the following rules:

- Each person that uses Classic should be given their own personal user account.
- Strong passwords should be used, and the passwords should be updated regularly.
- Each person should be assigned the appropriate User Role to ensure proper authorization.

In general, users should only be granted access to the features that they must use in their day-to-day work with Classic.

If multiple consecutive failed login attempts are detected in Classic, or the User Authentication is disabled, a Cybersecurity Event will be generated, and the users will be notified by a flashing Cybersecurity Event icon  in the caption area. This warning will persist until a system administrator manually clears the Cybersecurity Events.

Encryption of Image Data

Classic encrypts all image data, so that in case of a data-breach of the image data storage, the images must be decrypted before they can be opened using standard image viewers.

The Encryption/Decryption process will also indirectly ensure the integrity of the individual image files, as it will not be possible to decrypt the encrypted image files if they have been tampered with.

If Image Encryption is disabled in Classic, a Cybersecurity Event will be generated, and the users will be notified by a flashing Cybersecurity Event icon  in the caption area. This warning will persist until a system administrator manually clears the Cybersecurity Events or the Image Encryption is re-enabled in the settings (see Image Acquisition Settings for more details).

Backup of Data

We recommend performing regular scheduled backups of the Jazz Classic data, either manually through Jazz Classic's built-in backup feature or by using the ***Backup Helper*** scheduling application installed with Jazz Classic.

All Classic data should be backed up at least once every month, but the optimal backup frequency will typically depend on how many exams are being added on a monthly or weekly basis.

The only limiting factors for how often a backup should be performed is the total amount of data being backed up and how long the backup operation takes.

For larger systems, it is generally advisable to utilize the Backup Helper application to automatically perform scheduled backup of the Classic Data during off-hours when no users are using the system.

Updating Jazz Classic

It is important to keep Jazz Classic up to date for multiple reasons:

- To address known cybersecurity vulnerabilities with critical patches
- To add new advanced features and functional improvements
- To install bug-fixes

Handling Critical Updates

Whenever Classic starts up, it will automatically check the Jazz Imaging update server for any updates available.

If any critical updates (such as cybersecurity patches) are available, Classic will treat this a severe issue. The users will be notified by a flashing Cybersecurity Event icon  in the caption area, and the warning will persist until all critical updates have been installed.

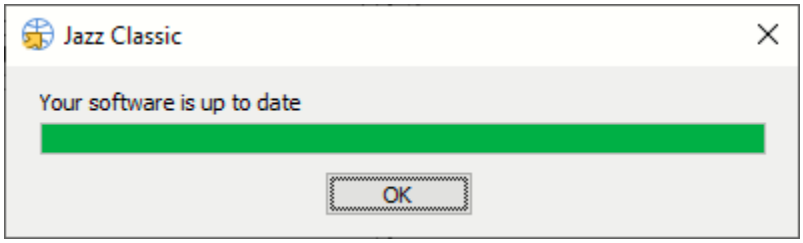
 Jazz Imaging will continuously monitor for known cybersecurity threats that are relevant to all the previously released versions of Jazz Classic! If a new vulnerability is detected, Jazz Imaging will address the issue as soon as possible and release a Critical update to its Update Server, and all Jazz Classic installations will automatically be notified about the update.

Manual Check for Updates

Users with System administrator roles will be able to manually check for updates directly from the Support section in the Settings dialog box (see Support Settings for more details).

If an update has been found, the administrator will be able to perform the update immediately.

If no updates are found, the administrator will receive the following message confirming that Jazz Classic is up to date.



Jazz Classic Bridge Interface

Jazz Classic supports multiple command line interfaces for implementing ***Bridge Integration*** from third party applications, typically from Practice Management Systems.

The basic functionality is always involves opening the Jazz Classic application and automatically selecting a specific patient from the Database. If the patient is not found in the Classic Database, the Patient will be automatically added to the database.

If the Classic application has already been opened previously, the existing instance will be selected and brought into focus instead of opening a new instance.

In Classic, you can choose between the following Bridge Actions:

1) Display the latest acquired Exam for the selected patient.
2) Initiate a new image capture session where the user only needs to select a Layout template.
3) Synchronize Patient Information data from the Practice Management Software.

Command Line Parameters

The Classic Bridge interface is implemented via command line parameters for the Classic.exe application executable.

The command line follows the following specification:

`Classic.exe <patient identification> [<optional command line parameters>]`

The `<patient identification>` command line parameter is mandatory and is used for either selecting existing patients or to be used for creating new patients in the Classic Database.

The `<patient identification>` supports multiple formats:

- `<PatientID>`
- `<LastName>,<FirstName>,<PatientID>`
- `<Patient Info file name>`

,where:

`<PatientID>` is the Unique Patient Identifier associated with the patient in the Classic Database

`<LastName>,<FirstName>,<PatientID>` is a comma-separated list of the Last Name, First Name and Unique Patient Identifier.

`<Patient Info file name>` is the name of an XML file that contains detailed patient information. The file name contains either the ***Full Path*** of the file, or if no path is specified, then the file will have to be placed in the ***Common Application Data*** folder (`C:\ProgramData\Jazz Imaging LLC\Classic\`).

Optional Command Line Parameters

The optional command line parameters determine the bridge interface action:

Command line	Action	Comments
/E	Show latest Exam	This will open and display the latest Exam for the selected patient.
/C [layout name]	Start new image capture. If the name of an existing Layout is specified after the /C command, then the specified Layout will be selected.	The name of an existing Layout is optional, and if the layout contains any "space" characters in the name, they will all have to be replaced by "underscore" characters '_' instead. Example: Layout name = "2 Horizontal Bitewings" will have to be selected using the name "2_Horizontal_Bitewings"

Command Line Examples

The following examples show how to use the Classic Bridge Interface.

Display Latest Exam Based on Patient Name and Identifier

```
"C:\Program Files\Jazz Imaging LLC\Jazz Classic\Classic.exe" Doe,John,2 /E
```

Display Latest Exam Based on Patient Information File

```
"C:\Program Files\Jazz Imaging LLC\Jazz Classic\Classic.exe" "PatientInfo.xml" /E
```

Start Image Capture Where User Must Select Layout

```
"C:\Program Files\Jazz Imaging LLC\Jazz Classic\Classic.exe" "PatientInfo.xml" /C
```

Start Image Capture Using the Standard FMX-18 Layout for Adults

```
"C:\Program Files\Jazz Imaging LLC\Jazz Classic\Classic.exe" "PatientInfo.xml" /C FMX_Adult_18
```

It is important to note that if the Patient Information filename or path contains any "space" characters, the command line parameter will need to be contained within a set of quotes!

Patient Info File Format

The detailed Patient Information file must conform to the following XML file format:

```
<?xml version="1.0"?>
<PatientInfo xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <FirstName>[FirstName]</FirstName>
  <LastName>[LastName]</LastName>
  <Identifier>[Patient Identifier]</Identifier>
  <Gender>[Gender]</Gender>
  <Address1>[Street Address]</Address1>
  <Address2>[Street Address – second line]</Address2>
  <City>[City]</City>
  <State>[State]</State>
  <Zip>[ZIP code]</Zip>
  <SSN>[Social Security Number]</SSN>
  <DOB>[Date of Birth]</DOB>
  <HomePhone>[Home phone number]</HomePhone>
  <CellPhone>[Cell phone number]</CellPhone>
  <WorkPhone>[Work phone number]</WorkPhone>
  <Email>[Email address]</Email>
  <Notes>[Notes]</Notes>
</PatientInfo>
```

All the fields marked with `[field name]` must be replaced with the actual data from the Practice Management Software. It is important to understand that the Classic Database fields will automatically be ***synchronized*** with all the data from the Patient Information file unless the individual field is marked as being ignored. If any of the fields are to be ignored, simply replace the field data with the **~** character.

If any field data is left empty in the XML file, the Classic Database will be updated accordingly, and any existing data in the database will be removed. By using the ignore character **~** instead, any existing data will be left unchanged!

This is an example of a Patient Information file for a patient named John Doe with the Patient Identifier "2". In this example, the patients email address, work phone number and notes will be kept unchanged (all marked with the character ~).

```
<?xml version="1.0"?>

<PatientInfo xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

  <FirstName>John</FirstName>

  <LastName>Doe</LastName>

  <Identifier>2</Identifier>

  <Gender>Male</Gender>

  <Address1>123 Main Street</Address1>

  <Address2>Apt. 3218</Address2>

  <City>San Jose</City>

  <State>CA</State>

  <Zip>95131</Zip>

  <SSN>123-45-6789</SSN>

  <DOB>12/24/1966</DOB>

  <HomePhone>+1 (408) 123 4567</HomePhone>

  <CellPhone>+1 (408) 234 5678</CellPhone>

  <WorkPhone>~</WorkPhone>

  <Email>~</Email>

  <Notes>~</Notes>

</PatientInfo>
```

The following fields are defined:

Field	Type	Comment
[FirstName]	Text string	First/Given name
[LastName]	Text string	Last/Family name
[Patient Identifier]	Text string	Unique Patient Identifier used in both PMS and Classic DB
[Gender]	Text string	M=male, F=female, 0=other or other text string like Male/Female/Other/…
[Address1]	Text string	Street address
[Address2]	Text string	Street address, second line
[City]	Text string	City name
[State]	Text string	State name. Either whole name or the abbreviated version.
[ZIP code]	Text string	Zip code of the city
[Social Security Number]	Text string	Social Security Number string (standard 9-digit format DDD-DD-DDDD)
[Date of birth]	Text string	Date of birth (using the convention of the currently selected culture in the Windows 10/11 OS)
[Home phone number]	Text string	Home phone number
[Cell phone number]	Text string	Cell phone number
[Work phone number]	Text string	Work phone number
[Email address]	Text string	Email address (must be correct format)
[Notes]	Text string	Optional patient notes.

Appendix A: Measurement accuracy and Calibration

The accuracy of measurements depends on multiple factors. Either the measurement calculations are based on prior knowledge about the ***pixel size*** and a model of the ***geometry*** of the scene, or whether the user decides to calibrate the individual images instead.

Option 1: Uncalibrated measurements

- Pixels size/pitch – typically measured in micrometers
- Correction for Geometric Magnification
- Sensor orientation relative to the X-ray radiation axis

Option 2: Calibrated measurements

- Calibration of individual images based on measurements of one or more objects with known sizes inside the images.

The two option has pro's and con's and it is up to the users to decide which option to choose:

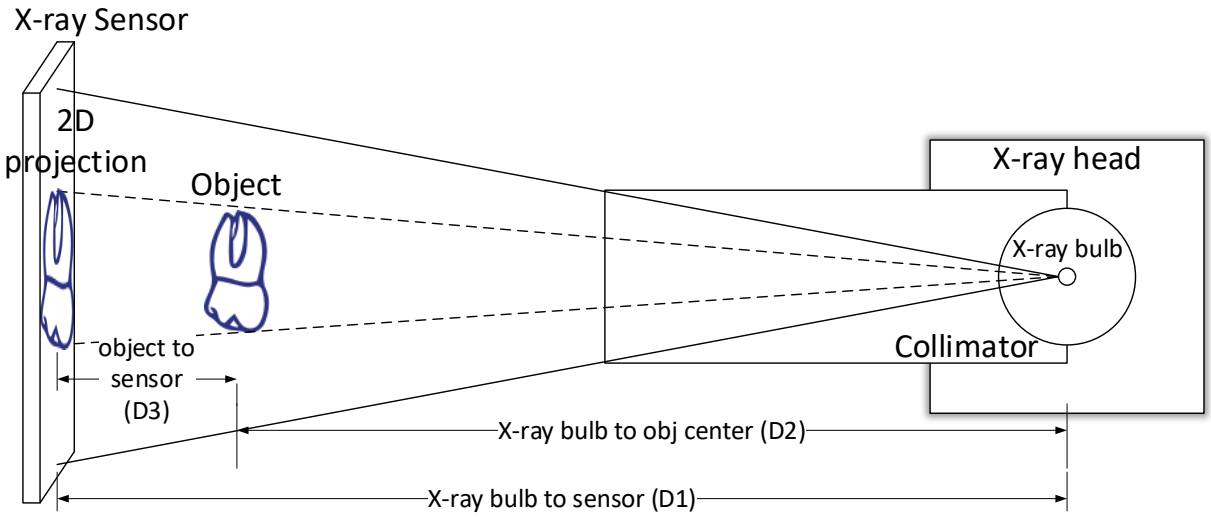
Option	Pro's	Con's
1: Pixel size and Geometric Magnification correction	Relatively accurate across image captures without the need to perform calibration on individual images – as long as the geometry is kept constant. Does not require any radiographic target in the images.	Assumes the sensor is placed perpendicular to the center of the X-ray radiation axis. Accuracy can vary if the geometry changes between captures.
2: Calibration of individual images	Very accurate if radiographic targets are placed correctly and the calibration is performed accurately. Can correct for sensor orientation variations where the sensor is not placed perfectly perpendicular to the center of the x-ray radiation axis	It is mandatory to have radiographic targets with known size placed within all images, and the distance from the radiographic target to the sensor should be identical to the distance from the object to the sensor.

Accurate measurements in uncalibrated images

Knowledge of the pixel size/pitch is normally not enough to make an ***accurate*** measurement because of the way the X-ray generators behave and how the images are being captured by the IO X-ray sensors.

X-ray generators typically emit the ionized radiation from the X-ray "bulb" located inside the X-ray generator head, and the radiation is then normally collimated by an extension tube that helps limit the amount of "stray" radiation hitting the patient.

But since the X-ray radiation is emitted from what can be thought of as a “point-source” within the X-ray head, then the image sensor will in turn create the images of the objects (like teeth and bone) as a two-dimensional “projection” onto the scintillator surface of the image sensor and this will result in Geometric Magnification as illustrated below:



The size of the 2D projection of any object will always be larger than the physical size of the object itself, and the amount of “geometric magnification” is proportional to the relationship between the distances between the X-ray point source and the object (D2) and the distance from the X-ray point source and the sensors scintillator (D1).

Pixel size/pitch

In general, accurate measurements requires that Classic knows the exact physical size/pitch of the individual pixels inside the IO X-ray sensor being used, and this information is typically automatically determined during image acquisition when Classic uses any of the “Direct Integration” (meaning non-TWAIN) acquisition plugins available, since the acquisition plugins is able to recognizes the IO X-ray sensor “make” and “model” when the images are being captured.

The following table shows the pixels size/pitch for IO X-ray sensor makes and models that are currently supported via Direct Integration:

Sensor make	Sensor model	Pixel size/pitch	Acquisition plugin
Jazz Imaging	SOLO/Minor	18.0 µm	Jazz X-ray Sensor
Dexis	Dexis Platinum	19.5 µm	Dexis Platinum/Gendex GXS-700 Sensor
Gendex	Gendex GXS-700	19.5 µm	Dexis Platinum/Gendex GXS-700 Sensor
Schick	Schick 33	15.0 µm	Schick CDR X-Ray
Sirona	XIOS XG Supreme	15.0 µm	Schick CDR X-Ray

However, if the pixel size/pitch is not known in advance, Classic allows the user to either manually specifying the pixel size/pitch (based on technical specification from the IO X-ray sensor vendor), or to "Calibrate" the individual images and thereby determine the pixel size/pitch and geometric magnification by measuring an object with a known size, and then let the user enter the known size of the reference object being used for calibration.

If the pixel size/pitch is unknown and no calibration has been performed, then the measurement distance is presented using "pixels" as the unit of measure. If a calibration is performed ***after*** one or more measurements have been performed, then all the measured distances will automatically be changed from the unit of "pixels" into the proper measurement distance in millimeters.

Correcting for the Geometric Magnification

Since the amount of Geometric Magnification is proportional to the relative distances from the X-ray point source to the sensor (D1) and distance from the X-ray point source to the object (D2), then it is relatively easy to correct for this distortion by simply measure these distances, and then try to keep them constant across image captures.

The magnification factor x can be calculated as:

$$x = \frac{D1}{D2} = \frac{D1}{D1 - D3}$$

The distance D1 is typically around 10 inches (around 25.4 centimeters) and the distance between the sensor and the teeth, D3, will typically be around ½ inch (around 1.25 centimeters) so the typical geometric magnification will be:

$$x = \frac{25.4cm}{25.4cm - 1.27cm} = 1.0526$$

So, to correct for this geometric magnification x, then the calculated pixel length will have to be divided by this magnification factor in order to get the corrected length:

$$l^{corrected} = l \times \frac{25.4cm - 1.27cm}{25.4cm} = l \times 0.95$$

The distances $D1$ and $D3$ can be easily adjusted in the Classic Settings so they fit with the typical geometry used in the individual dental practices. The key to achieving accurate measurements is to keep the geometry consistent across the image captures.

Sensor orientation relative to the X-ray radiation axis

If the IO X-ray sensor is rotated and hence is no longer perfectly perpendicular to the X-ray radiation axis when the image is captured, then there will be considerable magnification of the "2D projection" of the object in either the horizontal or the vertical directions (or both).
So, to make measurements as accurate as possible without the need for two-dimensional calibration, it is very important to ensure that the sensor is kept perpendicular all the time!

The IO X-ray sensor holders are great tools to help keep the distance from the X-ray source to the sensor constant across images captures. They also help with keeping the X-ray sensor perpendicular to the X-ray radiation axis which in turn minimizes the errors that stem from rotation of the sensor.

Measurement Calibration

Most of the IO X-ray devices that are supported by Jazz Classic have a well-known pixel size/pitch that is automatically recorded when the images are captured. However, if for instance an image is captured from a TWAIN Data Source where the sensor type (and subsequently the pixel size) is unknown, the user will have to perform a Measurement Calibration before accurate measurements can be performed.

Another typical reason for performing a calibration is that the ***Nominal Distance*** measurements rely on the sensor to be placed ***perfectly perpendicular*** to the X-ray generator head (collimated X-ray radiation axis), which is not always possible (especially when no sensor holders are used during the image acquisition!). If the sensor is slanted relative to the collimated X-ray radiation axis, the objects will appear a little larger than the actual size of the object and the distance measurements will be slightly too large as well.

Finally, the geometric magnification will have to be corrected - just like in uncalibrated measurements described in the previous chapter.

To correct for either an unknown pixel size/pitch, geometric magnification or a possible sensor slant, the user will have to include an object of a well-known size within the image and then perform a calibration on the image. Stainless Steel Radiographic Marker Balls with a diameter of 5.00mm are typically used for calibration because they can be used in both vertical and horizontal directions without needing to be oriented in any specific way within the image.

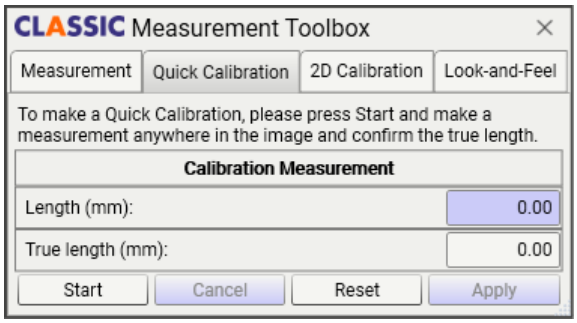
The calibration process then generally involves measuring the well-known sized object, and the user then types in the “real” size of the object. Jazz Classic calculates the calibrated pixel size accordingly for this specific image, and all current and subsequent measurements utilize this calibrated pixel size within the image.

NB: It is very important to place the reference object at the same distance from the sensor as the objects that are being measured! Or else the calibration will be incorrect! This is normally achieved by incorporating the reference object into surgical stents.

Quick Calibration

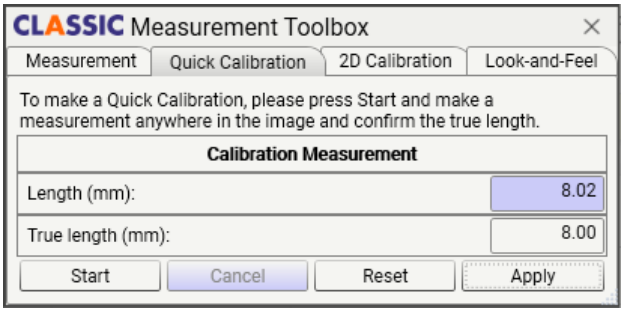
If the sensor is placed ***perfectly perpendicular*** to the X-ray radiation axis, then a Quick Calibration will be sufficient to calculate the pixel size/pitch and the geometric magnification from a ***single*** measurement in the image. ***This can normally be achieved by using the IO X-ray holders whenever images are taken!***

To start a new Quick Calibration, select the “Quick Calibration” tab in the Measurement Toolbox window.

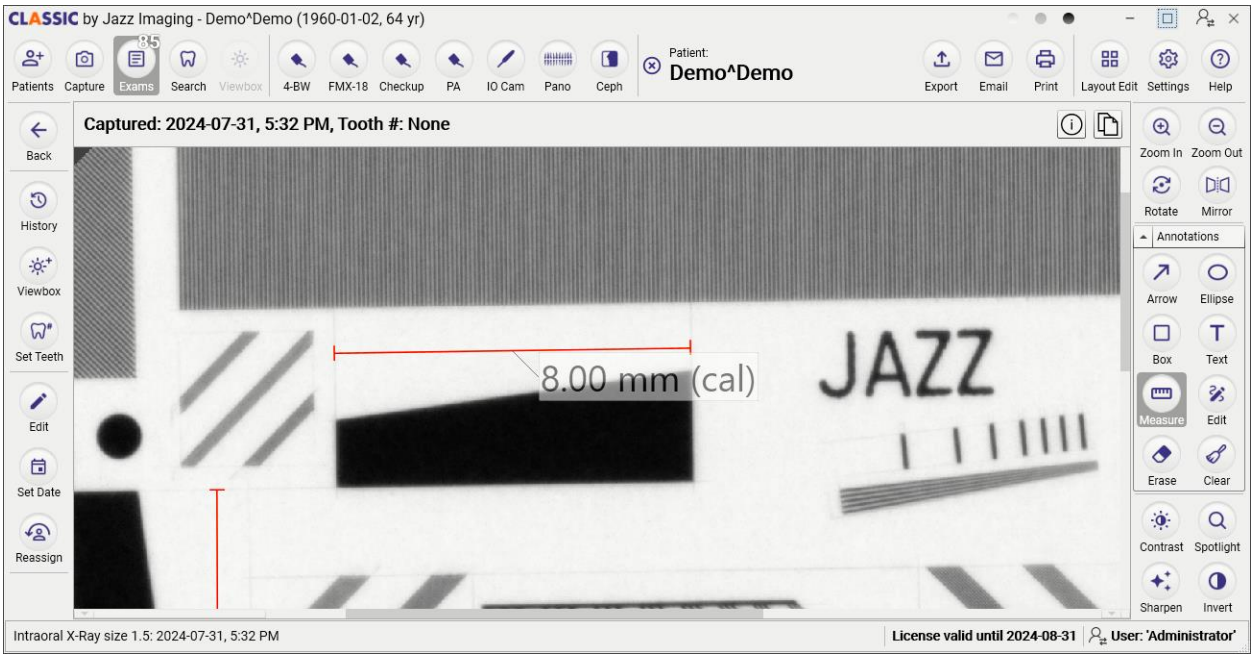


Click the Start button and perform a simple measurement of an object with a well-known size.

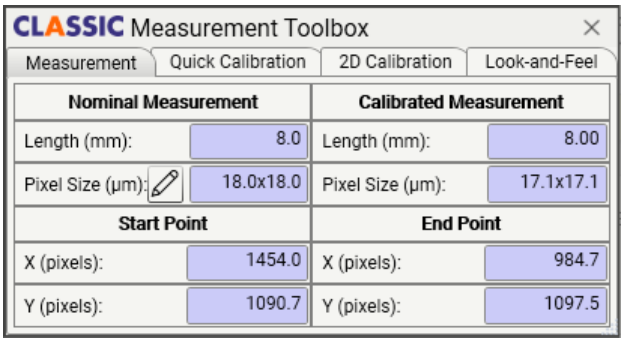
The following example shows a Quick Calibration where the measured distance is “corrected” from the nominal distance of 8.02 mm to the real size of the object which is 8.00mm



The calibration is finalized when the Apply button is pressed, and all the measurements are displayed with the distance based on the new calibrated pixel size, marked with the text “(cal)” after the distance.



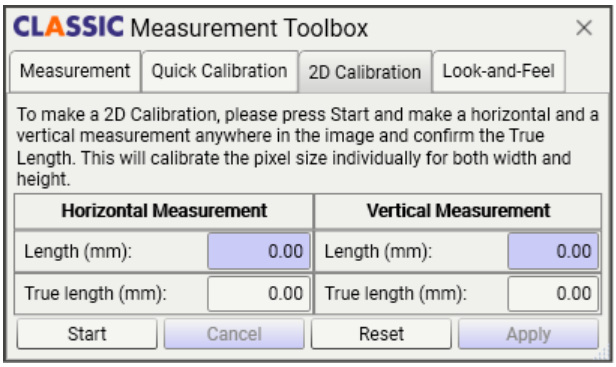
The new calibrated pixel size and measurement will now be shown in the Measurement Toolbox window next to the nominal pixel size and measurement.



2D Calibration

If the sensor on the other hand is not perfectly perpendicular to the X-ray source, then a 2D Calibration will be needed to handle the possibility that the amount of sensor slant is different in the horizontal and vertical directions.

To start a new 2D Calibration, select the “2D Calibration” tab in the Measurement Toolbox window.



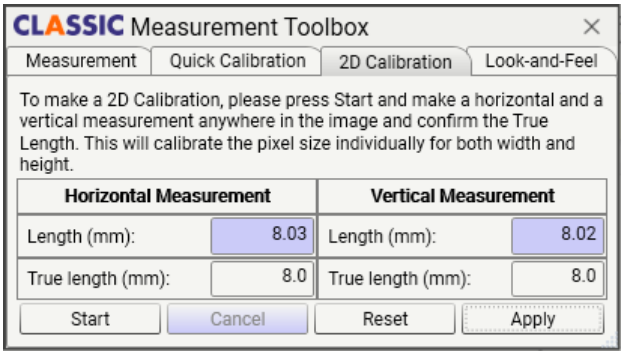
The calibration now requires ***two*** separate measurements (one horizontal and one vertical) to calculate the calibrated pixel size in both directions.

Click the Start button and perform a **horizontal** measurement of an object with a well-known size. Enter the True length in the text box on the left-hand side.

Next, perform a **vertical** measurement of an object with a well-known size and enter the True length in the text box on the right-hand side.

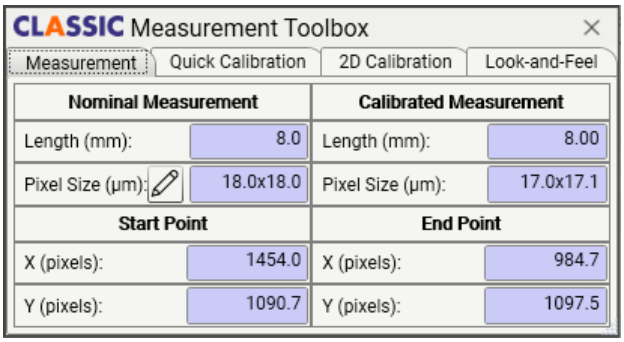
Finally, click the ***Apply*** button to perform the calibration calculations.

The following example shows a 2D Calibration where the measured horizontal distance is “corrected” from the nominal distance of 8.03 mm to the real size of the object which is 8.00 mm, and the measured vertical distance is “corrected” from the nominal distance of 8.02 mm to the real size of the object which is 8.00 mm.



On the Measurement tab, you can now see the calibrated pixel size is no longer identical in the horizontal and vertical directions (17.0µm by 17.1µm) so the calibrated measurements will be based on this size instead of nominal pixel size (18µm by 18µm).

The figure below shows that the Calibrated Measurement is somewhat shorter than the Nominal Measurement since the calibrated pixel size is smaller.



Radiographic Balls with a diameter of 5.00mm are typically used for 2D calibration since they can be used for calibration in both vertical and horizontal direction without needing specific orientation within the image. If the sensor is slanted in any direction, the Radiographic Balls will no longer appear as perfect circles but instead as ellipses!

Measurement Accuracy

The ***achievable*** accuracy of measurements depends greatly on the accuracy of everything from how precisely the measurement points are placed, to the precision of the geometric magnification distances values and the precision of the calibration of the images.

However, there are ways to improve the measurement accuracy by simply being consistent with the way the X-rays are captured – typically simply by using the IO X-ray holders.

Accuracy of uncalibrated measurements

The biggest sources of error in uncalibrated measurements are:

- Accuracy of the Geometric Magnification correction distance values
- Keeping the sensor perpendicular to the X-ray radiation axis

The following table contains estimates of typical variation in Geometric Magnification correction:

Error sources	Using holders	No holders
Distance from X-ray source to sensor	+/- 0.5 inch variation in D1	+/- 1 inch variation in D1
Distance from object to sensor	+/- 0.125 inch variation in D3	+/- 0.25 inch variation in D3
Estimated accuracy	Up to ~1.7% error	Up to ~3.5% error

The estimated accuracy Geometric Magnification correction above assumes that the sensor is perpendicular to the X-ray radiation axis.

When sensor holders are used then it is possible to achieve higher accuracy because it is possible to control the sensor location (relatively to the teeth) more accurately as well as avoid the rotation of the sensors relative to the X-ray radiation axis.

When measurements are being made in ***uncalibrated*** images, it is ***highly recommended*** to utilize the X-ray sensor holders and try to maintain a ***consistent*** distance between the X-ray head (typical the end of the collimator tube) and the sensor/holder/patient cheek across all captures!

Accuracy of calibrated measurements

The biggest sources of error in calibrated measurements are the precision of the calibration distance measurement values performed on the image as well as any difference in distance between the reference object and the objects that are being measured.

The precision of the calibration distance measurements is typically limited by the pixel size/pitch in the images and the ability of the user to determine the location of the "edges" of the reference objects. And the physical size of the reference object is very important. This measurement precision is typically around +/- 2 pixels.

Since the normal pixel size is in the range of 15 micrometers to 20 micrometers, and a typical size of the reference object is around 5.00 millimeters, then a typical calibration precision error is less than ~0.1%.

Two-dimensional calibration will be able to correct for rotation of the sensor in both axis whereas the Quick Calibration will rely on the sensor being perpendicular to the X-ray radiation axis. So, when using the sensor holders, Quick calibration would in most cases be sufficient in order to achieve high precision measurements, and consequently it is recommended to always perform 2D calibration if no holders are being used during image capture.

Technical Setup

Jazz Imaging offers free technical setup assistance to ensure everyday users of our program have an in-depth understanding of the tools and functions available to them during their workflow. We also aid in configuring advanced options related to the following:

- User Administration Settings
- System Security Settings and Permissions
- Secure Logging and Audit Trail Configuration
- Database Management and Utilities
- Customizing Layout Definitions
- Hardware Options
- Setting Default Options, Toolbars & Toolboxes on All Computers

For any inquiries or questions, feel free to reach out to Jazz Technical Support at +1 (567)-234-5299 or via email at support@jazzimaging.com