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SMARTDent

User Manual

RUG-400-EN

Rev. 3.1

This user manual provides information for proper use of SMARTDent. Users should read this manual carefully before using the product.

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This manual is subject to change without prior notice.

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Program Introduction

1

1 Program Introduction

SMARTDent V3 provides the function to efficiently manage CT, panorama, cephalometric, intraoral sensor images and intraoral camera images acquired using X-ray imaging equipment of Ray Co., Ltd. and performs various image analysis according to the diagnostic purposes.

1.1 Program Highlight

- ✓ **Fast and Stable Network Environment**

  Through the DBMS (Database Management System), you can check the image with SMARTDent from any PC in the dental clinic, and the high-speed TCP / IP transmission technology is applied to save and view the images faster than before.

- ✓ **Intuitive User Interface**

  Designed UX/UI based on the user experience, you can quickly select the desired function, and through the interface deployed from left to right and top to bottom, we have made it easy for anyone to learn and use the function.

- ✓ **Easy and Powerful Image Analysis**

  It supports various multi-view formats to compare images before and after treatment efficiently. You can configure the image viewing screen any way you want, and you can set the image type of each screen in advance to check the image you want by selecting the multi-view without selecting the image. In addition, if you use the image comparison function and adjust one image, the comparison image is changed together so that you can compare images with minimal manipulation.

- ✓ **Various and Convenient Function**

  Various conveniences available in the new version, such as moving images between patients, modifying image information such as image type, location, and length information, viewing image profiles such as 3D software, memo function to check contents before checking images, and capture function. In addition, the implant simulation allows you to display fixtures at your desired location with just two-point input and it supports the drawing of the mandibular canal.

- ✓ **Improved Printing Function**

  You can print with various multi-views of image view, and you can compose and print the image in the form you want. You can also add comments and use various image information display functions to organize the page and save it as a pdf or jpg file for use as a report.

- ✓ **Image Import/Export Improvement**
  You can conveniently select functions according to your workflow, such as importing images by selecting a patient, exporting multiple images from a list of images, and exporting images you are viewing.
- ✓ **Easy and Convenient Installation**
  The new SMARTDent makes server installation very easy and allows you to link digital solutions without installing RAYDENT Connect. You can use both the acquisition and diagnostic functions by installing SMARTDent without having to install RIOView, RIOScan, and RIOSensor software, and you can conveniently view images using a web viewer.
- ✓ **PACS Integration and DICOM 3.0 Compatibility**
  In SMARTDent, you can search the acquisition request list (MWL, Modality Worklist) which registered in PACS and send the acquired image to PACS (DICOM Storage SCU). DICOM files created by this software support DICOM 3.0.
- ✓ **Digital Solution Integration**
  The process from Impression CT imaging to the production of digital imaging devices can be performed more conveniently with SMARTDent, and the output can be efficiently managed.

1.2 Operating Environment

The table below shows the minimum and recommended specifications for PC to operate SMARTDent.

Item	Minimum Requirement	Recommended Requirement
CPU	Intel Pentium 4 or higher	Intel i5 2.0GHz (7th Gen.) or higher
RAM	1GB or higher	8GB or higher
Resolution	1024 X 800	1920 X 1080
Video Card	128MB Video RAM	512MB RAM
Operating System	Windows 7 Home 32bit	Windows 10 64bit

1.3 System Configuration

SMARTDent and Ray Co. Ltd X-ray imaging equipment can be configured as follows.

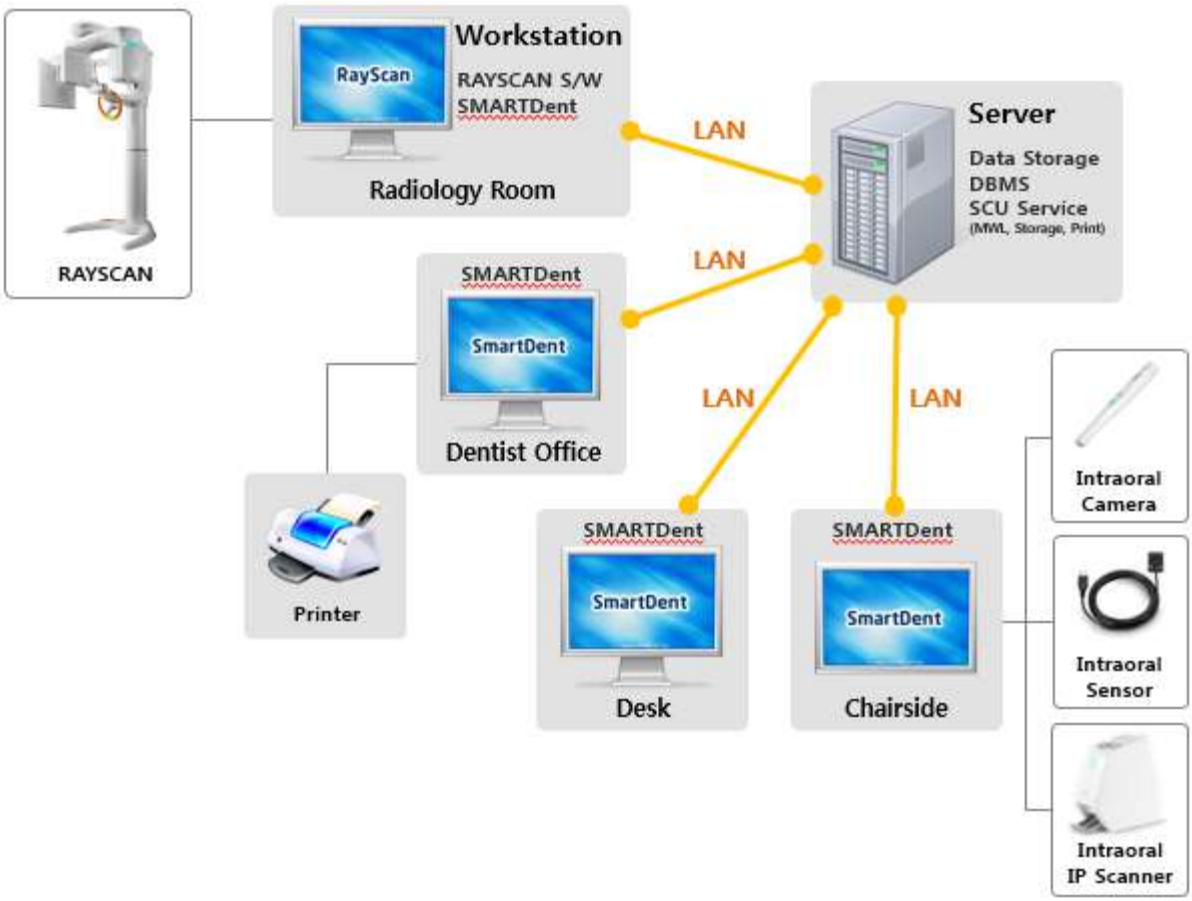


Fig 1 SMARTDent Software System Configuration

SMARTDent exchanges data using TCP / IP method with database and file server. Using RAYSCAN software, you can search acquired CT, panorama, and cephalometric images, and it supports the function of acquiring images from RIOScan, RIOSensor, USB intraoral camera, and imaging devices that support TWAIN, saving them to the server, and querying them.

Patient and image information can be searched and diagnosed / analyzed on all PCs with SMARTDent installed in the office network environment, and image analysis information entered using SMARTDent can be viewed on any PC.

Printing of images using a connected printer is possible, and PACS interworking is supported using the server's MWL, DICOM Storage, and DICOM Print SCU services.

In addition, you can use Impression CT image inquiry and STL conversion for interlocking ray digital solutions, software to make treatment devices, and 3rd party software.

1.4 Software Configuration

SMARTDent V3 is designed to provide users with a consistent user interface based on the user experience, making it easier and more intuitive to learn and use the software. The functions are deployed from left to right as a whole, the main selection functions, image view adjustment and option setting functions are displayed in the left tool menu, and other menus are displayed in the upper tool menu.

1.4.1 Starting Screen

When the SMARTDent software is launched, the [Patient] tab is displayed as shown below. From the far left, the screen is structured in the order of “function selection”, “patient search”, and “patient image”. When the program starts, the patient is automatically searched and displayed according to the last used patient search condition before the program ends.

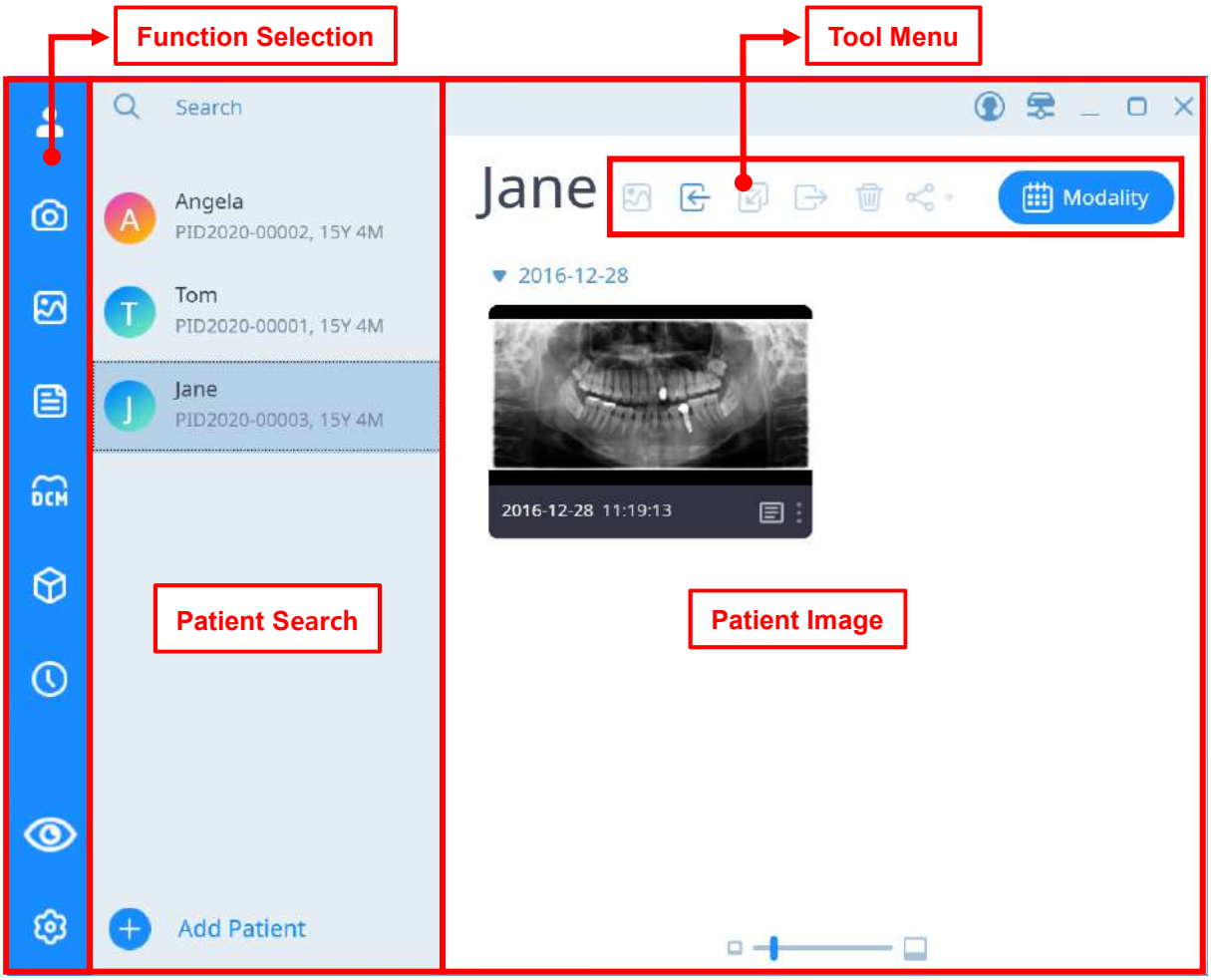


Fig 2 Starting Screen

The functions provided by the function selection are shown in the table below.

Icon	Item	Description
	Patient	This page is for managing patients and images.
	Acquisition	This is a page that acquires images of selected patients.
	Image	This is a page to diagnose / analyze the image of the selected patient.
	Report	It is a page that organizes pages and prints / saves / sends e-mails.
	DICOM	This is the page to search PACS acquisition list (MWL) and send video.
	Digital Solution	This page is for checking digital solution images and linking them to the digital solution program.
	Statistics	Check the patient's acquisition list and statistics of modality-specific acquisition records.
	View Patient	Select Show/hide patient search list.
	Setting	Software settings page.

Notice	SMARTDent provides the ability to show / hide the patient search list to prevent unnecessary exposure of personal information from the patient search list to others.

You can search for patients by selecting the patient search window and entering a name or chart number. If you select the patient search window, a window where you can set the detailed search condition is displayed as shown in the figure below, where you can search for the patient with the desired condition without entering a name or chart number.

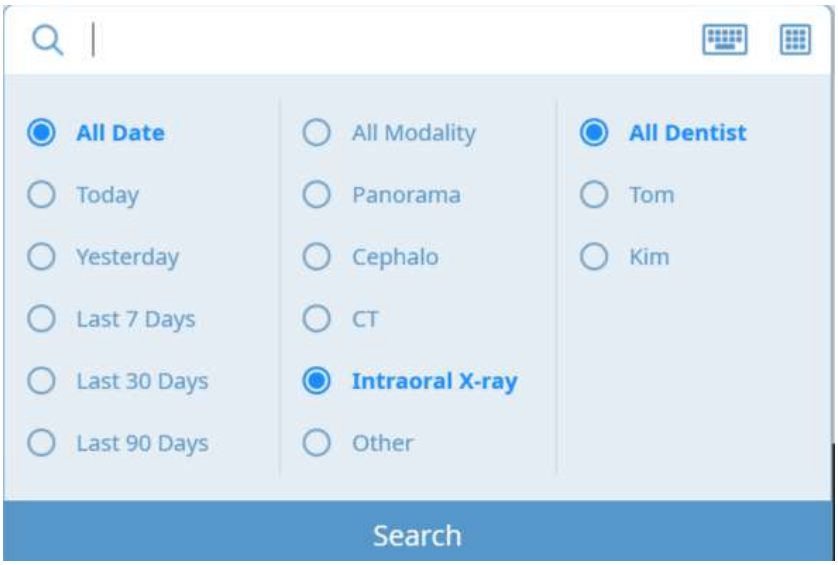


Fig 3 Detailed Patient Search Criteria

If a patient is selected after the patient list corresponding to the search condition is displayed, the image thumbnail of the patient is displayed on the right. Patient images can be checked by modality (image type such as panoramic or intraoral sensor) or by date.

You can import images using the tool menu function, or select one or multiple images using the mouse and use functions such as viewing images, moving images, exporting, deleting, and linking other programs.

1.4.2 Acquisition Screen

SMARTDent supports RAYSCAN integration to acquire CT / Panorama / Cephalometric images, Intraoral image acquisition with RIOScan, RIOSensor, intraoral USB camera image acquisition and TWAIN. In addition, you can request to acquire a CT / Panorama / Cephalometric image from the chair by using the registration method (MWL) on the DICOM page.

Notice	On the DICOM screen in RAYSCAN Workstation, you can select the acquisition request list (MWL) registered in PACS to take an image, and in the chair, CT / panoramic / cephalo acquisition request list (MWL) so that you can select and acquire on the workstation where RAYSCAN is installed as well as registration. For more information, please refer to 8. DICOM.

The acquisition screen consists of a menu panel and a screen that displays the captured image, as shown below.

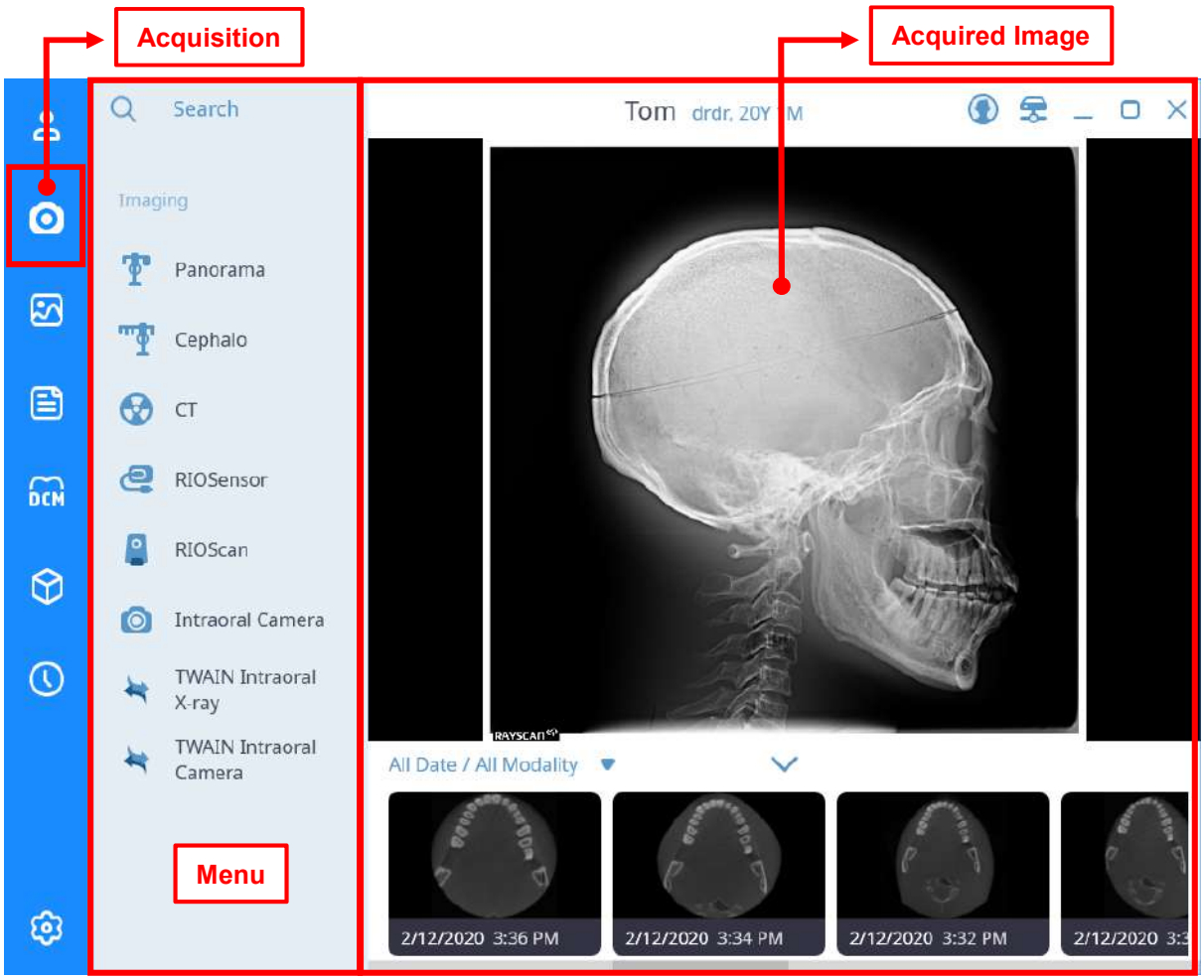


Fig 4 Acquisition Screen

In the menu panel on the left, for a PC with RAYSCAN scanner program is installed, the CT/Panorama/Cephalometric modality will be displayed automatically, and other modality will display the items selected in Settings.

After selecting the modality on the left, when the acquisition is completed, the saved image is displayed as the main screen and thumbnail image list of the acquired image as shown above.

If you select the RIOScan, RIOSensor, Intraoral Camera, TWAIN menu, the small device modality is displayed as shown below. Due to the difference in functions, the small device modality is displayed differently, and the RIOSensor acquisition screen is shown in the figure below.

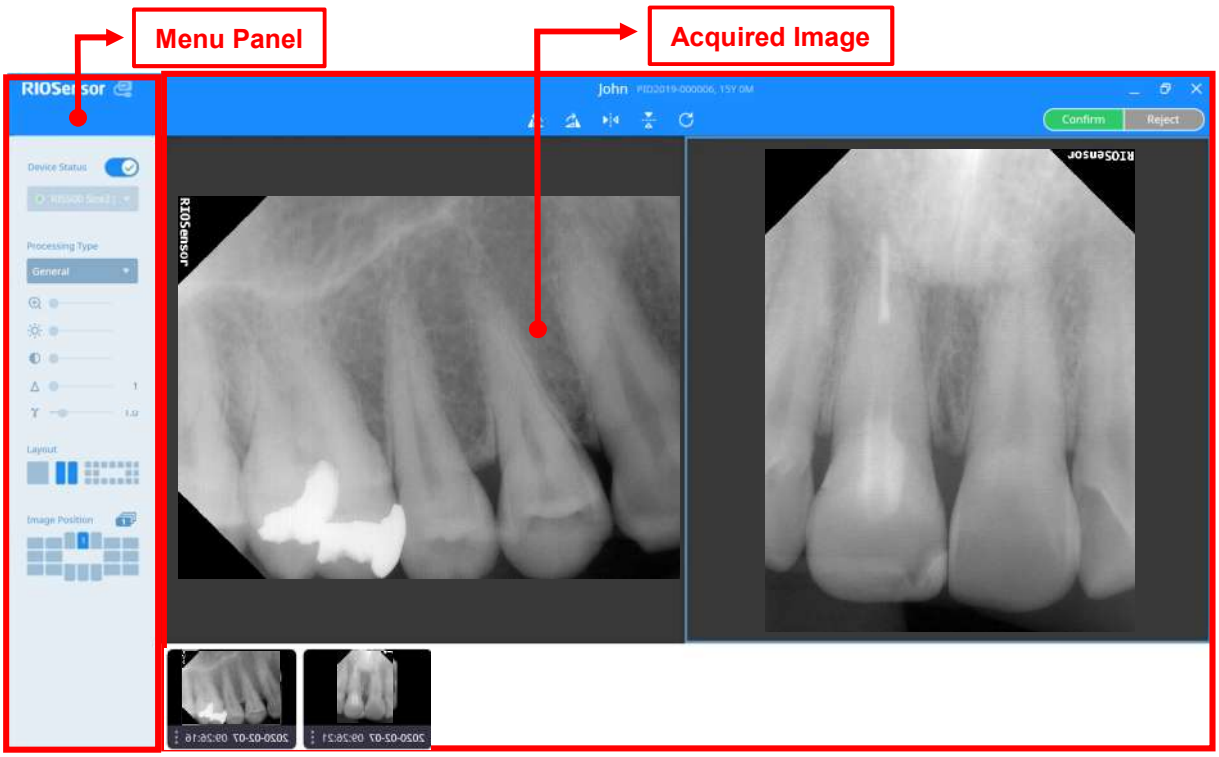


Fig 5 RIOSensor Acquisition Screen

At the top of the menu panel on the left is a menu that displays device status and allows you to change it. In addition, the menus for the image filter, image adjustment, layout, image position display, and acquisition order setting functions are displayed. SMARTDent provides FMX View for X-ray sensor image acquisition or single screen and two split screen for ease of use.

Notice	If you use a single screen, you can check the saved image larger, and if you use the 2 split screen, you can conveniently compare the newly acquired image with the previous image.

Notice	The new version has no default acquisition order, and supports the ability to create and select the desired acquisition order.

1.4.3 Image Viewer Screen

The image viewer screen consists of the menu panel on the left, the tool menu at the top of the patient image, the image screen, and a thumbnail list.

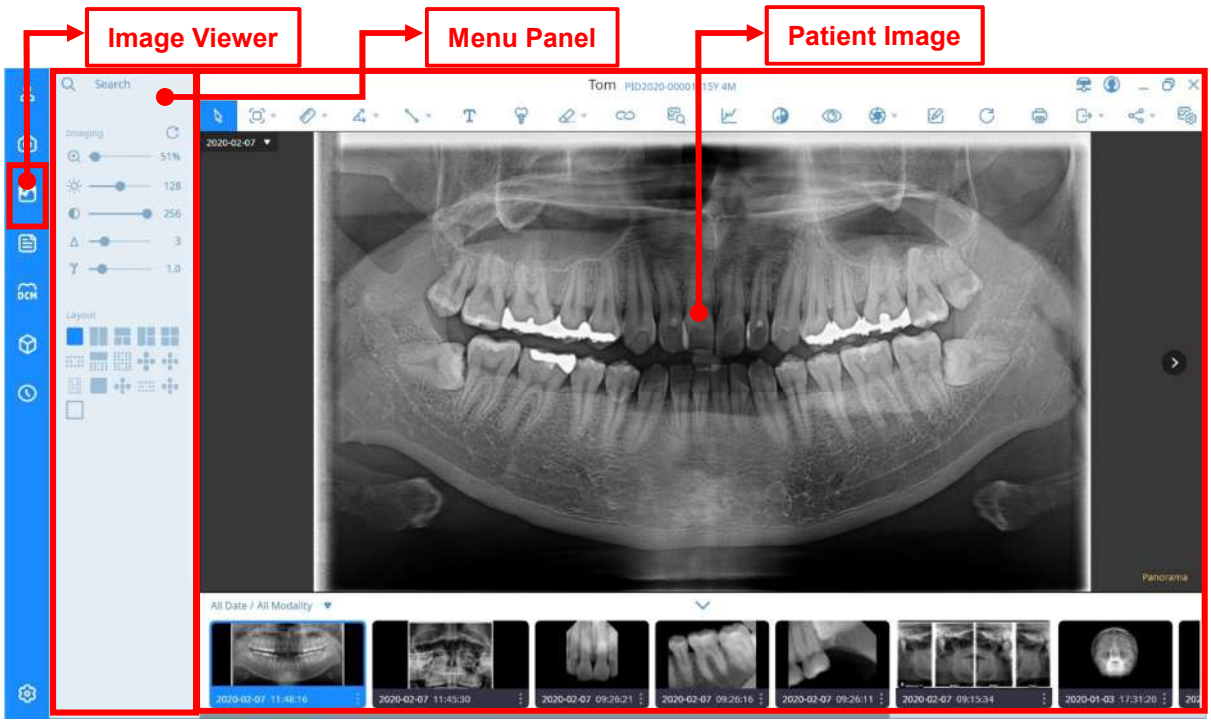


Fig 6 Image Viewer Screen

The menu panel consists of options for patient search, image adjustment (zoom, brightness, contrast, sharpness, gamma), layout selection, FMX position display, and tool menu functions.

On the image screen, you can change the image by selecting the date or left / right move buttons at the top left or double-clicking the thumbnail image at the bottom or doing drag & drop to check the video you want.

You can select the desired function by selecting the tool menu at the top of the patient image. If you select ▼ of the tool menu, you can change the tool menu to the desired function among the detailed functions. If you right-click while using the tool menu, the selected function is released and the “Select” function is selected.

The thumbnail list at the bottom of the patient image allows you to quickly find the desired image by selecting modality or date.

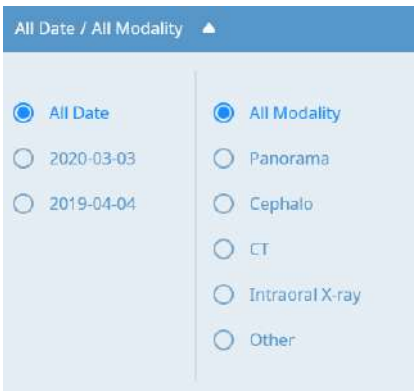


Fig 7 Detailed Image Search Condition

1.4.4 Report Screen

Selecting print button at image view or selecting “Report” from the left function selection panel, the report screen is displayed as shown below. After organizing the page in the form you want, you can print it, save it as a pdf or excel file, and send an email by attaching the created page.

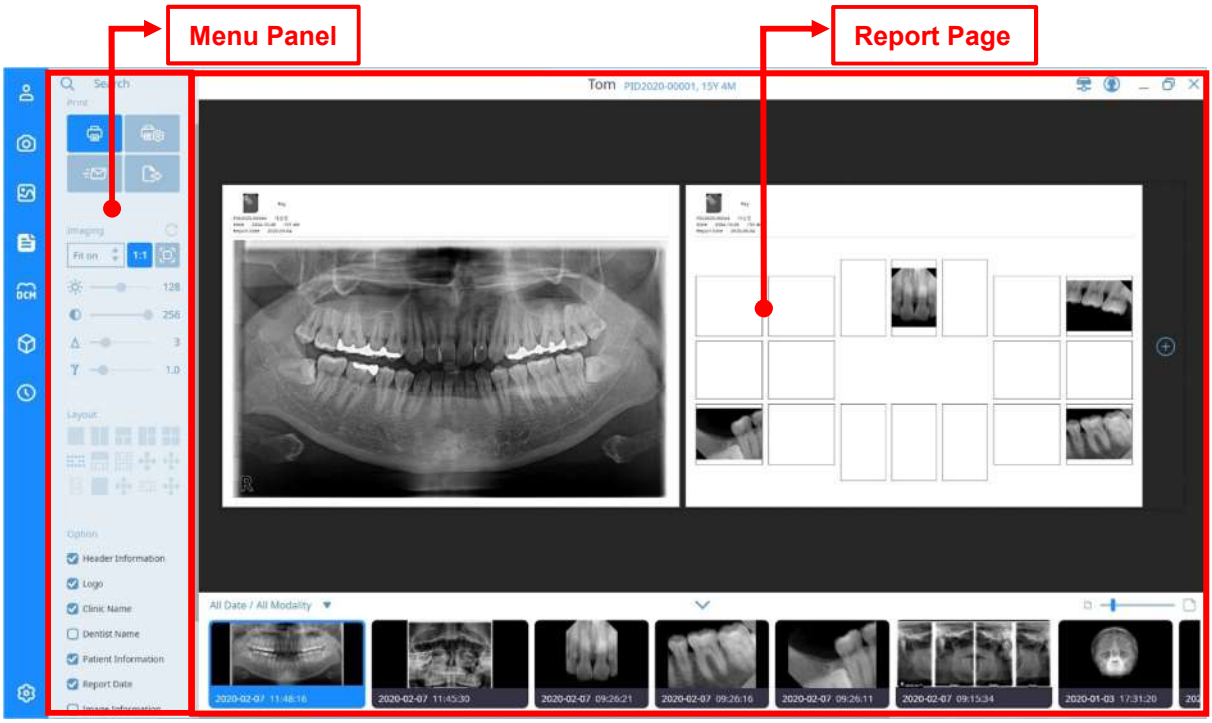


Fig 8 Report Screen

The menu panel consists of patient search, print configureation, print settings (magnification, image adjustment), layout, and print options for displaying clinic, patient, and image information.
You can compose the image in a desired form, select Comment to add diagnostic information about the image, and set options to display hospital information, patient information, and image information. You can organize multiple pages using Add Page, and when the page configuration is complete, you can perform any of the Print, Send Mail, and Export functions at the top of the menu panel.

Notice	If the brightness, contrast, sharpness, and gamma information in the report is modified, it is applied only to the report to print and save the created page, not to the original saved image.

Program Installation

2

2 Program Installation

After executing “Setup.exe” of the software installation package, if the screen below appears, select “Server” for the server PC and “Client” for the PC on which you want to install SMARTDent, and then select [Install] button.

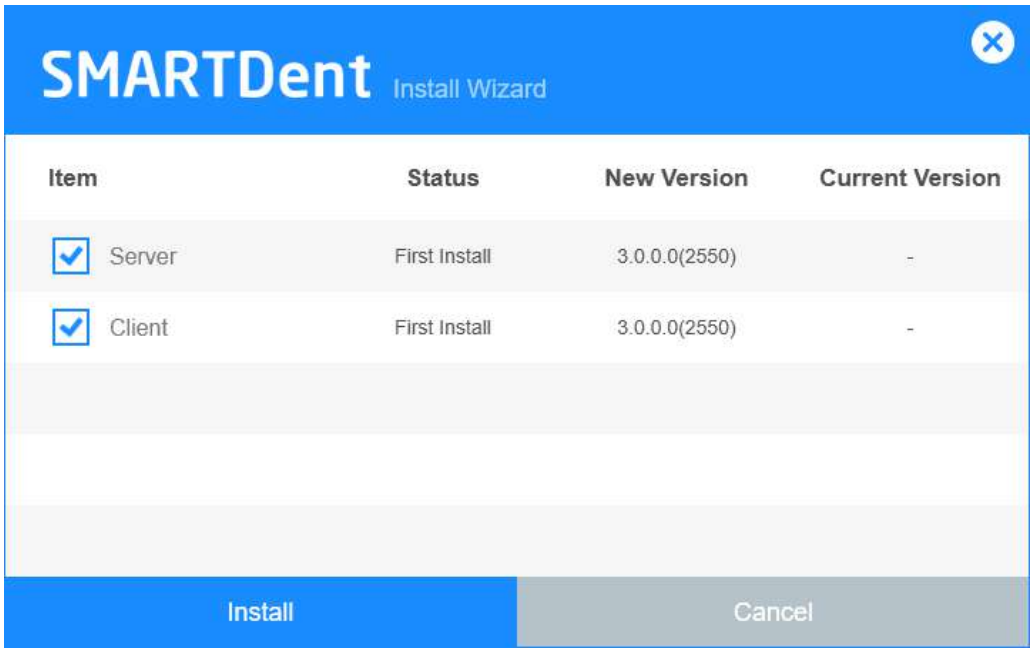


Fig 9 Program Installation Start Screen

Select the disk where the database file will be saved and select [Next] button.

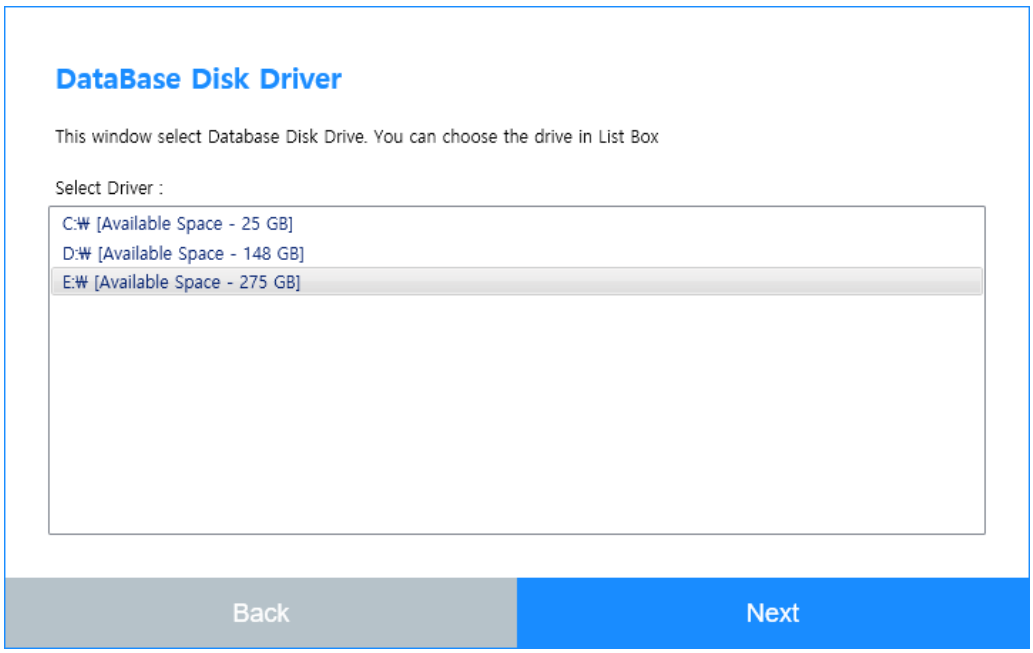


Fig 10 Select Database File Location

PostgreSQL, Visual C ++ Redistribution, etc. must be pre-installed to use SMARTDent. PostgreSQL takes a few minutes to install. Please wait a moment.

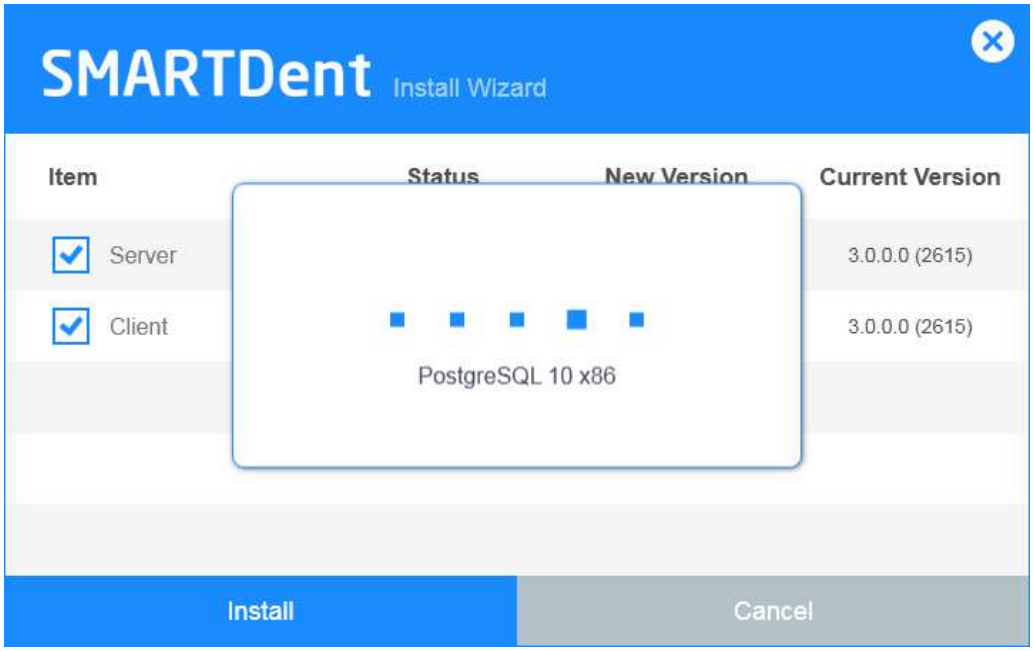


Fig 11 PostgreSQL Installation Screen

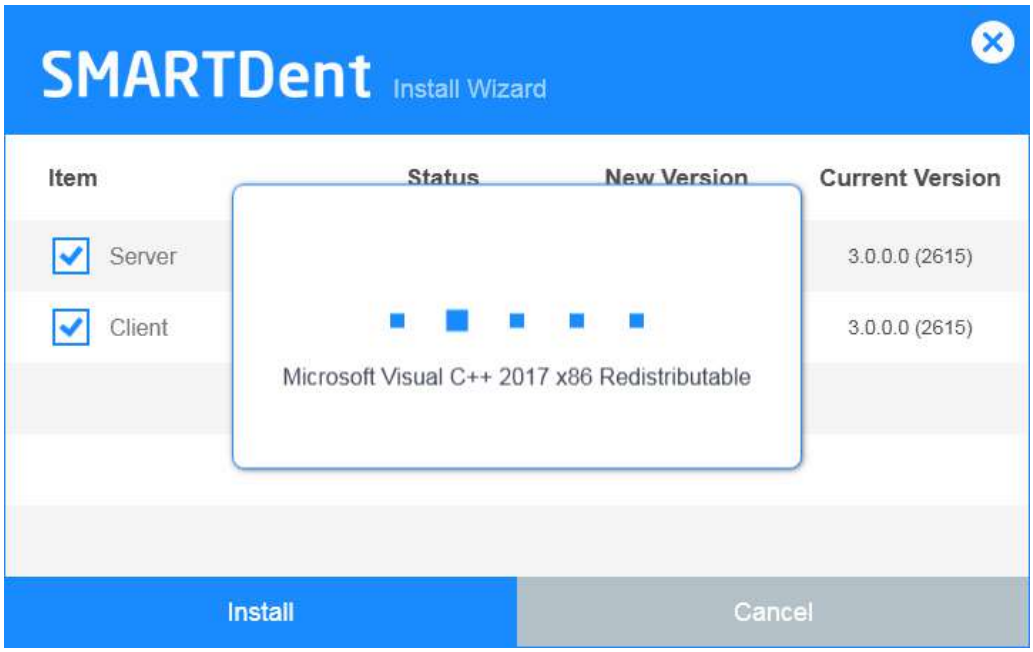


Fig 12 Visual C++ Redistributable Installation Screen

If SMARTDent V3 Server is selected, the installation is automatically executed as shown below. Please wait a moment.

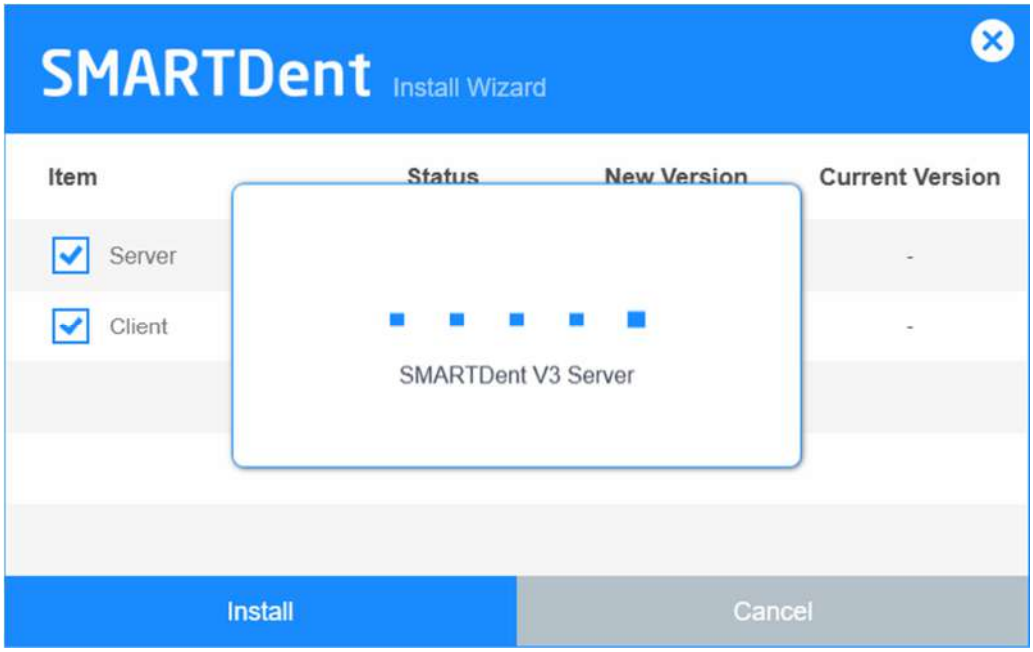


Fig 13 Server Installation Screen

If Client is selected, SMARTDent V3 is installed as shown below. Please wait a moment.

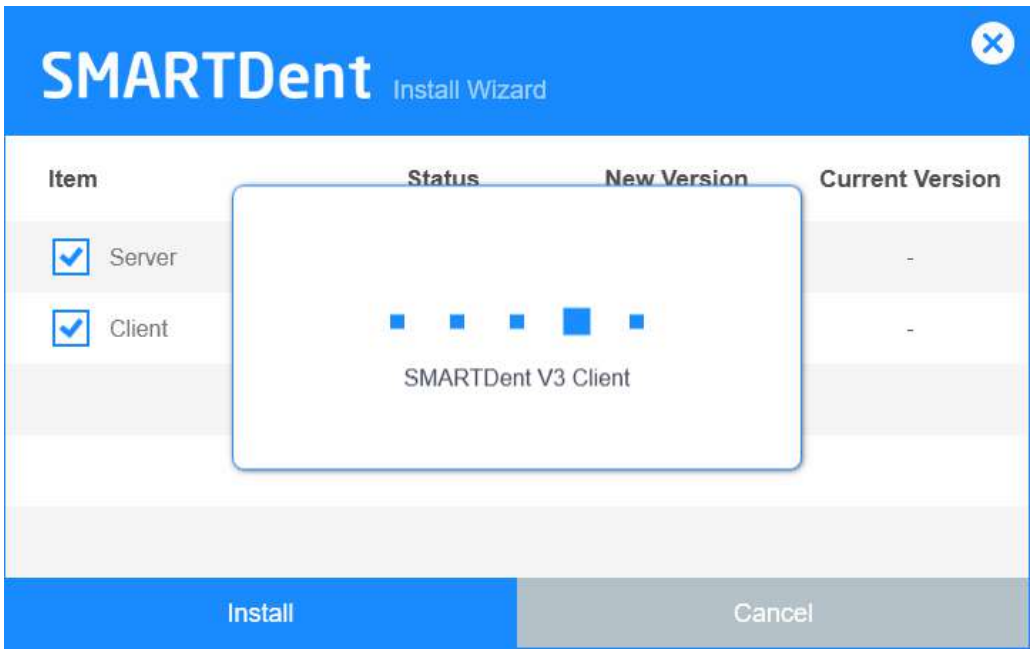


Fig 14 Client(SMARTDent V3) Installation Screen

Check if the program is installed normally.

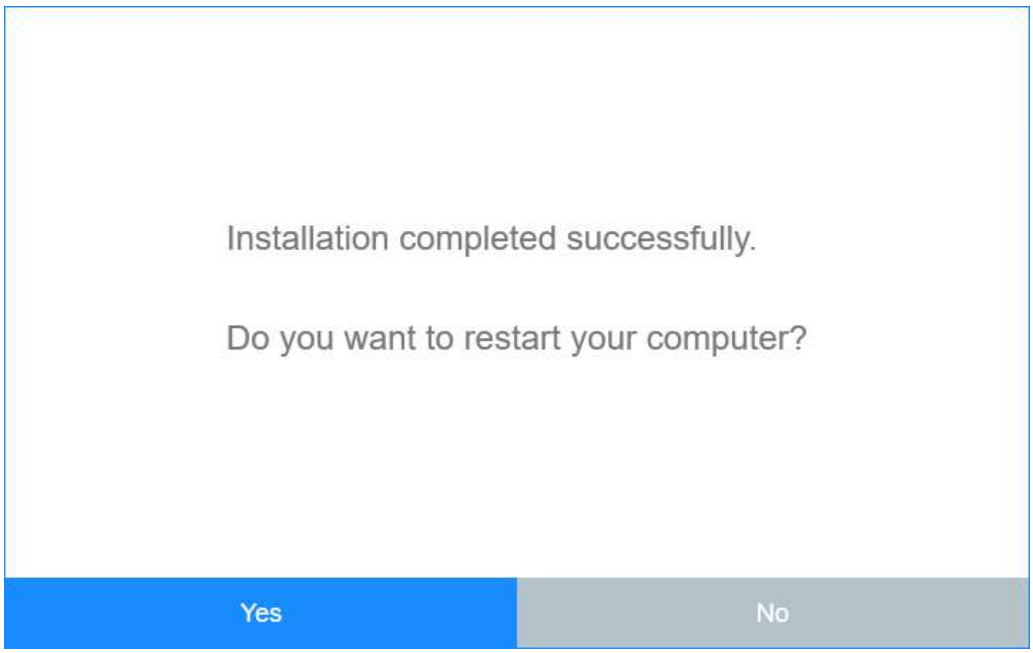


Fig 15 Completed Program Installation Screen

Notice	If Microsoft .Net Framework is installed during the installation process, select the [Yes] button on the screen above and reboot the PC to use SMARTDent.

Notice	When SMARTDent V3 is installed, RIOScan, RIOSensor, and TWAIN programs are installed together.

User Account Management

3

3 User Account Management

SMARTDent supports a log-in function and an automatic log-out function after a certain period of time has elapsed to prevent unauthorized users from using it. (Cybersecurity Requirements) After installation, you can use the program without a login procedure. If you check “Use Login” in the setting, a login window is displayed when the program starts. If you log in using an administrator account, you can add / modify / delete users, and the default administrator account and user account are as follows.

Account Type	ID	Password
Administrator Account	admin	admin
Guest Account	guest	guest

Notice	When using the user account management function, be sure to change the password of the administrator account before use and be careful not to leak the administrator account to others.

3.1 Log In

If you select Use login function in the settings, the login window will be displayed when starting the program as shown below.

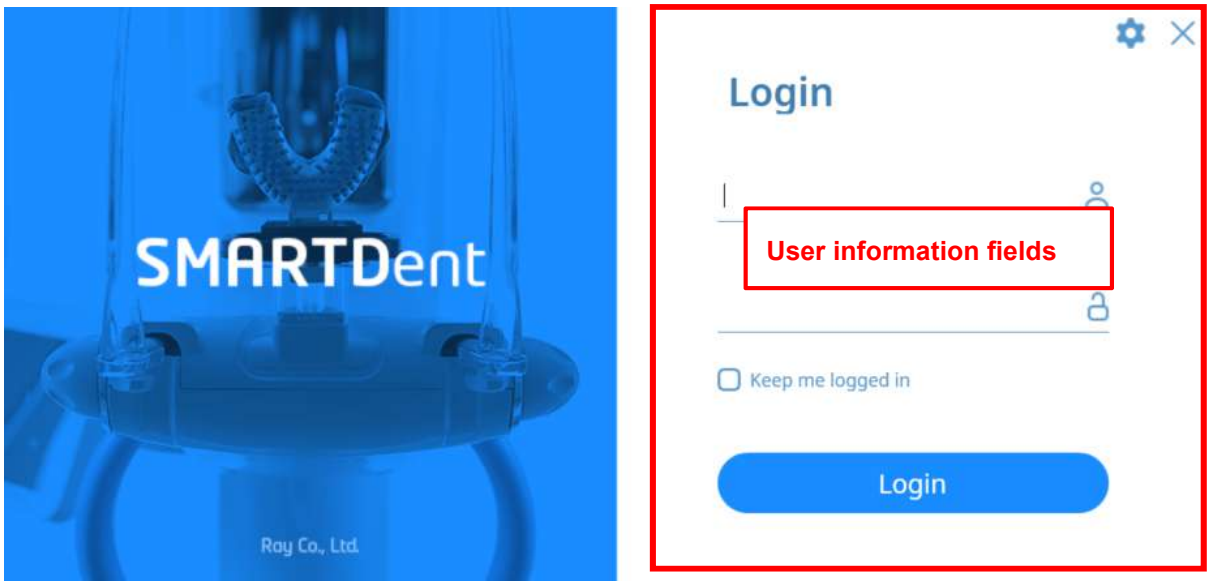
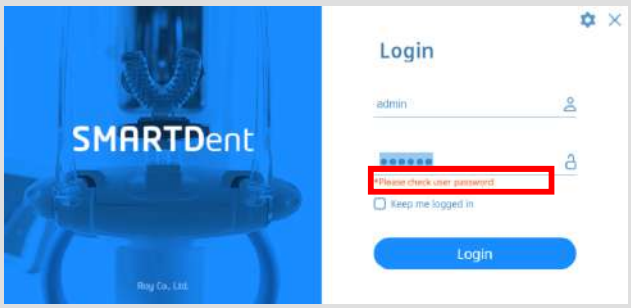
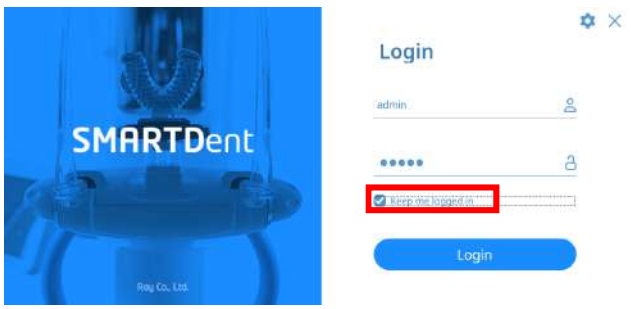


Fig 16 Login Screen

User information fields

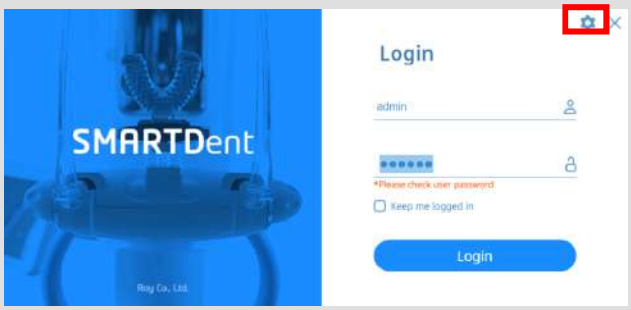
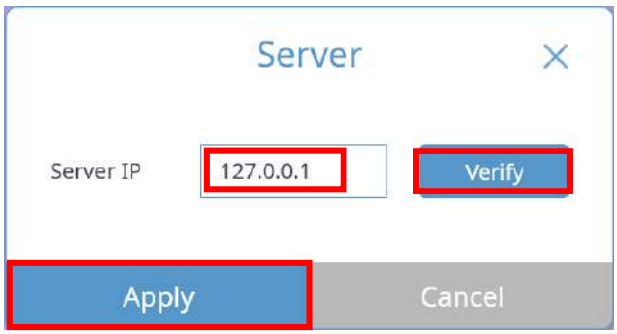
	Item	Description
	Server Settings	Set the IP of the server to connect
	End	End the SMARTDent program.
	User ID	Enter your user ID
	User Password	Enter the user password
	Login Automatically	Choose whether to log in automatically. If you check here and log in, the next time you run the program, you will be logged in with the user account information you are currently logged into.
	Login	Log in using the above information

Login

No.	Figure	Description
1		If the ID is English, it is case sensitive. If login fails, an error message appears at the bottom of the password.
2		If you check the “Keep me logged in” item, you are automatically logged in with the account you are currently logged in to.

Notice	The administrator account does not support the automatic login function. After automatic login, you can turn off automatic login in the user account menu.

Changing server settings

No.	Figure	Description
1		Click the [ ] button at the top of the login screen.
2		After entering the IP of the server you want to connect to, press the [Verify] button to confirm that it is connected to the server. If the connection is successful, click the [Apply] button at the bottom to change the server IP.

Notice	If the server connection is not normal, you cannot log in, so the login screen supports the server setting function and server connection test. If you cannot log in, check the server connection status.

3.2 User Account Management

When you log in with an administrator account, a screen to manage user account information is displayed. Account management supports the management of administrator account information along with the addition, modification, and deletion of user accounts.

The screen structure of the 'User Account Management' window and the contents of each item are as follows.

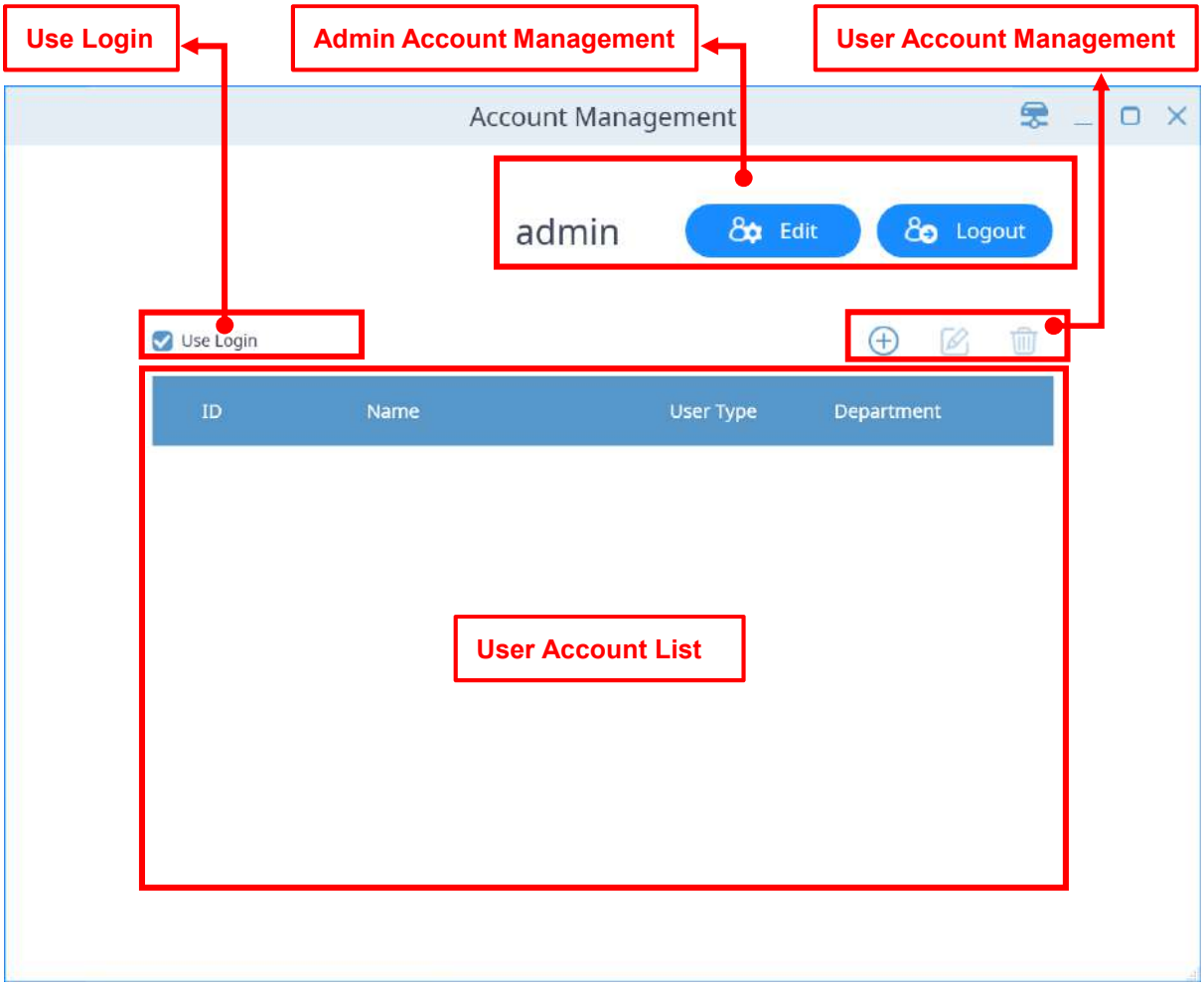


Fig 17 User Account Management screen

Admin account management

Item		Description
admin	Admin ID	Indicates the ID of the currently logged-in administrator.
Edit	Change Admin Information	Change the information of the currently logged in administrator account.
Logout	Log Out	To log into another account, log out of the current account and return to the login screen.

User account management

	Item	Description
	New User Registration	Register a new user account.
	Change User Information	Edit the selected account's information.
	Delete User Information	Delete the information of the selected account.

User Account List

Item	Description
ID	Indicates the ID of the user account.
Name	Indicates the name of the user account.
User Type	Indicates the permissions of the user account. It consists of None, Admin, Dentist, Staff, and Guest, and user information set as None type does not appear in the list. Each permission has different access areas.
Department	Represents the department of the user account. It consists of None, Coordination, Desk, Treatment, Shooting.

Notice	The account with User Type None and Admin does not appear in the user account list.

Use Login

Item	Description
Use Login	Enable or disable login.

3.3 New User Registration

The method of registering a new user in SMARTDent is as follows. When you click the [⊕] button on the user account management screen, the 'Account Information' window appears.

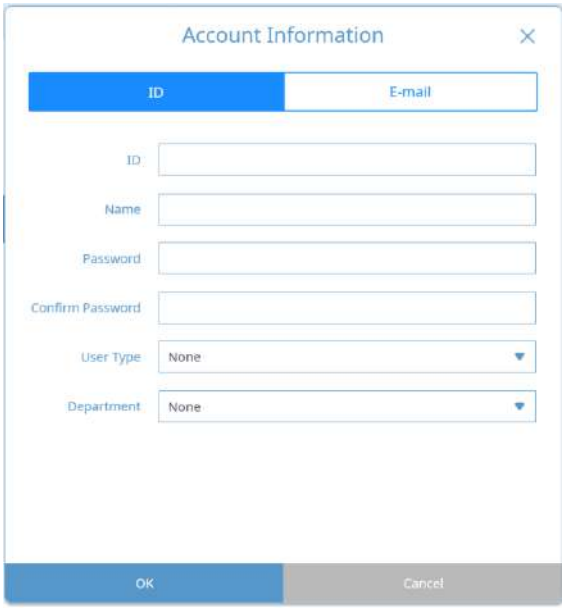


Fig 18 Account Information screen

Enter the required information such as ID, name, password, and confirm password.
To use the e-mail function, select [Account Information] button and enter the e-mail setting information in the window as shown below.

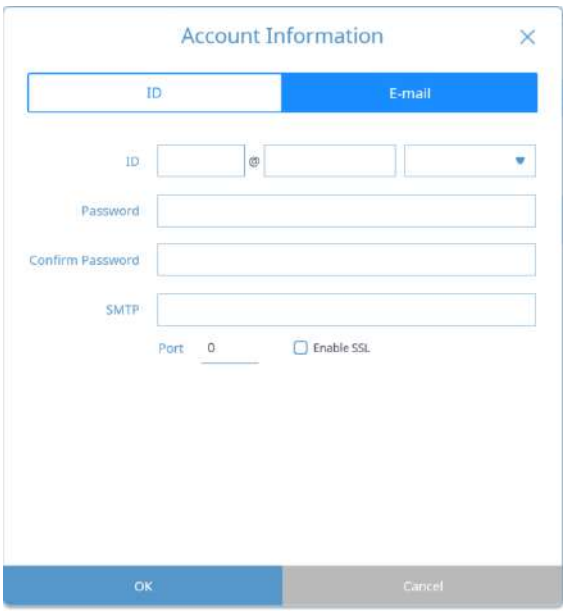


Fig 19 Account Information screen - E-mail

3.4 Modify User Information

After user login, you can edit the account information or log in with the administrator account and select the user account to modify the information. You cannot change your ID, you can change your name, password, user type, department type, and email account information.

3.5 Delete User Information

After selecting the user information, select the delete function to delete the user information. When deleting the user account, a confirmation message is displayed. If you select “Yes”, the information is deleted and cannot be checked again.

3.6 Modifying Admin Information

Administrator account information can be modified in the same way as user accounts. Please be careful not to leak the password for the administrator account information.

Notice	Please be careful not to leak your admin account to others.

Patient Management

4

4 Patient Management

Using SMARTDent, you can use search for patients, register new patients, modify patient information, and delete functions.

You can search for the patient you want by entering the patient ID or name, and you can easily search for recently visited patients by using the search button for frequently used periods such as today, yesterday, and last 1 week. By specifying “Modality” (type of images), you can search only those patients who have taken the corresponding “Modality”, and designate your doctor to search only those patients in charge of that doctor. By setting the “Modality”, the duration, and the doctor in charge, you can search for patients who have taken a specific video by the doctor in the desired period.

Notice	Today's patient means the patient who visited the office the same day, the patient who acquired the image, and the patient who was viewed. If you query the patient who has been reserved or received from SMARTDent (Patient selection), it can be searched as a patient today on any PC in the dentist, so you can conveniently select a patient without entering a name or chart number.

The screen structure of the 'patient' page and the contents of each item are as follows.

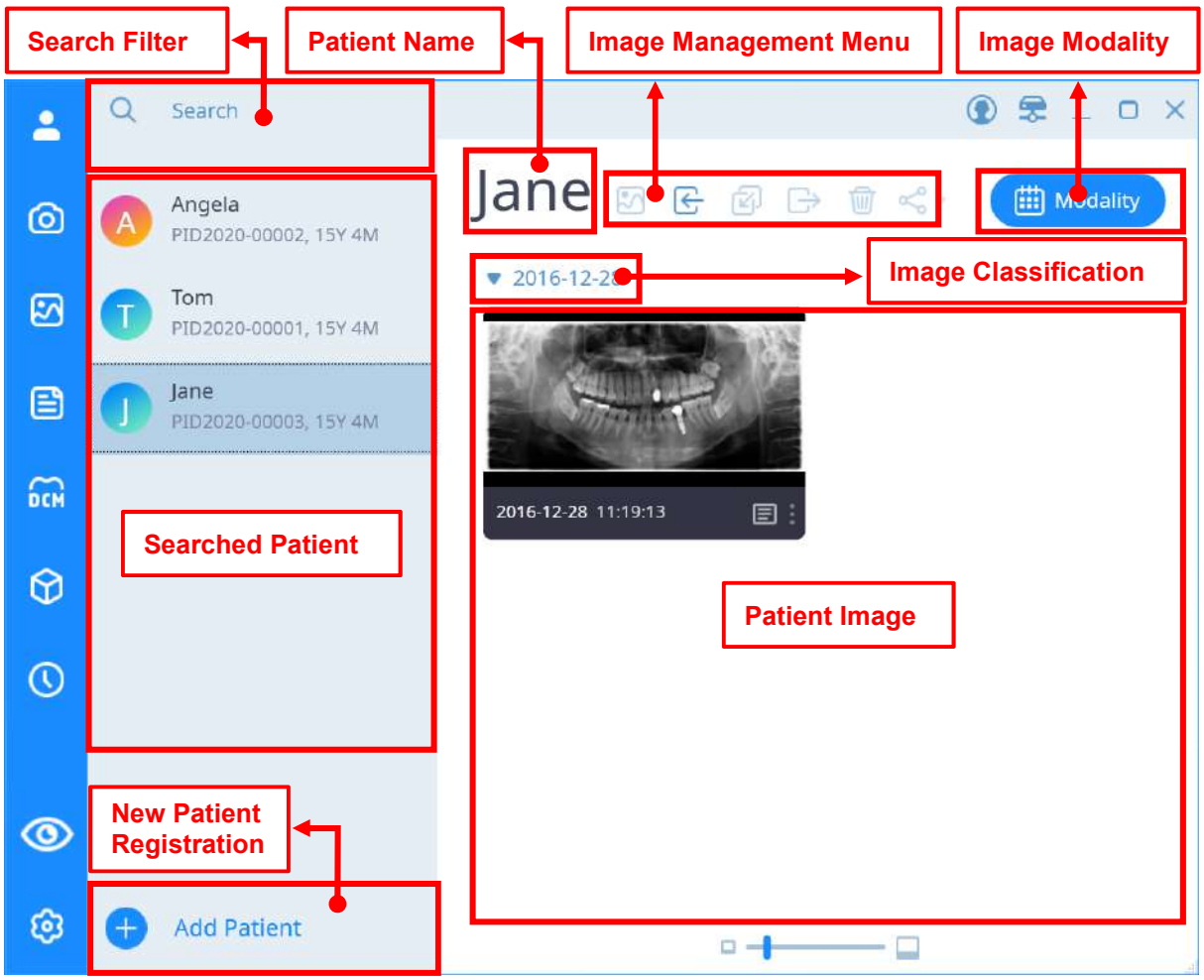


Fig 20 Patient Tab Screen

Search Filter

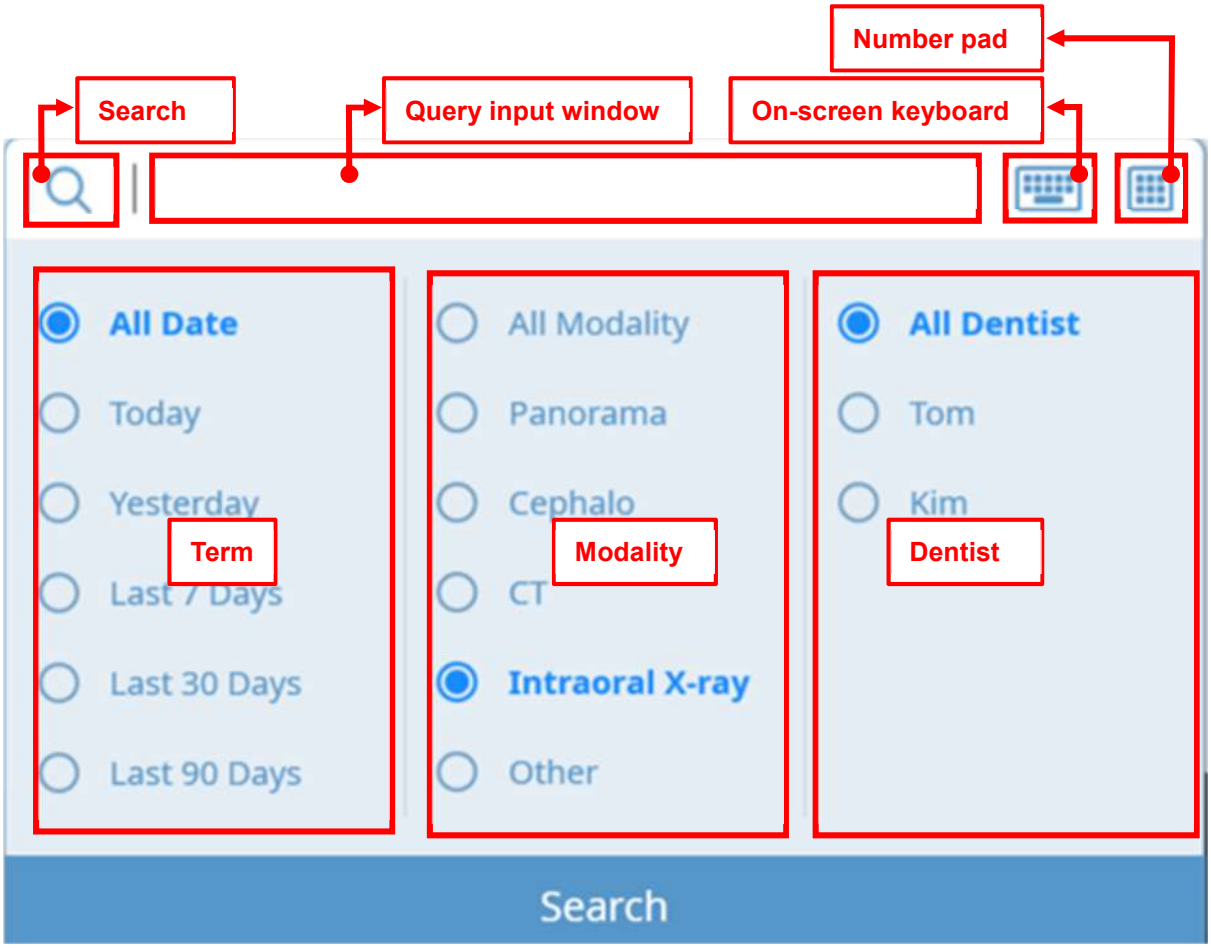
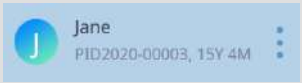


Fig 21 Search Filter

Item	Description
Search	Search for patients that meet the search criteria.
Search Input	Insert the patient's ID or name for searching patients.
On-screen keyboard	Run Windows on-screen keyboard when it is difficult to use keyboard.
Number pad	Run number pad to insert numbers only.
Term	Search for a list of patients who have been registered or whose images were taken within the period.
Modality	Search the list of patients who have images of the modality.
Dentist	Retrieve a list of patients the doctor is responsible for. The list of doctors consists of the name of the account whose user type is 'Dentist' in the user account.

Searched Patient List

	Item	Description
	Patient Name	Indicates the patient's name.
	Patient ID	Indicates the patient's ID.
	Patient Age	Indicates the patient's age.

New Patient Registration

	Item	Description
	Create new patient button	Open a window to create a new patient.

Image Management Menu

Basic

When selecting a patient, the Import button is activated as shown below.

When selecting an image, all the buttons are activated as shown below.

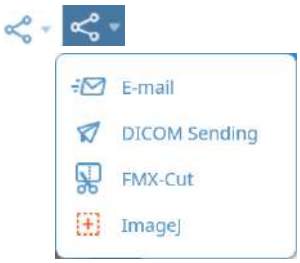
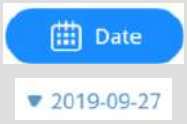
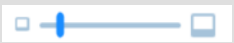
	Item	Description
	Open Image	Open the selected image with the Image tab.
	Import Image	Add images to the selected patient.
	Move Image	Move the selected image to another patient's image.
	Export Image	Export selected image to file.
	Delete Image	Delete the selected image. (It can be recovered later.)
	link	• The selected image is sent by mail or connection program. • Select a program to display CT images.

Image Classification Conditions

Item		Description
	Sort by date	Images are sorted and displayed based on their acquisition date
	Sort by modality	Images are sorted and displayed based on their modality

Patient Image

Item		Description
	Patient image thumbnail	Thumbnail of the patient's image.
	Memo indicator	Shows when memo exists, and tooltips allow to view the contents.
	Resize patient image thumbnails	Adjust the size of the patient image thumbnail.

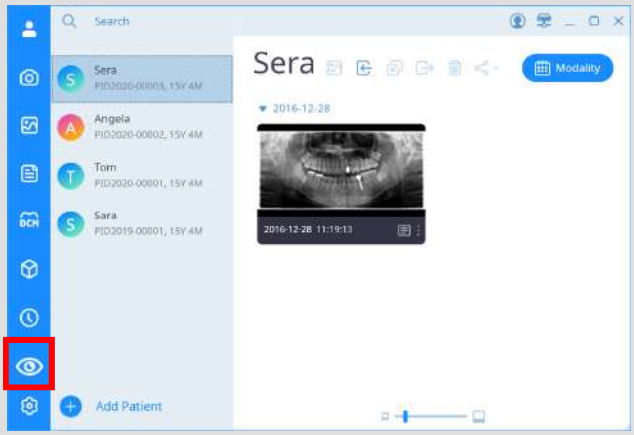
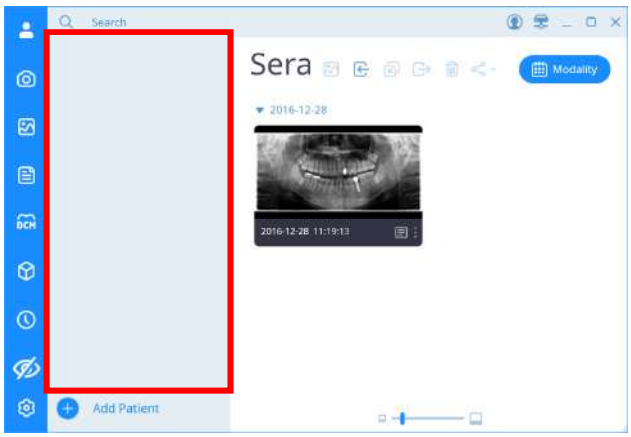
4.1 Patient Search

Patient searches are searched for a combination of the ID or name entered in the search field and the terms below, modality, and doctor's criteria. Enter a search condition or select an option and click the search button at the bottom to display a list of patients corresponding to the condition.

Notice	If you select the on-screen keyboard and numeric keypad icons on the right side of the search term input window, you can enter a search term without a keyboard and search for patients.

Notice	User account information with User Type 'Dentist' is displayed as a list of doctors who are search filters in the patient detail search window.

To protect patient information, you can select [Hide patient list] or [Show patient list] as shown below.

No.	Figure	Description
1		On the Patient tab, click the [Hide patient list] button.
2		Confirm that the patient list is not visible.

4.2 New Patient Registration

Click the [Add Patient] button at the bottom of the left patient search panel on the patient screen displayed for the first time after SMARTDent is executed, and the “New Patient” registration window is displayed as shown in the figure below.

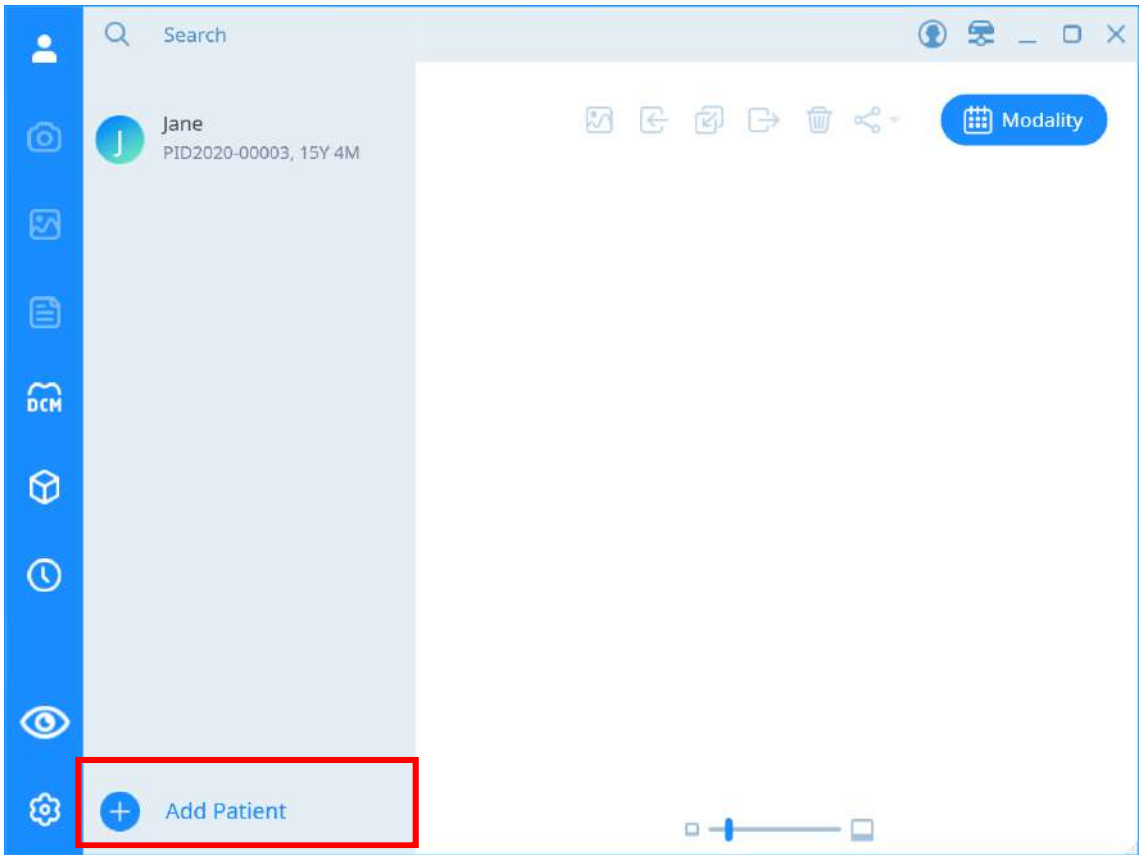


Fig 22 Patient Screen

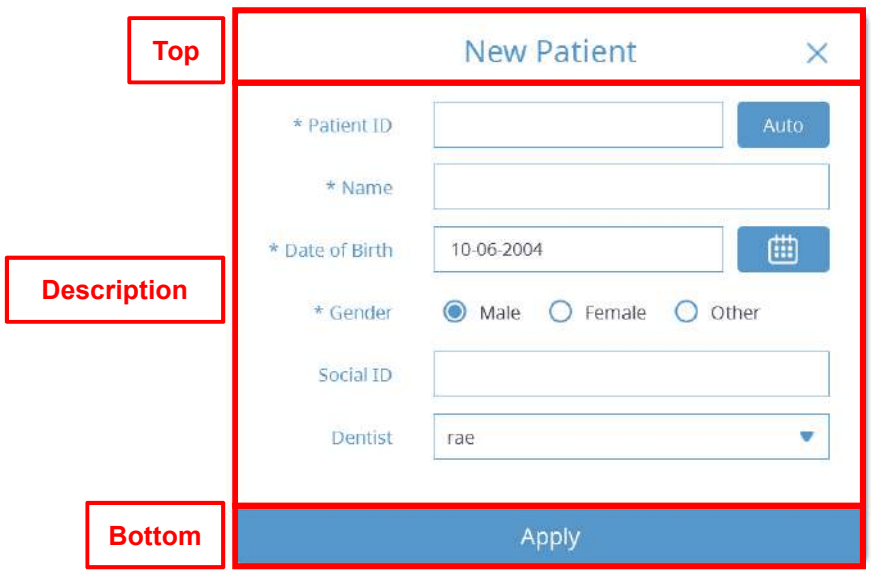


Fig 23 New Patient

The “Content” item in the “New Patient” window is as follows.

Item	Description
Patient ID	Patient ID
Automatic	Auto generate patient ID button
Name	Patient's name
Date of birth	Patient's date of birth
Calendar	Calendar display button
Gender	Patient's gender
Resident registration number	Patient's Social Security Number
Doctor in Charge	The name of the doctor in charge of the patient

Enter the patient ID, name, date of birth, gender information, etc. on the new patient registration screen and select the Apply button to register the patient.

Notice	The patient ID is 20 characters or less, and only alphanumeric characters, kanji characters, Japanese / special characters, ‘-’ (hyphen), ‘.’ (period), ‘,’ (comma), and blank characters can be entered.

Notice	Patient names can be 50 characters or less, only alphanumeric characters, kanji characters, Japanese / special characters, ‘-’ (hyphen), ‘.’ (period), ‘,’ (comma), and blank characters.

Notice	The doctor in charge uses the name of the account whose user type is Dentist as a list.

4.3 Correct Patient Information

Patient information can be edited by right-clicking the patient whose information is to be edited in the patient list on the 'Search' tab or by selecting the patient menu and selecting 'Edit'.
After modifying patient information in the patient information edit window, select [Apply] button.

4.4 Delete Patient

Patient information can be deleted by right-clicking the patient whose information is to be deleted from the patient list on the 'Search' tab or selecting the patient menu and selecting the 'Delete' item.
When the message window to confirm the deletion of patient information is displayed, select [Yes] button.

Notice	Deleted patients can be permanently deleted or reactivated. Please refer to "12.7 Patient, Image Information Activation and Deletion".

4.5 Export Patient Image

You can export all images of a patient to a file by right-clicking on the patient to which you want to export the image from the patient list in the 'Search' tab or selecting the patient menu and selecting the 'Export Image' item. Using SMARTDent, the registered patient's image can be saved by setting the desired image format and volume label of the storage folder.
If you right-click the patient on the 'Search' tab screen and select the [Export Image] item, the 'Export Image' window appears as shown below.

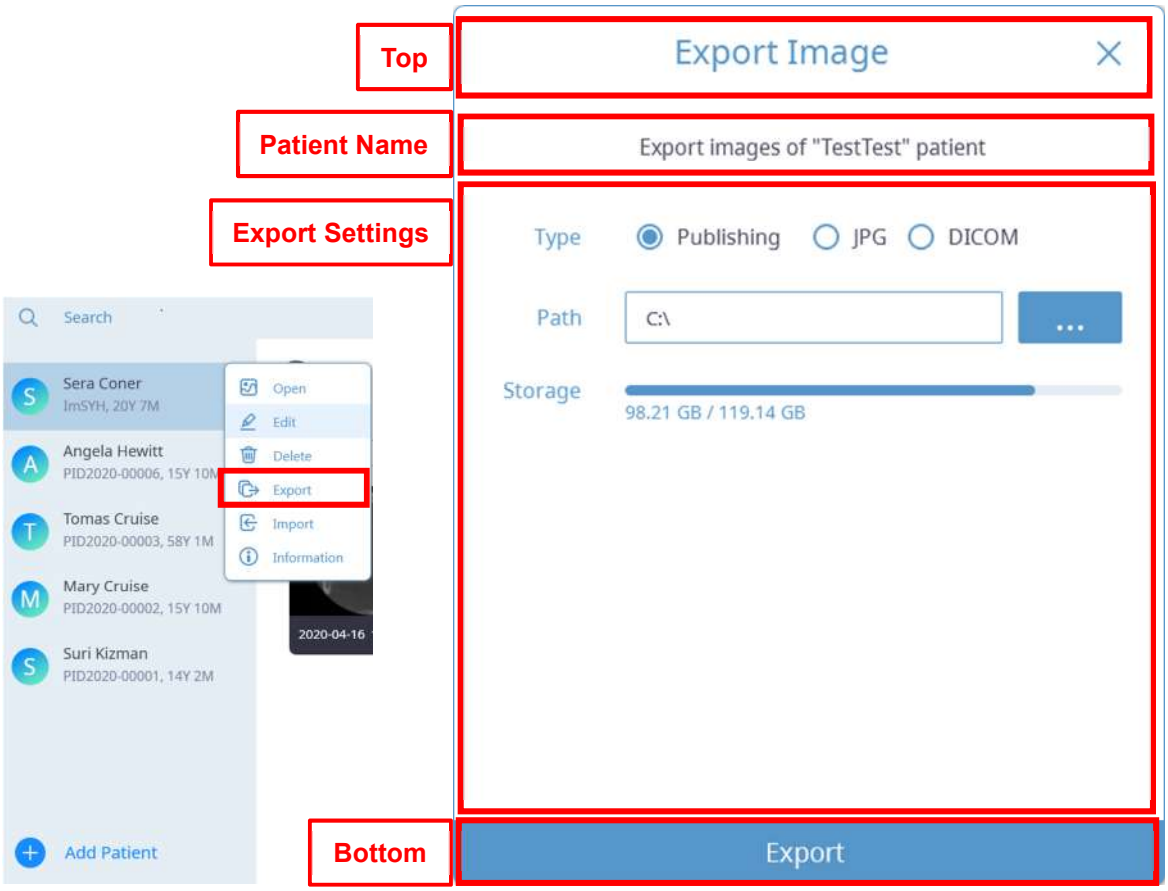
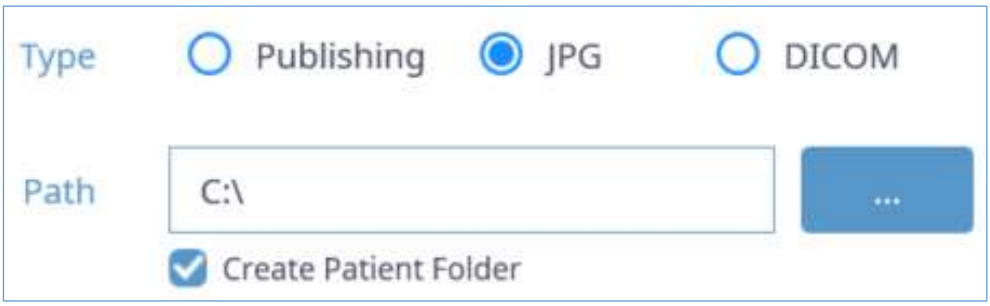


Fig 24 Exporting Image



Item	Description
Type	Publishing: Export image and viewer together. JPG: Export as a JPG image. DICOM: Export as DICOM image.
Path	Set the storage path.
Storage	Display the available / total capacity of the storage medium. Choose whether to export overlays, shooting information, project files, and more.

Notice	In the case of exporting JPG and DICOM, if you select the “Create Patient Folder” option, a folder of “Patient ID_Patient name” is created in the file path.

4.6 Importing Patient Images

You can register the selected image by right-clicking on the patient to which you want to import the image from the patient list on the 'Search' tab or selecting the patient menu and selecting the 'Import' item.

The image format supports general Windows image formats such as JPG / BMP and DICOM format.

If you right-click the patient on the 'Search' tab screen and select the [Import] item, the 'Import patient image' window appears as shown below.

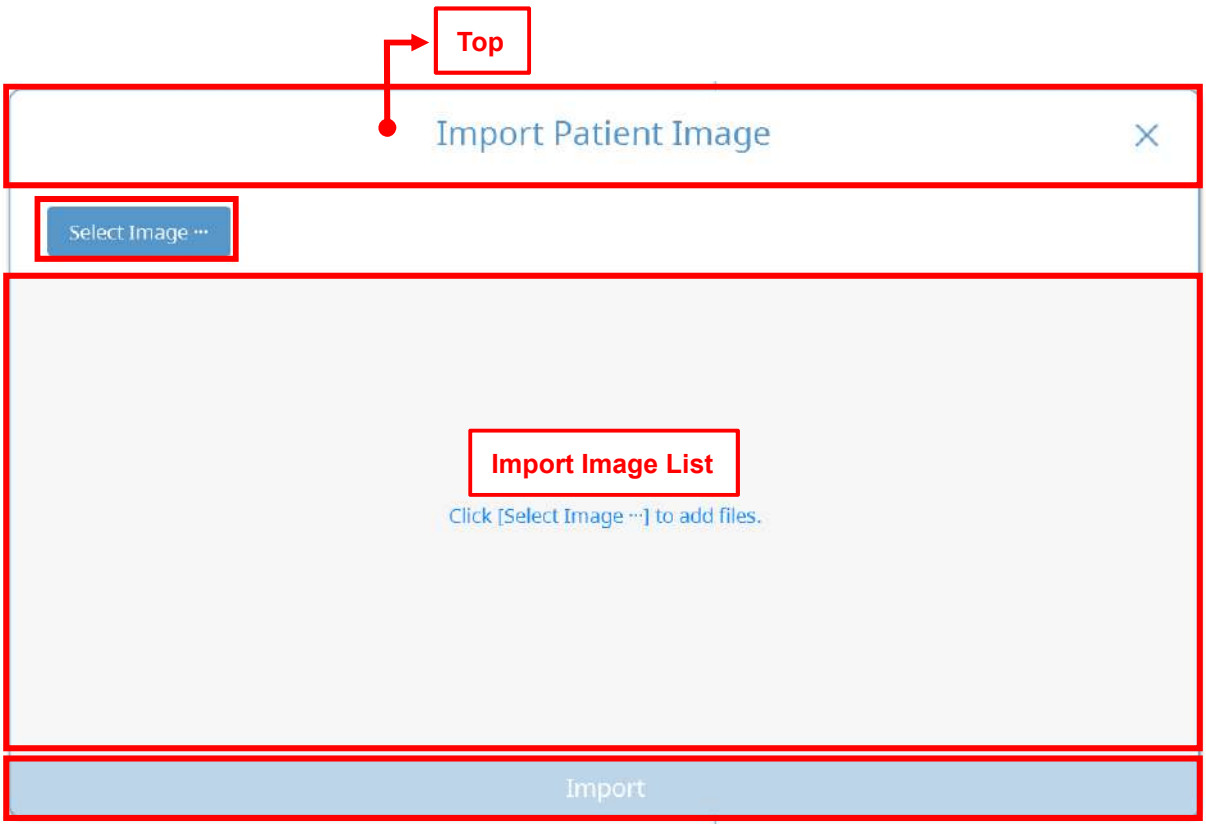


Fig 25 Importing Patient Image

After clicking the [Select Image…] button, when the Windows Explorer is displayed, select the image to be imported. When the image is displayed, select modality and then select [Import] button at the bottom. When a DICOM image of a patient whose information is different from the currently selected patient is imported, a window to select the patient to add the image to is displayed as shown on the left. Select [Import] button above to import the current patient information, or select the [Import] button below to add a new patient.

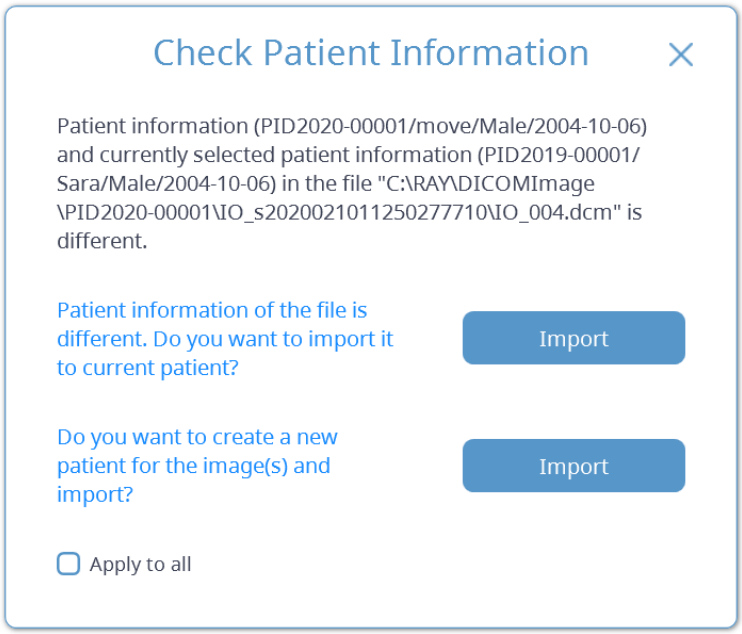


Fig 26 Check Patient Information

In the case of CT images, selecting one image to import all images in the folder.

4.7 View and Export Patient Information

You can check the patient information by right-clicking the patient whose information you want to check in the patient list on the 'Search' tab or by selecting the patient menu and selecting the 'Information' item.

If you right-click the patient on the 'Search' tab screen and select the [Information] item, the 'Patient Information' window appears as shown below.

Fig 27 Basic Patient Information

Category

Item	Description
Patient	Check patient information.
Acquisition	Check the patient's imaging information.

Content

Item	Description
Patient ID	Patient ID
Patient name	Patient's name
Date of Birth	Patient's date of birth
Age	Patient's age
Gender	Patient's gender
Social ID	Patient's Social Security Number
Dentist	The name of the doctor in charge of the patient

If you select [Acquisition] button, the image acquisition screen will appear as shown below.

Fig 28 Patient Image Information

Patient image information content

Item	Description
CT	Number of images with modality CT among patients' images
PX	Number of images with modality panorama among patients' images
DX	Number of images with modality Cephalometric among patients' images
IO	Number of images with modality Intra Oral among patients' images
OT	Number of images with modality other among patients' images
Export to Excel	Export patient basic information and image information list as Excel file
Export to PDF	Export patient basic information and image information list as PDF file
Date	Date the image was taken
Modality	Image type such as CT, Panorama, and Cephalo
Protocol	Image protocol
Number	Number of images

The acquisition image information can be exported as an Excel or PDF file.

Image Acquisition

5

5 Image Acquisition

For using RAYSCAN, CT, Panoramic and Cephalo images can be acquired, and images obtained using RIOScan, RIOSensor, intraoral USB cameras and intraoral sensors and intraoral camera images through TWAIN are supported. The image information acquired by RAYSCAN is automatically updated to all running SMARTDent programs, and image acquisition of small devices is integrated into the viewer so that after the image is acquired, the image acquired by SMARTDent can be diagnosed faster.
The list of acquisition equipment shows the item selected in Settings, and the Panorama / Cephalometric / CT menu is automatically displayed for workstations using RAYSCAN.

Notice	In the chairside computer without RAYSCAN software, you can register a request to acquire images acquired with RAYSCAN, such as CT, Panorama, and Cephalometric, on the DICOM tab. For more information, please refer to “8. DICOM”.

The Acquisition tab consists of:

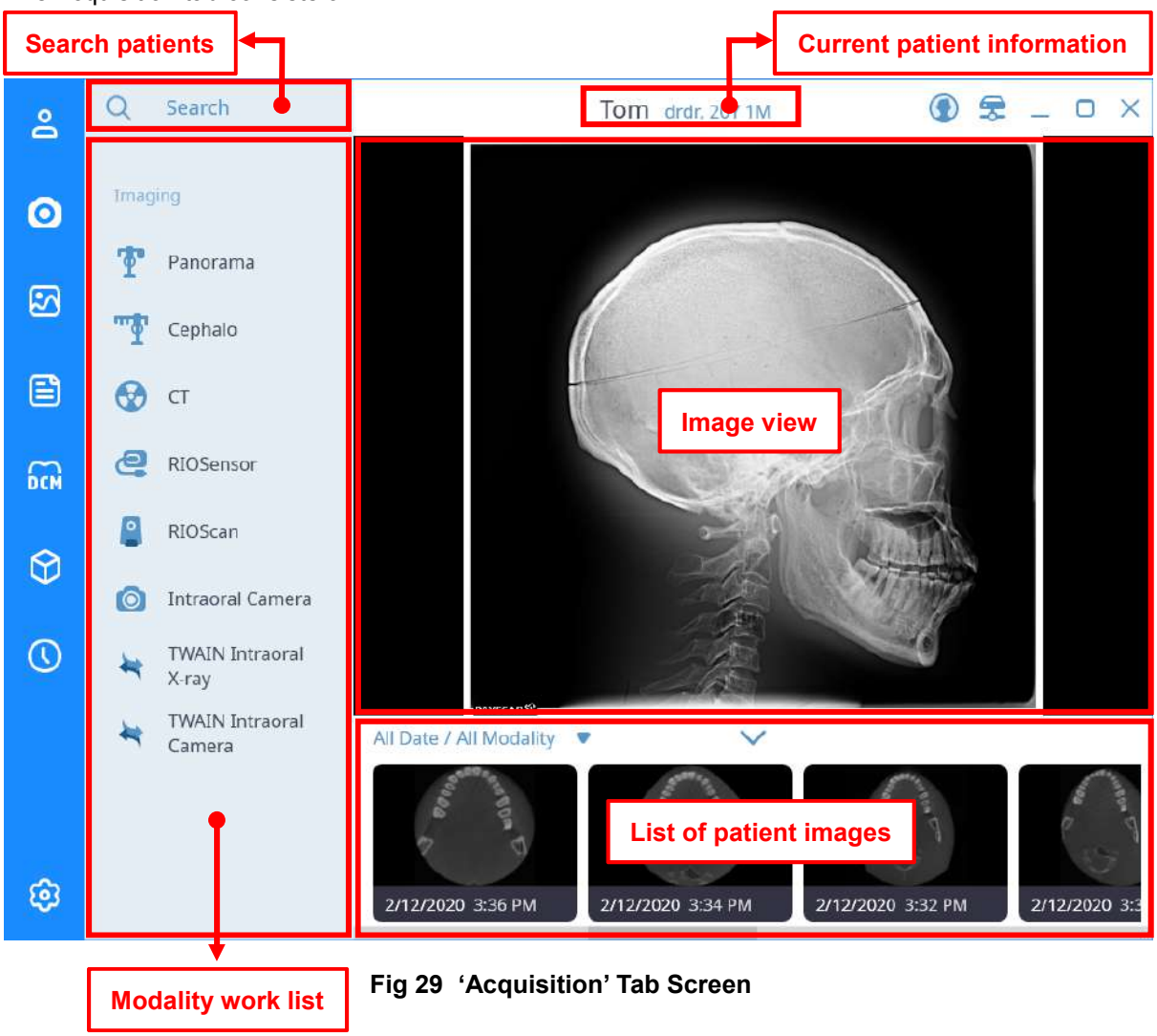
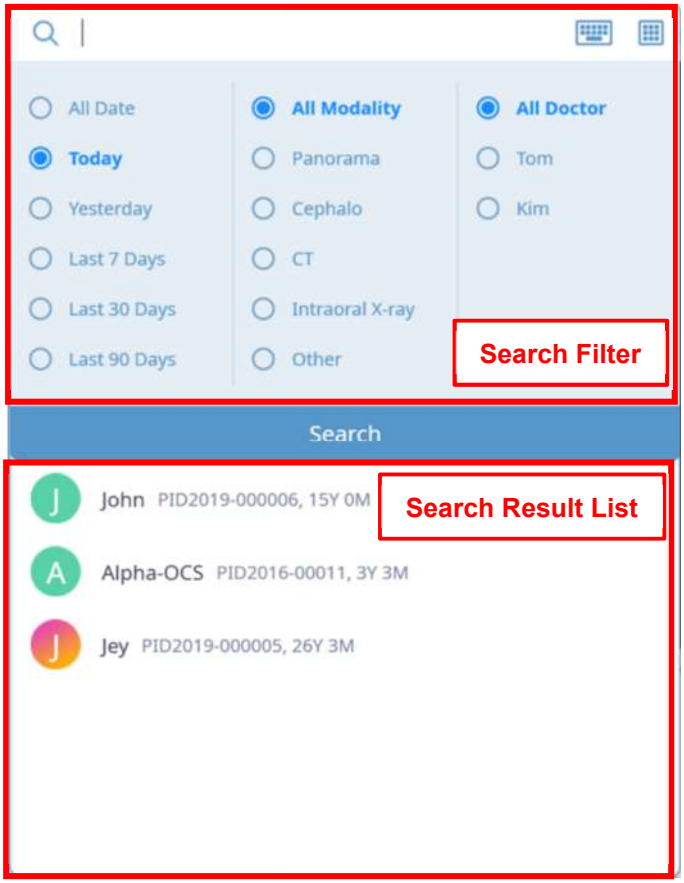


Fig 29 ‘Acquisition’ Tab Screen

Search Patients



Search Filter

Please note ‘4. Patient Management’.

Search Results

A list of patients matching the search criteria appears. If you double-click the searched patient, the current patient is changed to the selected patient.

Current Patient Information

Displays the information of the currently selected patient in the form of [Name, ID, Age].

Imaging Device List

A list of available image acquisition is displayed. If the RAYSCAN program is installed on the PC, the Panorama, Cephalometric, and CT lists are displayed automatically.

Imaging device list can be modified in the Acquisition Settings.

Item	Description
Panorama	Run RAYSCAN program for Panorama image acquisition.
Cephalometric	Run RAYSCAN program for Cephalometric image acquisition.
CT	Run RAYSCAN program for CT image acquisition.
RIOScan	Open RIOScan acquisition window.
RIOSensor	Open RIOSensor acquisition window.
Intraoral Camera	Open intraoral camera image acquisition window.
Intraoral X-ray TWAIN	Open intraoral X-ray acquisition window for TWAIN device.
Intraoral Camera TWAIN	Open intraoral camera acquisition window for TWAIN device.

Image view

Display the patient's image.

List of patient Images

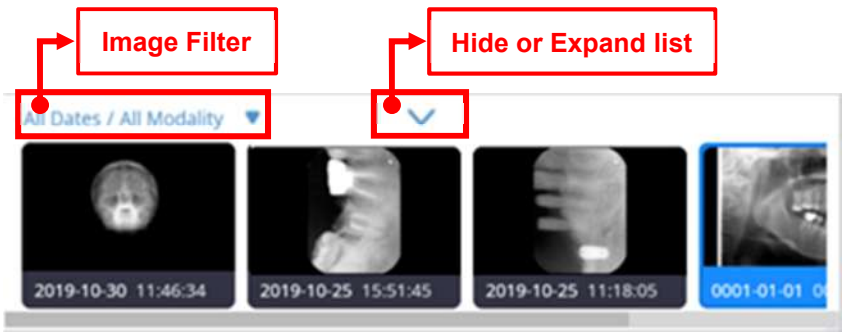
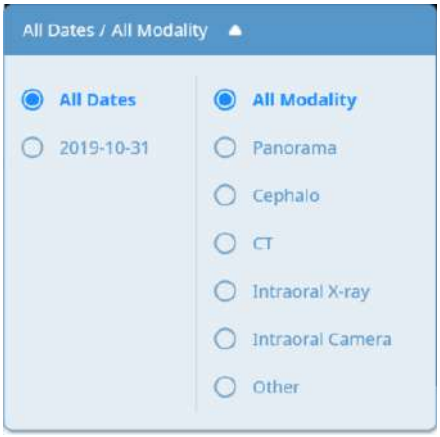


Image Filters



You can select an image date or modality so that only the images that meet the conditions are displayed in the image list.

Hide / Expand Images

You can hide or expand the image list.

5.1 RIOScan Acquisition

When you click the RIOScan button in the list of imaging device, the RIOScan acquisition window will open. RIOScan acquisition screen composition and contents of each item are as follows.

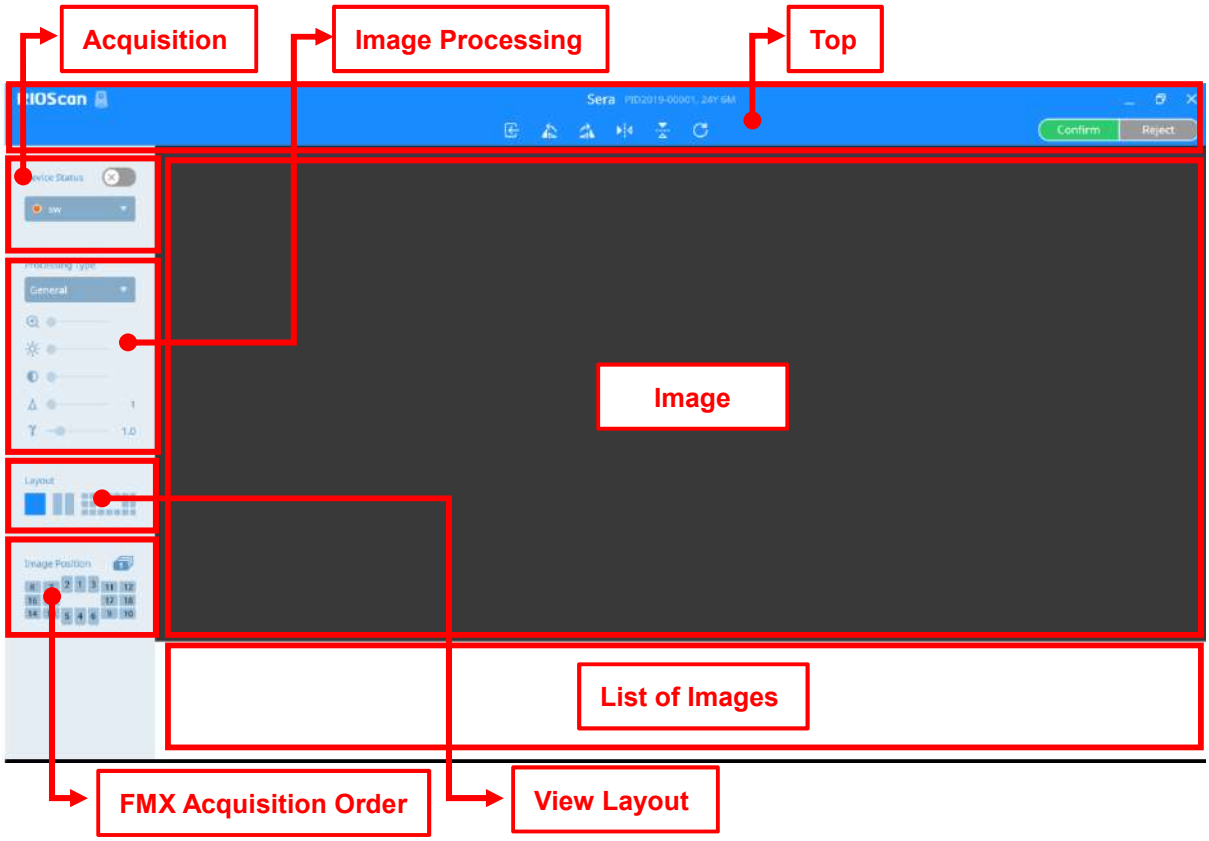
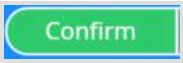


Fig 30 RIOScan Acquisition screen

Top

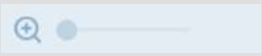
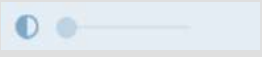
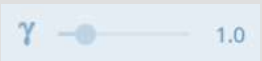
Item	Description
RIOScan Logo	Indicating RIOScan acquisition window.
Sera PID2019-00001, 24Y 6M Patient	Name, ID, and age of current patient.
Browse	Browse a list of images stored in RIOScan.
Rotate Left	Rotate image 90 degrees to the left.
Rotate Right	Rotate image 90 degrees to the right.
Horizontal Flip	Flip image horizontally.
Vertical Flip	Flip image vertically.

	Initialize	Initialize image rotation.
	Save	Save images.
	Cancel	Exit RIOScan acquisition.

Acquisition

	Item	Description
	Device Status	Change device status to [Ready] or [Disconnect]
	Devices	Show available RIOScan devices to connect.

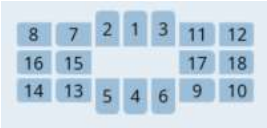
Image Processing

	Item	Description
	Filter type	Image processing filter type.
	Initialize image	Initialize image processing.
	Zoom in/ out	Zoom in or out the Image.
	Brightness	Adjust Brightness Value.
	Contrast	Adjust Contrast Value.
	Sharpness	Adjust Sharpness Value.
	Gamma	Adjust Gamma Value.

View Layout

	Item	Description
	Single View	Displays captured images in one view.
	Two View	Displays the captured image on two screens for comparison with the previous captured image.
	FMX View	Displays the captured image in FMX view.

FMX Acquisition Order

	Item	Description
	Order of Acquisition	A window is displayed where you can add and select the FMX acquisition sequence.
	Selected Image location	Indicates the FMX position of the selected image.

When Acquisition Order menu is selected, the window is displayed as shown below. Order of acquisition can be added, modified, and deleted. Select the item of FMX to set order of acquisition and select the numbered item to release.

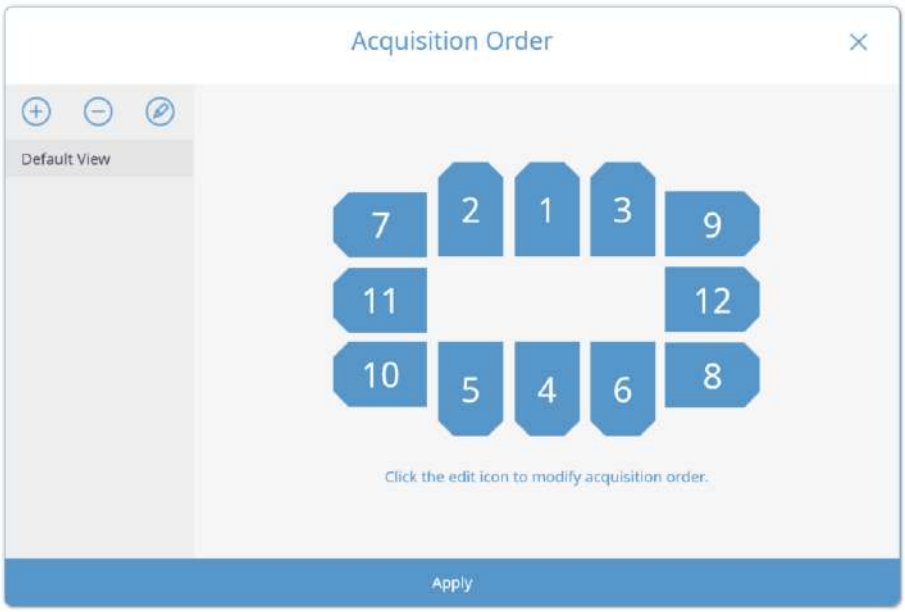
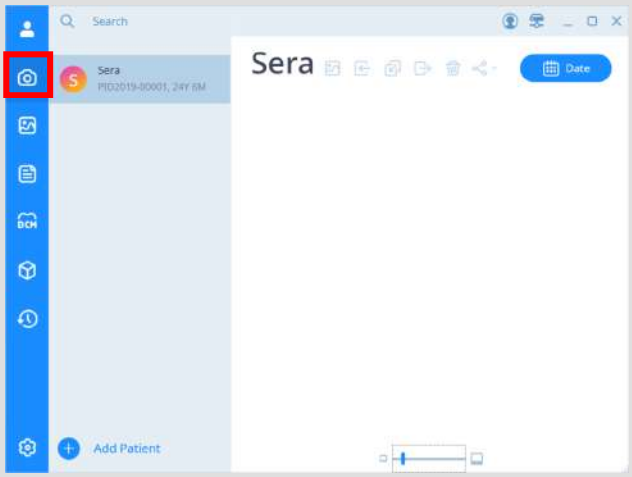
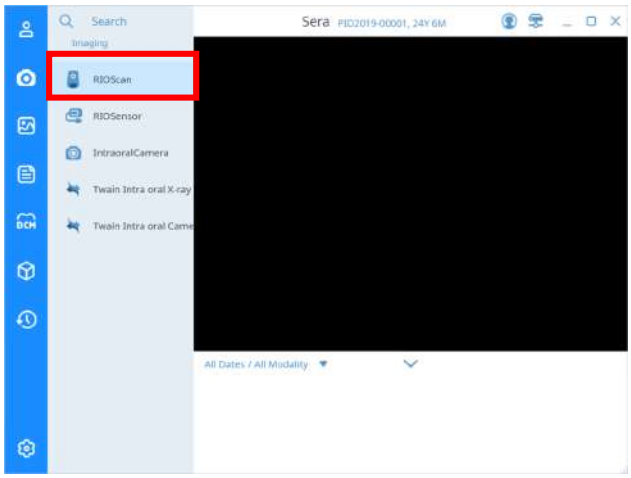
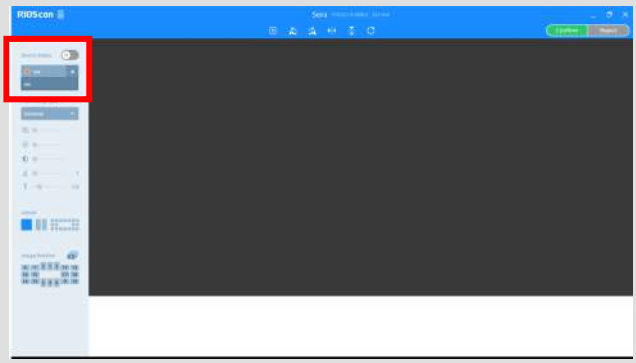
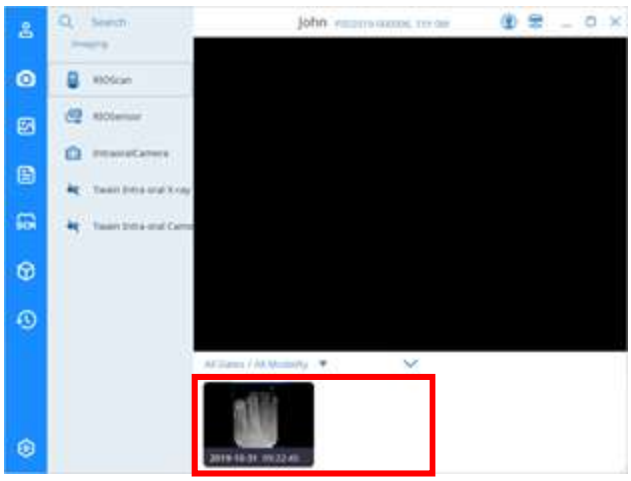


Fig 31 'Acquisition Order'

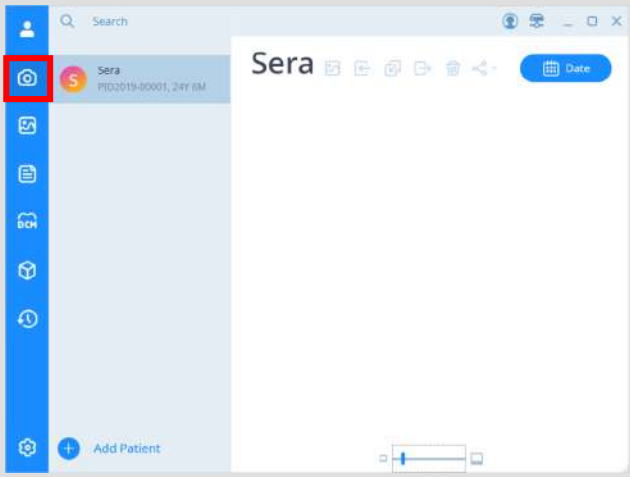
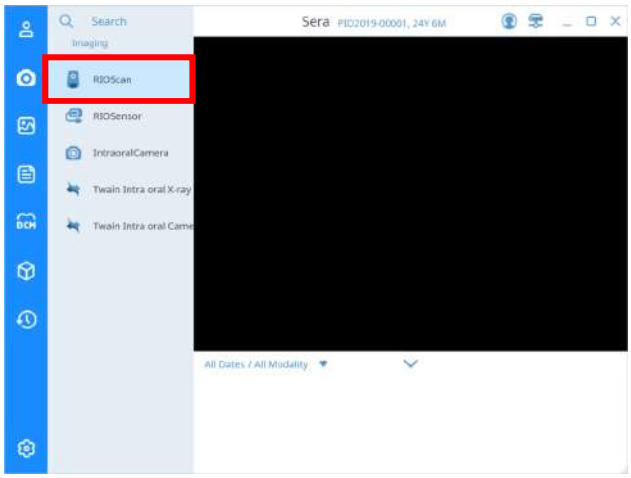
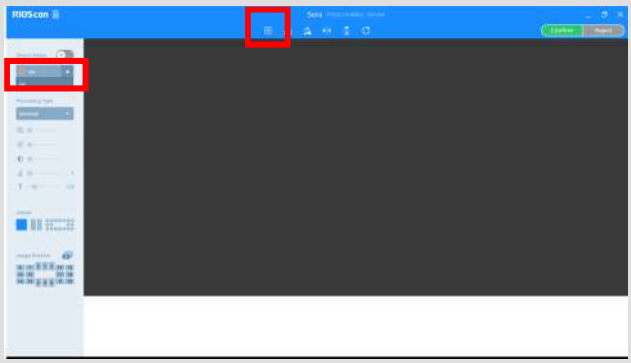
Notice	Setting the order of acquisition and acquiring image by order are supported for RIOScan, RIOSensor, Intraoral Camera, and TWAIN acquisition.

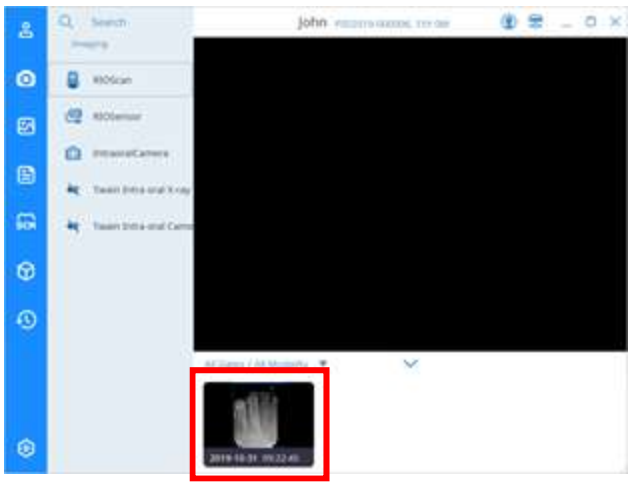
5.1.1 Acquisition Images with Scan Button

No.	Figure	Description
1		Select the patient to be taken and click the [Acquisition] button on the left menu.
2		Click the ‘RIOScan’ button
3		Select the RIOScan to scan from the device list and change the device status to [Ready] button.

4		Confirm the connection status of RIOScan and perform a scan on the device.
5		When the scanned image appears on the image screen, confirm it and then click the [Save] button to save the image.
6		You can check the images in the list on the 'Acquisition' Tab.

5.1.2 Browse Images

No.	Figure	Description
1		Use the Browse function to store images which acquired using the QuickScan. Select the patient to be taken and click the [Imaging] button on the left menu.
2		Click the [RIOScan] button
3		Select the RIOScan to scan from the device list and click the [Import] button.

4		When the 'Import Image' window opens, select the Image to import and click the [Import] button.
5		When the imported image appears on the screen, click the [Save] button to save the image.
6		You can check the images in the list on the 'Acquisition' Tab.

5.2 RIOSensor Acquisition

Click the [RIOSensor] button to display RIOSensor acquisition window. The composition of screen and the contents of each item are as follows.

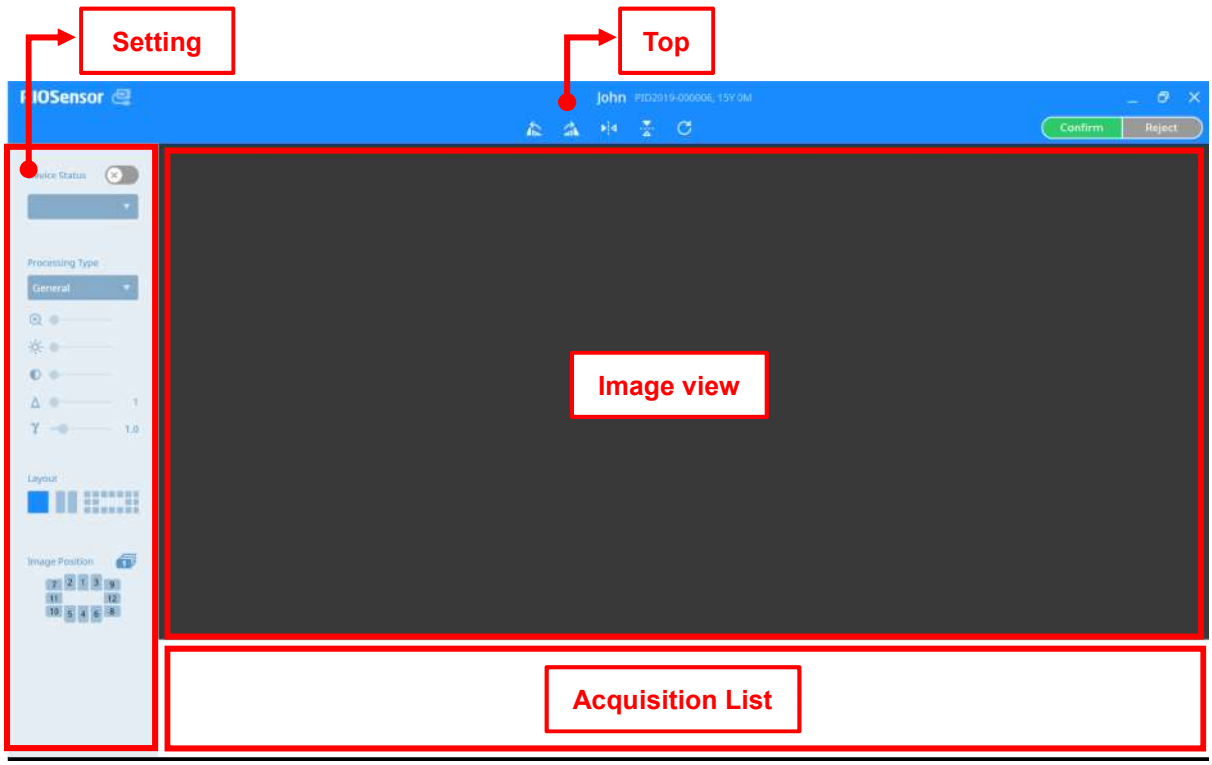
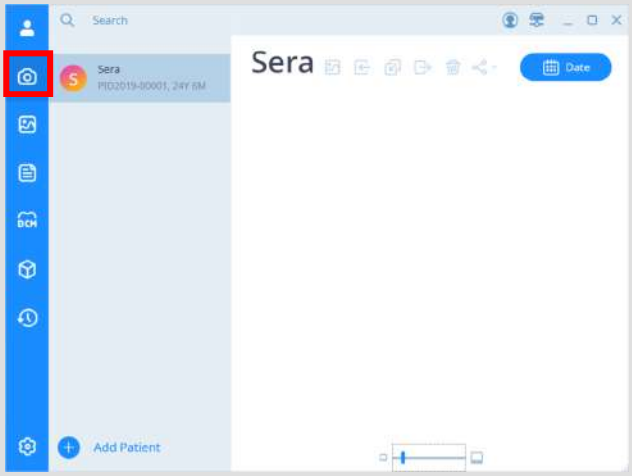
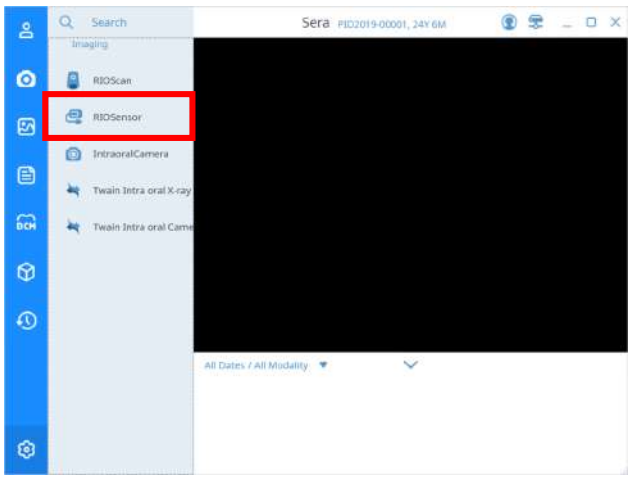
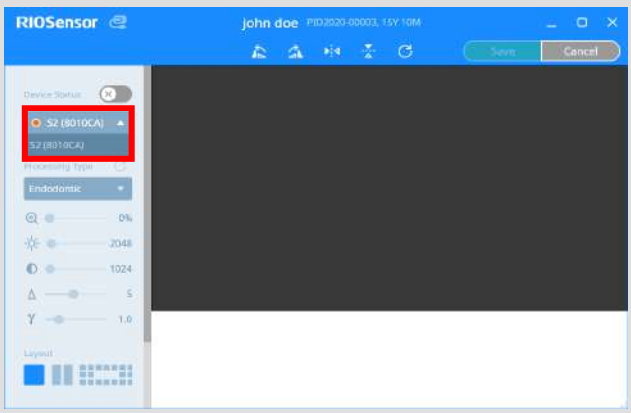
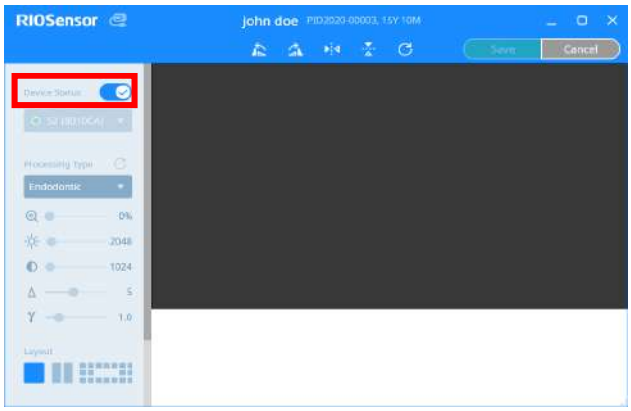
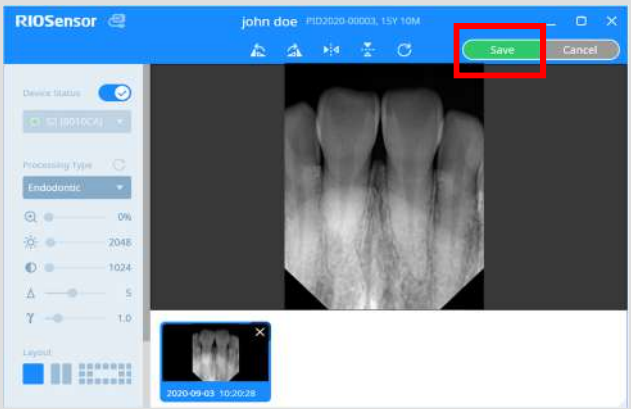
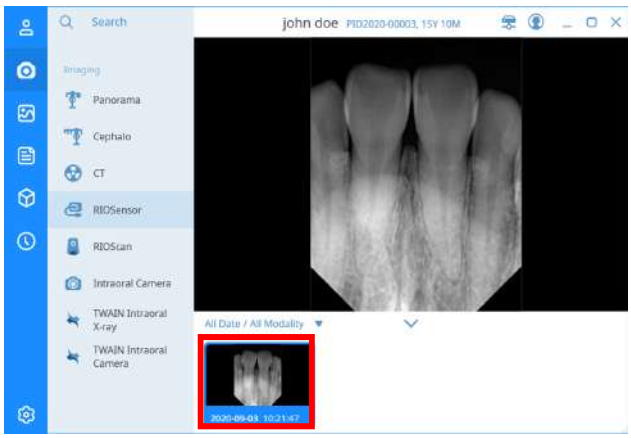


Fig 32 Intraoral Sensor Acquisition Screen

The menu of the setting panel is the same as RIOScan. Please refer to “5.1 RIOScan Acquisition”.

RIOSensor Acquisition

No.	Figure	Description
1		Select the patient and click the 'Acquisition' button on the left menu.
2		Click the [RIOSensor] button.
3		Select the sensor to acquire from the device list and change the device status to [Ready] button.

4		Take acquisition using the Sensor.
5		Click the [Save] button to save the image.
6		You can check the images in the list on the 'Acquisition' Tab.

5.3 Intraoral Camera Acquisition

Click the [Intraoral Camera] button to open intraoral camera acquisition window. The composition of the intraoral image screen and the contents of each item are as follows.

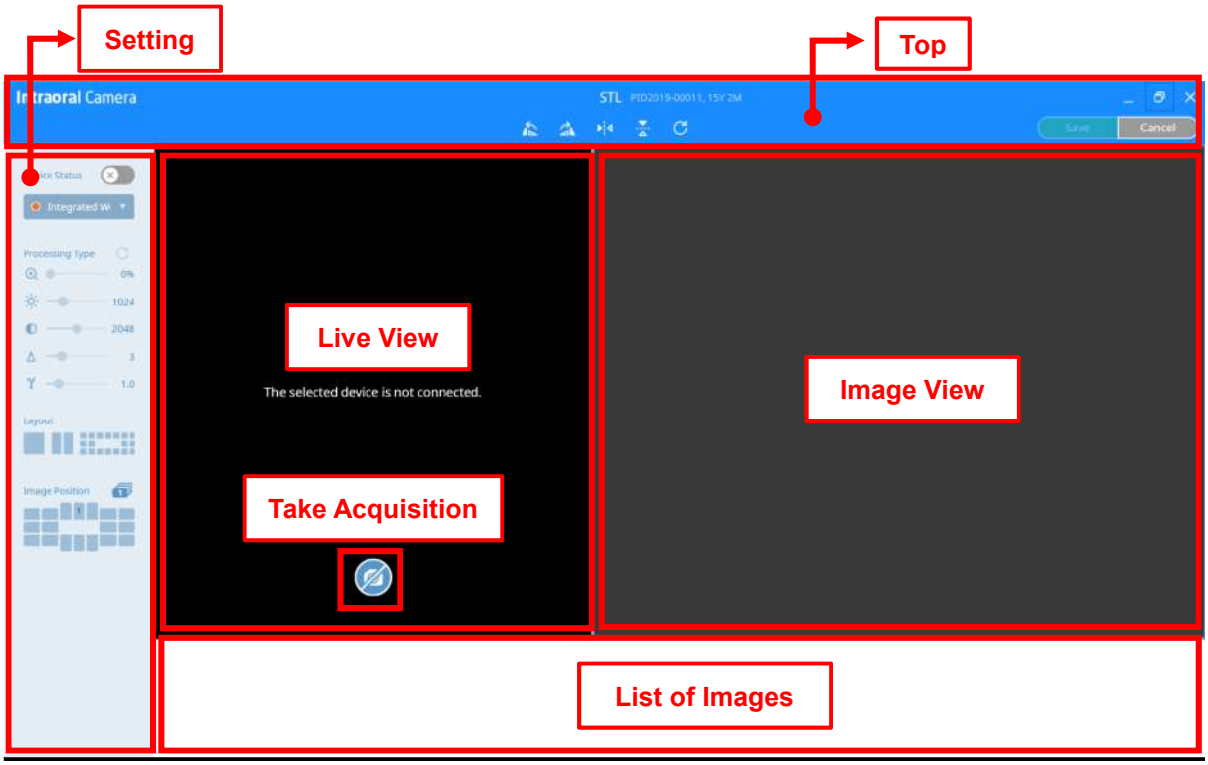
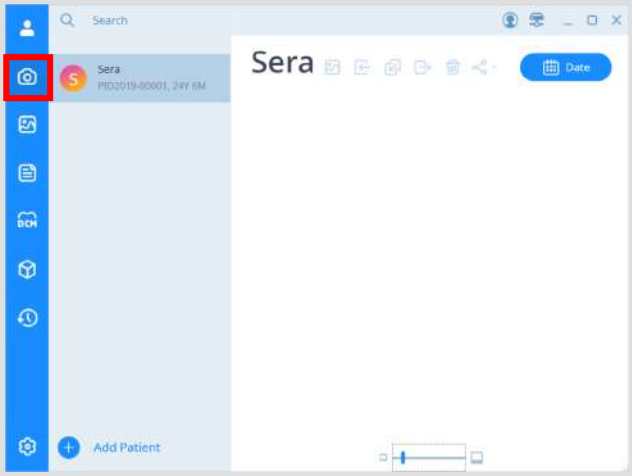
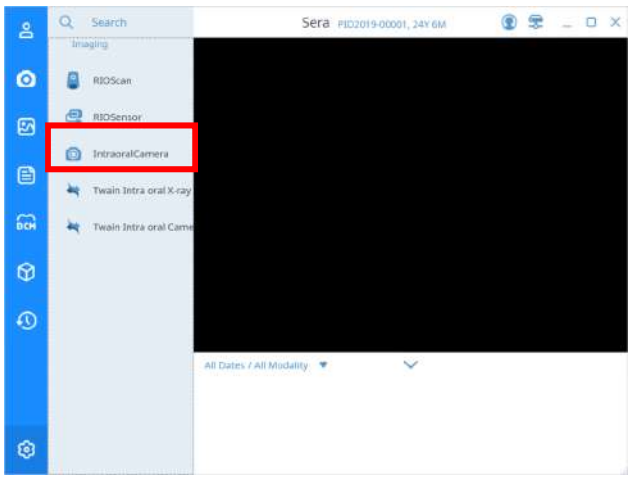
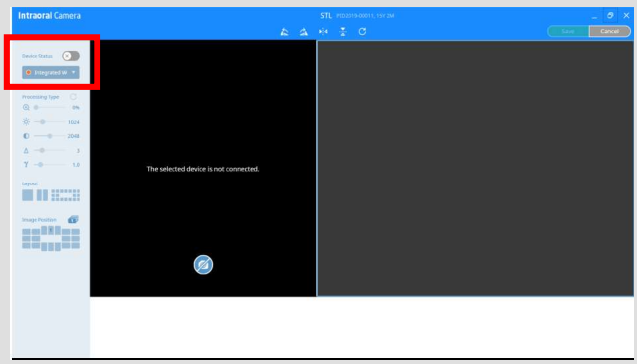


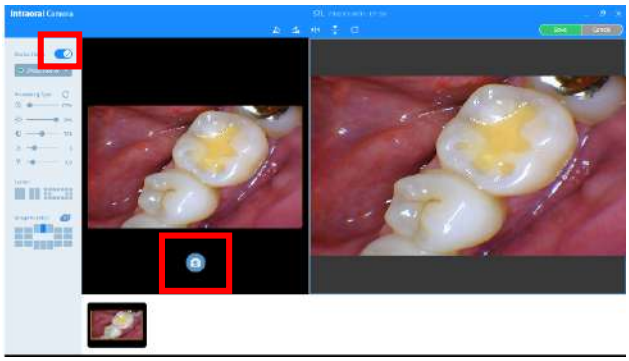
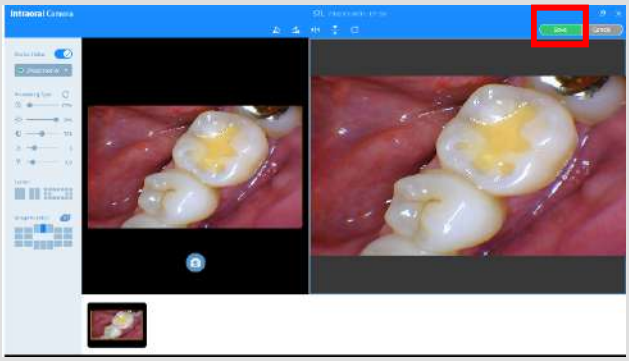
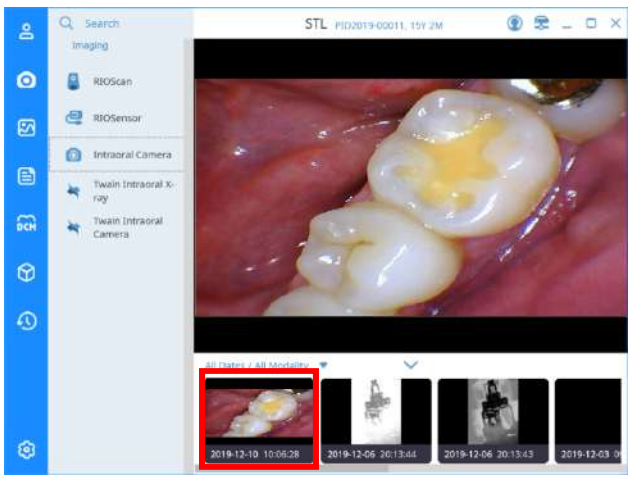
Fig 33 Intraoral Acquisition Screen

The menu of the setting panel is the same as RIOScan. Please refer to “5.1 RIOScan Acquisition”.

Notice	Intraoral photo acquisition does not support the image processing filter function, and the image adjustment menu (enlarge/brightness/contrast/sharpness/gamma) can be activated and used by selecting the captured image.

Intraoral Acquisition

No.	Figure	Description
1		Select the patient and click the [Imaging] button on the left menu.
2		Click the ‘Intraoral Camera’ Button
3		Select a camera to take acquisition from the device list and change the device status to [Ready] button.

4		Check the screen of the intraoral camera in Live View and click the [Imaging] button or use Space, Enter, user registration capture key, etc. to take acquisition.
5		When taking acquisition is complete, click the [Save] button to save the image.
6		You can check the images on the 'Acquisition' tab.

5.4 TWAIN Acquisition

Click the [Intraoral X-ray TWAIN] button to display the TWAIN Intraoral X-ray acquisition screen as shown below, and the shooting window of the selected TWAIN device will open. This manual explains the acquisition procedure when selecting a RIOScan or RIOSensor as a TWAIN device for the user's understanding.

The composition of the TWAIN acquisition screen and the contents of each item are as follows.

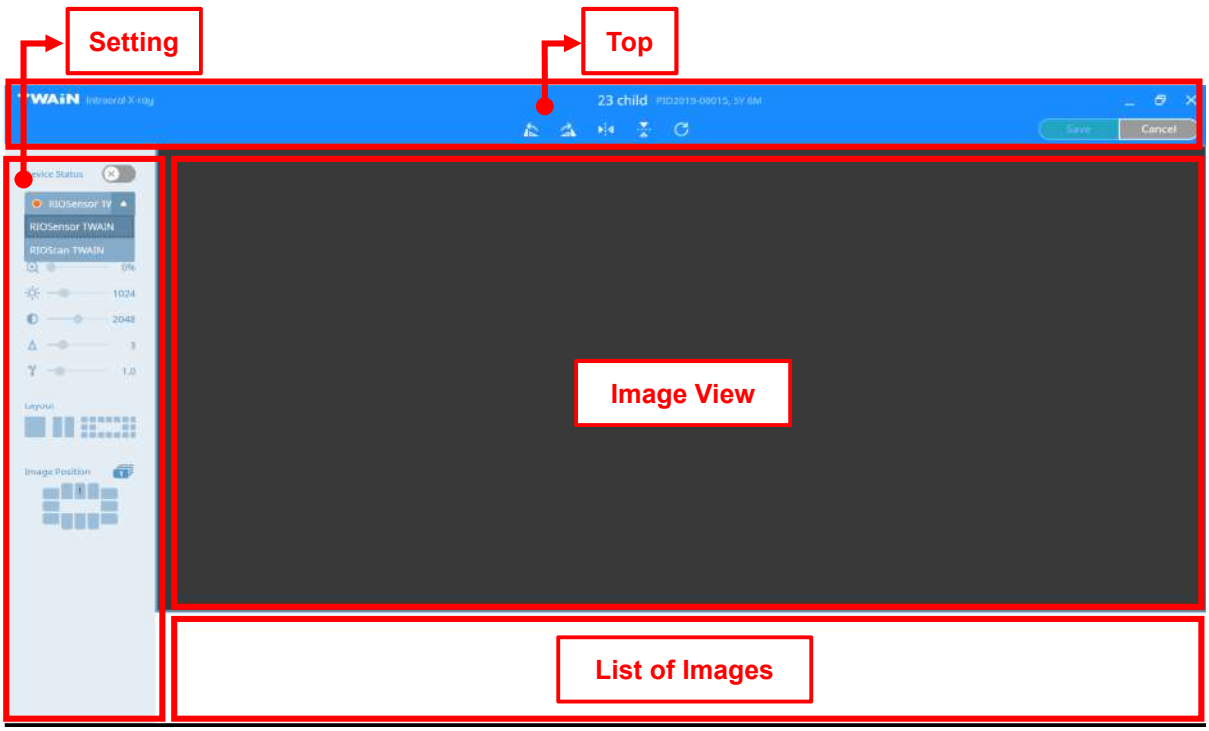


Fig 34 Twain Acquisition Screen

The menu of the setting panel is the same as RIOScan. Please refer to “5.1 RIOScan Acquisition”.

Selecting a TWAIN device launches the TWAIN software for that device.

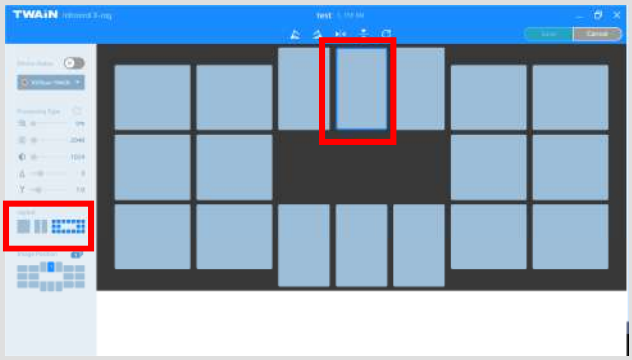
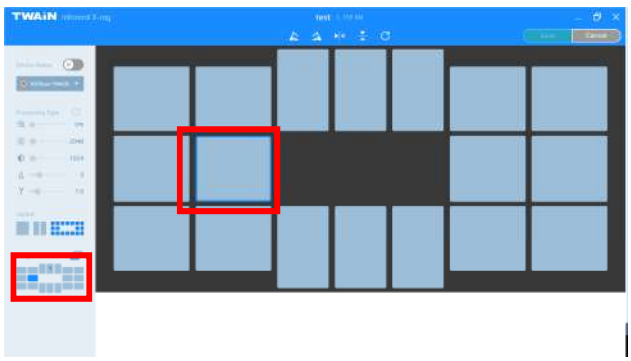
For how to acquire images using TWAIN software, refer to the manual of the product.

Notice	TWAIN shooting does not support the image processing filter function, and the image adjustment menu (enlarge/brightness/contrast/sharpness/gamma) can be activated and used by selecting the captured image.

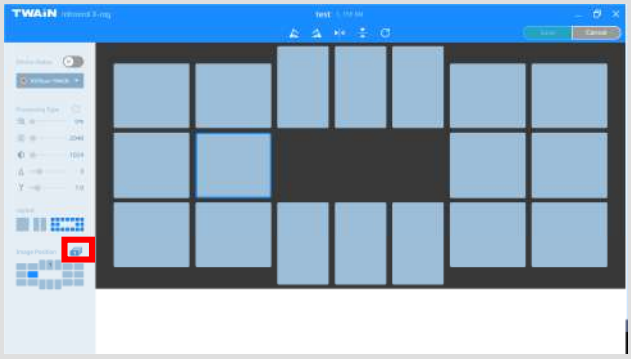
5.5 FMX Acquisition

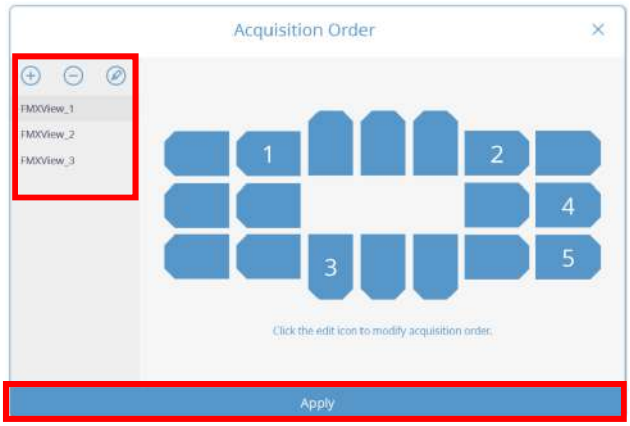
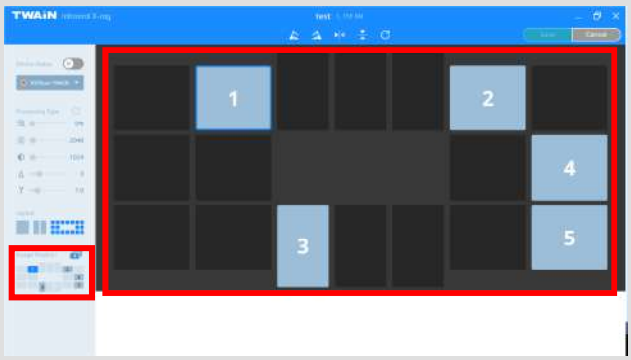
In FMX acquisition mode, you can see the location of the images being taken, and you can set the order of the images to store them in the desired location in order.

FMX Acquisition

No.	Figure	Description
1		Select FMX icon it the lower left of menu panel. FMX view is displayed with upper incisor position selected.
2		Clicking the position of FMX view for acquiring image, FMX indicator of menu panel shows the location.

Set Order of Acquisition

No.	Figure	Description
1		Click [Acquisition Order] button.

2		Add Acquisition Order item to left list and select each position to add order. After making order of acquisition, click [Apply] button. Selecting the selected position again will clear the selection.
3		Each FMX view position is automatically selected according to the order and acquired image is displayed each time an x-ray is exposed.

Notice	The order of FMX acquisition can be customized by a user. In sequential mode, a user is able to select the position within the preset for retaking by clicking the position window. Note that other locations are disabled in sequential acquisitions.

Image Management

6

6 Managing the Image

SMARTDent provides the centralized management of all images used in dentistry.

You can optimize and read panoramic, cephalometric, and intraoral sensor x-ray images for diagnostic purposes, and analyze images and plan treatment using length measurement, angle measurement, and implant simulation functions.

Various multi-view functions allow you to organize various kinds of images into one screen, which allows you to use a variety of line drawing, measurement, and text functionality to make consultation and diagnosis more efficient.

It can be conveniently used for diagnosis, orthodontic analysis, CT image analysis and simulation functions using panorama, cephalometric, intraoral sensor, and intraoral camera images by supporting integration with orthodontic analysis and simulation programs, 3D viewers that support CT image diagnosis and simulation. There is the screen structure of the 'Image' tab and the contents of each item are as follows.

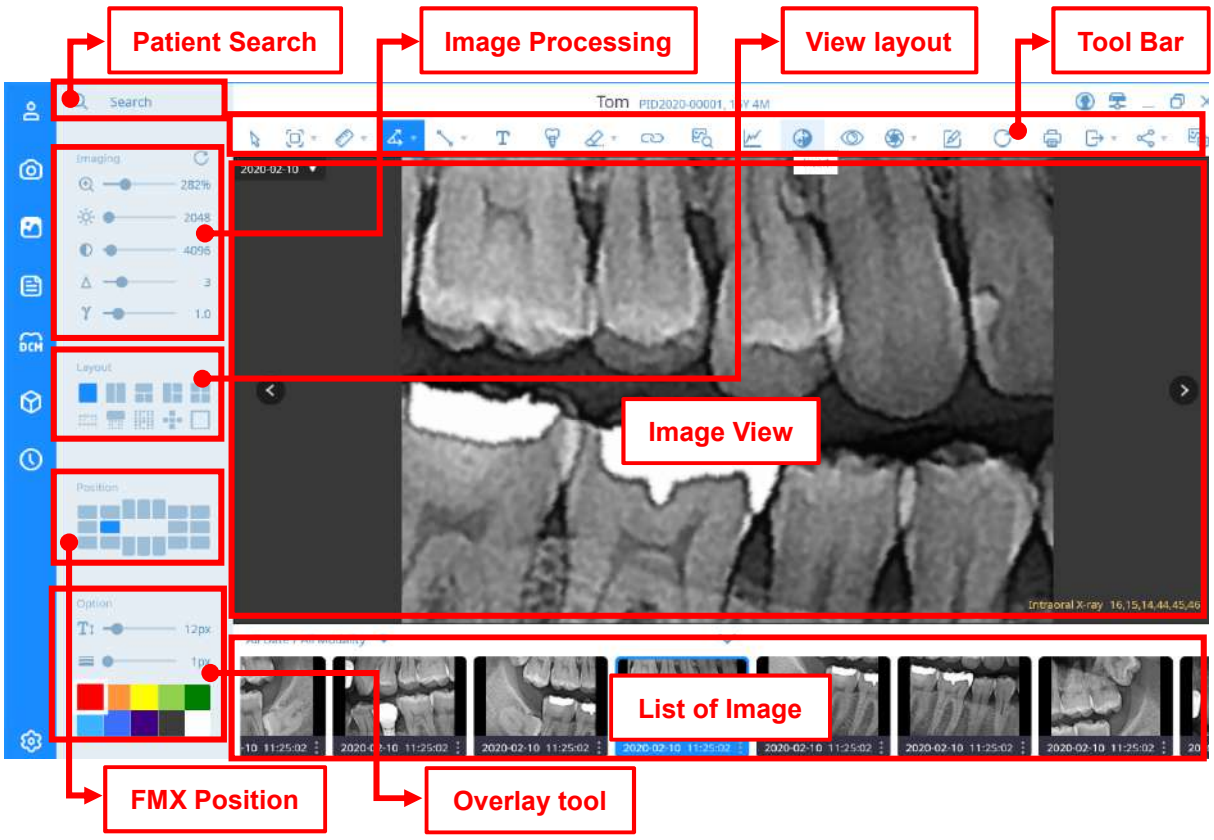


Fig 35 'Image' Tab Screen

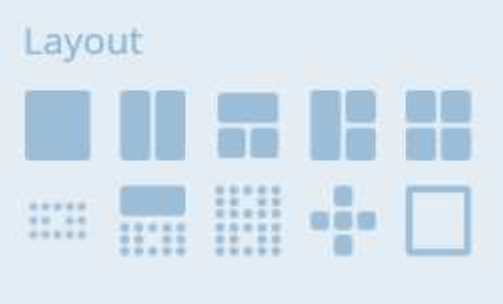
Patient Search

Please refer to "5. Image Acquisition - Patient Search".

Image Processing

Please refer to "5.1 RIOScan Acquisition – Image processing".

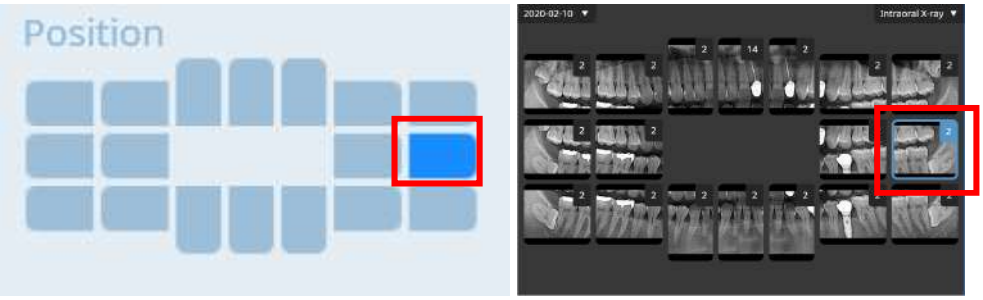
View layout



Item	Description
Basic View	Displays image on one screen
Horizontal split view	The image is displayed on two horizontally divided screens.
Vertical three-part view	Displays the image on the vertical 3-split screen.
Landscape split view	Displays the image on the horizontal 3 division screen.
4-split view	The image is displayed on the 4-split screen.
FMX view	Display the image on the FMX screen.
Panoramic and FMX views	Displays one panoramic image and FMX screen.
2-split FMX view	Display images on two FMX screens.
OT5	Intraoral photos are displayed on a 5-split screen according to their location.
Scatter View	Each image is displayed in a popup window.

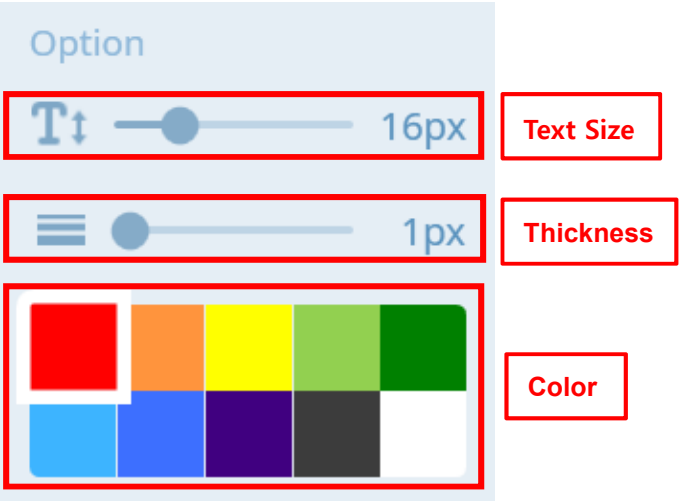
FMX Position

After selecting the image view to change the FMX position, click the Position button of the desired position or drag and drop the image to move to the desired position.



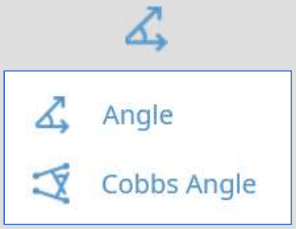
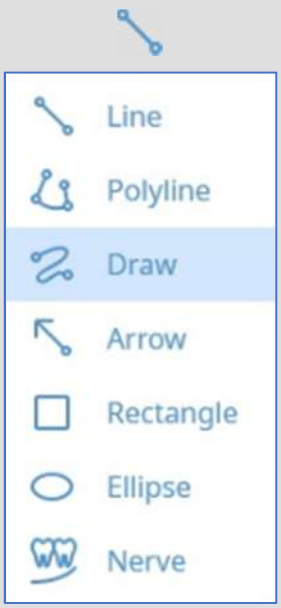
Notice	Right-click on the FMX window to rotate the image.

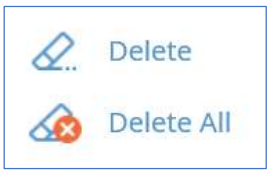
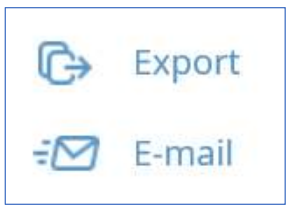
Overlay Tool



Item	Description
Text Size	Sets the text size of the text overlay.
Thickness	Sets the pen thickness of the overlay item.
Color	Sets the pen color for overlay items.

Toolbar

	Item	Description
	Select	This mode selects image, measurement, and annotation as the default state.
	Image alignment	Change image magnification to the screen size.
	Full screen	Displays the selected image in full screen.
	1:1 Actual size	Displays on the screen in actual size of image.
	Length measurement	Measure the distance between two entered points.
	Continuous length measurement	Measure the distance between two points continuously.
	Angle measurement	Measure the three-point internal angle. .
	Cobbs angle measurement	Measure the internal angles of the two segments of the 1/2, 3/4th of the line segments.
	Straight	Displays a straight line.
	Multiline	Displays multiple straight lines.
	Drawing	This function draws a curve on the image.
	Arrow	Enter the arrow above the image.
	Rectangle	Enter a rectangle over the image.
	Ellipse	Enter a circle on the image.
	Nerve	Draw mandible nerve on the image.

	Text	Add a text box over the image.
	Implant	This function displays the implant on the image.
	Delete	Delete the selected overlay.
	Delete All	Delete all overlays displayed on the screen.
	Image comparison	Apply image movement and magnification before and after treatment to two screens simultaneously.
	Magnifying Glass	The image around the mouse cursor is enlarged and displayed.
	Profile	It displays the pixel value of the image between the two entered points as a graph and provides length adjustment according to the pixel value.
	Reverse	Invert the color of the video.
	Show / Hide overlay	Hide or show the overlay.
	Region capture	Capture a specific part of the image.
	View capture	Capture the selected image view.
	Screen capture	Capture the entire image view.
	Memo	Add a memo to the Image
	Print	Go to the ‘Report’ tab to create a report
	Export	Export the image as a file
	E-mail	Send an email with the image attached.

	Connect Program	The image is transmitted to a program set for each modality and executed
	Image Information	Display the image properties window.
	Reset	Initialize the overlay.

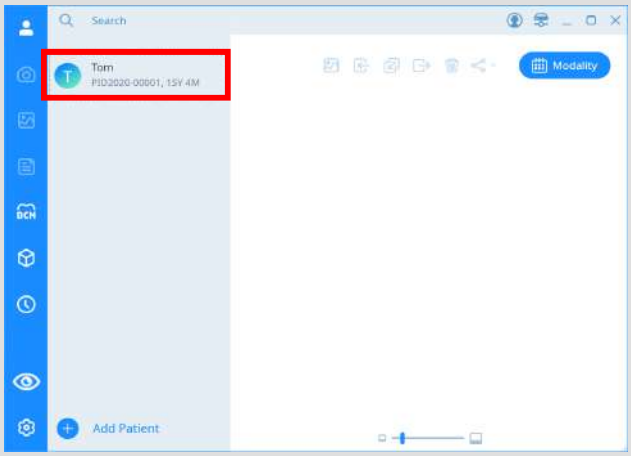
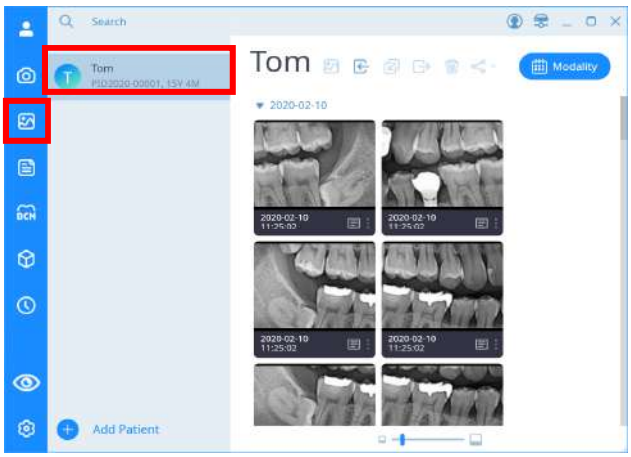
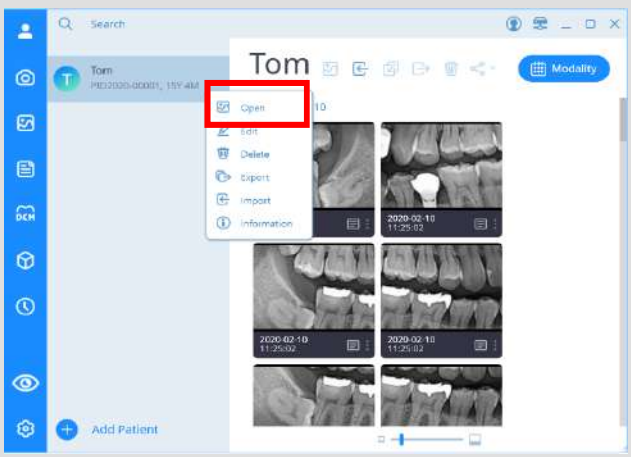
Image View and Patient Image List

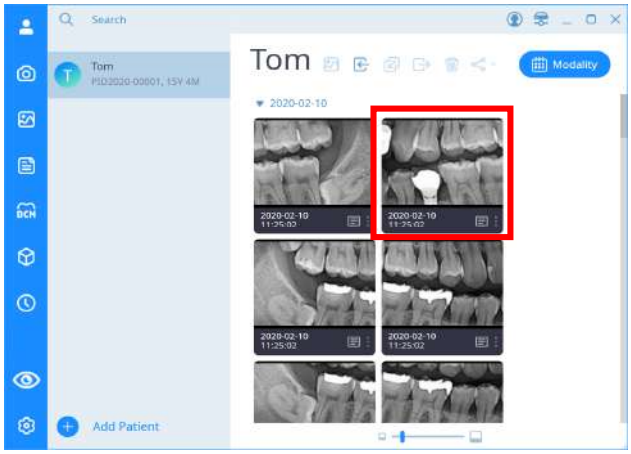
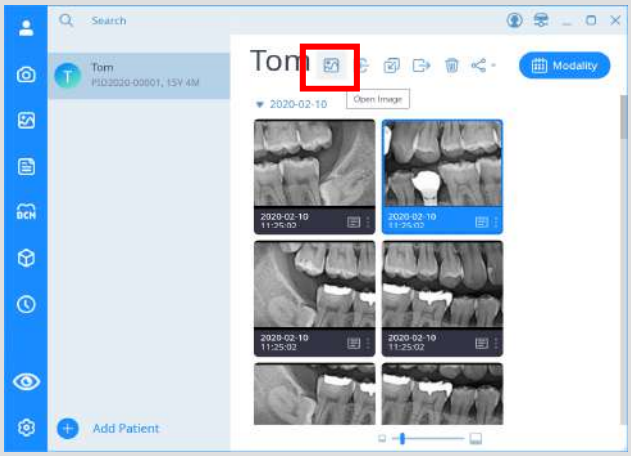
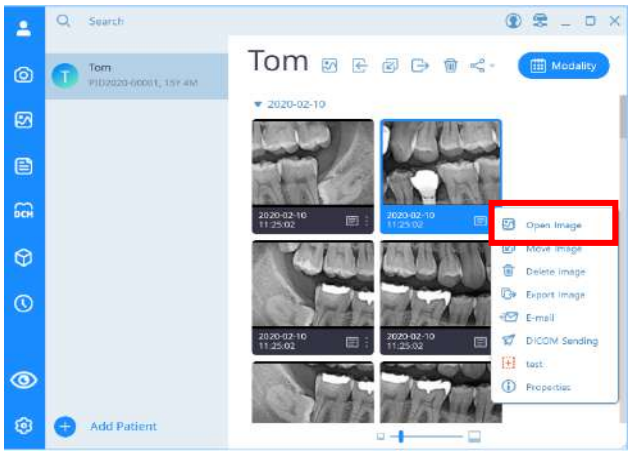
Image Acquisition-Please refer to the image view and patient image list.

6.1 View Image

On the ‘patient’ screen, double-click ‘Patient List’ or right-click and select the [Open] item to automatically switch to the ‘Image’ screen. If multiple images are not selected, the most recently taken image is displayed on a single screen, and all images from the selected patient are displayed as thumbnails in the 'Patient Image List'. Double-click the thumbnail of the desired Image in the 'Patient Image List' or drag and drop it onto the image view to display the image.

6 Ways to Go to the Image Tab

No.	Figure	Description
1		Search for a patient in the patient list and double-click.
2		Select a patient from the patient list and select [Image] button on the left tab.
3		Select a patient from the patient list, right-click and select [Open] button.

4		Double-click the desired image in the patient image list.
5		Select the desired image from the patient image list, and the [Open Image] button at the top is activated and click this button.
6		Right-click on the desired image in the patient image list and select [Open Image] button.

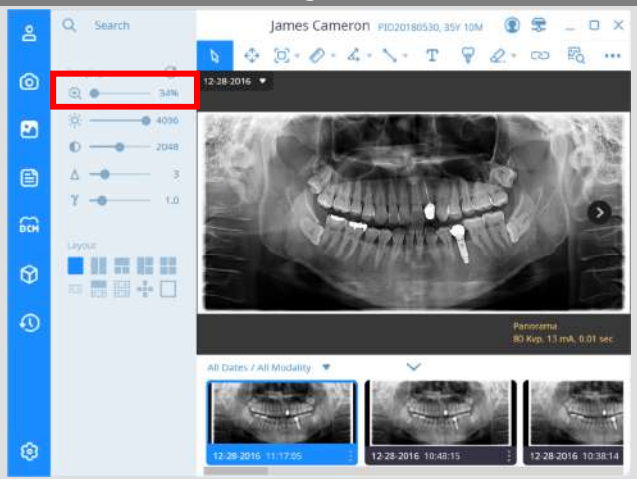
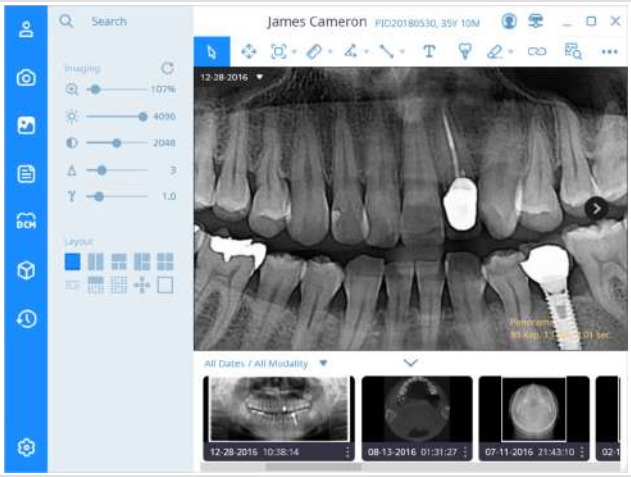
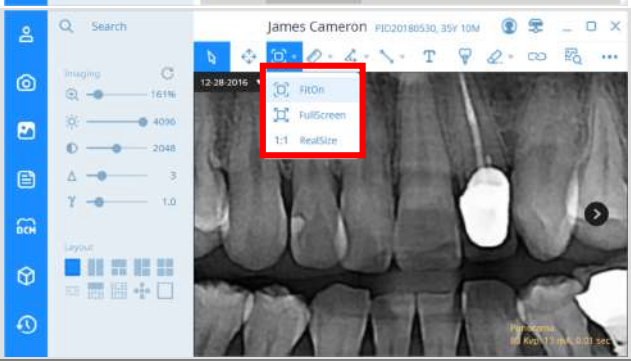
Notice	If you click the selection button on the upper right of the screen when the mouse is placed on the thumbnail image, and then select the additional image you want to select, you can easily select multiple images using only the mouse.

6.2 Zooming In/Out the Image

You can adjust the magnification of the image according to the purpose of diagnosis by using the 'image zoom' function.

Notice	When double-clicking the mouse, the image is enlarged around the selected area, and double-clicking again changes the screen to fit-on.

Zooming In/Out the image

No.	Figure	Description
1		Changing the magnification of the image by adjusting [Zoom] slide control.
2		You can zoom in / out using the mouse wheel on the Image view.
3		Click the [Fit] button to return to the initial size of the image.

6.3 Adjust the Image

For accurate image diagnosis, you can use the slide controls on the left to adjust the Windowing Center, Windowing Width, Sharpness, and Gamma values. Changes are saved in the image and can be checked in the same way. If you select the reset button at the top of image processing, the image is initialized.

Windowing adjustment can also be adjusted by dragging the right mouse button up / down (brightness) or left / right (contrast) regardless of the currently selected mode.

6.4 Measuring Length

You can measure the distance between two points or a continuous point, and after measuring the length, you can move the position of the entered point to modify the length information or change the position where the result of the length measurement is displayed.

The color and thickness of the line, font size and color setting function of the result are displayed on the bottom left.

6.5 Measuring Angle

'Angle' is a function to measure the internal angle (external) of two segments of three points, and 'Cobb's angle' is a function to measure the internal angle (external) of two segments of four points. After measuring the angle, you can measure the exact angle by moving the position of each point, and you can move the display position of the result.

The color and thickness of the line, font size and color setting function of the result are displayed on the bottom left.

6.6 Drawing Shapes

Diagnostic information can be recorded on the image using the 'Shape' function, and can be used for effective consultation with patients. Types include line, polyline, draw, arrow, rectangle and ellipse.

6.7 Insert Text

Using the 'Letter' function, you can record the diagnostic information of the image or the patient's requirements in letters. Click the location where you want to insert the text to display the text window. After entering the text, you can change the location, size, and color.

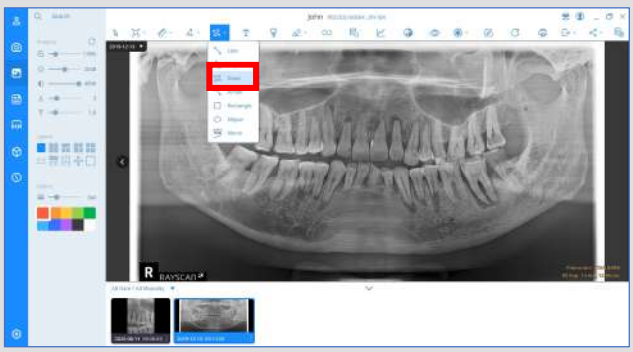
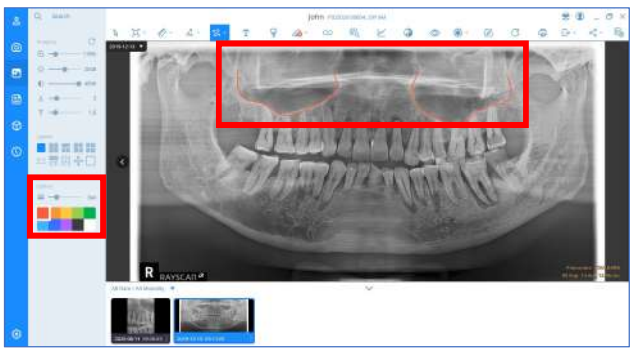
6.8 Delete Overlay

'Overlay' refers to items that are additionally entered into the image, such as length, angle measurement information, implants, shapes, and text.
After selecting ‘Overlay’, click [Delete] button to delete them one by one, or click [Delete All] button to delete all input information at once.

6.9 Draw

Draw features allow you to conduct more efficient consultation and record diagnostic information on images.

Draw on image

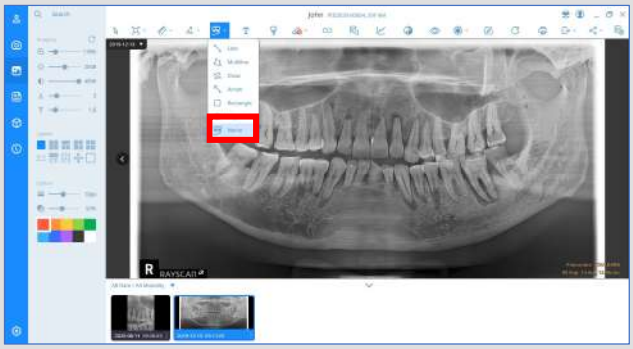
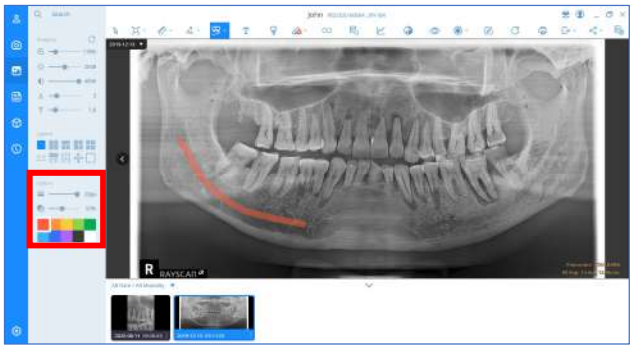
No.	Figure	Description
1		Select [Draw] on Draw menu.
2		Move the mouse to draw on image. Thickness and color of line can be adjusted from option at the bottom left corner.

Notice	If you change the line thickness of color after drawing, it applies to the last entered drawing item, and you can change it to desired thickness or color by selecting each item. Right-click on the drawing item to display menu and you can edit or delete it.

6.10 Nerve

Drawing mandibular nerve is supported for implant simulation.

Drawing mandibular nerve

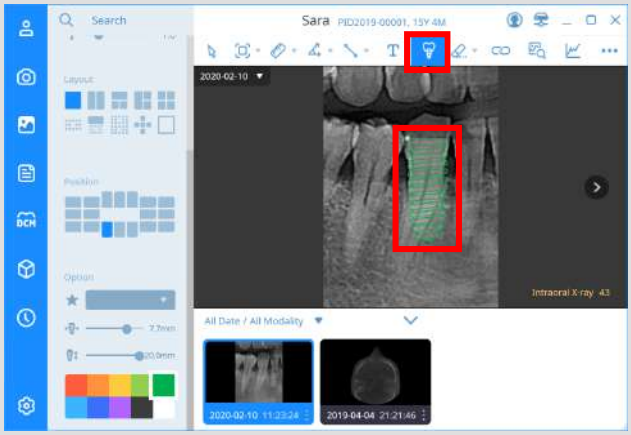
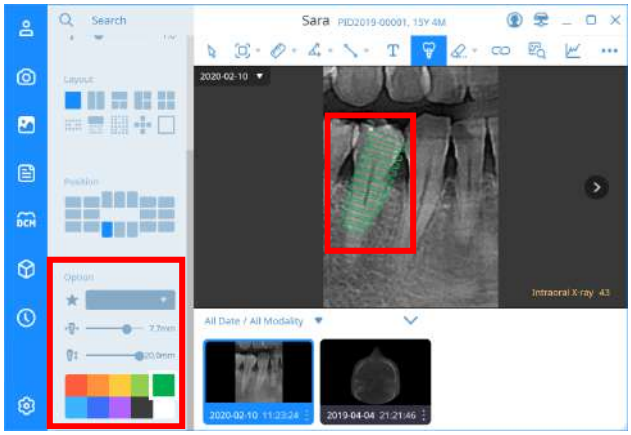
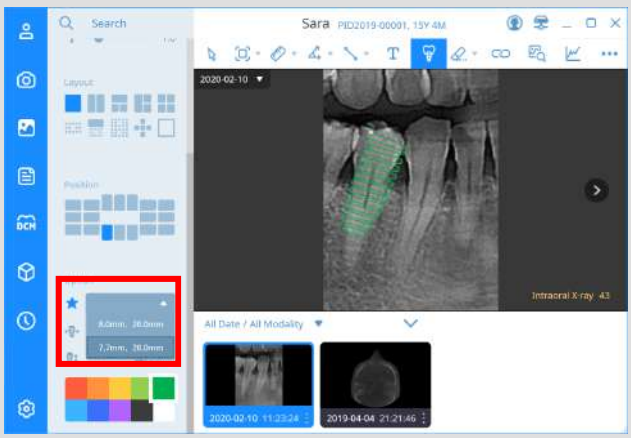
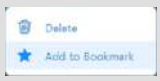
No.	Figure	Description
1		Select [Nerve] under Draw menu.
2		Move the mouse to draw mandibular nerve on image. Thickness, opacity and color of line can be adjusted in option at the bottom left corner.

Notice	Move the cursor over drew nerve line. Right mouse-click allows to access the [Edit] and [Delete] options.

6.11 Implant Simulation

The 'Implant' function allows the implant image to be superimposed on an X-ray image to select the optimal implant size for implant surgery. SMARTDent supports an image-based implant simulation function to more effectively consult with patients.

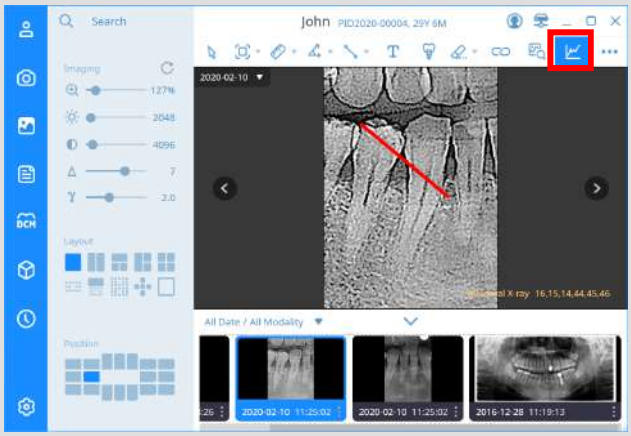
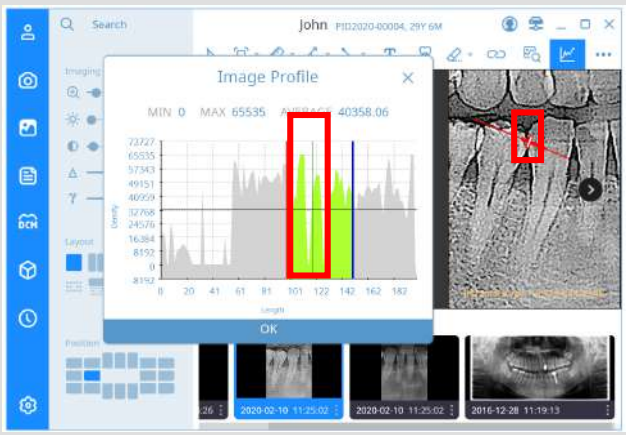
Inserting the Implant

No.	Figure	Description
1		Click the [Implant] button in the 'Toolbar' and click two points on the image to create implant. The position of fixture is optimized based on the distance and angel of two points.
2		Upon complete of fixture position, use the mouse-scroll to change the width. The height, thickness and color can be also adjusted under Option section on the bottom of left corner.
3		Right mouse-click allows to access the [Delete] and [Add to Bookmark] options. Added favorite fixtures can be loaded easily with a single click. 

6.12 Profile View

You can check the profile information between two points as a graph and check the length adjusted by the Y axis according to the value.

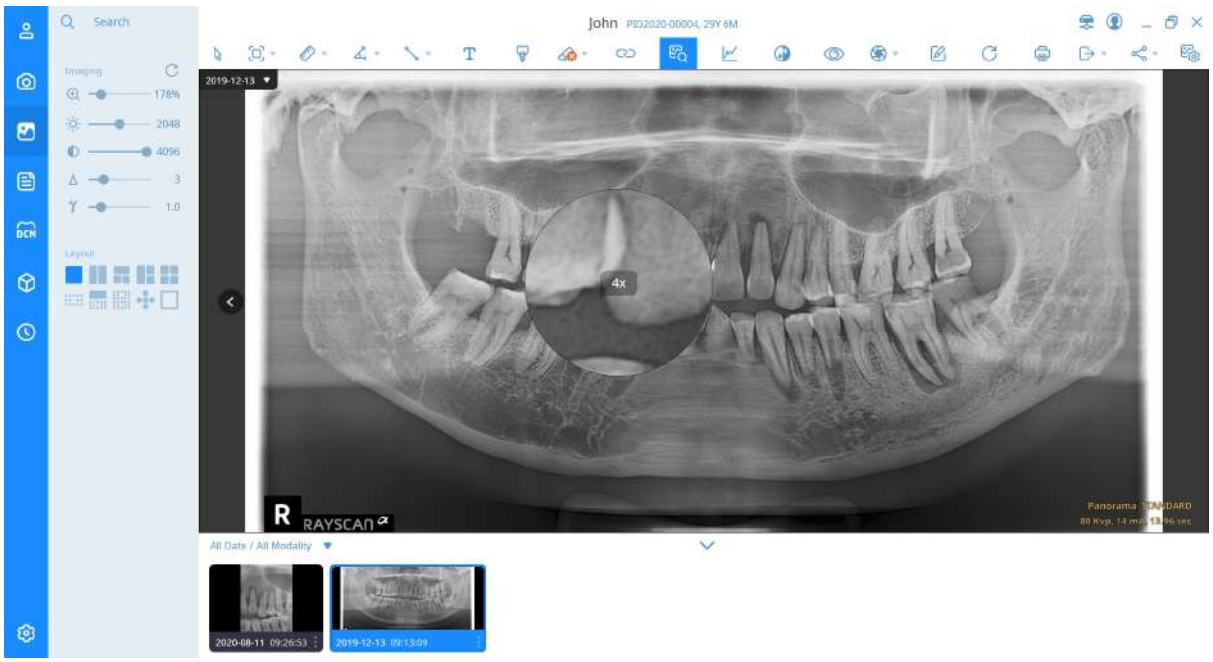
Viewing Image Profile

No.	Figure	Description
1		Select the [Profile] button in the 'Toolbar' and click two points to verify the profile information.
2		Hovering the mouse over the graph displays the location on the image.
3		You can move the start and end point of the profile by dragging the left mouse button.

6.13 Magnifying Glass

You can use the 'magnifying glass' function to zoom in on a part of the image for precise analysis. After selecting the magnifier function and hovering the mouse over the image, the image around the cursor is enlarged and the contrast is improved to be displayed in a separate window.

Use the mouse wheel to change the magnifying glass size and click left button to change the magnification ratio. When you move the mouse, the image around the cursor is updated in real time.

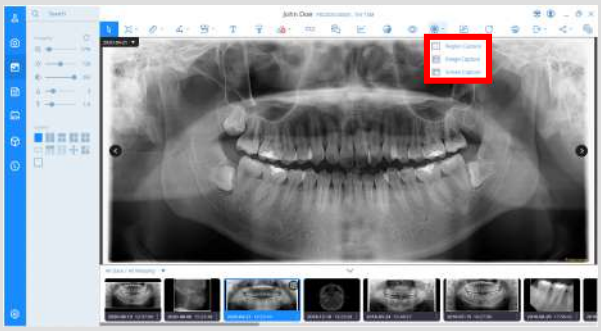
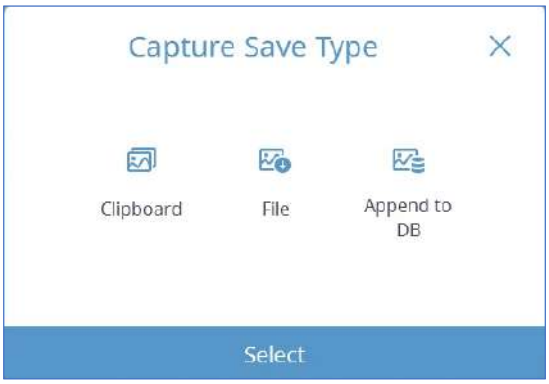


Notice	All functions of the magnifying glass are available with the mouse. · Mouse wheel –Resize of the magnifier · Left-click mouse – Change zoom factor · Moving the mouse – Changing the position of the image display · Right-click mouse – Turn off the magnifier

6.14 Capture the Image

In SMARTDent, capture such as [Region Capture] to capture the selected blind area, [Image Capture] to capture the selected image, [Screen Capture] to capture the entire view area. After capturing the image you can choose save type such as clipboard, file, and Append to DB. The captured file name is automatically created in the form of [Patient ID_Patient Name_Modality_Date], and can be changed by the user.

Capturing the image

No.	Figure	Description
1		Click [Capture] and select one of options (Region, Image and Screen).
2		Select save type.

Sub-Menu of Capture

Item	Description
Clipboard	Copy the captured image to Windows Clipboard
File	Save the captured image to file
Append to DB	Save the captured image to SMARTDent server

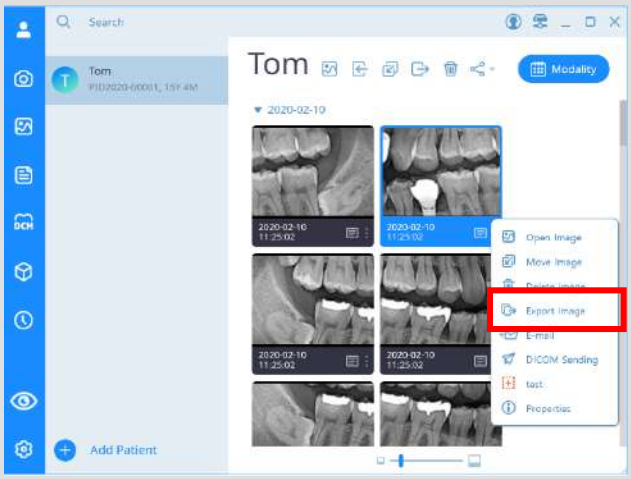
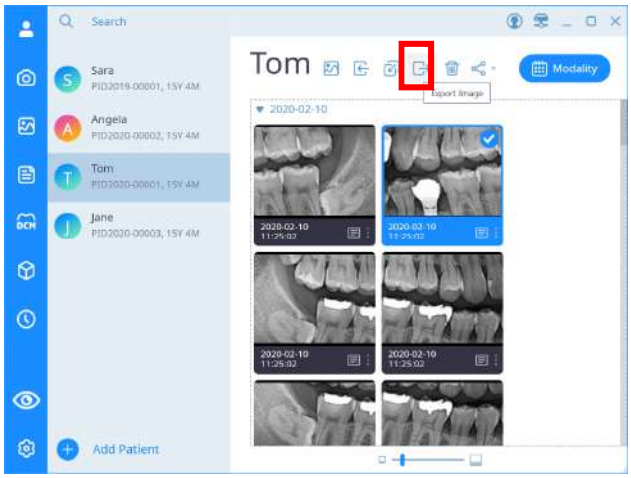
6.15 Export

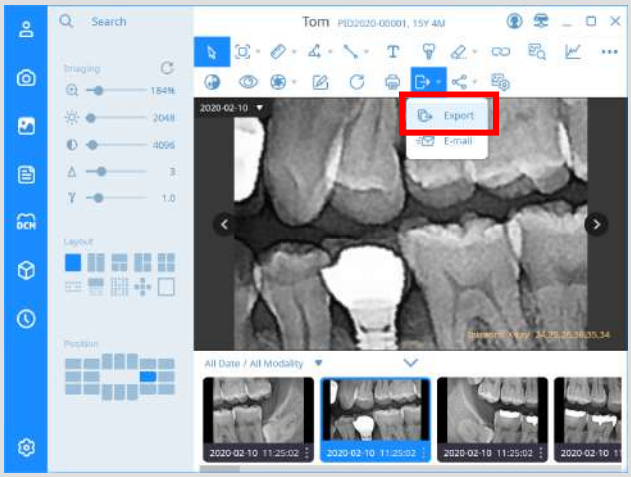
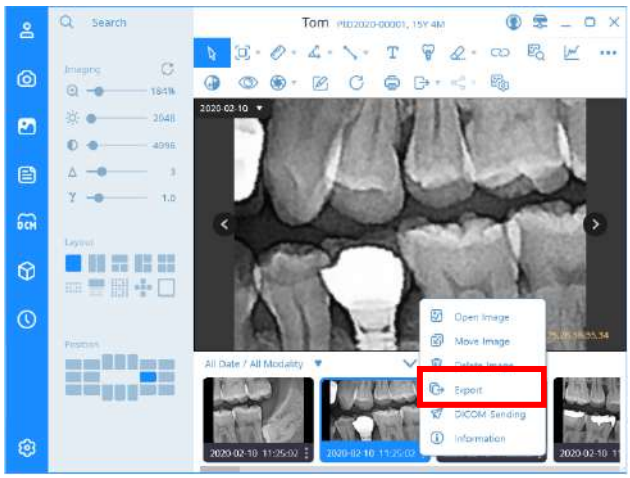
SMARTDent allows you to export the image as a file or email.

Exporting to a file is the same as “4.5 Export Patient Image” and the selected image is saved in the path set in the explorer.

Image export can be done in several places as shown below.

4 Ways to Export Images

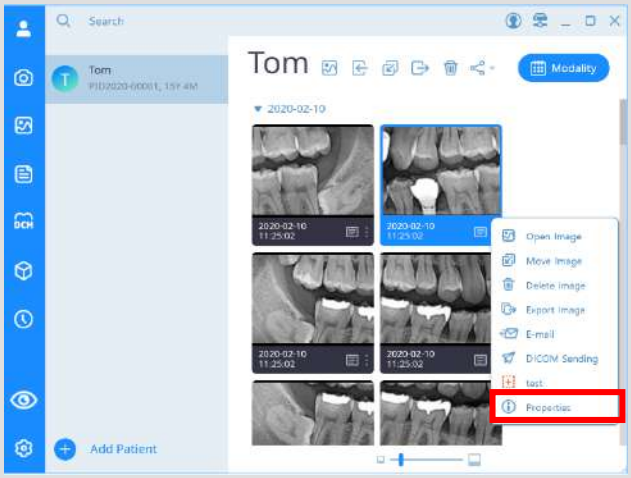
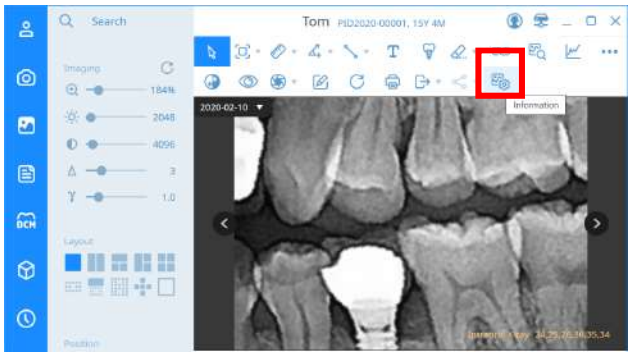
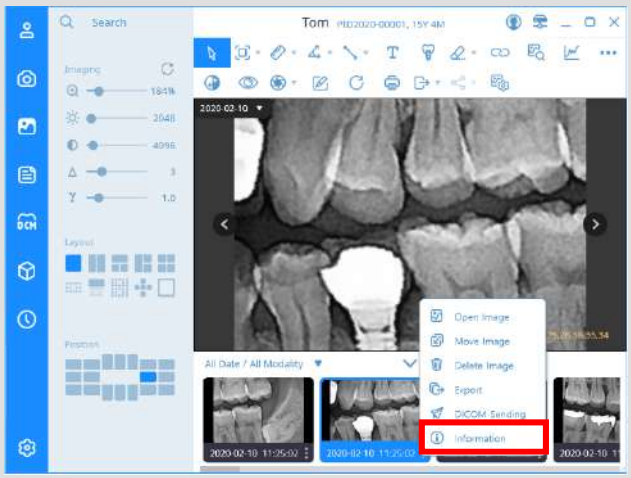
No.	Figure	Description
1		Right-click on the image you want to export as a file and select [Export Image] button.
2		Select the image to export as a file and click the [Export] button at the top.

3		Select [Export] button from the ‘Image’ screen toolbar.
4		Right-click on the image to export from the 'Patient Image List' and select [Export] button.

Notice	If you click the selection button on the upper right of the screen when the mouse is placed on the thumbnail image, and then select the additional image you want to select, you can easily select multiple images using only the mouse.

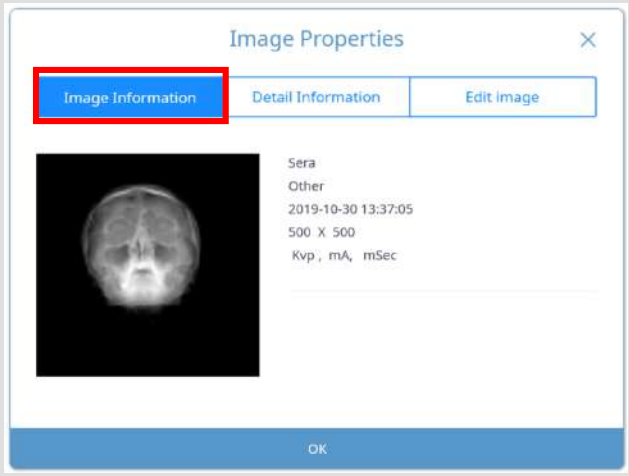
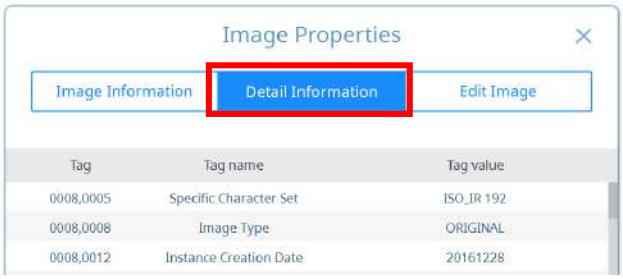
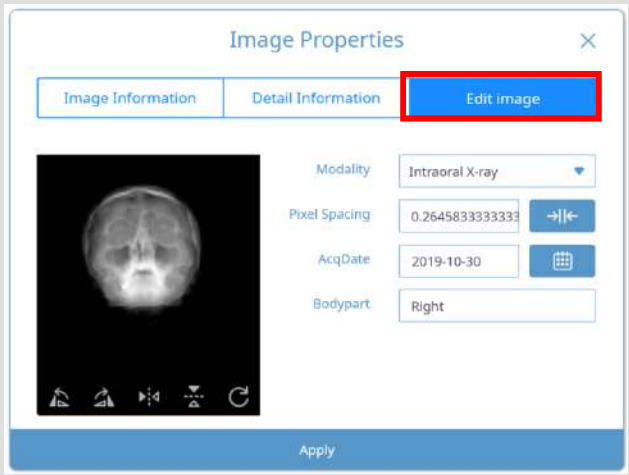
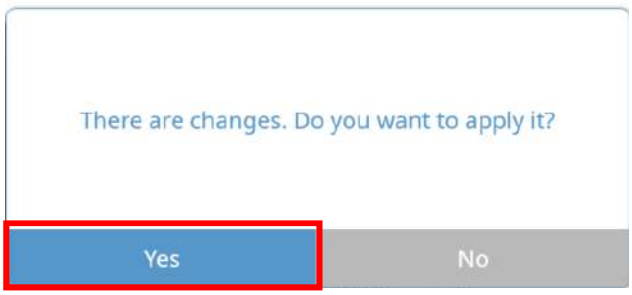
6.16 Checking/Modifying Image Information

3 Ways to Check Image Information.

No.	Figure	Description
1		Right-click on the image to check the properties and select [Properties] button.
2		When you click the [Information] button on the image tab 'Toolbar', the 'Image Properties' window opens.
3		Right-click on the image to check in the thumbnail of the image tab and select [Information] button to display the "Image Properties" window.

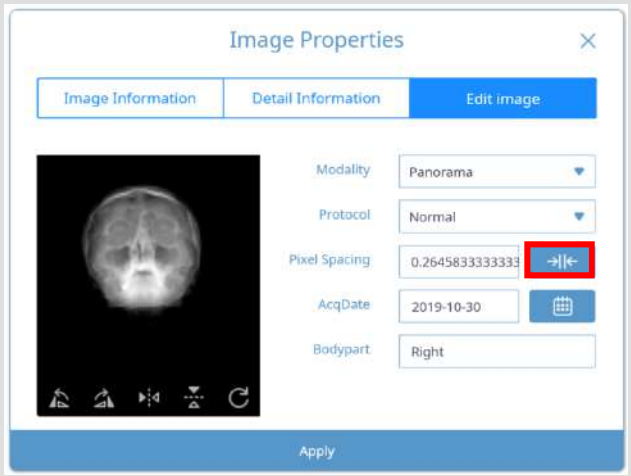
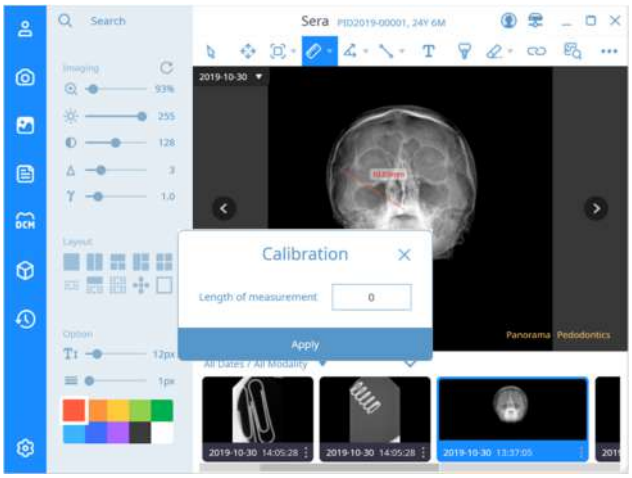
You can check the image information and modify the modality, protocol, length information and rotation information of the image.

Image Properties

No.	Figure	Description
1		Select [Image Information] button to check the basic information of the image.
2		Select [Detail Information] button to view DICOM header information.
3		Select [Edit Image] button to modify the rotation and image information of the image.
4		After changing the image information, click the [Yes] button when the 'Change Image' window appears.

6.17 Calibrating Length

If the length information of the image is entered incorrectly, the length of the image can be corrected using the calibration function.

No.	Figure	Description
1		In the 'Image Properties' window, select the [Edit Image] button and click the [Calibration] button in the [Pixel Spacing] item.
2		The length calibration setting window appears. After measuring the length of the area you want to measure on the image, enter the actual length to set the calibration value.

6.18 Memo

You can register a memo on the image, and an icon is displayed on the thumbnail of the [Patient] screen for the image with the memo, so you can select the image and check the content through the memo before displaying it on the screen.

Fig 36 Memo View

Memo Menu

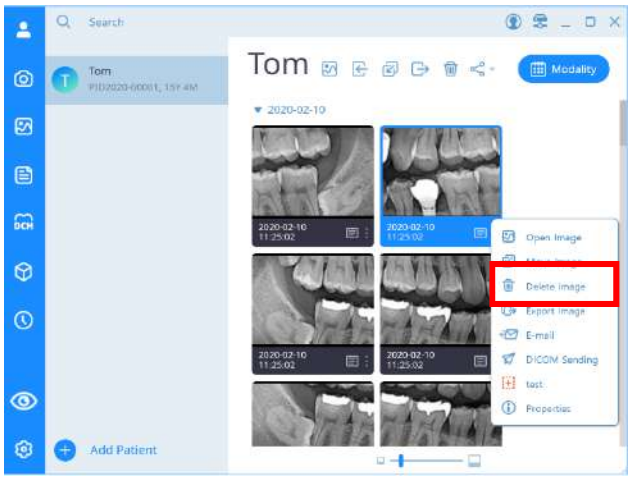
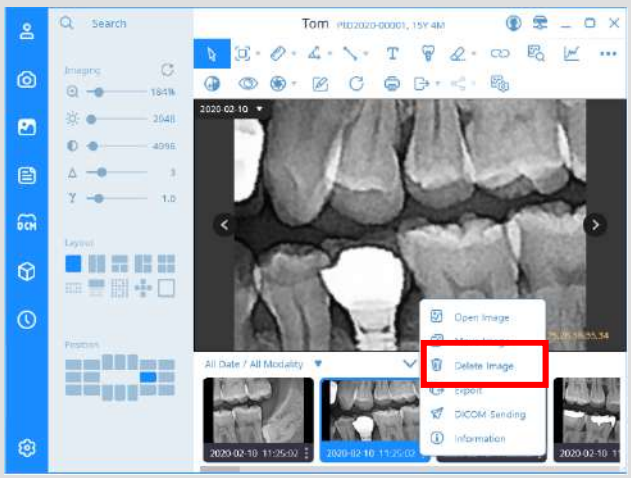
Item	Description
	Edit memo.
	Delete memo
	Add memo

Notice	Hover over the memo icon in image thumbnail to check diagnosis and consultation information in advance.

6.19 Delete the Image

'Delete' function prevents the image from being searched by SMARTDent and longer, and the actual files are not deleted from the server.

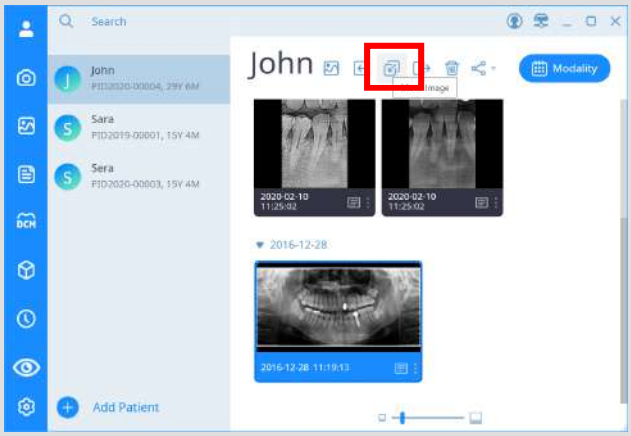
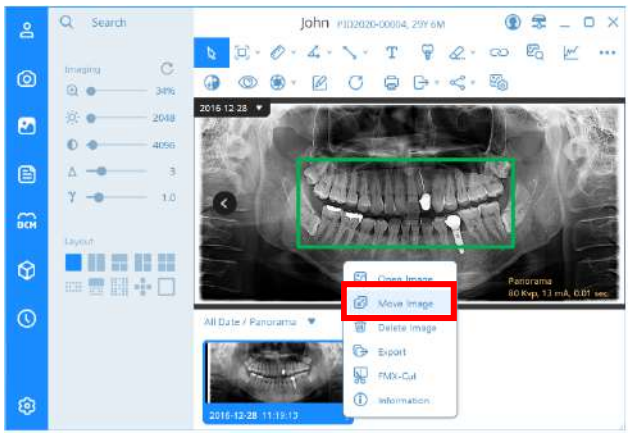
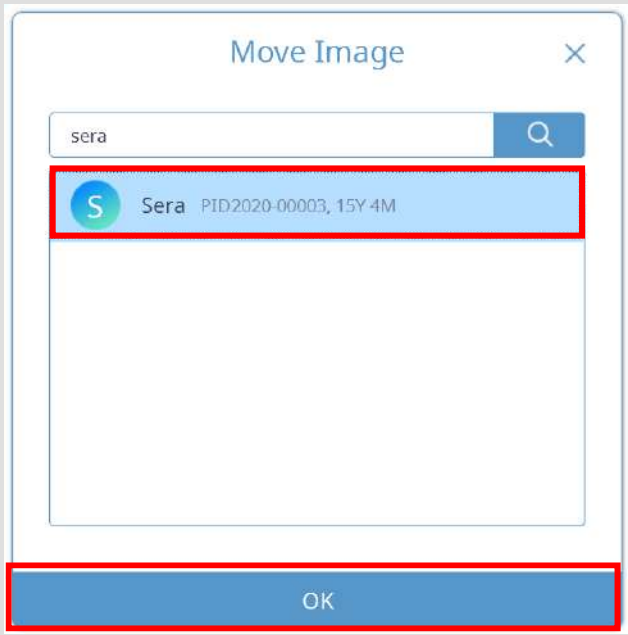
Delete Image Menu

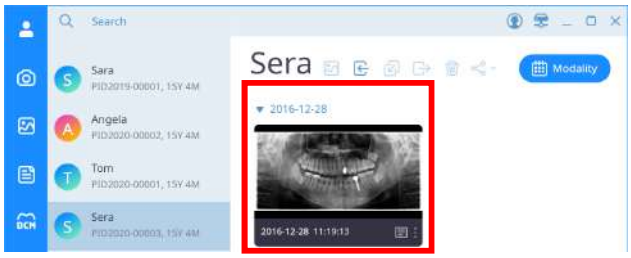
No.	Figure	Description
1		If you select an image to delete from the patient image list, the 'Delete Image' button at the top is activated. Click the [Delete Image] button.
2		Right-click the image to delete from the patient image list and select [Delete Image] button.
3		Right-click on the image you want to delete from the 'Patient Image List' in the 'Image 'tab and click [Delete Image] button.

Notice	Deleted images can be restored again or deleted completely. See "12.7 Patient, Image Information Activation"

6.20 Move Images to Another Patient

SMARTDent provides the ability to move selected images to other patients.

No.	Figure	Description
1-1		Select an Image to move from the image list (multiple selections possible) and select [Move image] button at the top.
1-2		Right-click on the image to move in the 'Patient Image List' and select [Move Image] button.
2		In the ‘Move Image’ window, search for the patient to be moved, select it, and click the [OK] button at the bottom.

3		Confirm that the image has moved

Notice	If you click the selection button on the upper right when the mouse is placed on the thumbnail image, and then select the additional image you want to select, you can easily select multiple images using the mouse only.

Report

7

7 Report

Report is a new printing feature of SMARTDent. Various pages can be configured in the form desired by the user, and various functions such as image adjustment, text insertion, and patient and image information display settings are supported.
If you select the [Print] button in the image view, the image displayed in the view area is displayed on the report page, and all images of the patient are displayed as a thumbnail list at the bottom.

The report screen is shown as in the figure below.

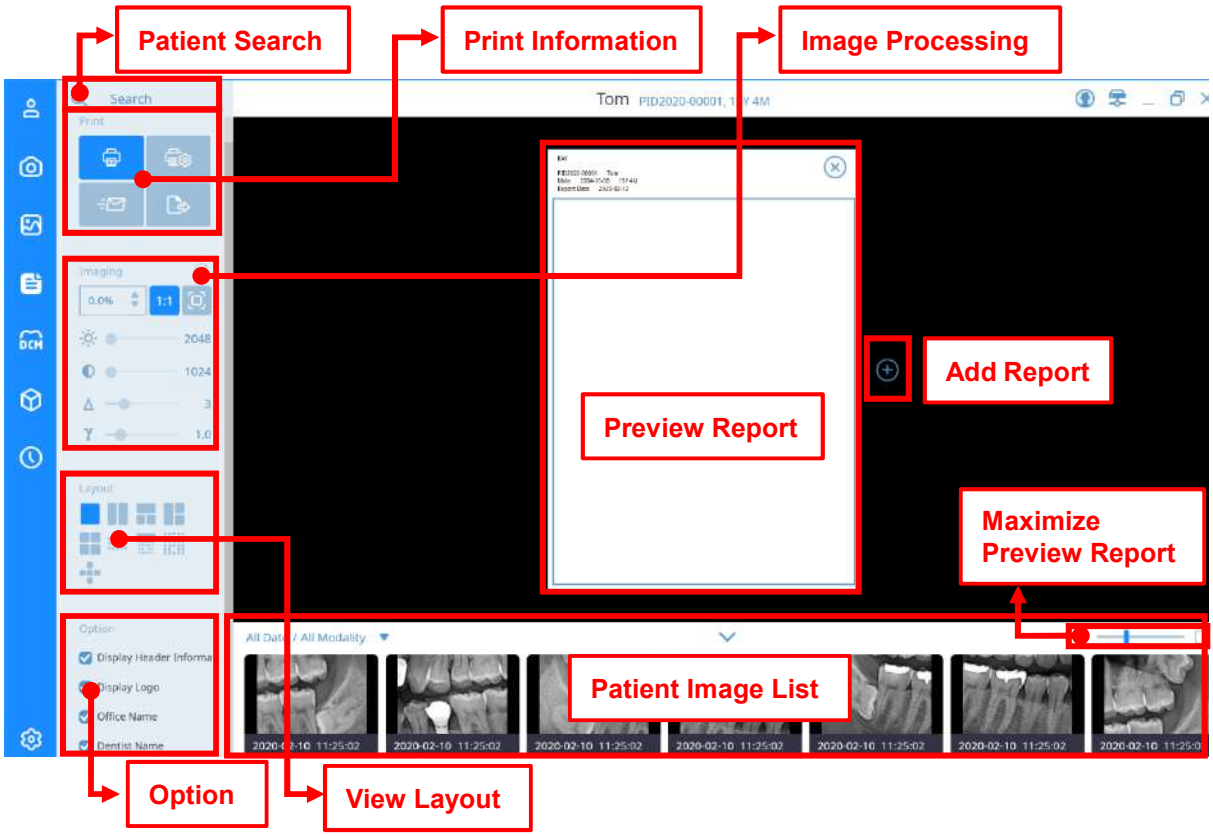


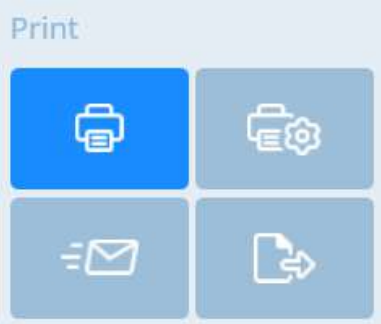
Fig 37 'Report' Tab Screen

Patient search

Please refer to "5. Image Acquisition - Patient Search".

Notice	Using patient search, you can select a patient without going to the [Patient] tab from the [Report] screen.

Print



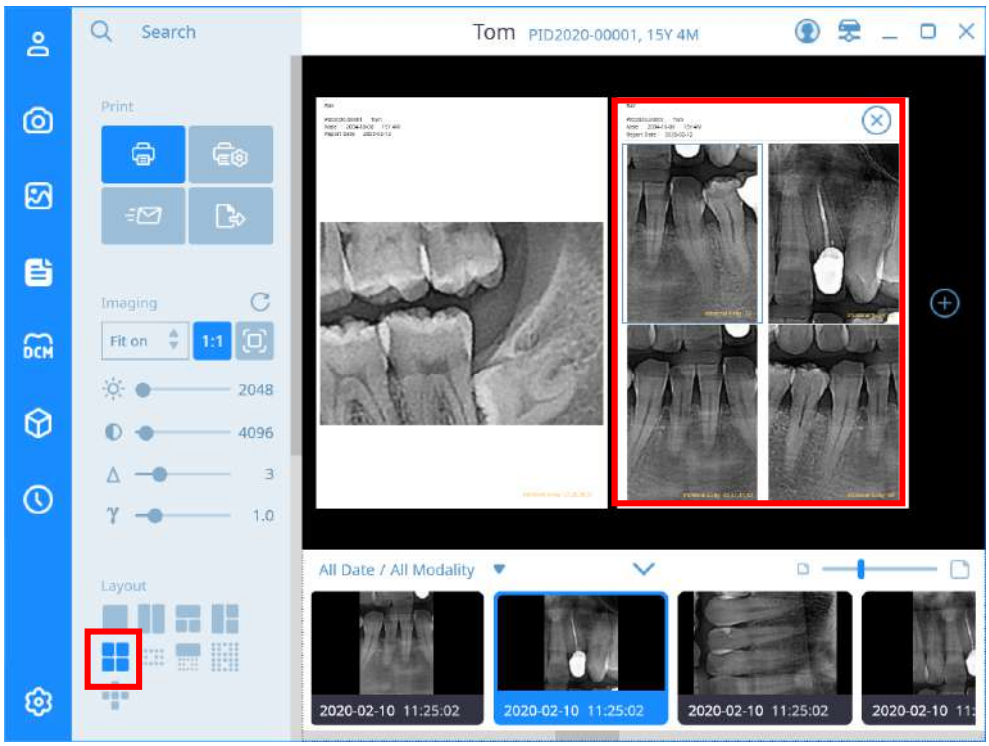
Item	Description
Print	Print the current report.
Print settings	Open the printer settings window.
Email	Email the current report.
Export to file	Save the current report as a file.

Image Processing

Please refer to “5.1 RIOScan Acquisition – Image Processing”.

View Layout

Select the layout of the image to be displayed in the report.



Option

Select what you want to appear on the report.

Item	Description
Header Information	Set whether to use the following information on the report page.
Logo	Set whether to display hospital logo.
Clinic Name	Sets whether to display the hospital name.
Dentist Name	Sets whether or not to show the doctor in charge.
Patient Information	Sets whether to display patient information.
Report Date	Set whether to display the print date as a report.
Image Information	Set whether to display image information.
Image Overlay	Set whether to include image overlay.
Guide Ruler	Set whether or not to show the guide ruler.
R Mark	Set whether to display the 'R' mark at the bottom left of the report.
Comment	Set whether to enter a comment.

Report Preview

The report page that will be printed last.

Add Report

Add a report page.

List of Patient Images

5. Image Acquisition-Please refer to the list of patient images.

Please refer to “5.1 RIOScan Acquisition – list of patient images”.

Report Preview Size

Adjust the size of the report preview screen.

Print Setting

You can print a report page with a print connected to a PC or a DICOM Printer. Click the 'Print Settings' button to display the 'Print Settings' window where you can set the printer type, page size and page orientation.

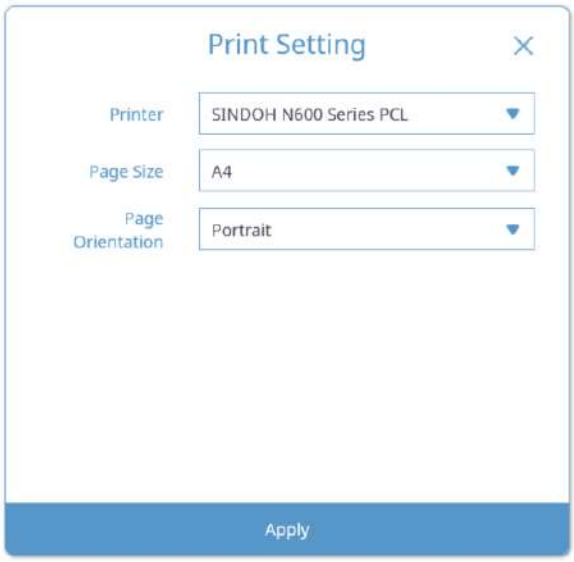


Fig 38 Print Setting Screen

Print Report

After selecting the layout, select the desired image and click the [Print] button to print the image. You can adjust the magnification of the image on the report screen by scrolling the left control or mouse wheel and adjust the image quality using the image processing function.

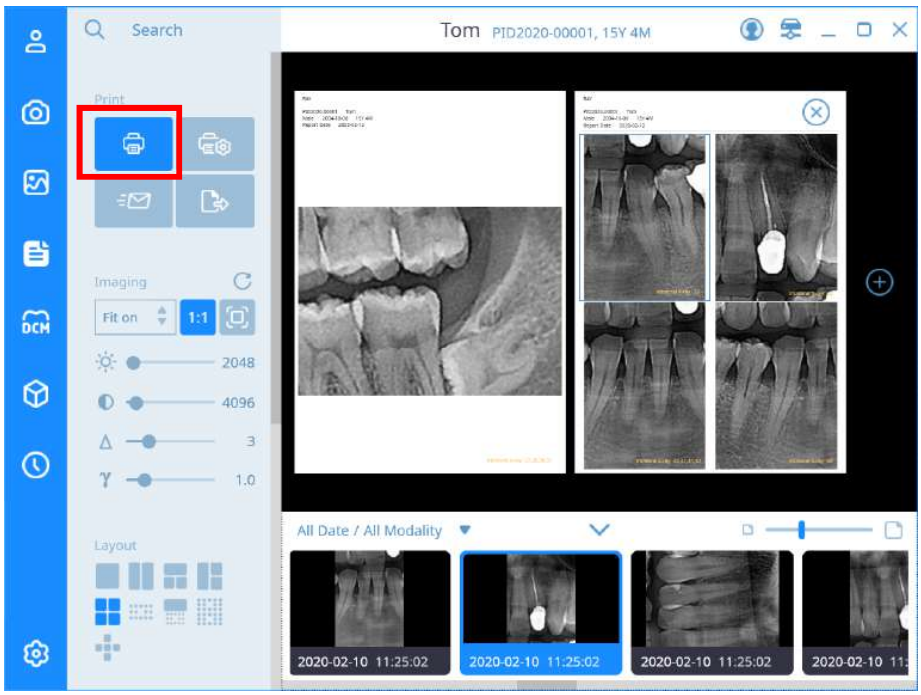


Fig 39 Print Report

DICOM

8

8 DICOM

PACS provides the function to inquire the acquisition request list (MWL, Modality Work List) created by PACS, the function to send the captured image to the set PACS server (DICOM Storage SCU), and to register the acquisition request from the chair end PC.

In the menu tab on the left, you can select the acquisition list inquiry or acquisition image transmission function. On the right, it consists of the patient information, menu, and inquiry list window from the top.

DICOM screen “The composition of the “Modality List” screen is shown below.

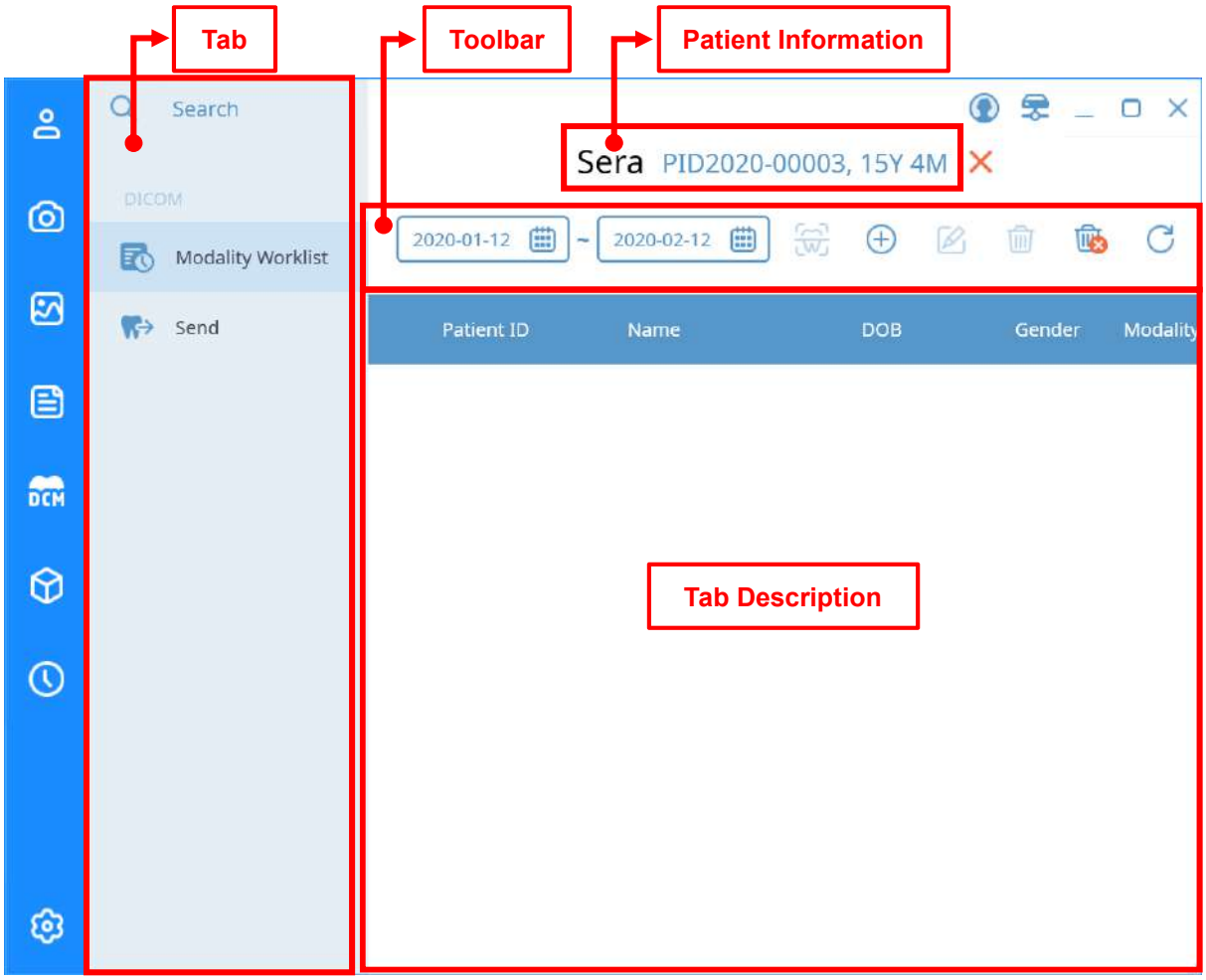


Fig 40 ‘DICOM’ Tab MWL Screen

Notice	CT, Panorama, and Cephalometric image acquisitions are not available for chairs where RAYSCAN is not directly connected. After registering an acquisition request in the chair, select the acquisition request in the RAYSCAN on Workstation and proceed with the acquisition.

DICOM screen “Transfer” is shown in the figure below.

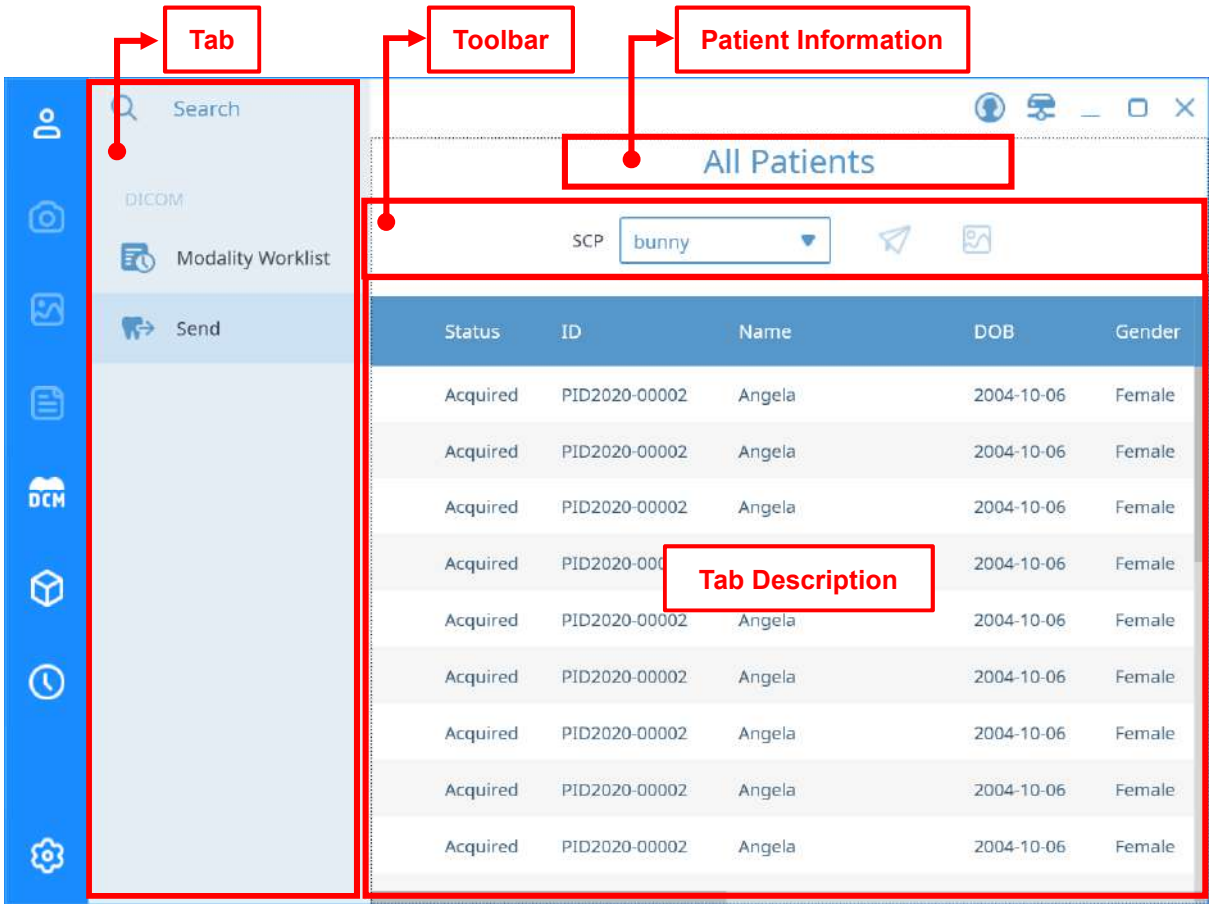


Fig 41 ‘DICOM’ Tab Send Screen

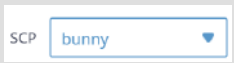
Patient Information

	Description
All Patients	No patient selected
Sera PID2020-00003, 15Y 4M ✕	If there is a patient selected, the patient name, ID, and age are displayed, and you can click the X button to return to the case where no patient is selected.

MWL Toolbar

Item	Description
Period setting	Set the search period for the acquisition list.
RAYSCAN	Open the RAYSCAN program
Add	Add an acquisition list.
Edit	Edit the selected acquisition list.
Delete	Delete the selected acquisition list.
Delete All	Delete all acquisition lists.
Refresh	The acquisition list is updated.

Send Toolbar

Item	Description
 Storage	Select the SCP server to send.
Send	Send image to the selected SCP server.
Watch video	Check the selected image on the image tab.

Notice	SMARTDent displays image transmission status. If the transmitted image is in the failed transmission state, send the image again.

Digital Solution

9

9 Digital Solution

The digital solution provides a function to search a list of 3D images stored, select one or more images, and link with 3D design software. Select an item in the [Image Category], and then select the image to work with in the [Image List]. When you select the data list, the related images of the selected patient are displayed in the patient image list. After selecting the files to be linked, select the program or task to be linked from the toolbar.

The screen composition of the digital solution is as follows.

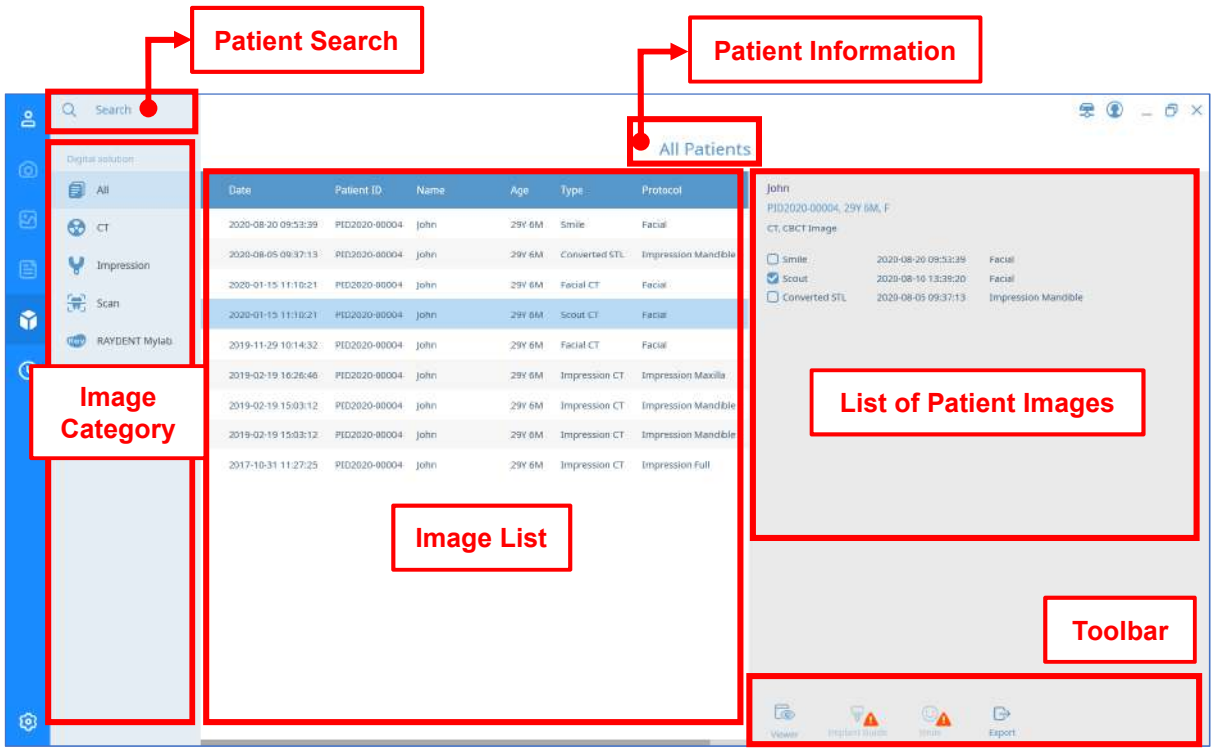


Fig 42 'Digital Solution' Tab Screen

Composition

Item	Description
Patient Search	Search for a specific patient. See "5. Image Acquisition - Patient Search".
Image Category	All : Display all digital solution-related images(files) CT : Acquired patient's CBCT images Impression :Acquired 3D objects (model, impression, bite etc.) before converted to STL Scan : Converted STL files
Patient information	The selected patient information is displayed. Default is "All Patients"
Image List	List of images related to digital solution

List of patient images	The image list of the selected patient is displayed.
Toolbar	Linking software list for selected image list

Toolbar

	Item	Description
	Viewer for STL	Viewer for viewing STL files such as intraoral scan data and CT-to-STL conversion data
	Viewer program list	Viewer program list for CT images
	Implant Guide	Run implant guide program with selected data (Default: R2Gate)
	Smile	Run digital smile design program with selected data
	Face View	Run face scan image viewer
	Convert STL	Run STL conversion program for CT-to-STL converting
	Edit STL	Run STL editing program.
	Export	Export the image as a DICOM file.
	Caution Icon	If the program is not installed, a warning icon is displayed

Notice	The linked program icons are deactivated if all required data set are not selected as guided-matrix. Move the cursor over the application button, the tooltip displays for the reason of status.

History

10

10 History

Check acquisition statistics by modality in a certain period and the acquisition list of the modality selected in a certain period, print and export files

10.1 Statistics

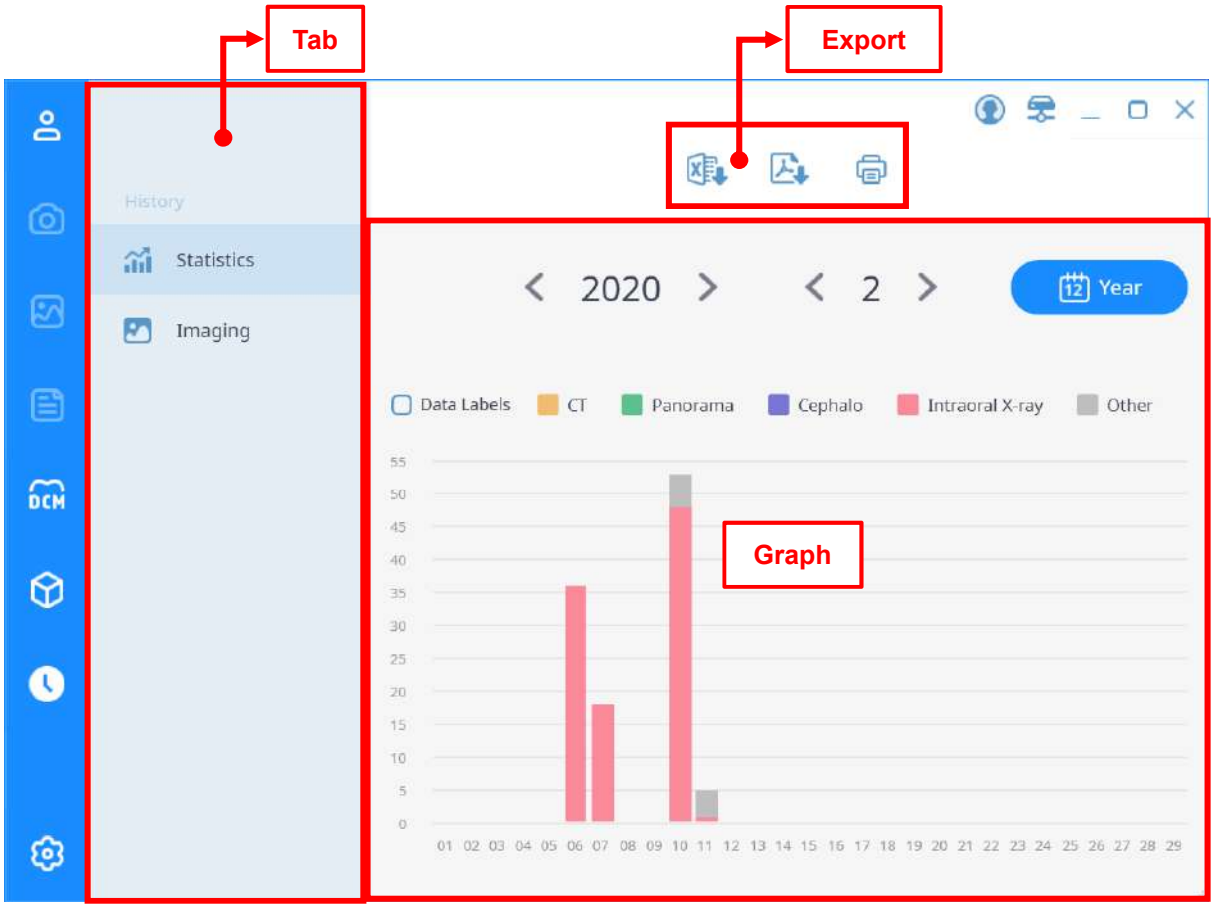


Fig 43 'History' Statistic Screen

Export function supports Excel, PDF, Print, etc.

Item	Description
Export to Excel	Export the graph to an Excel file.
Export to PDF	Export the graph as a PDF file.
Print	Print the graph.

The graph supports the following functions.

Item	Description
Select year	Select the year for the statistical date.
Month selection	Select the month of the statistical date.
Date unit change button	Change the unit of date. (Year, month)
Data label	The number of images is displayed on the graph.
Graph	Divide the image by date and modality to graph.

Compare before and after applying data labels

[Before application] **[After application]**

Export Graph

See “4.7 View and Export Patient Information – Export to Patient Information File”.

10.2 Image History

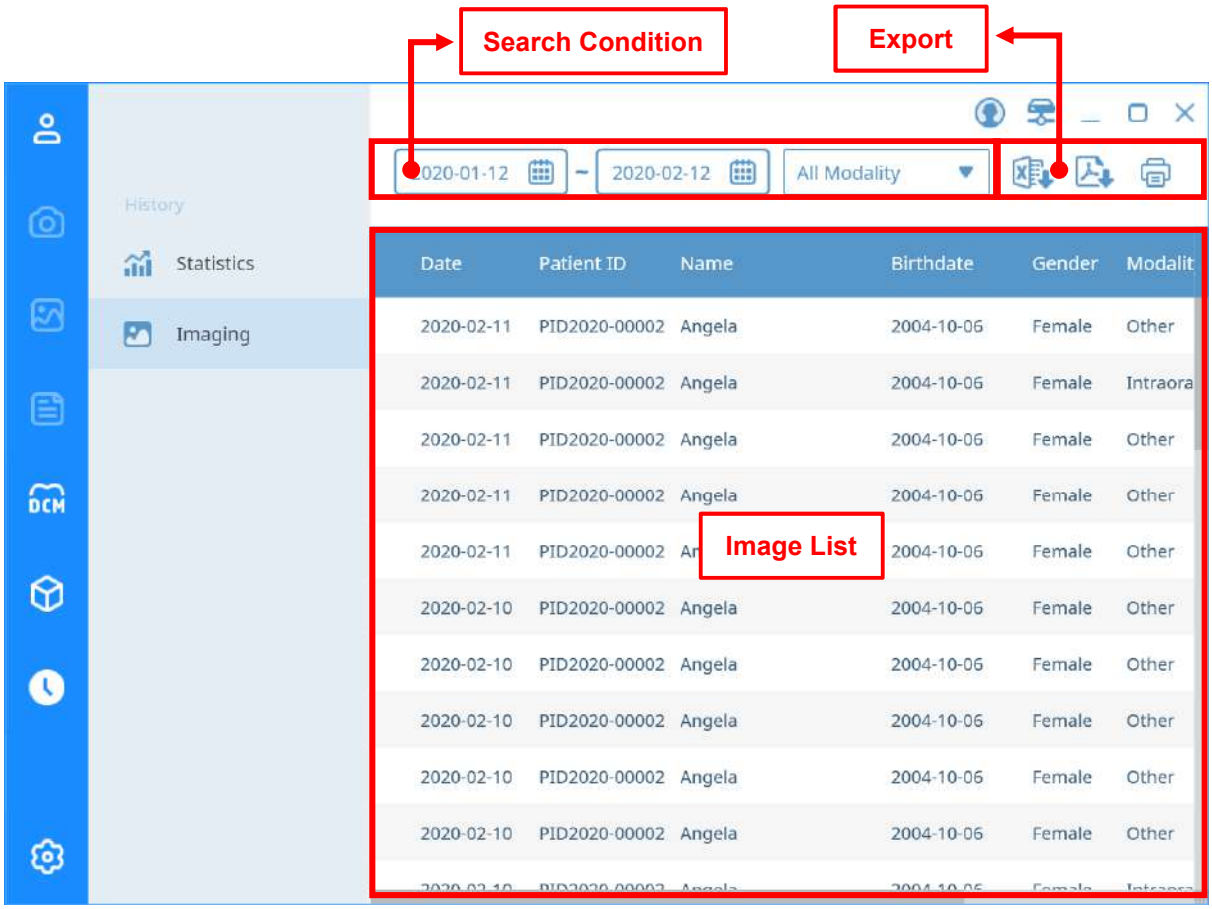


Fig 44 'History' Image Screen

Search Requirement

Item	Description
From	Set the start date of the period to search.
To	Set the end date of the period to search.
Modality	Set modality to search.

Image List

Item	Description
Date	Date the image was taken
Patient ID	Patient ID with image
Name	Patient's name with imaging
Date of Birth	Patient's date of birth with imaging
Gender	Patient's gender with imaging
Modality	Image modality
Protocol	Image protocol
Count	Number of bundled images
Description	Image description

Edit Layout

11

11 Edit Layout

Using the 'LAYOUT Edit tool' program, users can add or edit the desired view layout directly.

The screen layout of 'LAYOUT Edit tool' and the contents of each item are as follows.

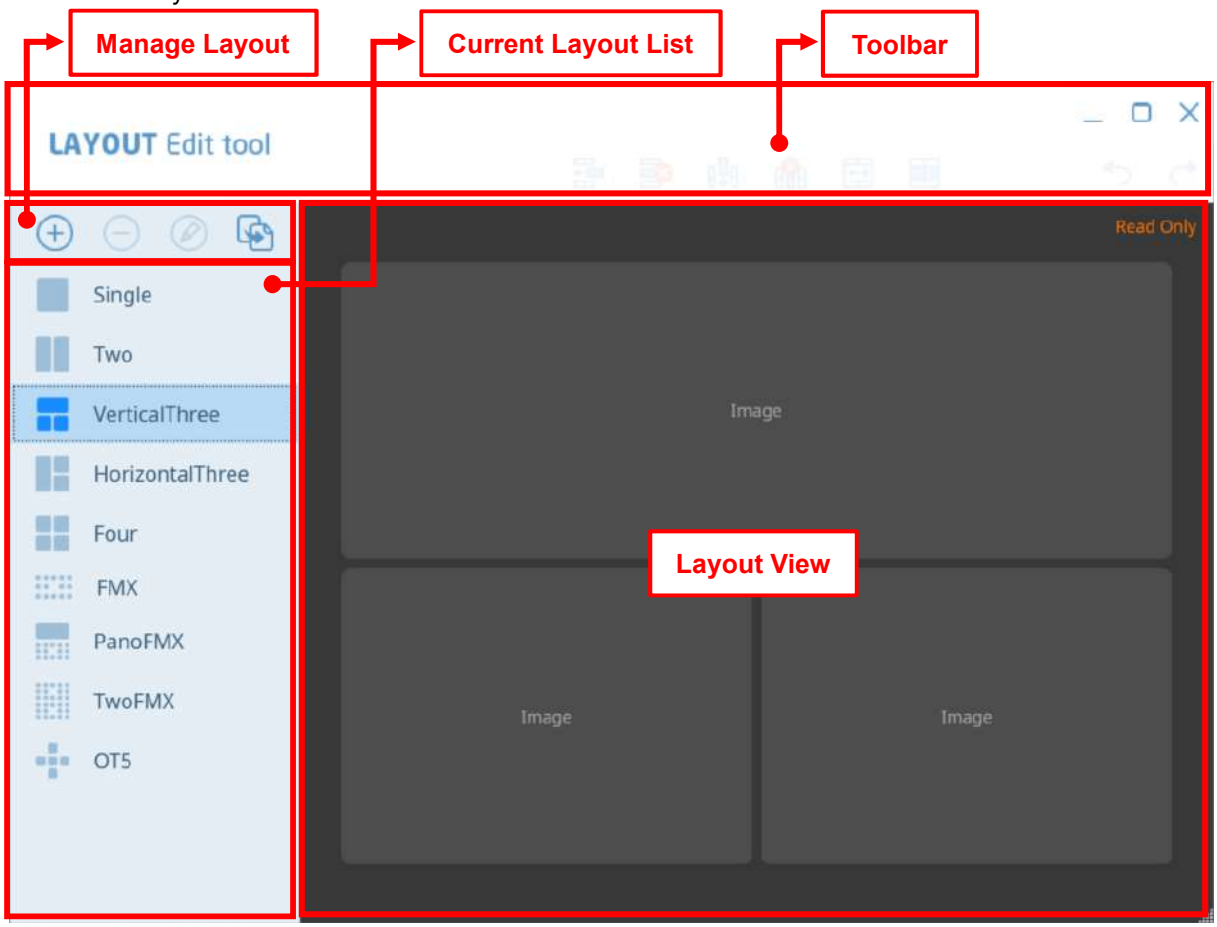


Fig 45 'LAYOUT Edit tool' Main Screen

Layout Management

Item		Description
	Add Layout	Add layout for the image
	Delete Layout	Delete the layout
	Edit Layout	Change the current layout
	Copy Layout	Copy the current layout

Notice	The default layout registered when installing the program cannot be deleted or edited.

Current Layout List

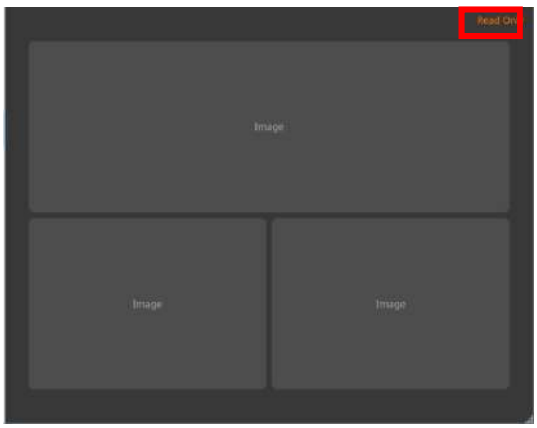
Item	Description
Basic view	Displays image on one screen.
Horizontal split view	The image is displayed on two horizontally divided screens.
Vertical three-part view	Displays the image on the vertical 3-split screen.
Landscape split view	Displays the image on the horizontal 3 division screen.
4-split view	The image is displayed on the 4-split screen.
FMX view	Display the image on the FMX screen.
Panoramic and FMX views	Displays one panoramic image and FMX screen.
2-split FMX view	Display images on two FMX screens.
OT5	Intraoral photos are displayed on a 5-split screen according to their location.

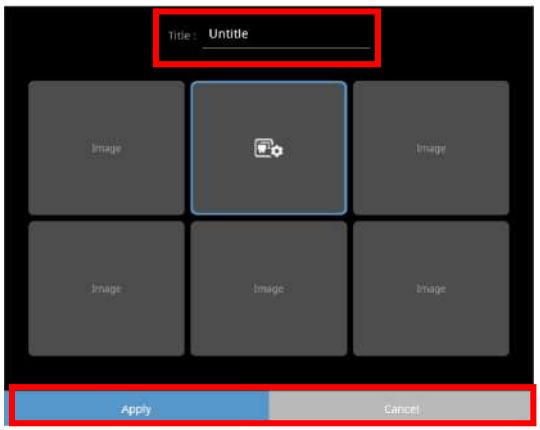
Toolbar

Item		Description
	Add row	Add a new row.
	Delete row	Delete the row to which the selected cell belongs.
	Add column	Add a new column.
	Delete column	Delete the column to which the selected cell belongs.
	Merge cells	Merge two or more selected cells into one cell.
	Cell separation	Add rows and columns to cells as many as the number entered by the user.
	Undo	Cancels the executed action.
	Redo	Redo the undone action.

Notice	Deleting rows, deleting columns, and separating cells are activated only when one or more cells are selected, and merging cells is activated only when two or more cells are selected.

Layout View





Indicates the layout selected in the layout list. If the edit mode is not activated, 'Read Only' is displayed in the upper right corner and the layout cannot be edited.

When the edit mode is activated, you can set the layout name in the [Title] column at the top, and the [Apply] and [Cancel] buttons at the bottom can be activated to save or cancel the layout.

Setting

12

12 Setting

You can modify the settings used in the SMARTDent program. You can enter the screen by clicking the [Settings] button at the bottom left of the program.

The basic structure of SMARTDent program is as follows.

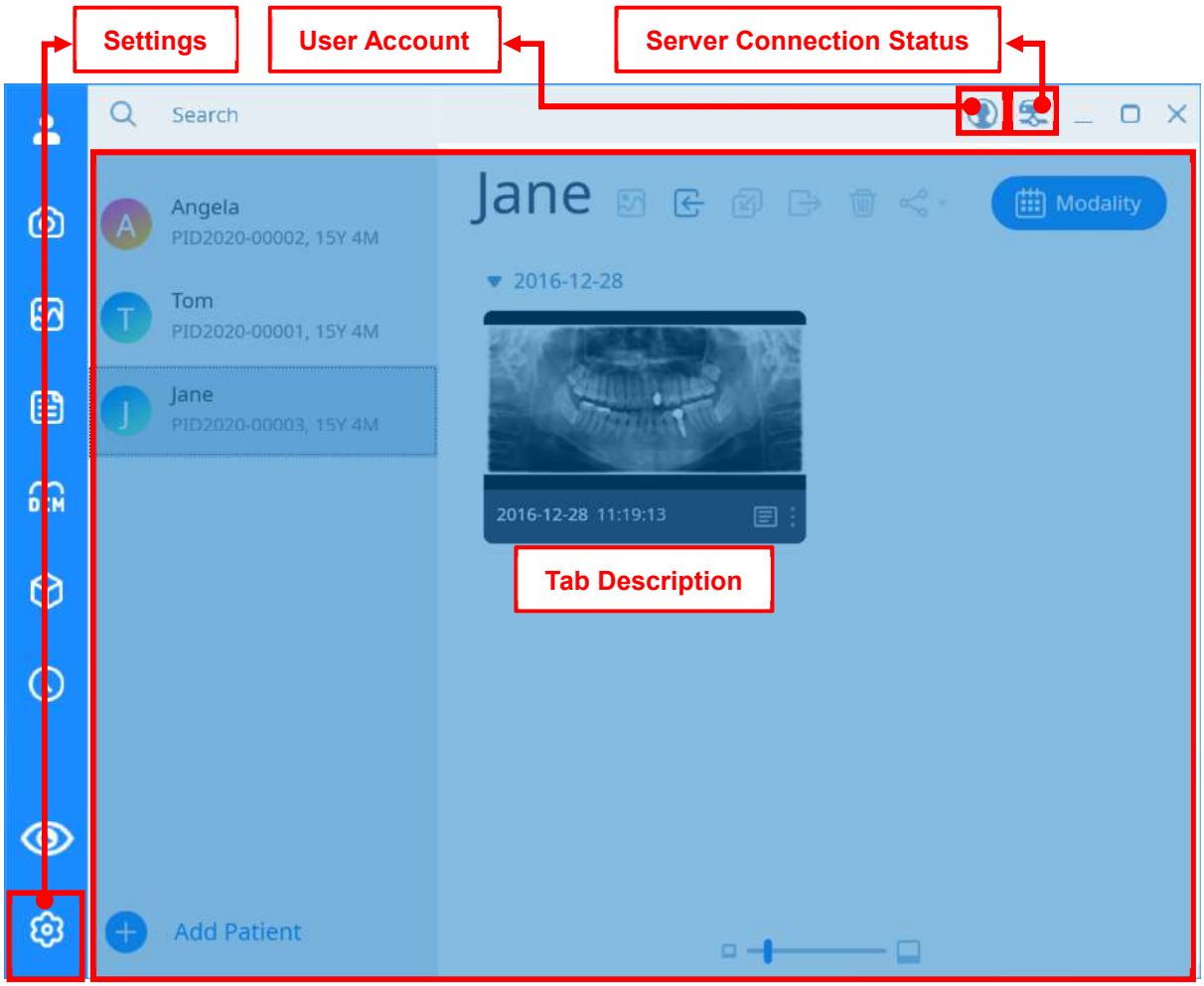
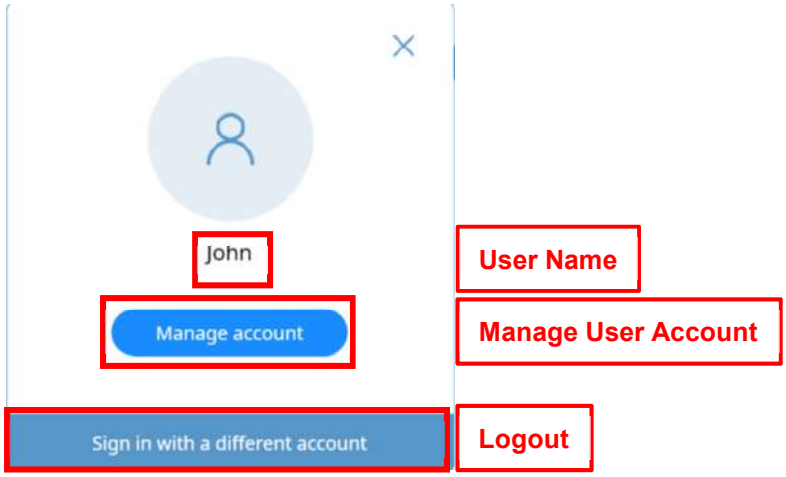


Fig 46 Main Screen – Setting

User Account



Item	Description
User Name	Indicates the name of the currently logged in user.
Manage User Account	Manage the account information of the currently logged in user.
Logout	Logout and go to the login screen.

Server connection status

Item	Description
Server connected	Indicates the status when connected to the server.
Server disconnected	Indicates the status when disconnected from the server.

The screen composition of the ‘Settings’ window and the contents of each item are as follows.

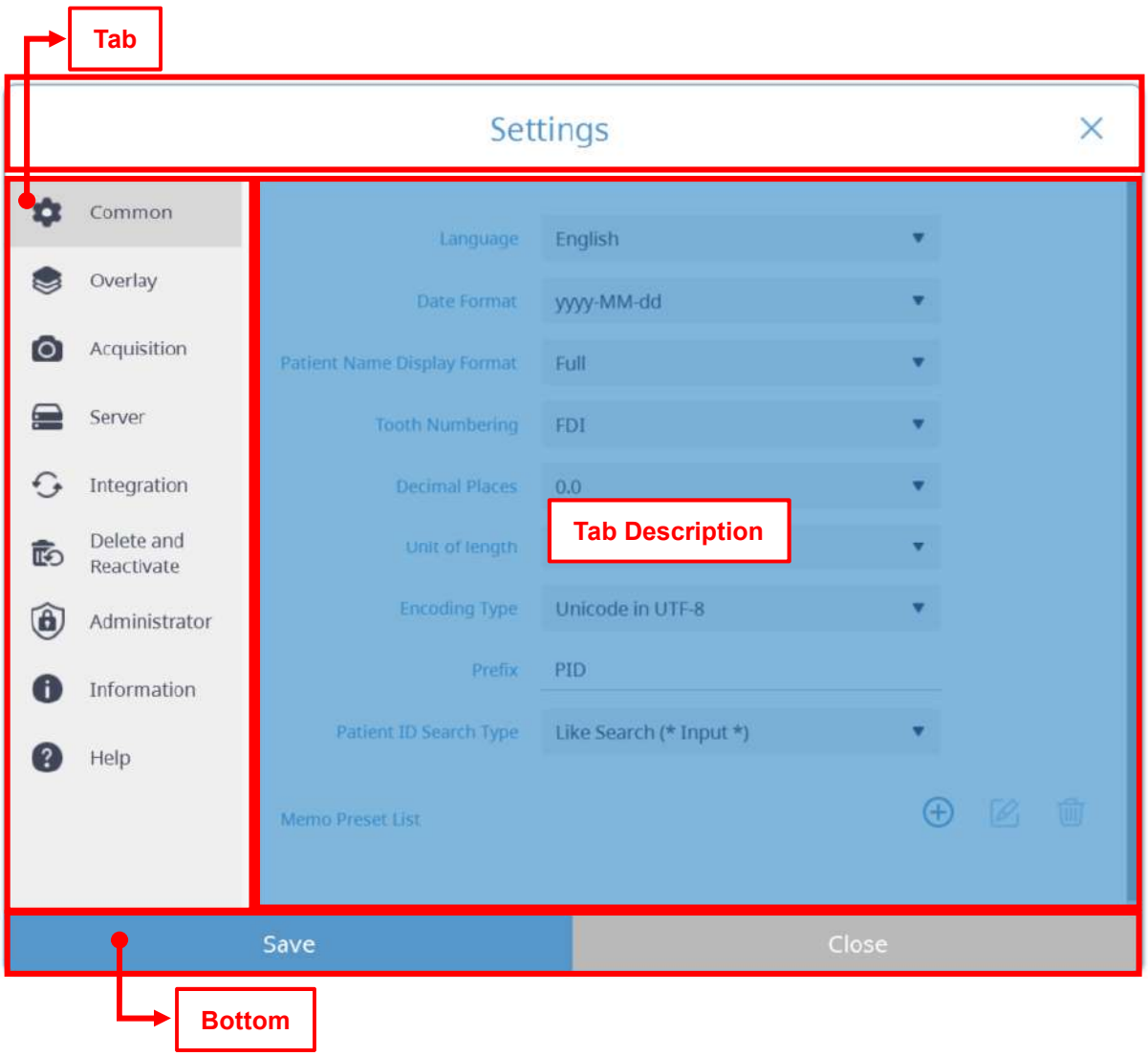


Fig 47 ‘Settings’ Screen

Bottom

Item	Description
Save	Save the changed setting values and exit the setting window.
Close	Close the setting window without saving the changed setting values.

12.1 Common Settings

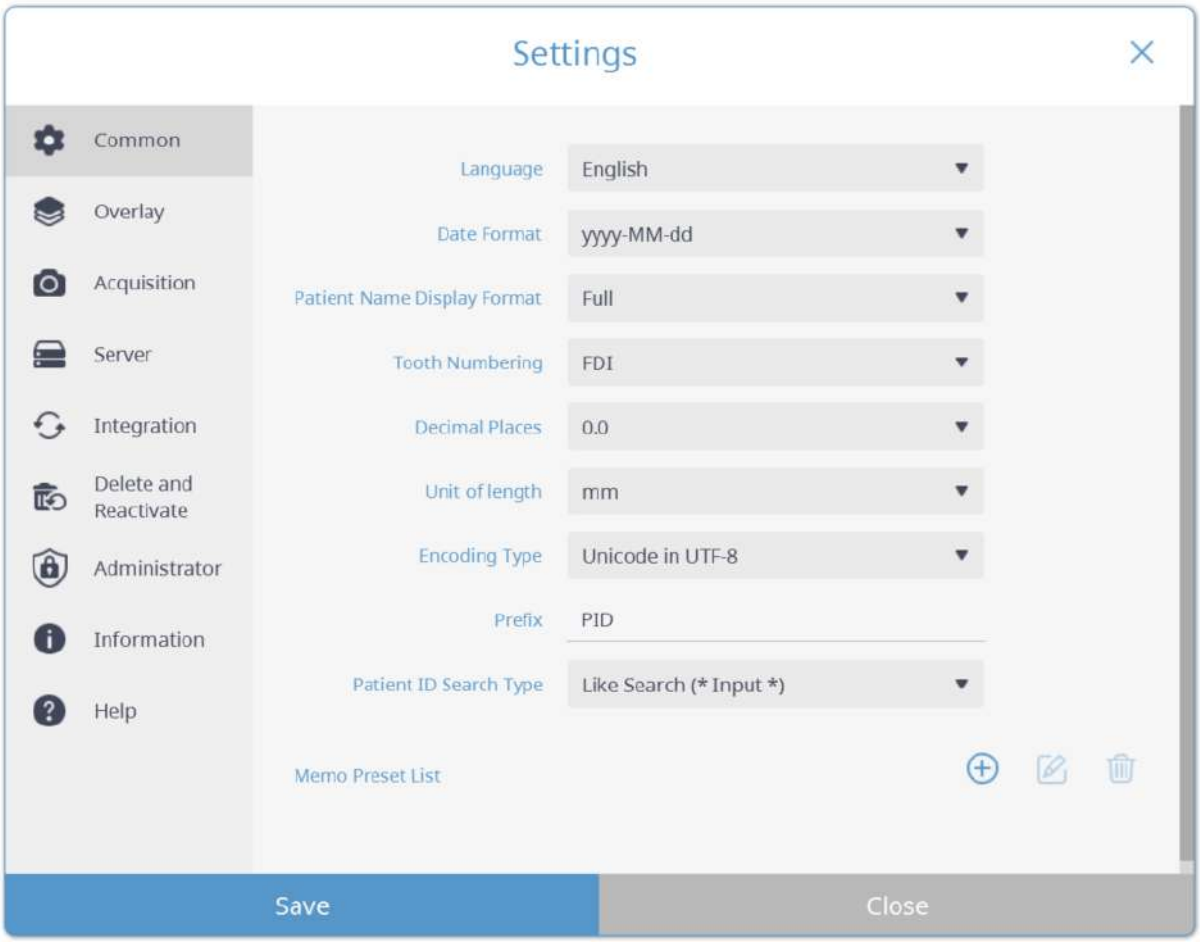


Fig 48 Common Settings

Item	Description
Language	Set language settings.
Date Format	Set the date format.
Patient Name Display	Change the patient name input and display format.
Tooth Numbering Type	Sets the display method of the tooth number displayed for each FMX position.
Decimal Places	Sets the number of decimal places for calculated values expressed as numbers.
Unit of Length	Set the length unit.

Encoding Type	Set the encoding format according to the language setting for each country.
Prefix	Set the prefix of the patient ID.
Patient ID Search Type	Set the type when searching for the patient ID.
Memo Preset List	Set the prefix list when writing memos.

12.2 Overlay Color Settings

Set the color to be displayed in the video view. After selecting the color you want to change, select the desired color when the Windows palette is displayed.

[Text Background of Measurement] is option for color filling to background of measurement result.

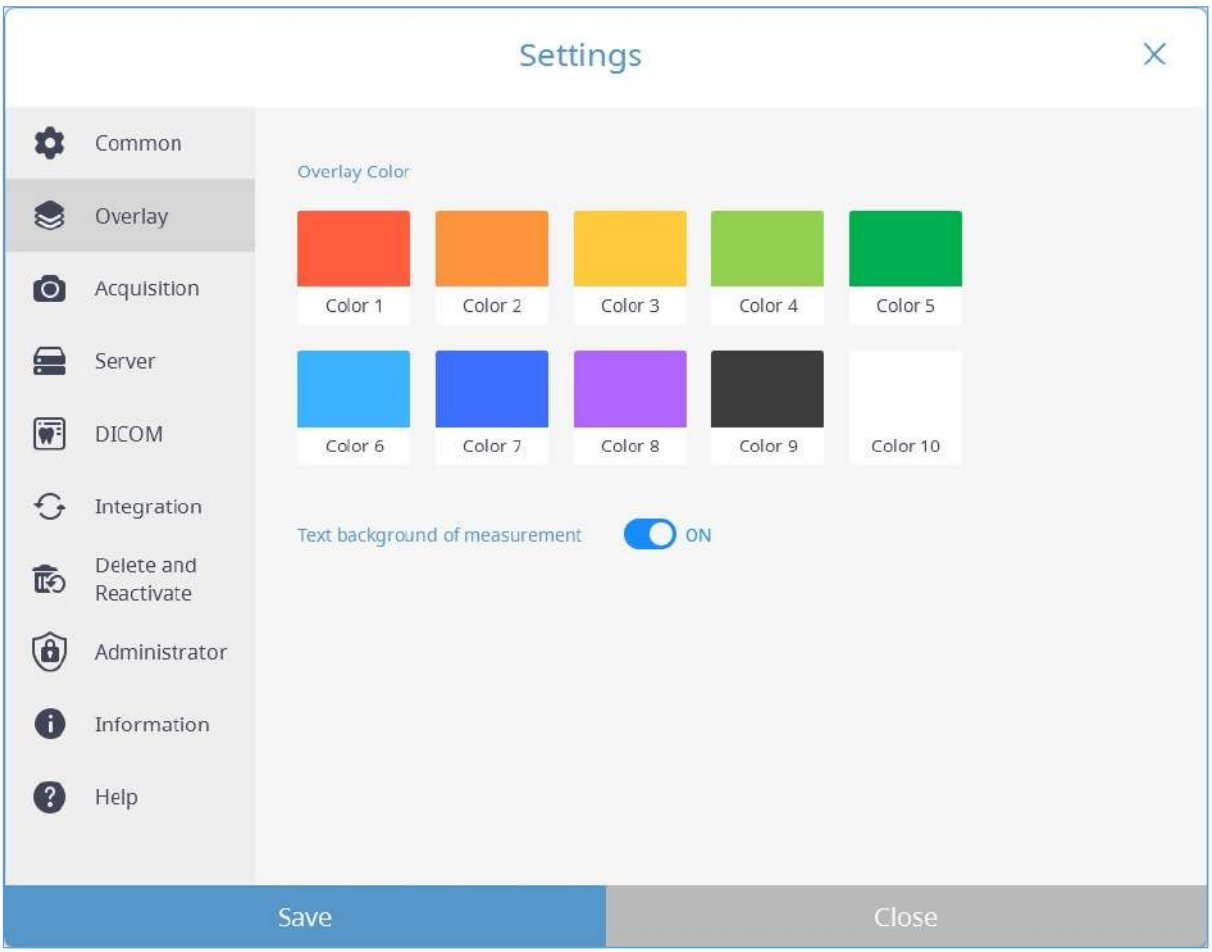


Fig 49 Overlay Settings

12.3 Acquisition Settings

You can set up a list of acquisition devices and configuration for RIOScan, RIOSensor, and TWAIN.

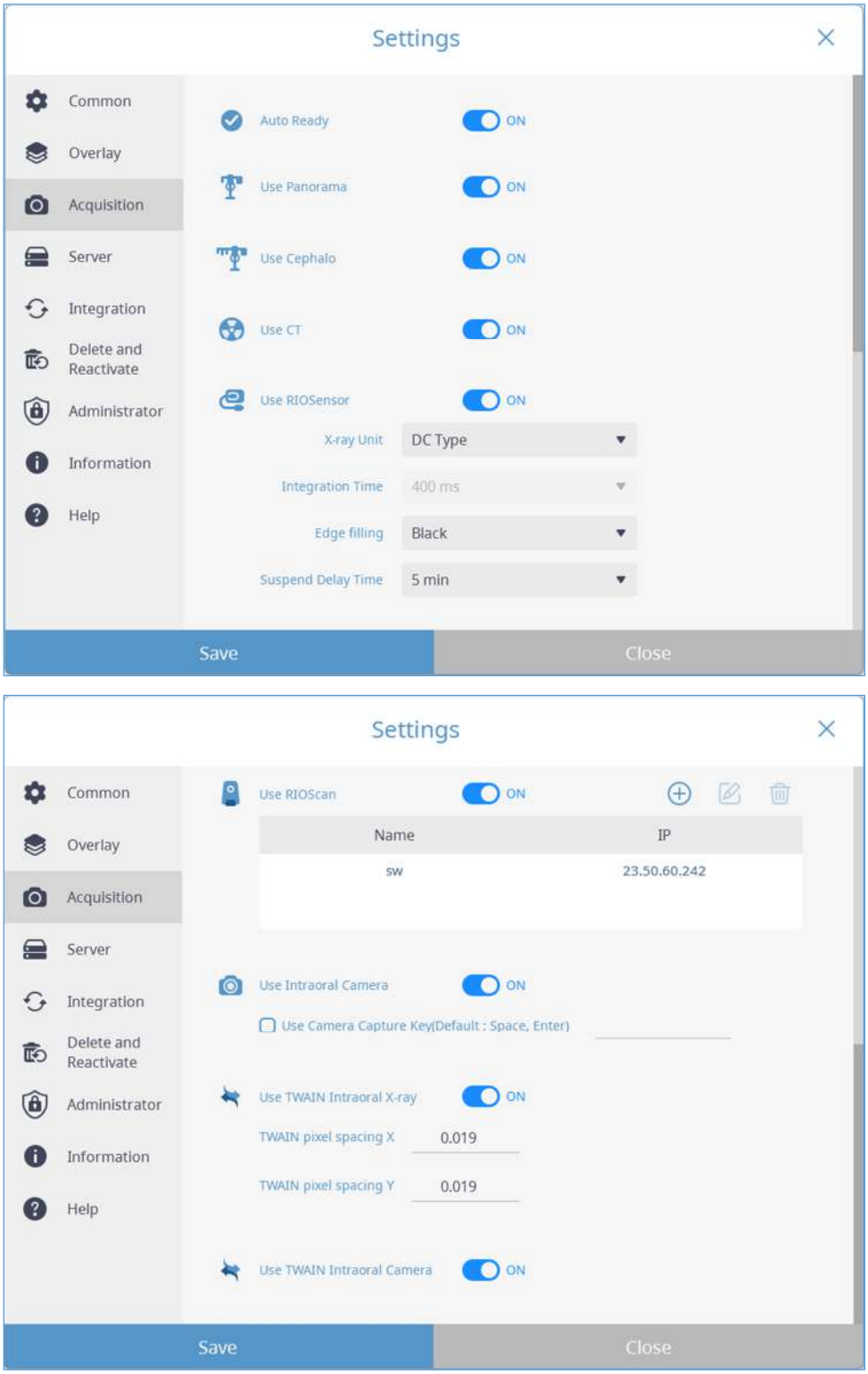


Fig 50 Acquisition Setting

	Item	Description
	Auto connect	Set whether to automatically connect to the device when shooting is performed.
RIOSensor Setting	X-ray Unit	Set whether the X-ray generator type is DC / AC.
	Integration Time	When using an AC type X-ray unit, set the time that adds 20% to the maximum X-ray irradiation time.
	Edge Filling	Set the color to fill the corners of the sensor.
	Sleep mode time	Set the waiting time to enter power saving mode to prevent heat.
RIOScan Setting	Device List	Add/Modify/Delete RIOScan device
Intraoral Camera Setting	Use Camera Capture Key	Set up the key for capturing image
TWAIN Intraoral X-ray	Pixel Spacing X, Y	Set up the image pixel size for TWAIN

12.4 Server Settings

Change the hospital name, hospital dentist name, and hospital logo image settings. When changing the server IP, be sure to check the connection to the server by selecting [Verify] button.

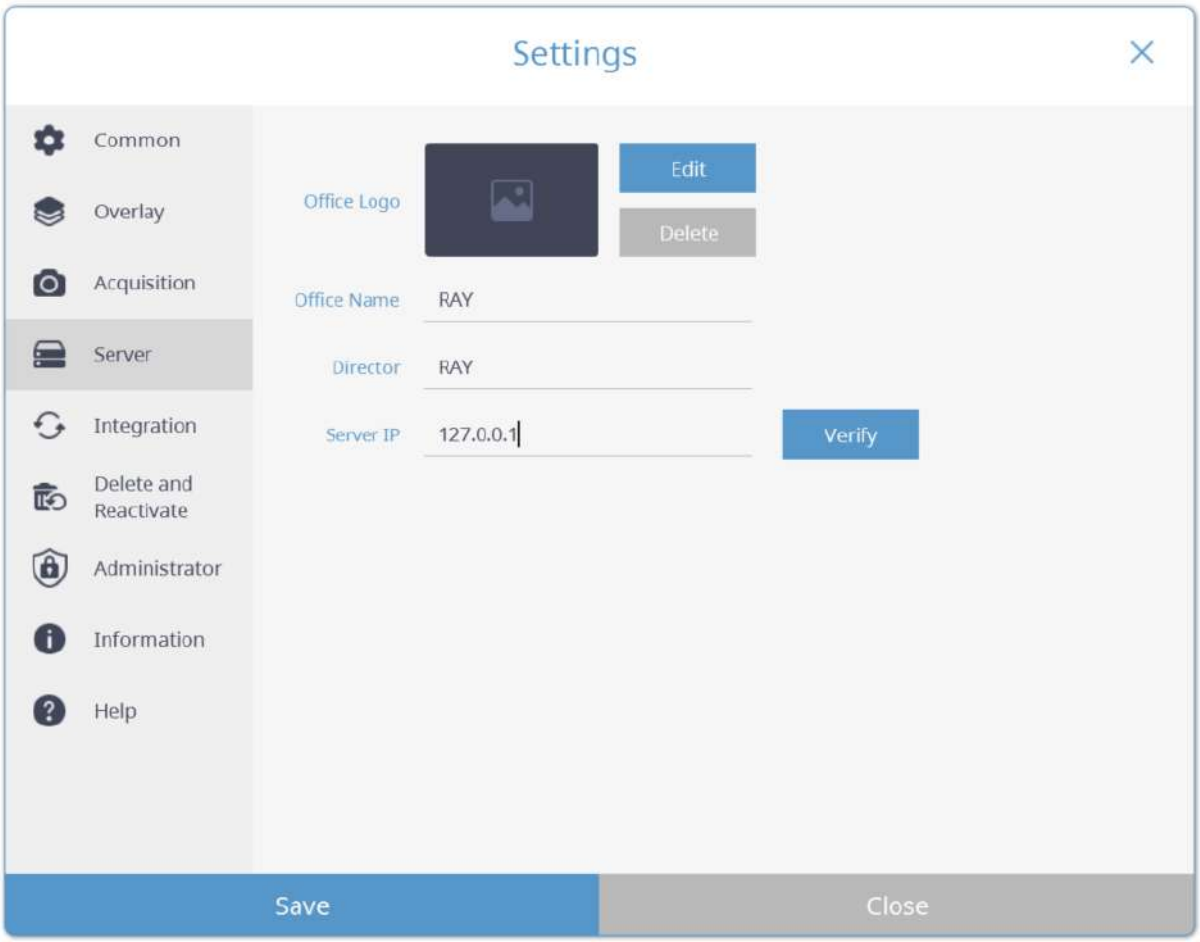


Fig 51 Server Settings

12.5 DICOM Setting

It supports MWL SCP for linking PACS and shooting list, Print SCP for DICOM Print, and Storage SCP for sending images to PACS. You can add / modify / delete SCP to each service.

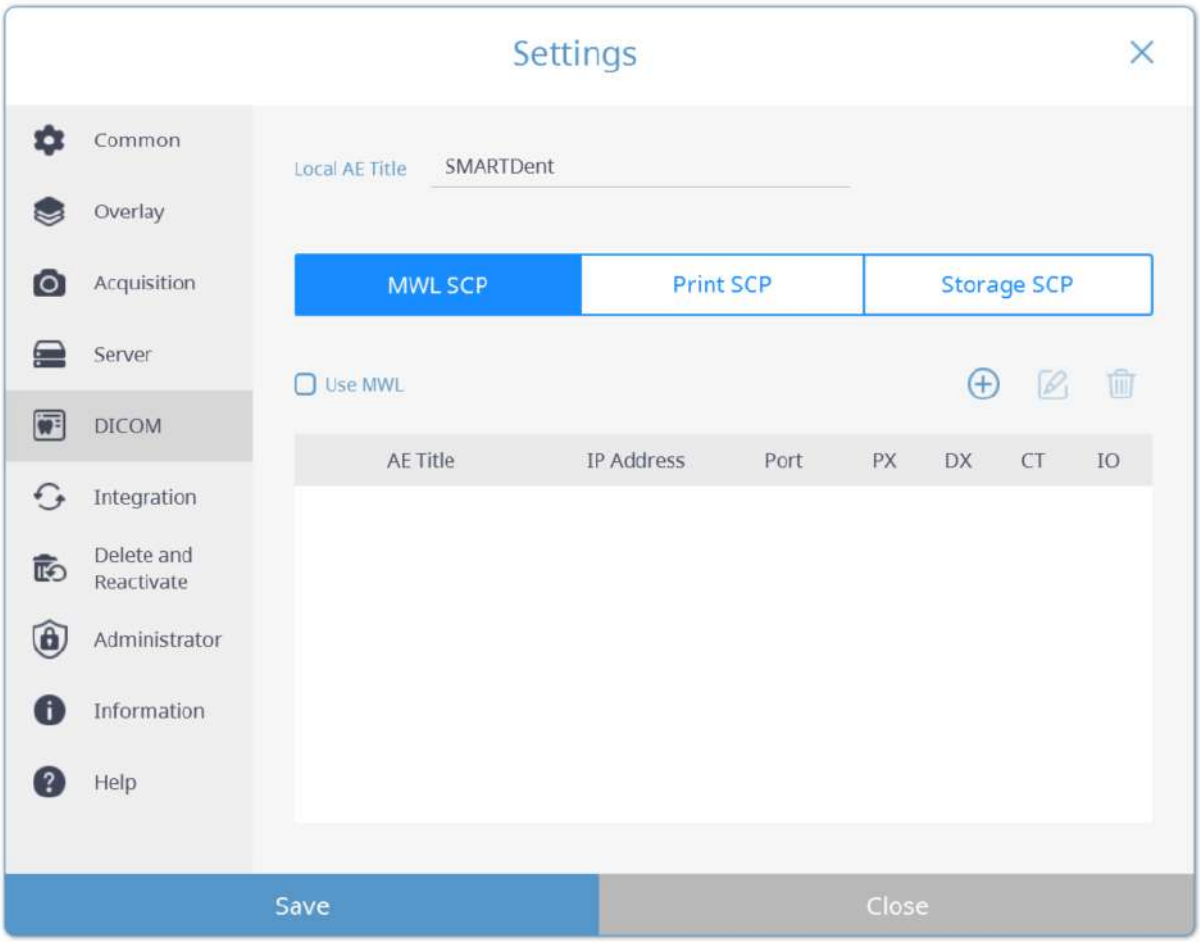


Fig 52 DICOM Settings

When the MWL SCP creation / editing window is displayed, set “AE Title”, “IP Address”, and “Port” and save. If a different modality name is used in PACS, you must enter that name for each modality.

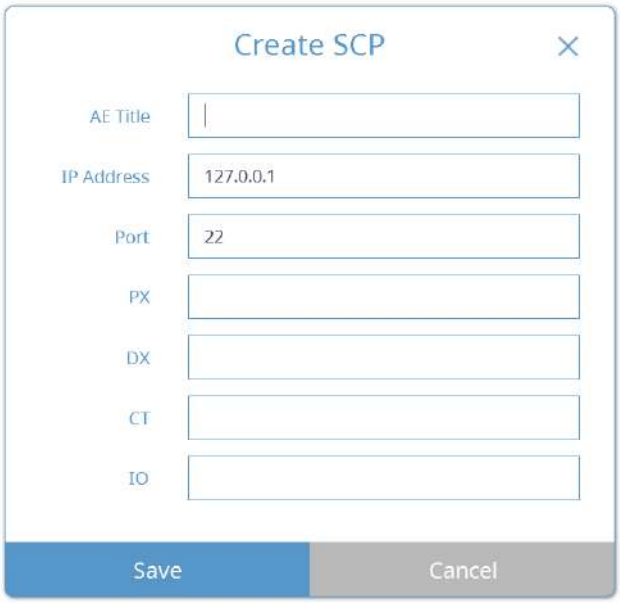


Fig 53 MWL SCP Settings

When creating and modifying Print SCP, the setting window is displayed as shown below. Set “AE Title”, “IP Address”, “Port” and “BitStored” and save.

Fig 54 Print SCP Settings

When creating and modifying Storage SCP, the setting window is displayed as shown below. Set “AE Title”, “IP Address” and “Port” and save. Depending on the usage environment, you can use the settings of “automatic transmission”, “modality matching”, “user magnification setting”, and “use alternative tags for oral X-ray images”.

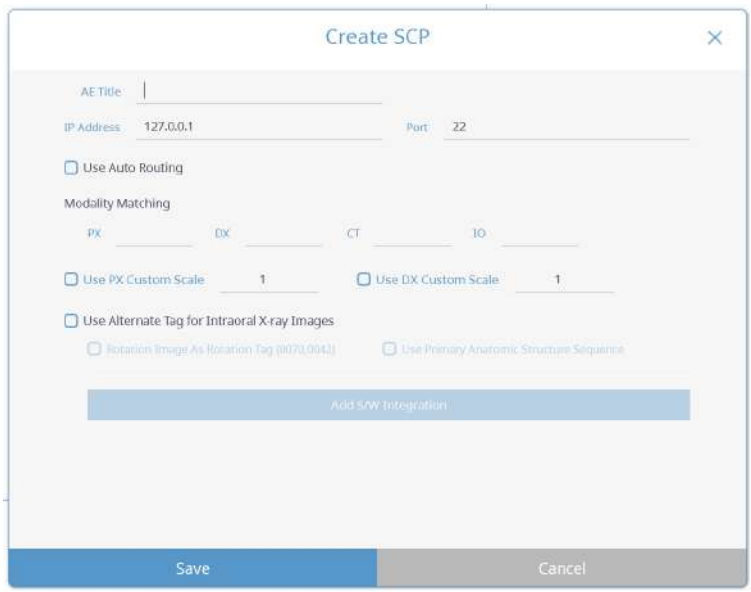


Fig 55 Storage SCP

12.6 Integration Setting

You can set the linked program supported by SMARTDent, and if you set the linked program according to the modality, the linked program menu is displayed when you select the image.

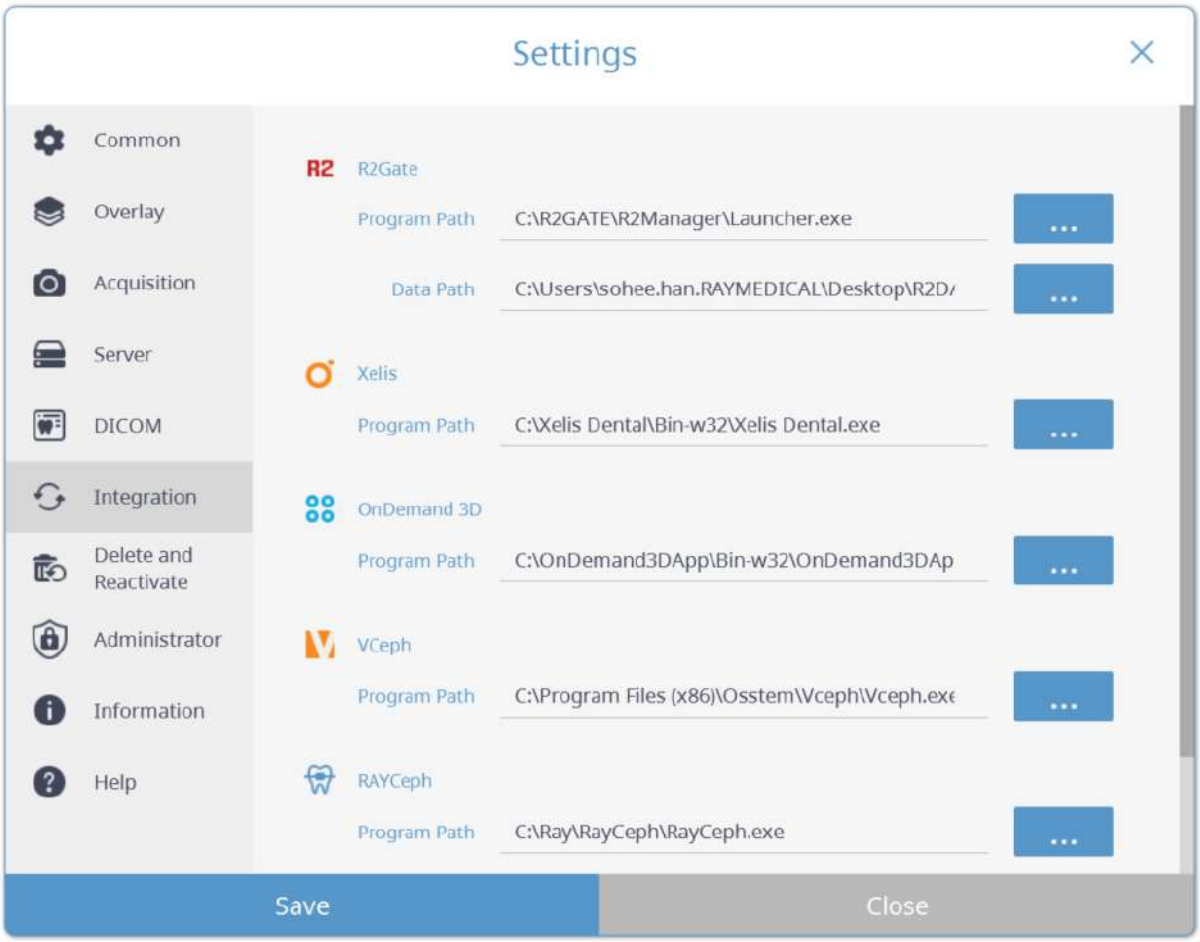


Fig 56 Integration Settings

Notice	SMARTDent can add a link if it is possible to link through software path and data path settings. If it does not work even after the normal link setting, please contact the technical support center.

12.7 Patient, Image Information Activation and Deletion

When deleting a patient or image, SMARTDent does not search for the patient or image, but the server does not completely delete the data for later restoration. It displays the list of deleted patients or images and supports the function to restore selected patient or image information again or to delete them completely from the server.

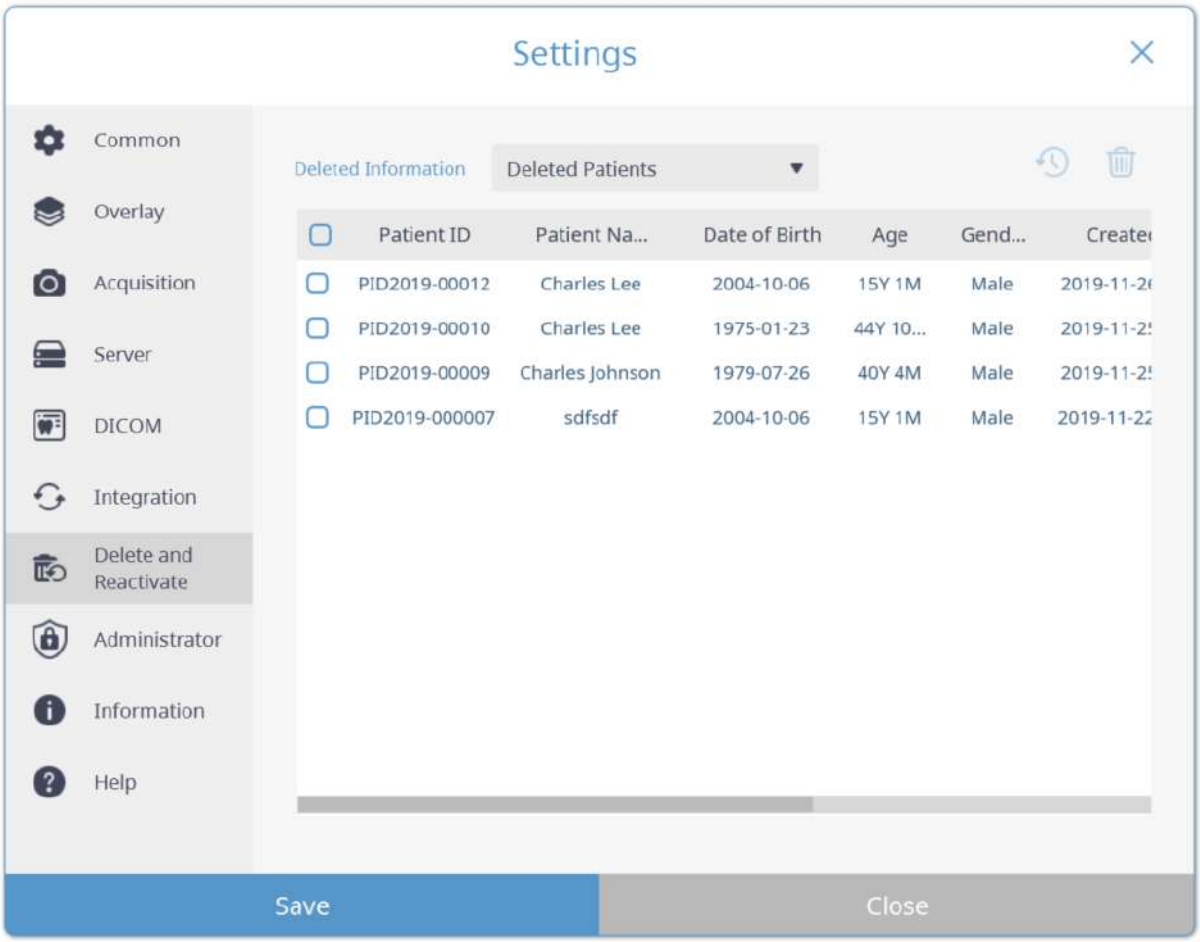
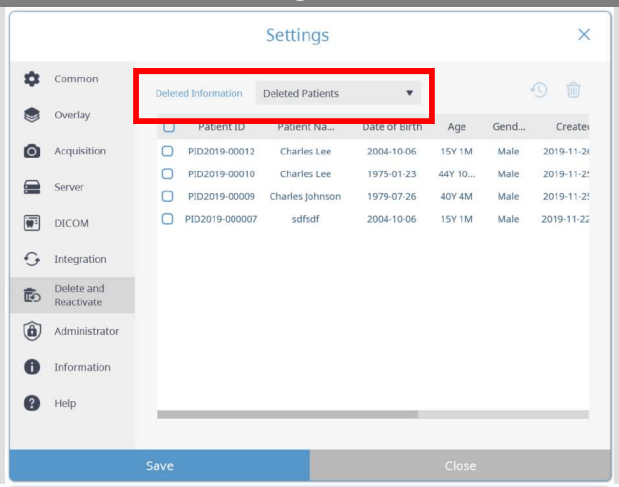
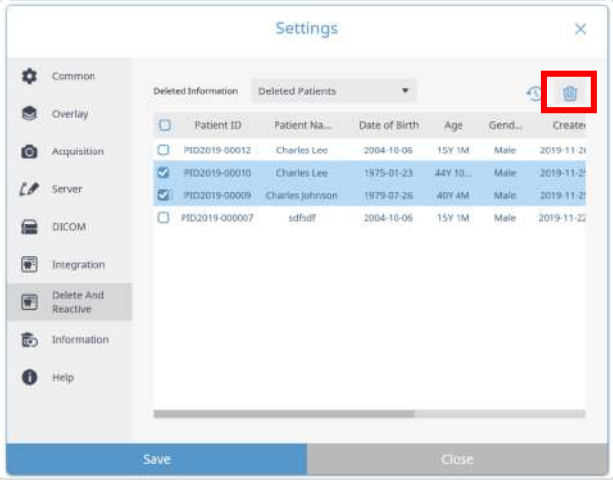
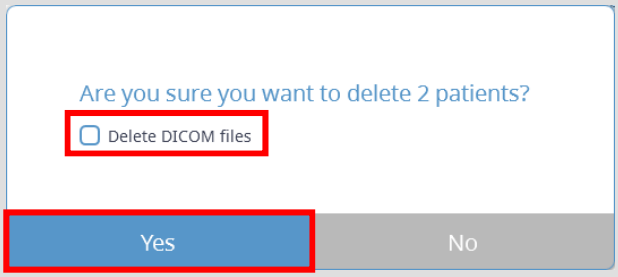
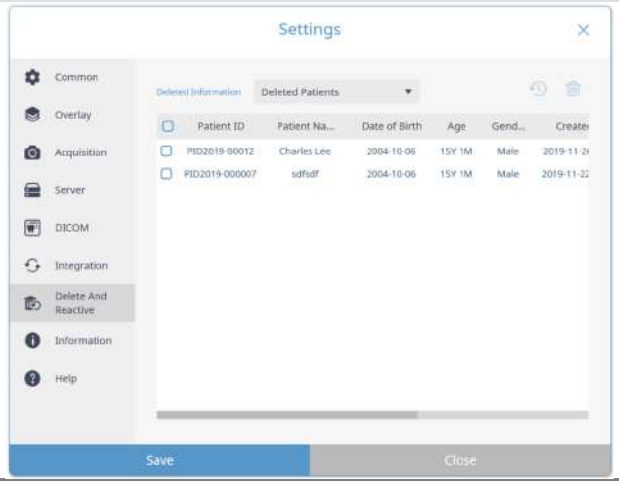
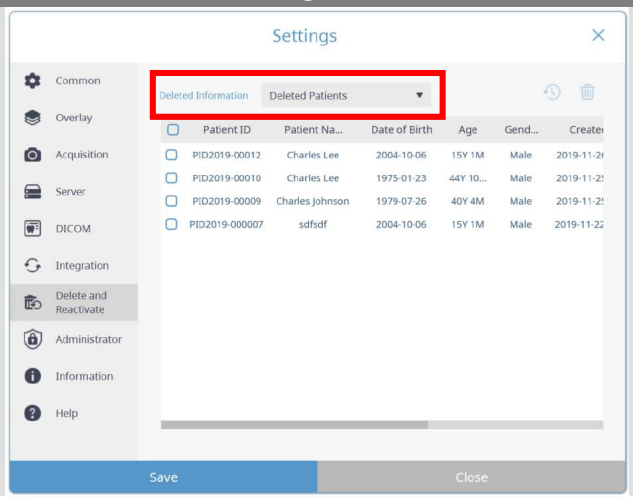
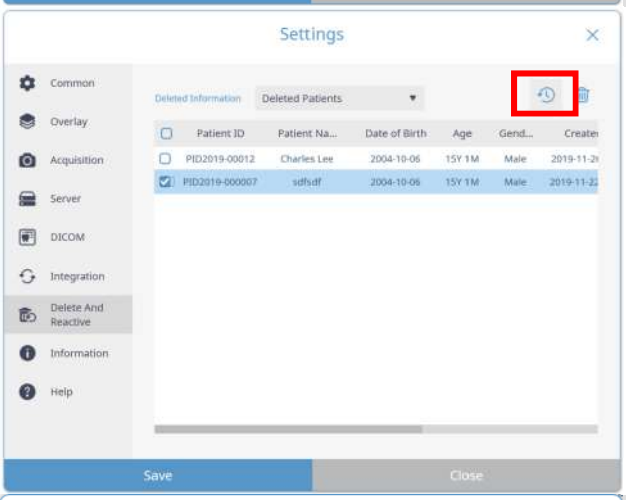
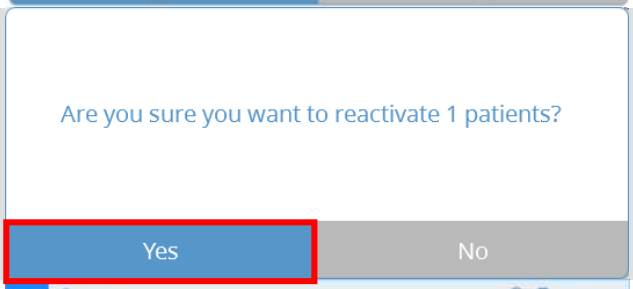
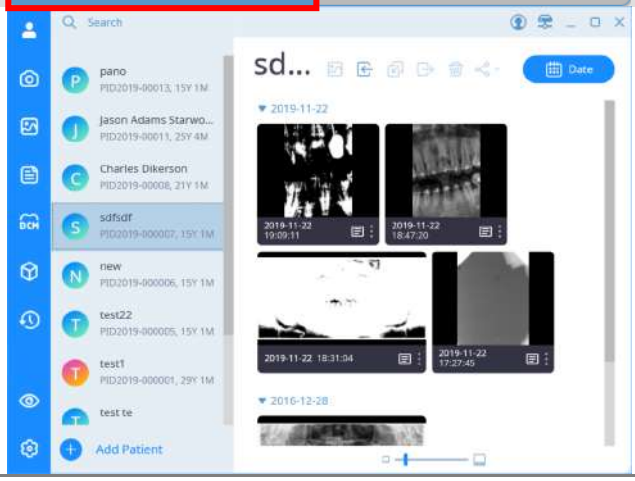


Fig 57 Delete and Reactive Settings

Permanently Delete

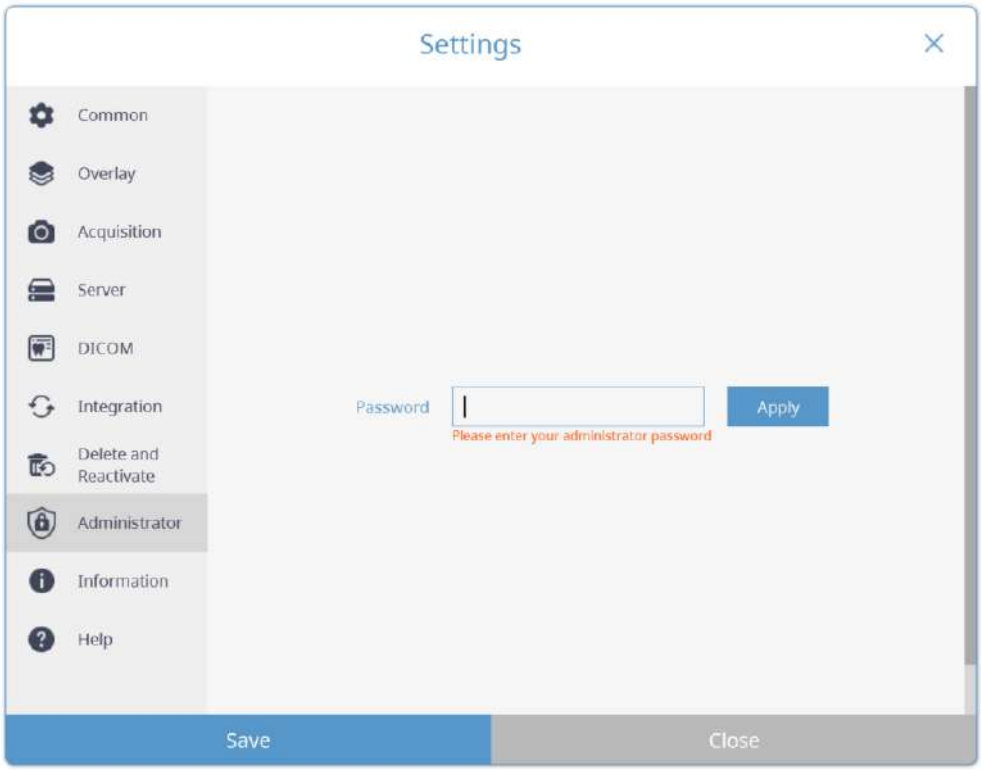
No.	Figure	Description
1		Select [Deleted patient] or [Deleted video] for 'Deleted information'.
2		Select patient information or image information and click the [Delete] button at the top.
3		Click the [Yes] button to permanently delete patient information or image information. You can set whether to delete the image file (DICOM) when deleting the patient.
4		Check for permanently deleted patients or images.

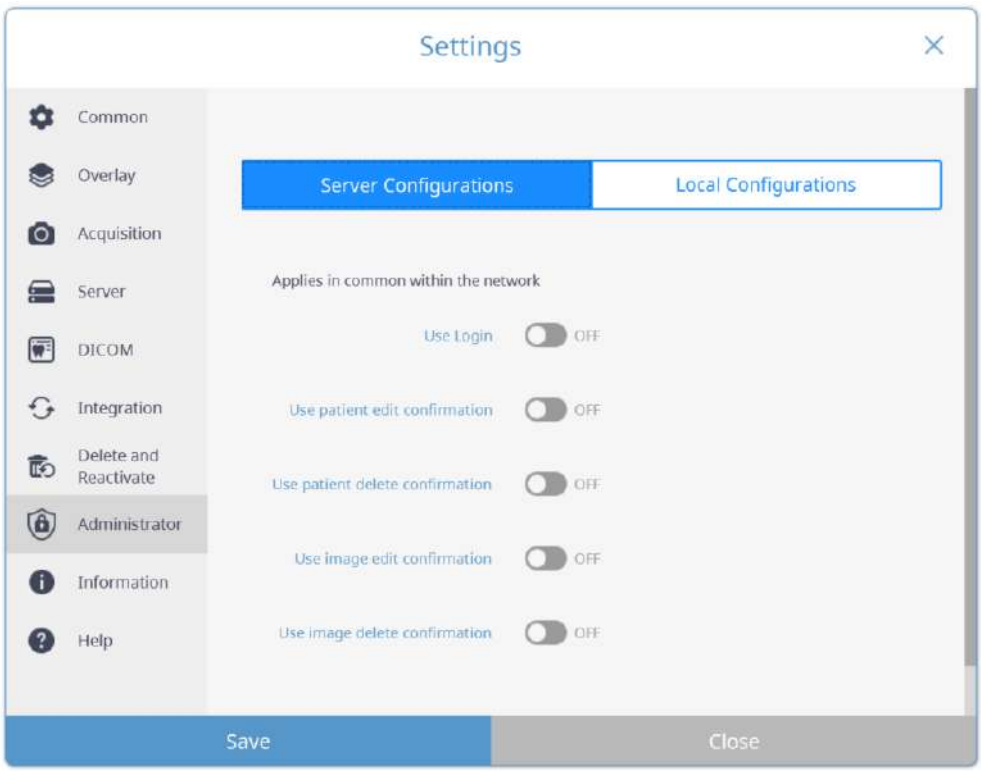
Reactivate

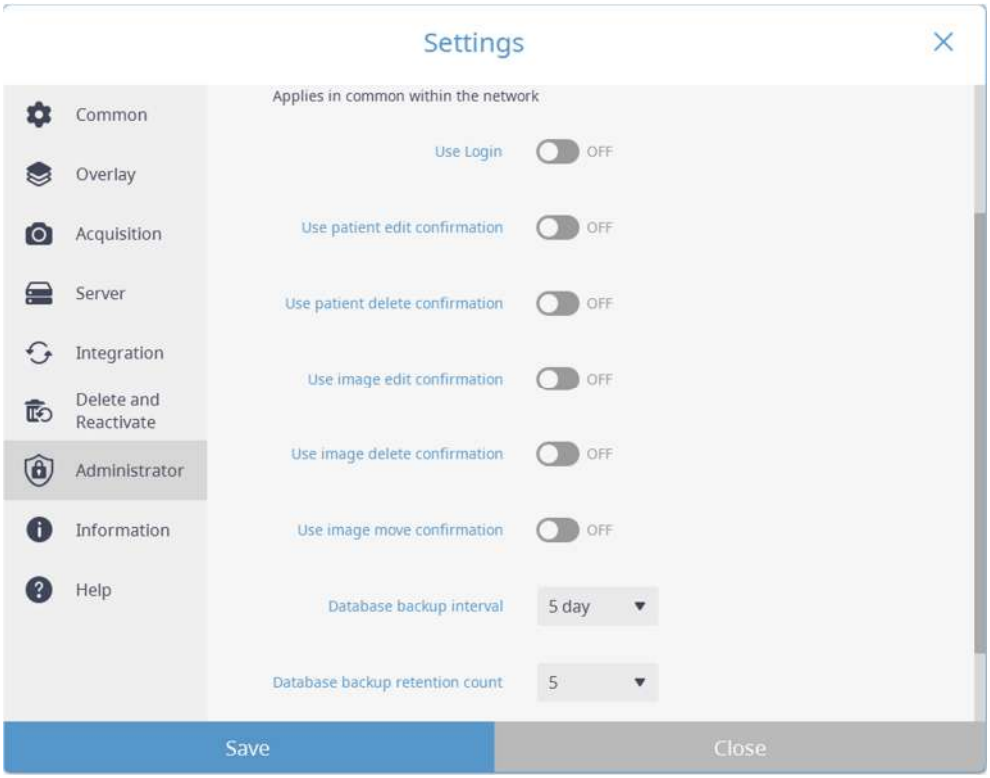
No.	Figure	Description
1		Set 'Deleted Information' to [Deleted Patient] or [Deleted Image].
2		Select the patient or image information to reactivate and click the [Reactivate] button at the top.
3		Click the [Yes] button to proceed with the reactivation.
4		Verify that the reactivated patient or image is being retrieved.

12.8 Administrator

You can set whether to use login and security options and whether to enable the [DICOM], [Digital Solution], and [History] modules. You must enter the password for the administrator account to use the administrator settings. Initial password for administrator account is “**admin**”.







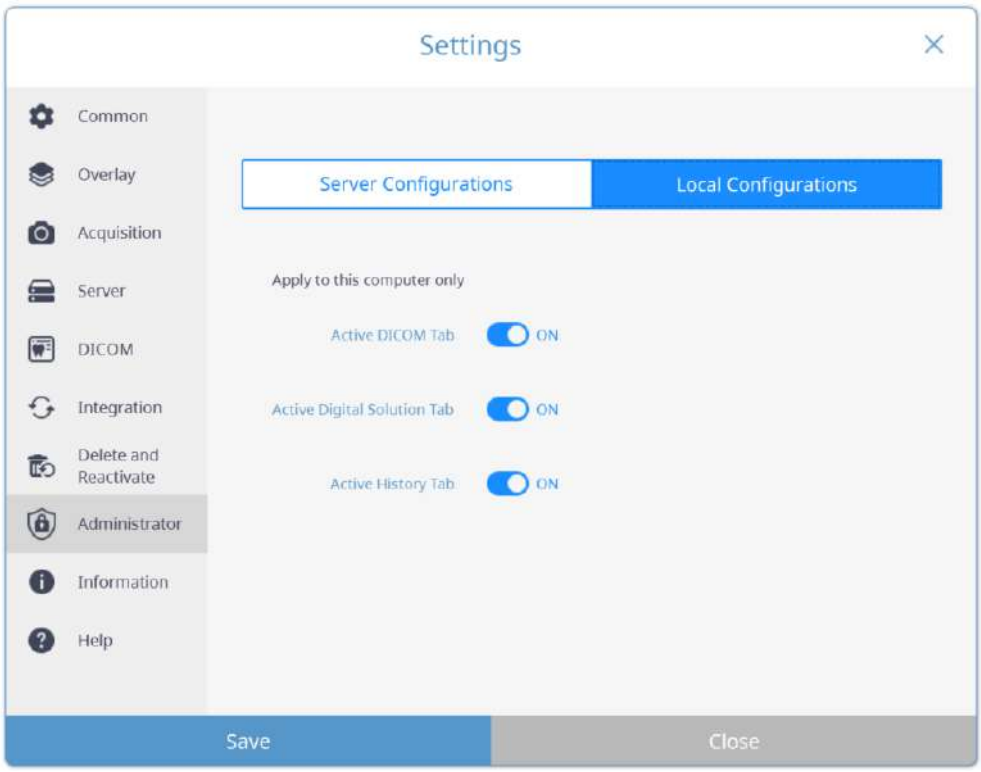


Fig 58 Administrator Settings

Item	Description
Password	Enter Administrator password.
Use Login	Enable or disable login
Use patient edit confirmation	Set whether to require password when modifying patient.
Use patient delete confirmation	Set whether to require password when deleting patient.
Use image edit confirmation	Set whether to require password when modifying image.
Use image delete confirmation	Set whether to require password when deleting image.
Use image move confirmation	Set whether to require password when moving image
Database backup interval	Set interval of database backup
Database backup retention count	Set retention counts for database backup
Active DICOM Tab	Enable or disable DICOM tab.
Active Digital solution Tab	Enable or disable Digital Solution tab.
Active History Tab	Enable or disable History tab.

Notice	When using the user account management function, be sure to change the password of the administrator account before use and be careful not to leak the administrator account to others.

12.9 Program Information

You can check the version information and copyright information of the current program. Click the link to go to the Ray website.

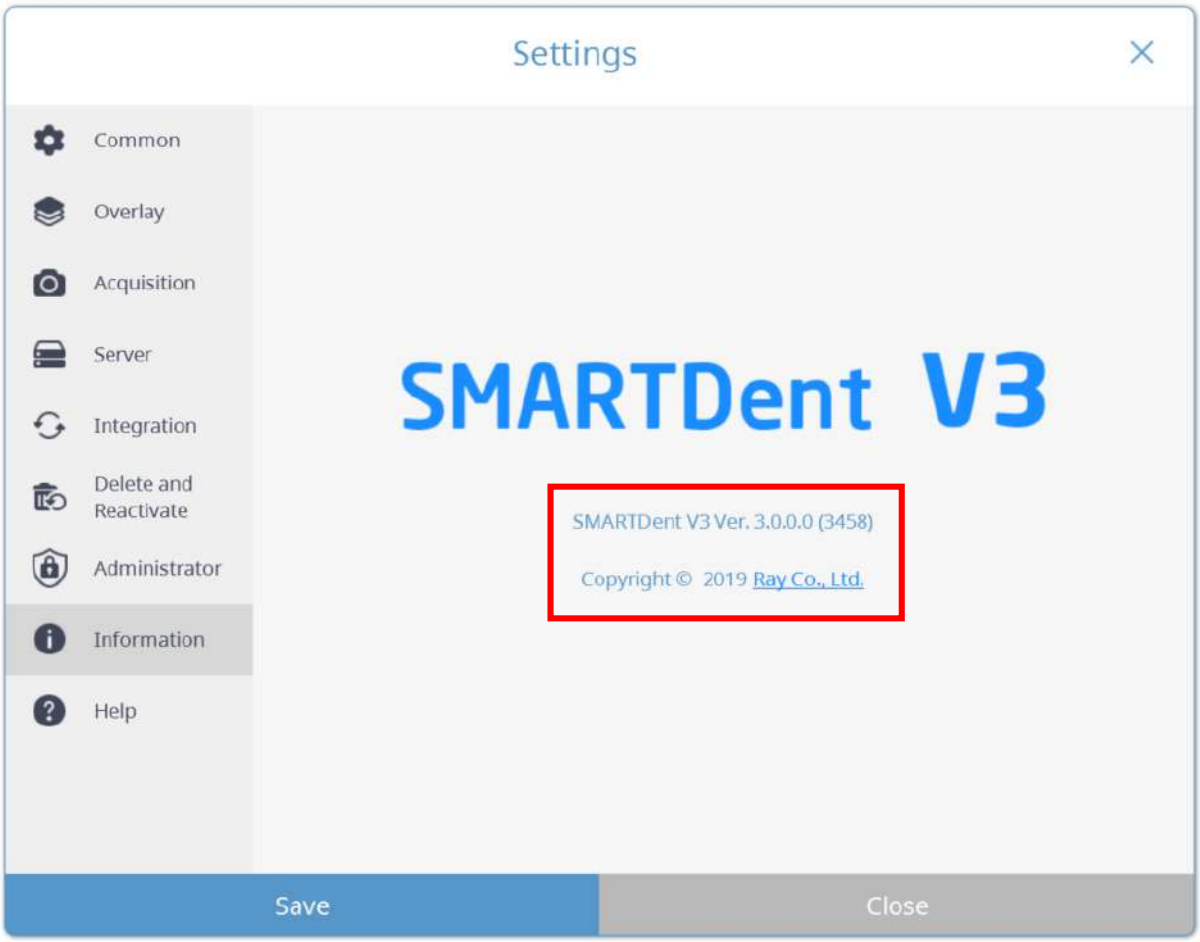


Fig 59 Program Information Page

12.10 Help

SMARTDent V3 provides video manuals. You can watch the manual of the function in videos on Youtube.

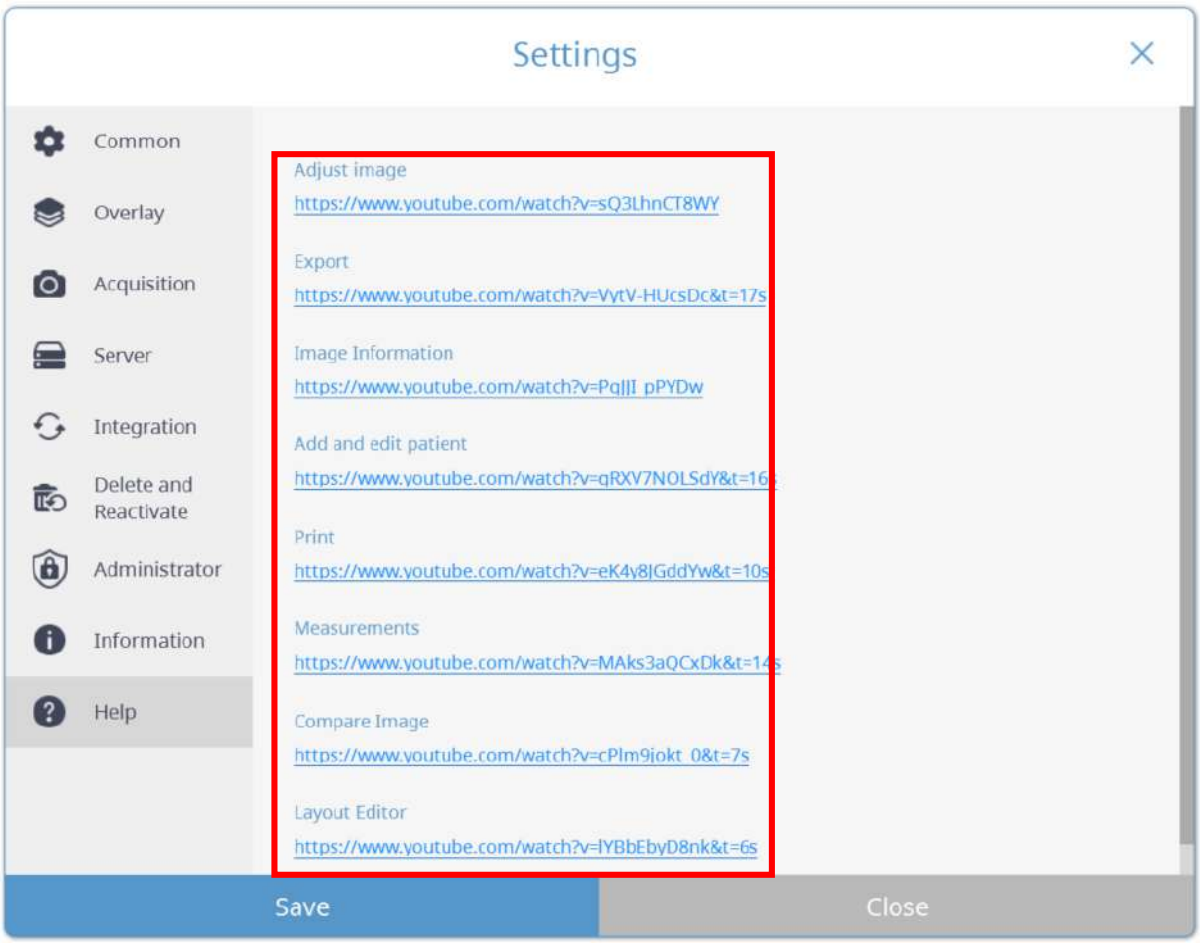


Fig 60 Help Page

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