KP Dental Software Manual

1. Summary

KP Dental is the software component of k-Sensor K1/K2/K1.5、u-Sensor、KP Cam Pro, which is produced by Guilin Kevin Peter Technology Co., Ltd. It runs separately on the Windows system and performs functions such as receiving image data from k-Sensor K1/K2 、u-Sensor、KP Cam Pro, as well as image processing.

System function overview

The KP Dental software consists of several modules, each performing a specific function to enable the case examination process and provide valid diagnostic image data.

Login module: Administrator registration, user login, automatic login, password remembering, etc.

Patient module: Register/modify/delete/view patient, image preview and image acquisition, etc.

Viewer module: Image preview and image processing, etc.

Report module: Add/delete/save/open report, etc.

Setting module: Basic system setting, clinic management, default processing algorithm setting, device management, staff management.

2. Working conditions

- Minimum computer configuration requirements:

  CPU：Quad-core 3.0GHz processor

  Memory: 8GB

  Hard disk: 500GB

  Graphics card: NVIDIA GT710

  Display resolution: 1920 * 1080 and above

- Software environment:

  Windows7，Windows8，Windows10，Windows11

- Network conditions:

  LAN is available, with client and server in the same LAN.

3. Software function

3.1 Software installation

3.1.1 The software installation package is stored in the U disk of the equipment box.Double-click the installation program, as shown in Figure 1:

Figure 1

3.1.2 Select "Setup Language", as shown in Figure 2:

Figure 2

3.1.3 After the installation program is started, click the "Browse" button to select the installation path. After the path is selected, click the "Next" button, as shown in Figure 3:
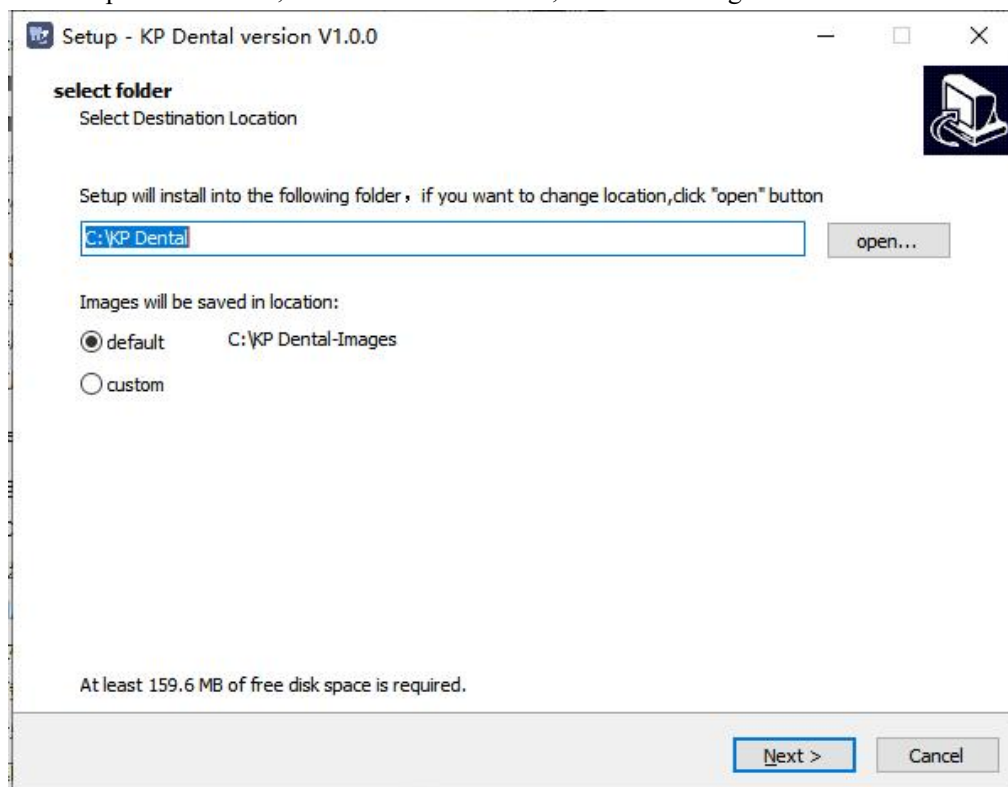

Figure 3

3.1.4 Read the software license agreement, agree to this agreement and click "I accept the agreement", click Next to continue installation, disagree with this agreement and click "I do not accept the agreement" to exit the installation program，as shown in Figure 4。
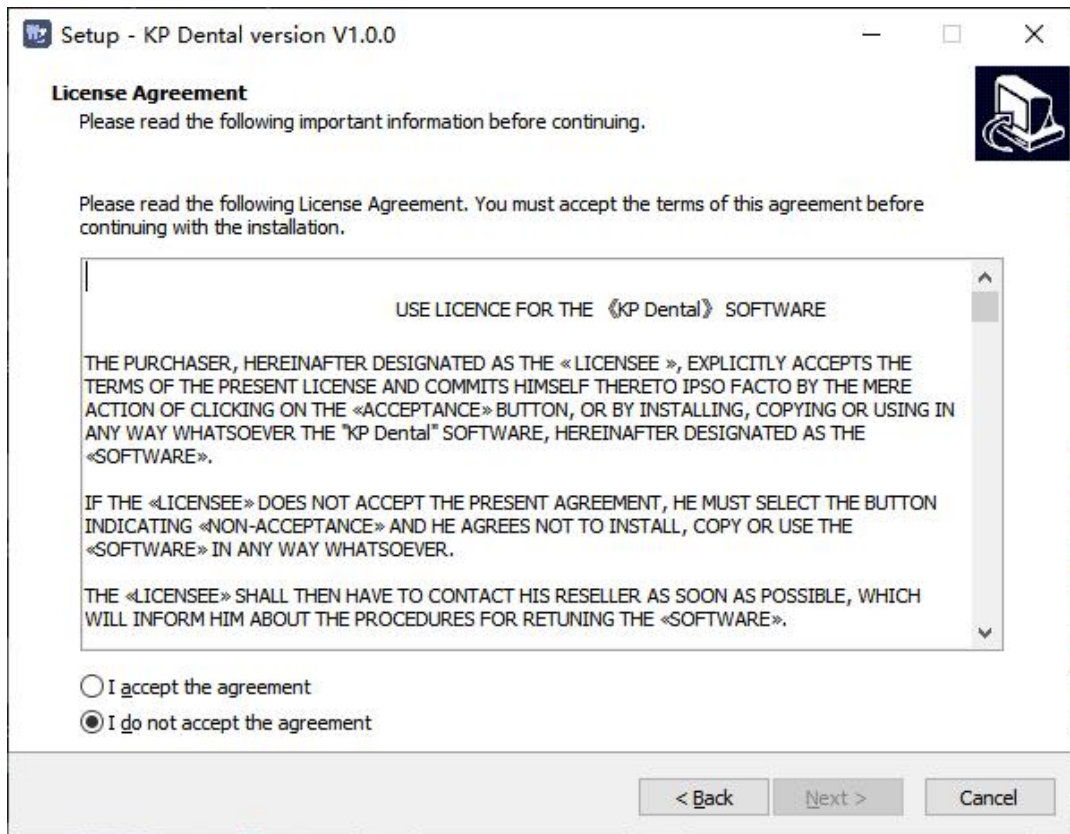
Figure 4

3.1.5 Select components. The user selects the corresponding component as needed, and then click the "Next" button, as shown in Figure 5:
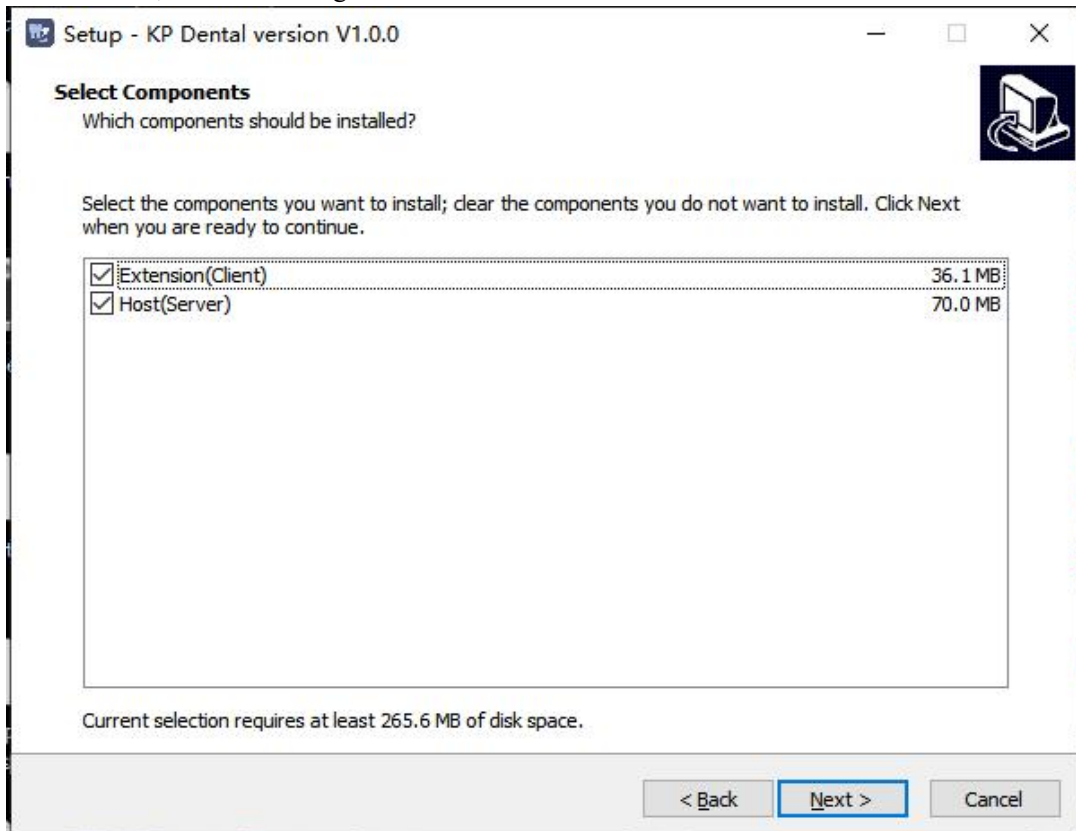

Figure 5

3.1.6 Set whether to create a desktop shortcut and server auto start, click the "Next" button after completion, as shown in Figure 6:
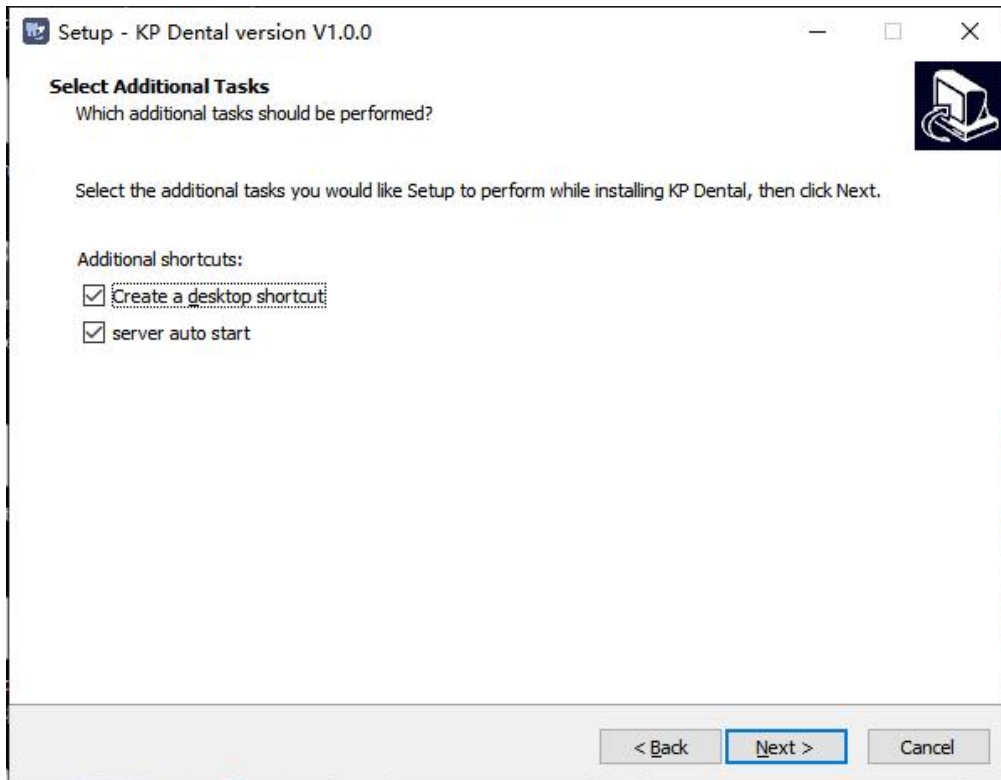

Figure 6

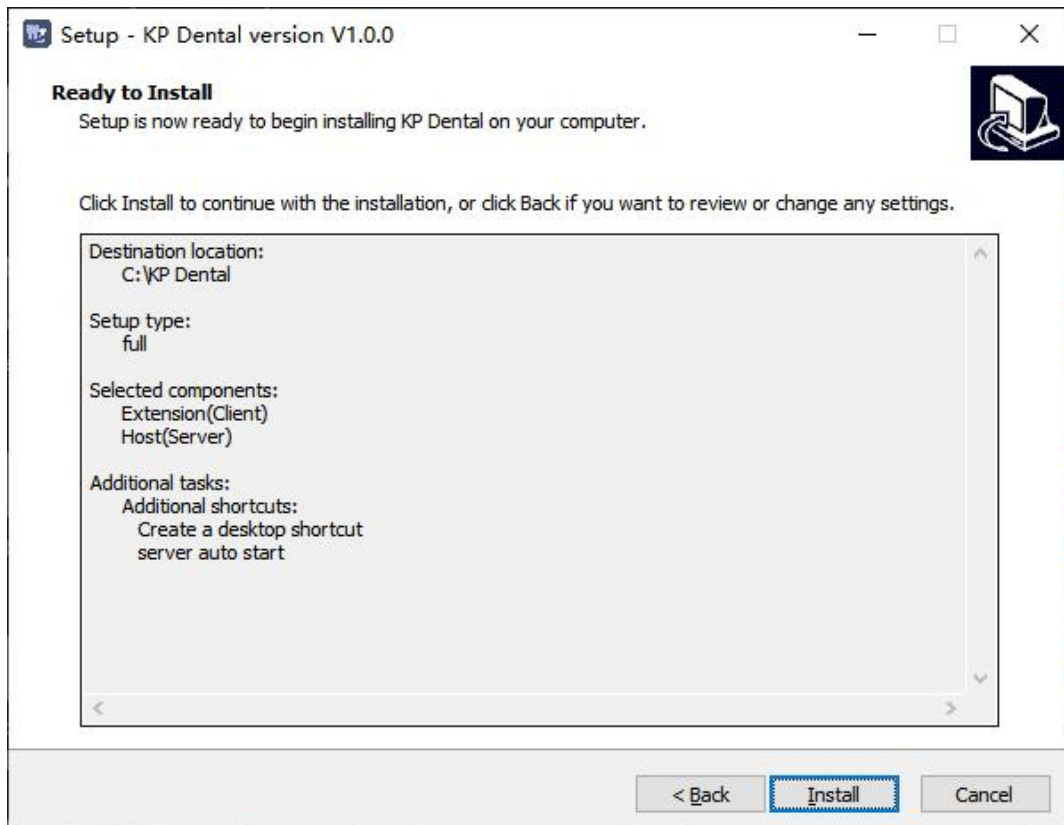3.1.7 Click the "Install" button to start the installation, as shown in Figure 7:

Figure 7

3.1.8 After the "Install" button is clicked, the program starts to install. The user just waits for the installation to complete, as shown in Figure 8:
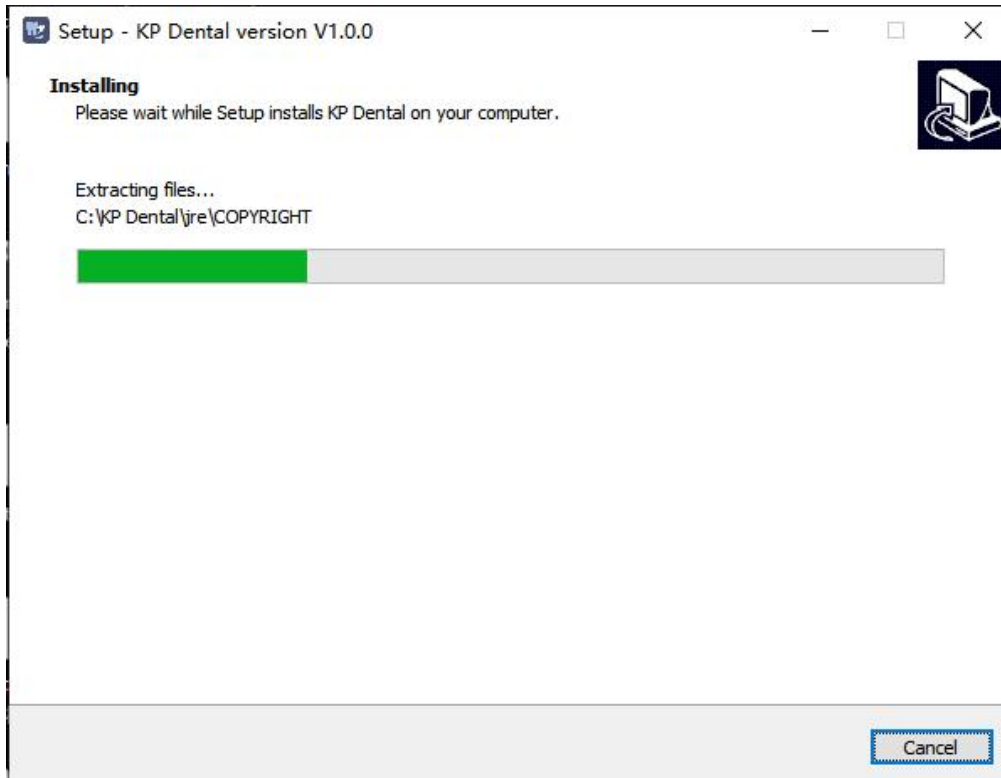

Figure 8

3.1.9 Install the driver, click "Next", click "Next", and then click "Finish", as shown in Figure 9, 10, and 11. If the system has already installed the driver, the page of Figure 9 will display Figure 12, select "Repair", and then click "Next".
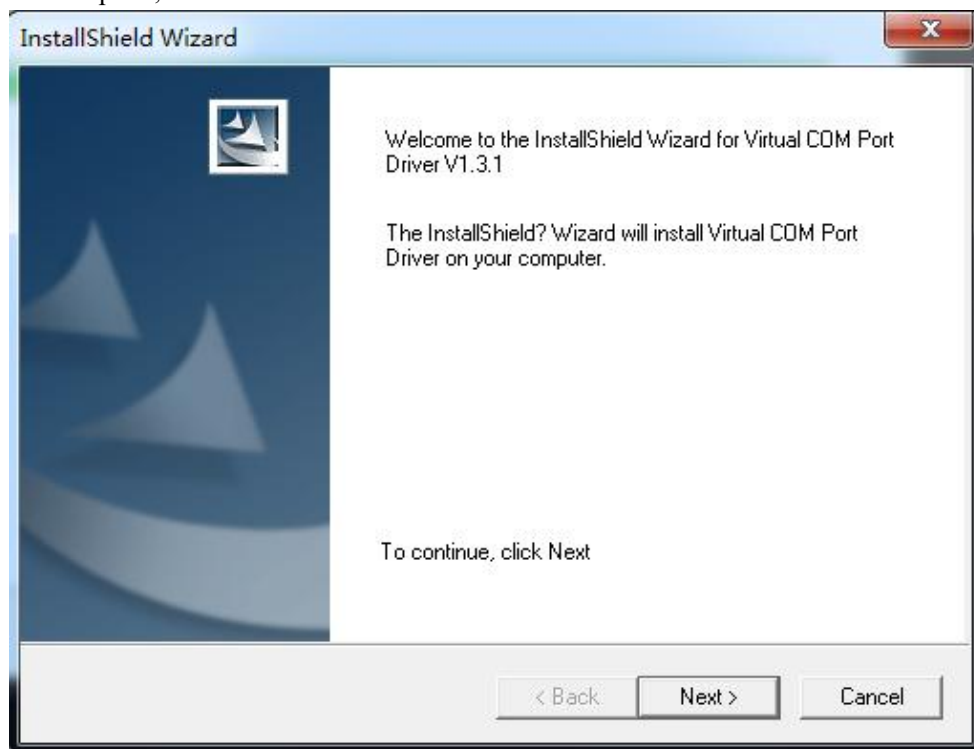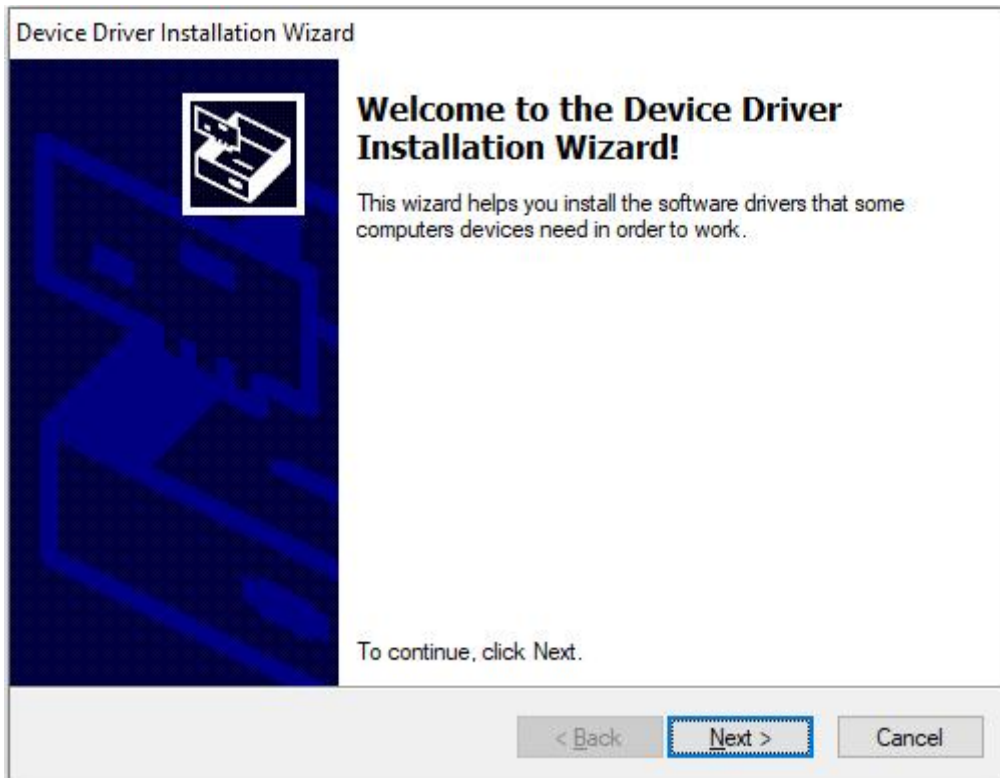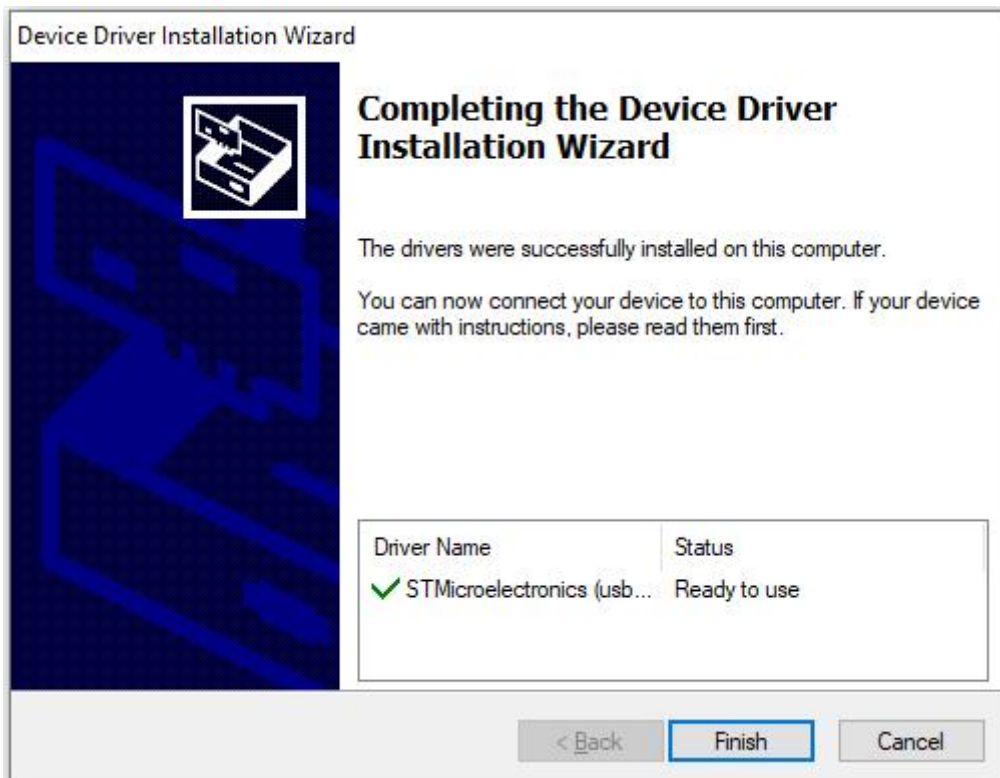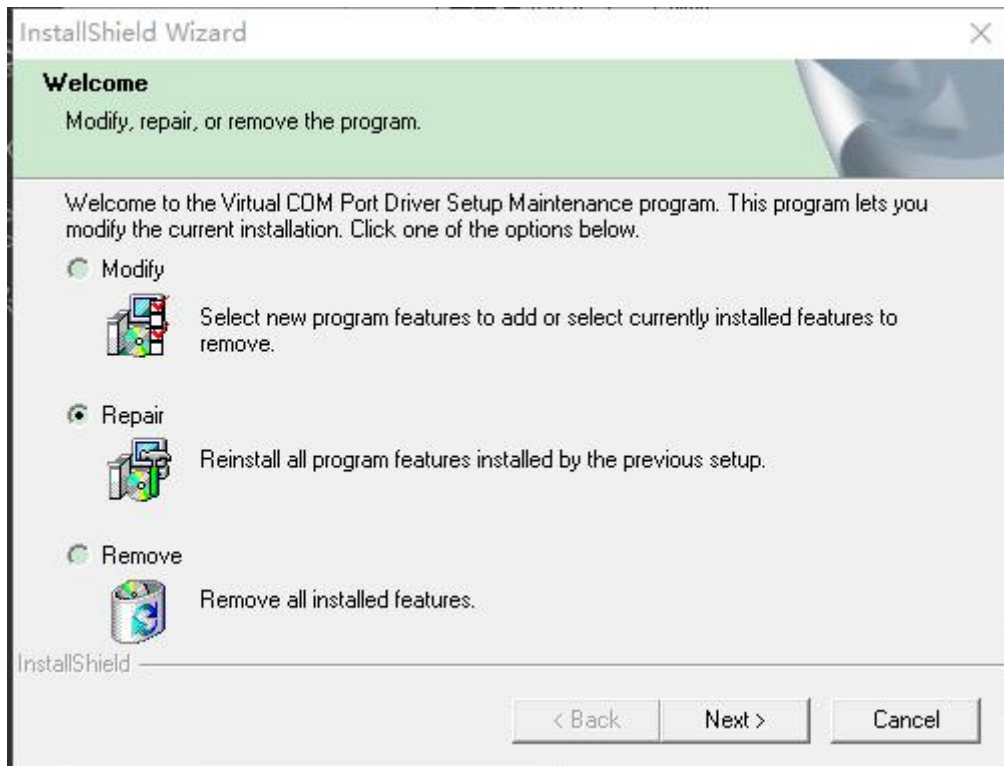

Figure 9

Figure 10

Figure 11

Figure 12

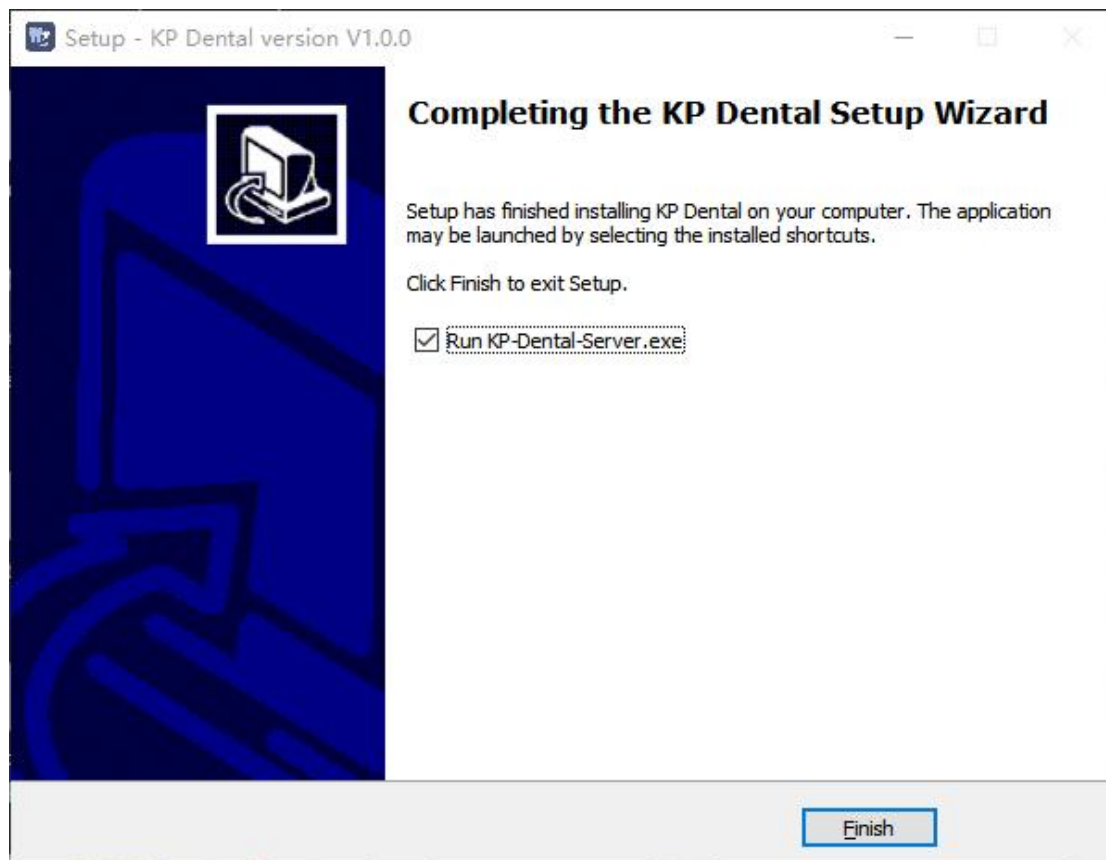3.1.10 After the software is installed, click the "Finish" button, as shown in Figure 13:

Figure 13

3.2 Login module

Double-click "KP Dental-Server" to start the server. After the server is started successfully (as shown in Figure 14), double-click "KP Dental-Client" to start the software and enter the software login interface (as shown in Figure 15). Enter the user name and password, and click the "Login" button to log in to the main interface, as shown in Figure 16.

The first time you use the software, you don't have a user name and password, as shown in Figure 17. Click "Sign up for free" to register the administrator, as shown in Figure 18. Enter user name, password, confirm password, and other information to register successfully. Enter the user name and password in the login interface to log in to the main interface of the software. The administrator account has user management functions such as New User, Delete User, Modify User and Search User. Ordinary users do not have user management functions. For details, please refer to "3.6.6 Staff Management".
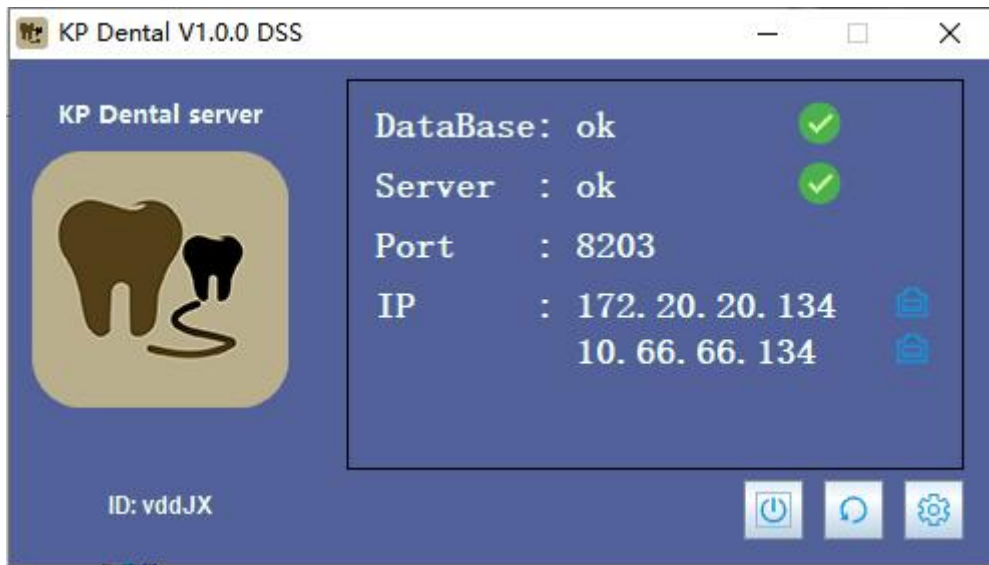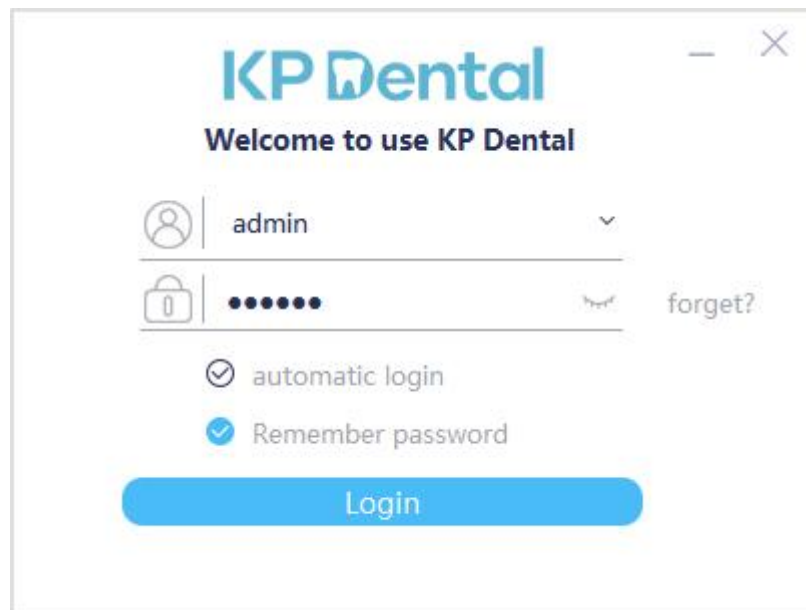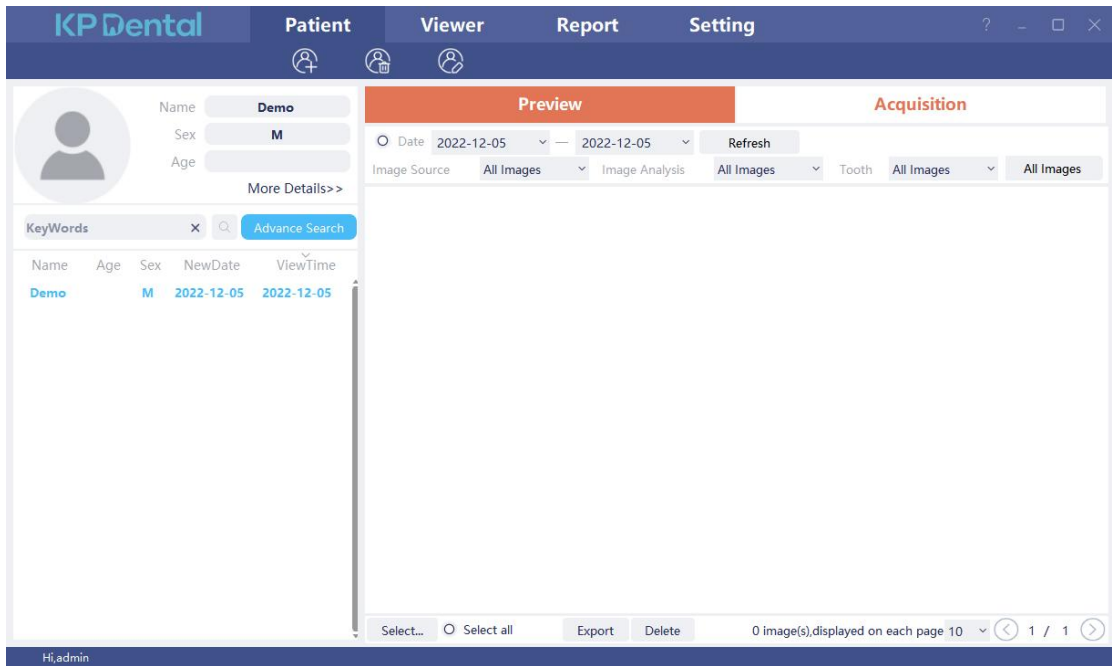

Figure 14

Figure 15

Figure 16

Figure 17

Figure 18

3.3 Patient module

Click the "Patient" button to enter the patient module.

3.3.1 Add, delete, modify and query patients

The patient toolbar is as shown in Figure 19. Click the "Add Patient" button to enter the information, click "OK" and a patient can be added, as shown in Figure 20. If you need to modify the patient information, click the "Modify Patient" button to modify the patient information. Click "Modify" and the modification can be successful, as shown in Figure 21. If you need to delete a patient, click the "Delete Patient" button and click "OK" after 3 seconds, as shown in Figure 22.
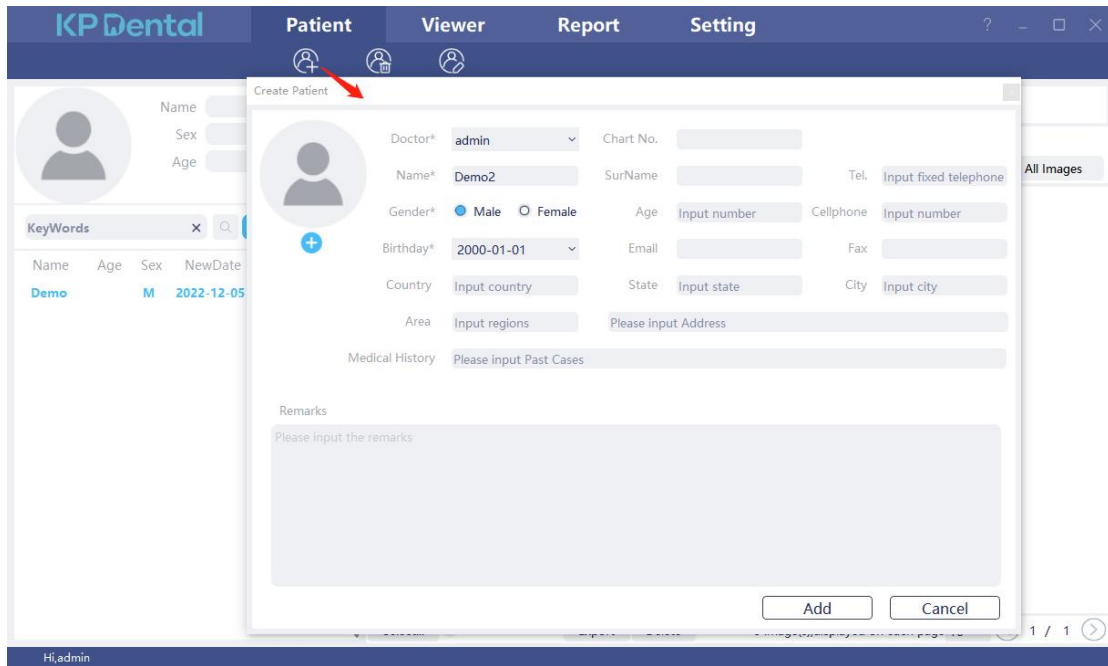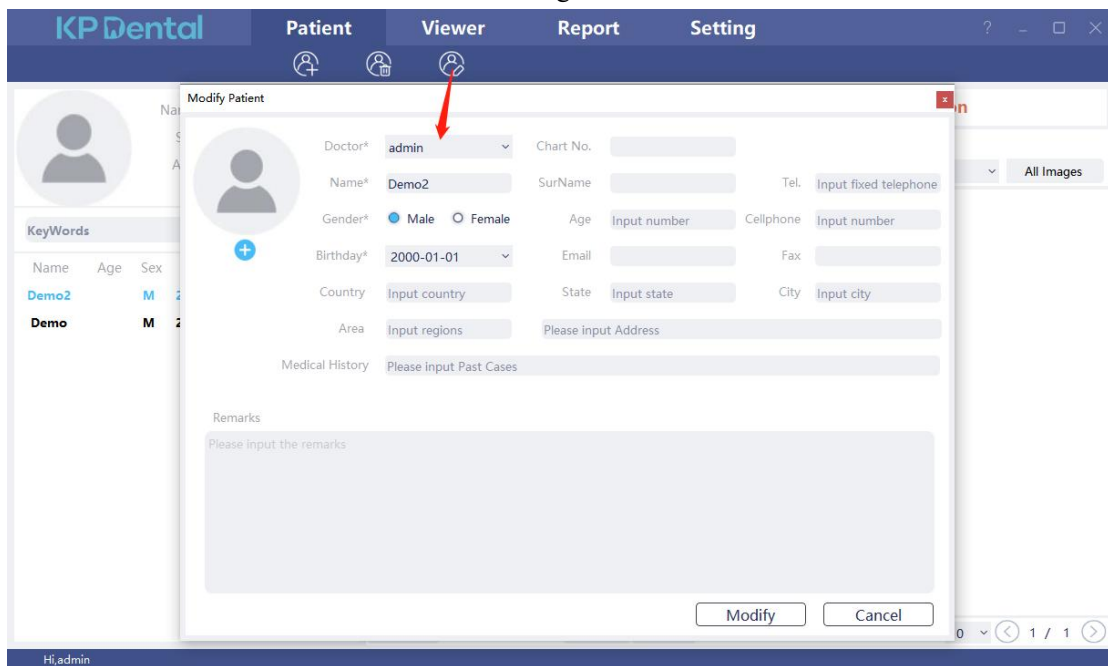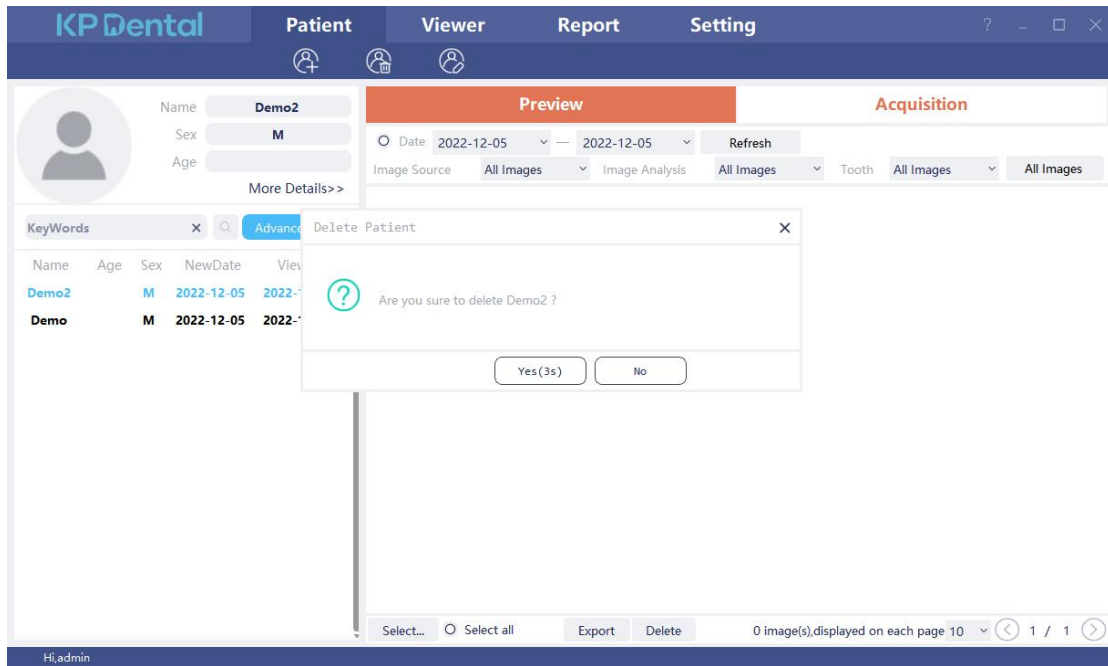

Figure 19

Figure 20

Figure 21

Figure 22

Select the patient in the patient list, as shown in Figure 23. The patient information is displayed on the patient information interface. Click "More Details" to view detailed patient information. Enter patient information in the search bar. Click "Advance Search", enter or select information such as New Date, Age, Sex, and Doctor, and click the search button to query the specified patient. If you only want to view the patients created by the current user, select "Current User" in the Doctor option, as shown in Figure 24.
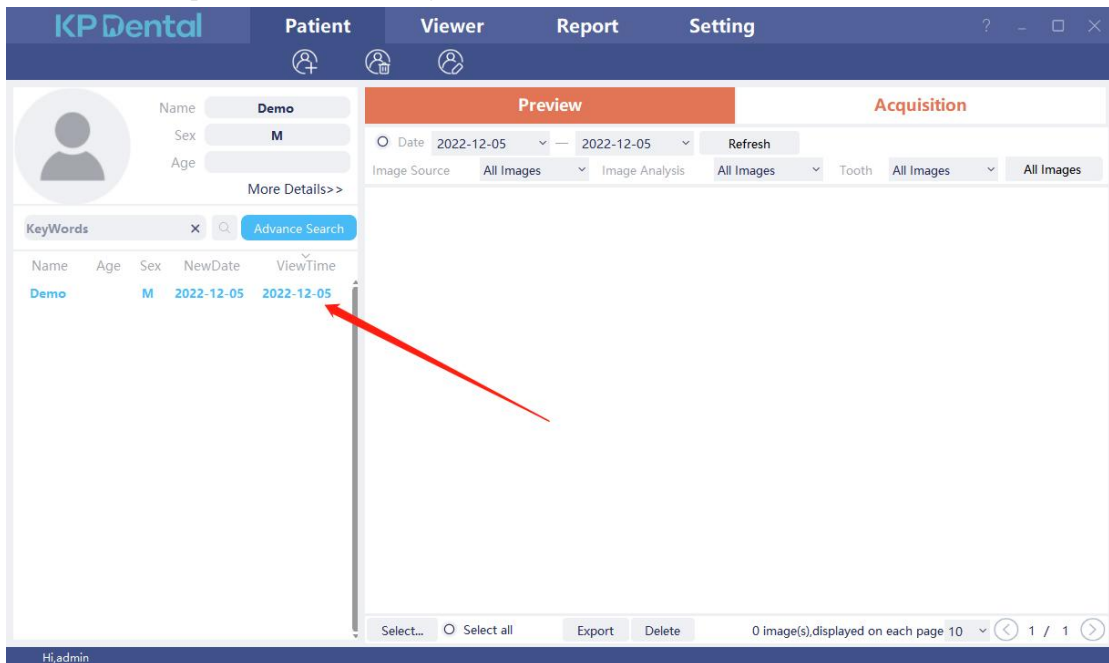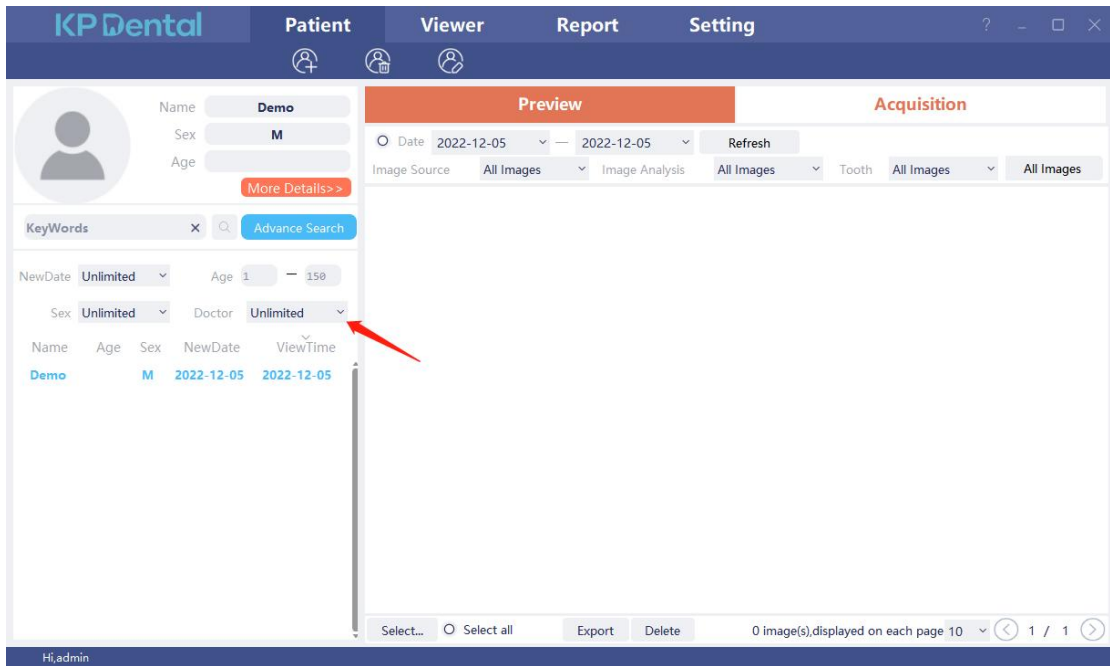

Figure 23

Figure 24

3.3.2 Image acquisition

Click the "Acquisition" button to enter the image acquisition interface.

Take the sensor as an example. After entering the software, click the "Acquisition" button, connect the sensor device to the computer USB interface, and select the "Sensor" device type. Click "Open", the k-Sensor device will enter the acquisition state, and start to acquire images. At this time, the sensor serial number is displayed in the software status bar, as shown in Figure 25. When the sensor is used for the first time, the calibration file will be downloaded through the network, and the user will be prompted "Whether to manually import the calibration file". Click "Yes" to select the calibration file to import. Generally, the image acquired by the sensor will be better after the calibration file is selected, as shown in Figures 26.
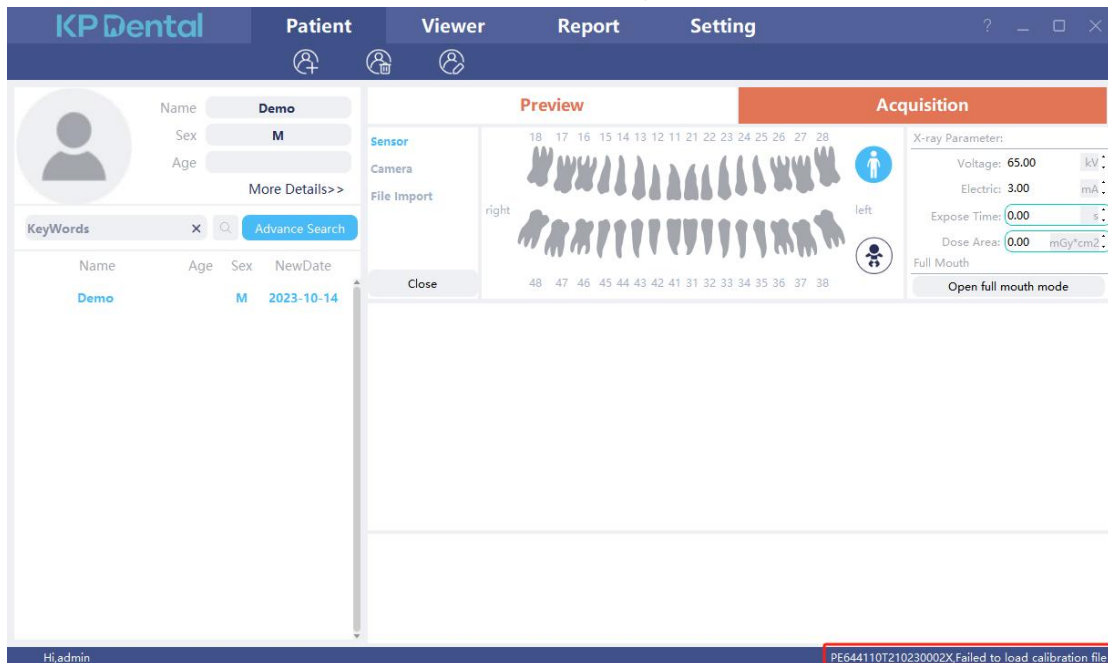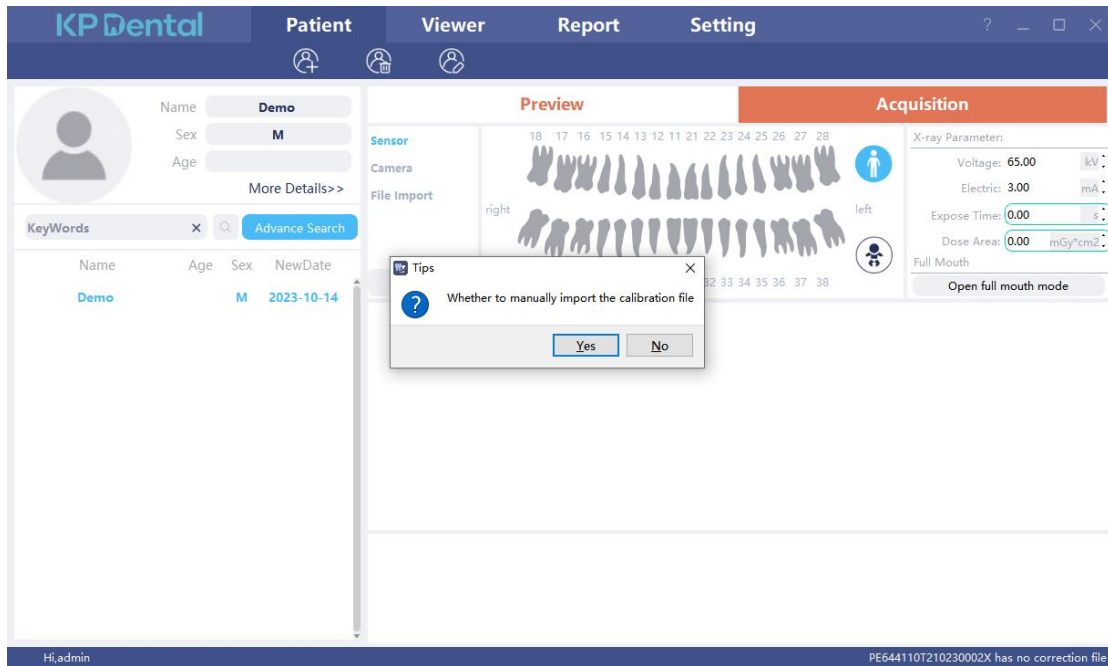

Figure 25

Figure 26

Take "u-Sensor" as an example. After entering the software, the software automatically detects the device, click the capture button, the u-Sensor device is connected to the computer USB interface, select the "Sensor" device type, the button displays "Exposure", the software detects the device, click the exposure, you can start the acquisition images, as shown in Figures 27, 28, 29. When the equipment is used for the first time, the calibration file must be made manually. The software will prompt "The calibration file does not exist. Do you want to create a calibration file". Click Yes, the software will display the manual calibration page, as shown in Figures 30 and 31. Click "Calibration Help" to view the steps of making the calibration file, as shown in Figure 32, or in 3.6.5.2 u Sensor Equipment Management of this document。
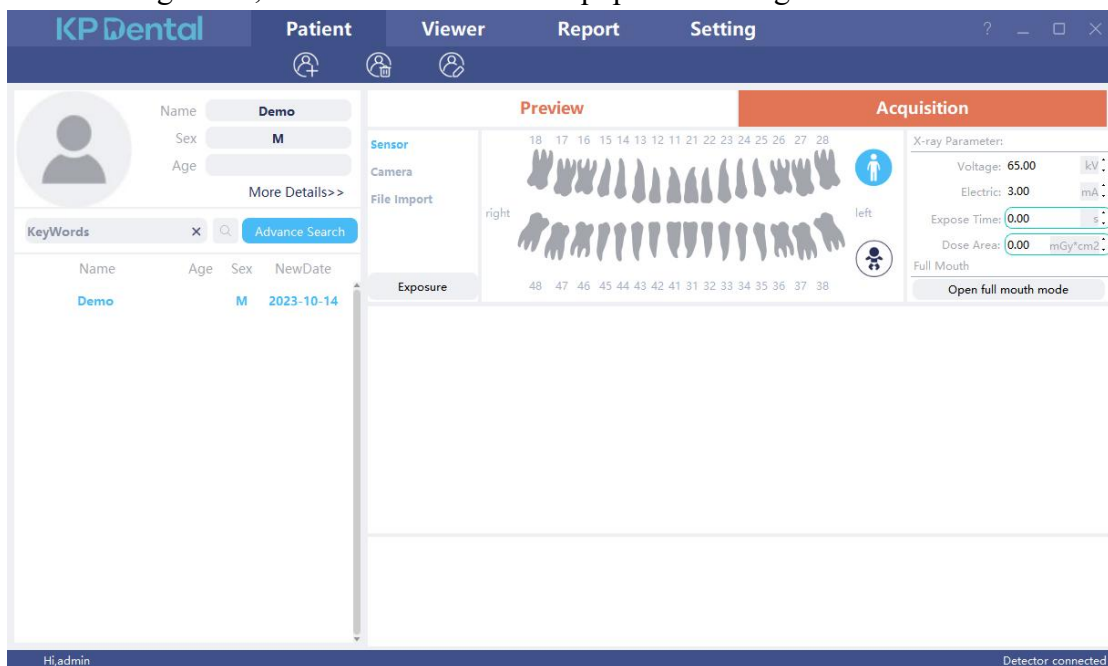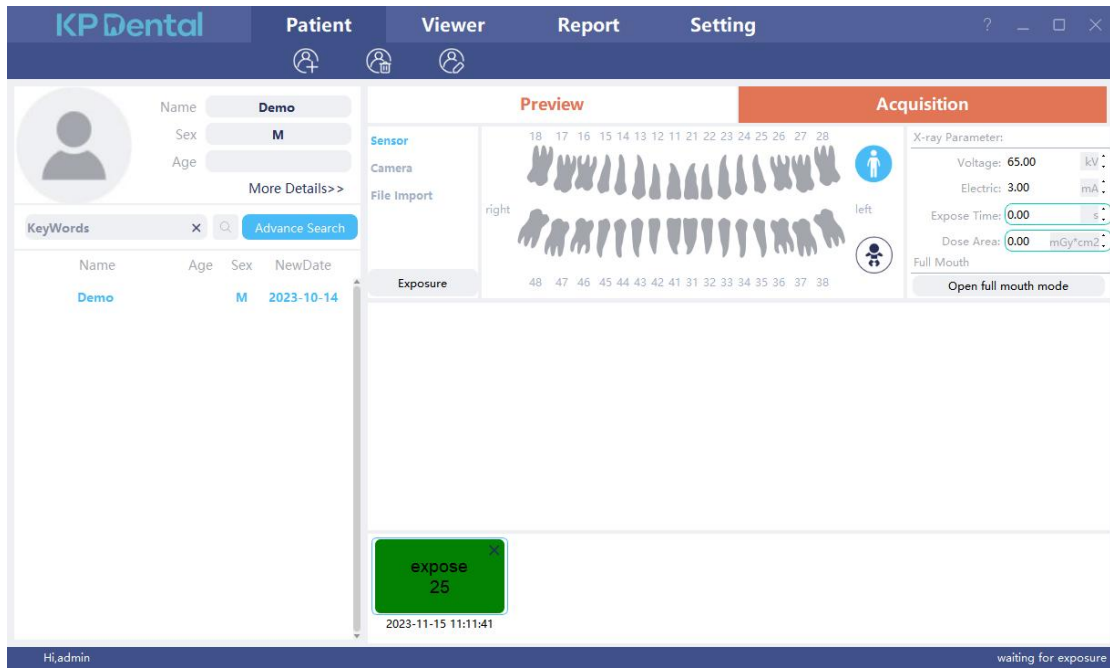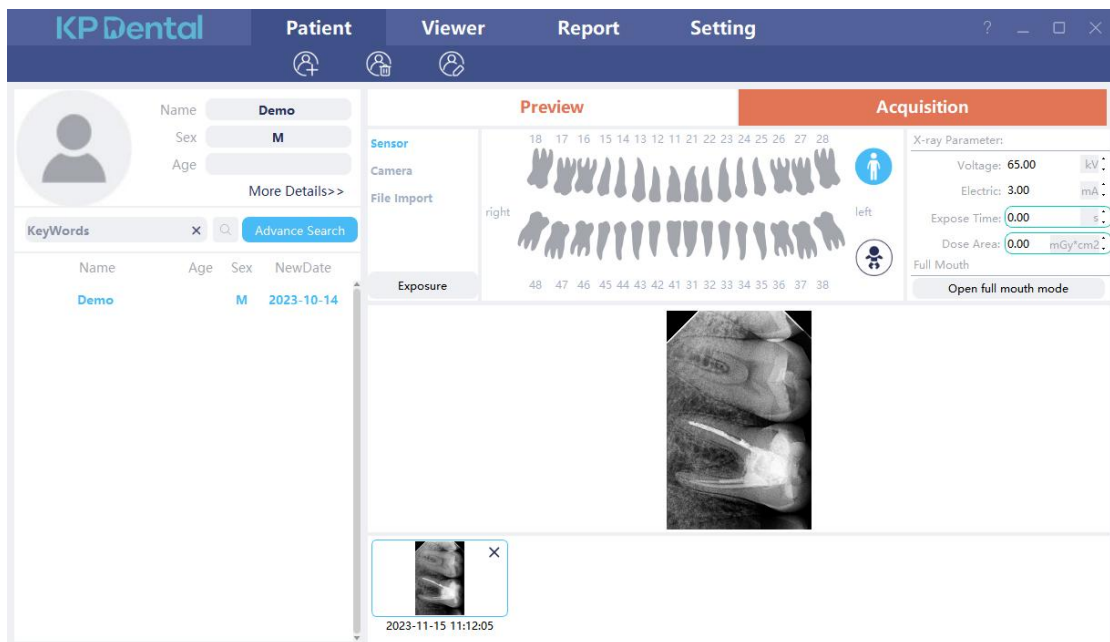

Figure 27
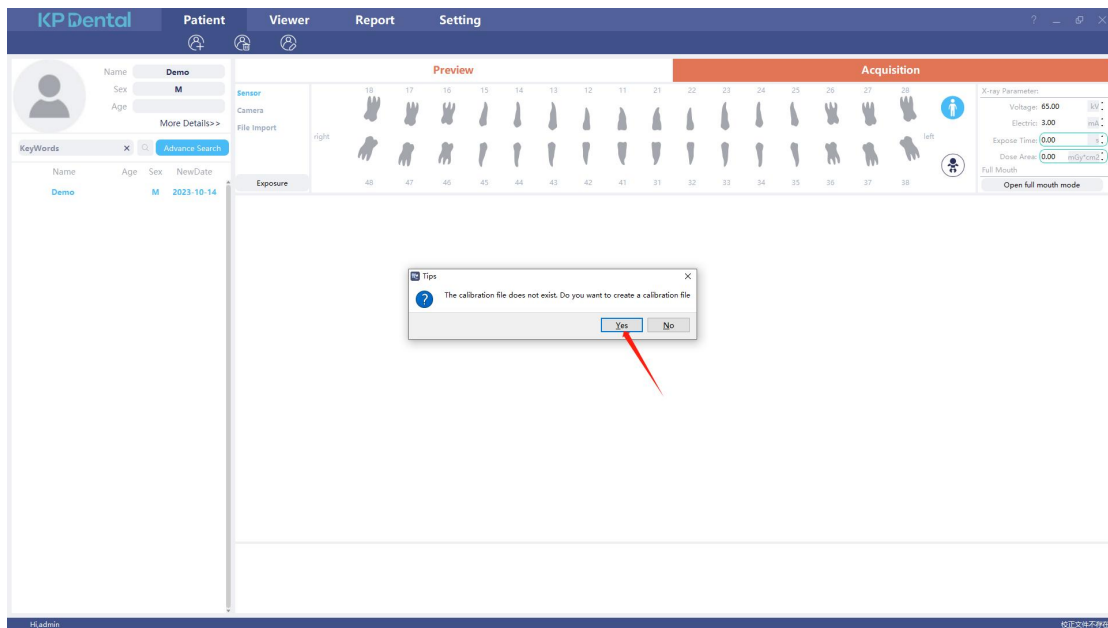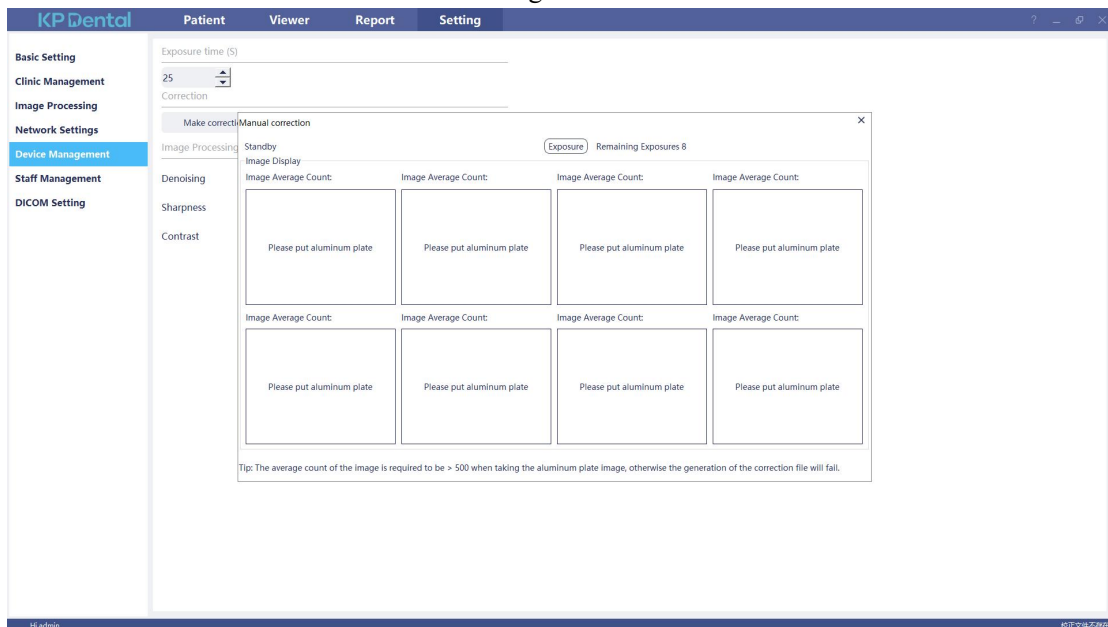
Figure 28
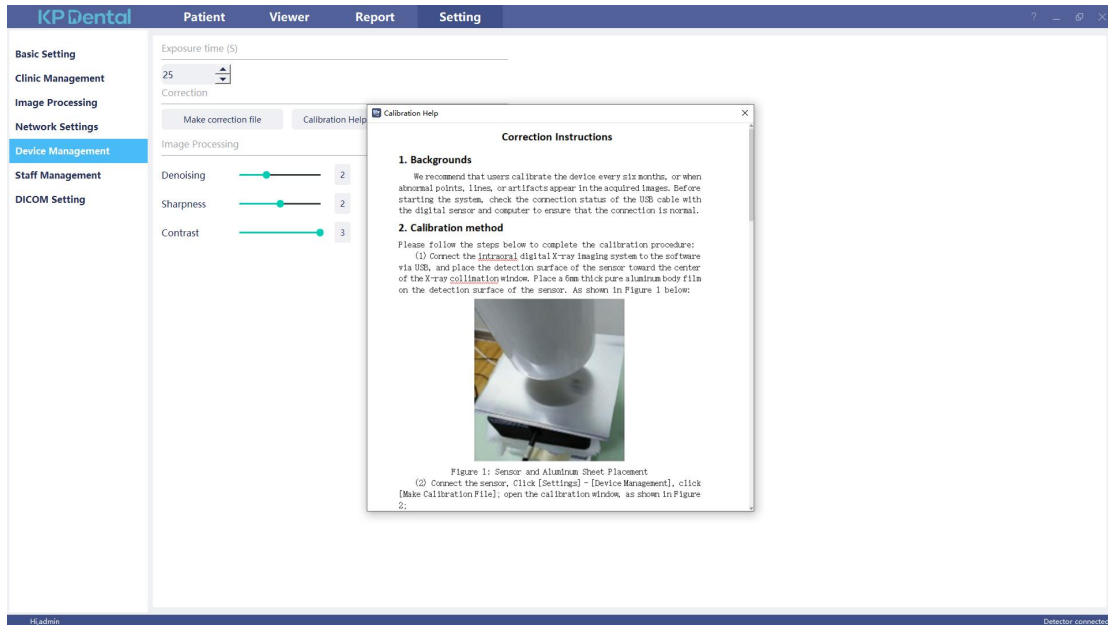

Figure 29

Figure 30

Figure 31

Figure 32

The k-Sensor sensor and the u-Sensor sensor are generally not used on the same computer at the same time. If you need to use them at the same time, please plug in the k-Sensor sensor first, click Open, open the k-Sensor, and then plug in the u-Sensor sensor, you can use two sensors by switching the sensor, as shown in Figure 33
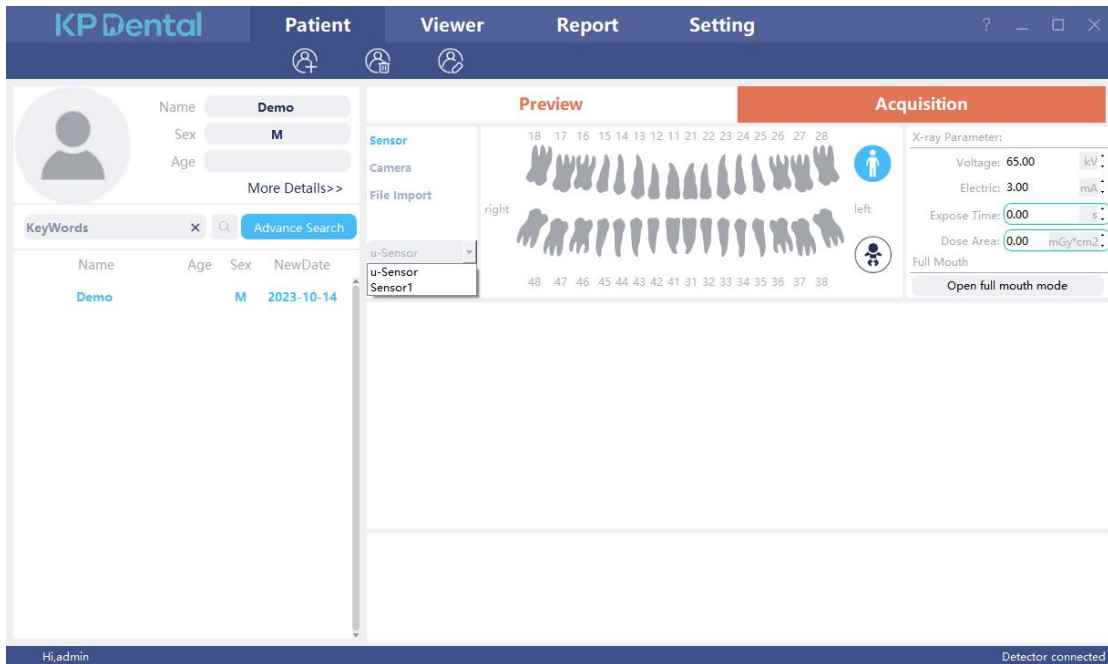

Figure 33

Take the camera as an example. After entering the software, click on the acquisition button, select "Camera", click on "Open" to enter the image acquisition page of the oral digital observer (hereinafter referred to as "Camera"), as shown in Figure 34. If the handle of the oral digital observation device is inserted, the image acquisition page of the oral digital observation device will display the name of the camera. Click "Start" to display real-time video in the central video stream display area. Click "Capture Photo" to save the photo to the software and display the image on the right side of the page, as shown in Figure 35. Click "Stop" to shut down the device. Click

"Recording" to record the video stream in real-time and form a file. Click the play button to achieve video playback, as shown in Figure 36. Users can select full screen, split screen, or quarter screen to view images as needed, and click Clear to clear the image in the display area, but the image will not be deleted. The page also has functions such as image flipping, creating new patients, modifying patients, and querying patients, as shown in Figure 37. Cameras have different resolutions. You can click on "Format Setting" and select the desired resolution. The default is the maximum resolution. The image captured in the display area has a sharing function. Click the sharing button, and the patient will connect their phone to the same network as their current computer. Scan and download the image. As shown in Figure 38. The image list on the right displays all images captured by the patient's camera, with pagination function. Click on "Multiple Choice" to select the desired image for export and deletion, as shown in Figure 39.
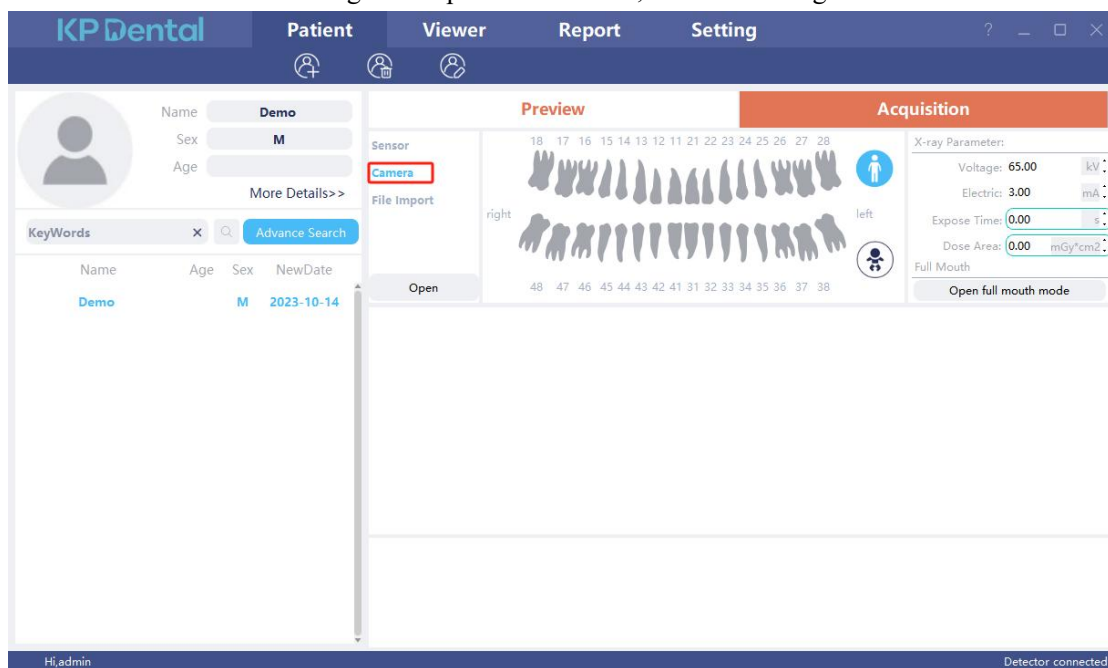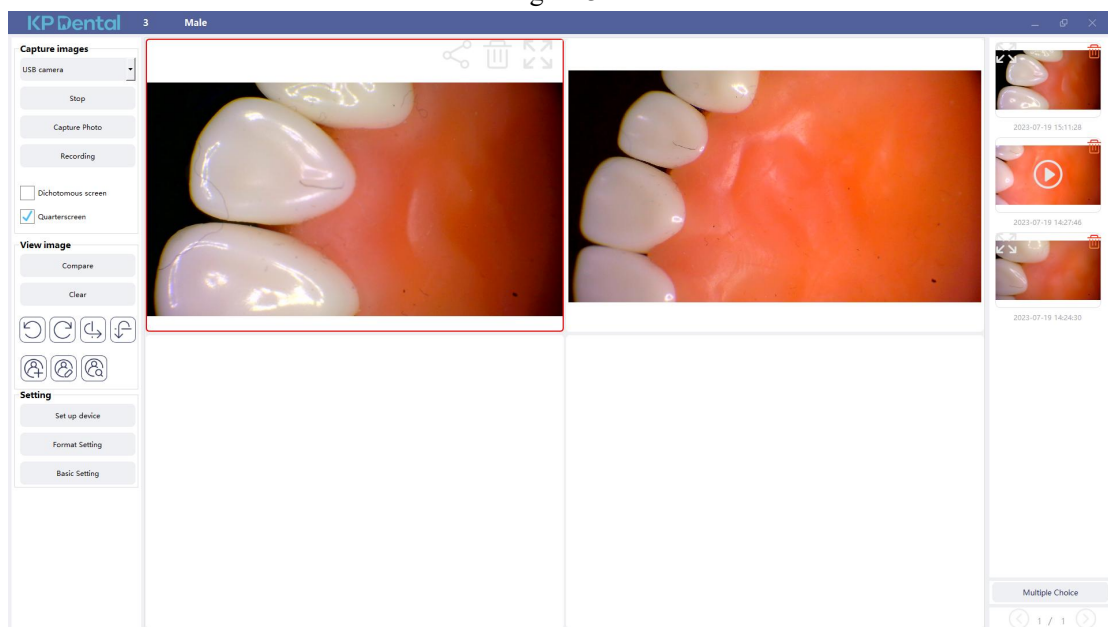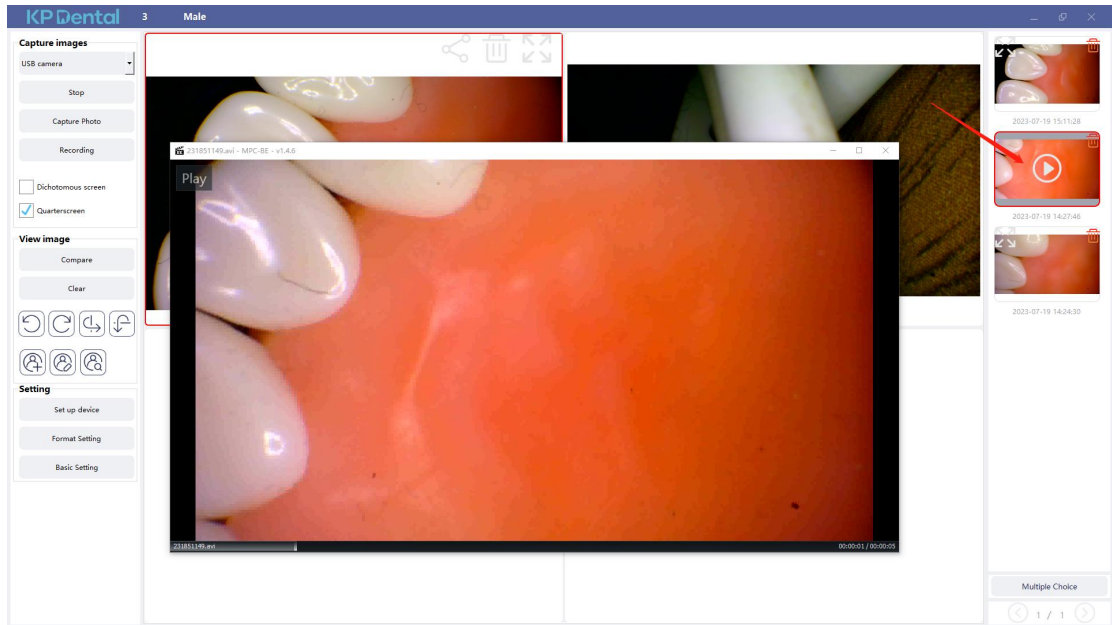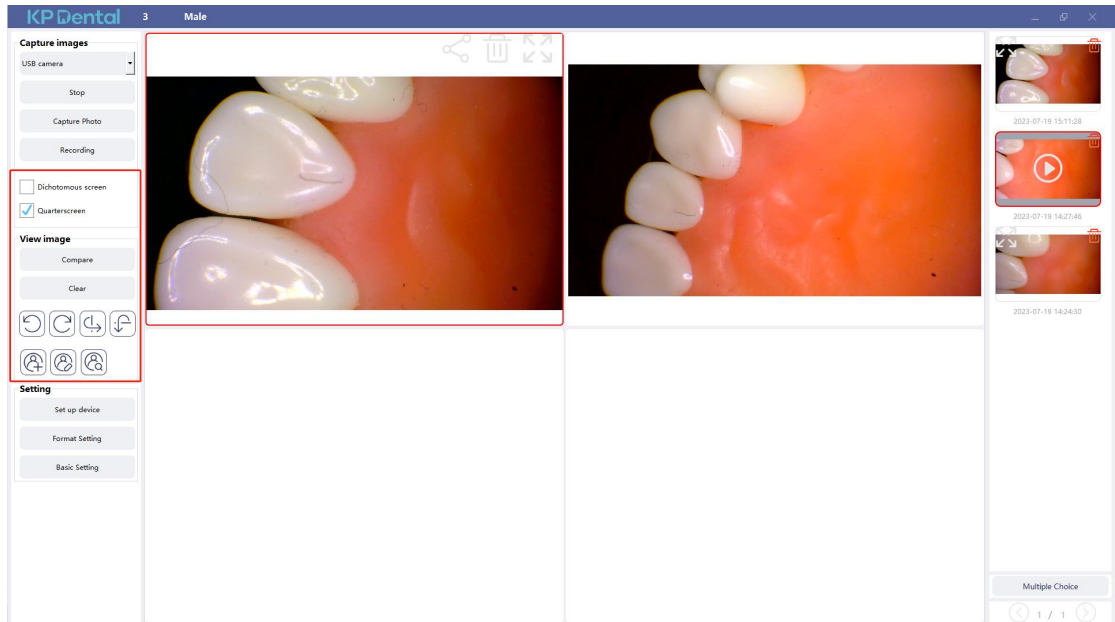

Figure 34

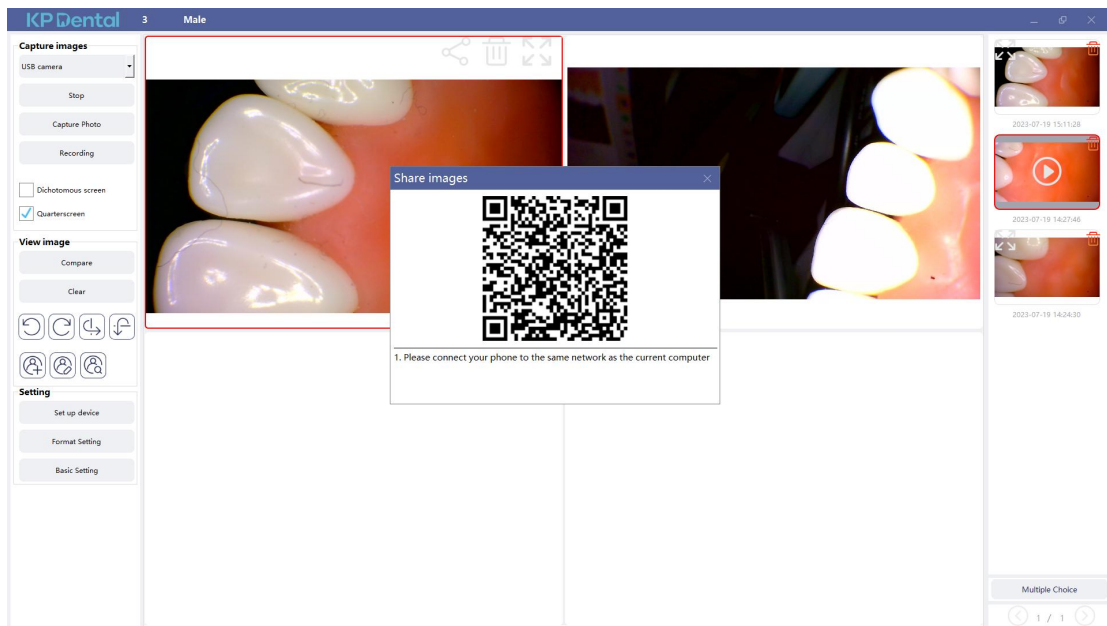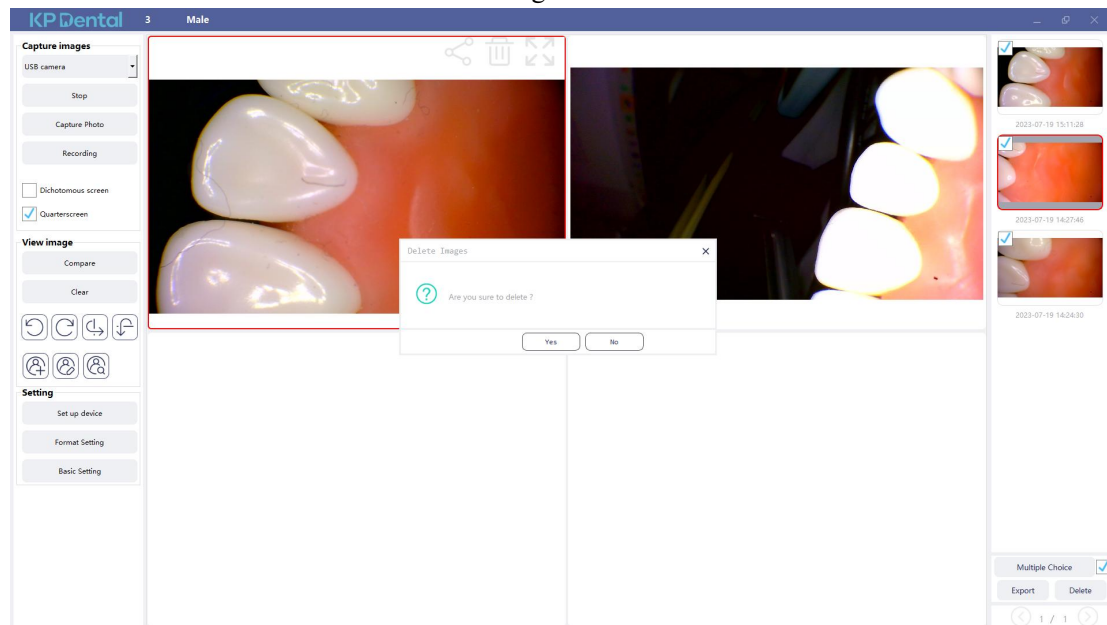Figure 35

Figure 36

Figure 37

Figure 38

Figure 39

Take file import as an example. After entering the software, click the "Acquisition" button. Select the "File Import" device type and click "Import" to enter the image selection interface. The software supports the import of images in PNG, JPG, JPEG, BMP, DCM and other formats, as shown in Figure 40. After selecting the image, click "OK" to enter the "Import image" interface, as shown in Figure 41. You can select the target patient and shooting time for each image, and click "OK" to save the image to the specified patient.
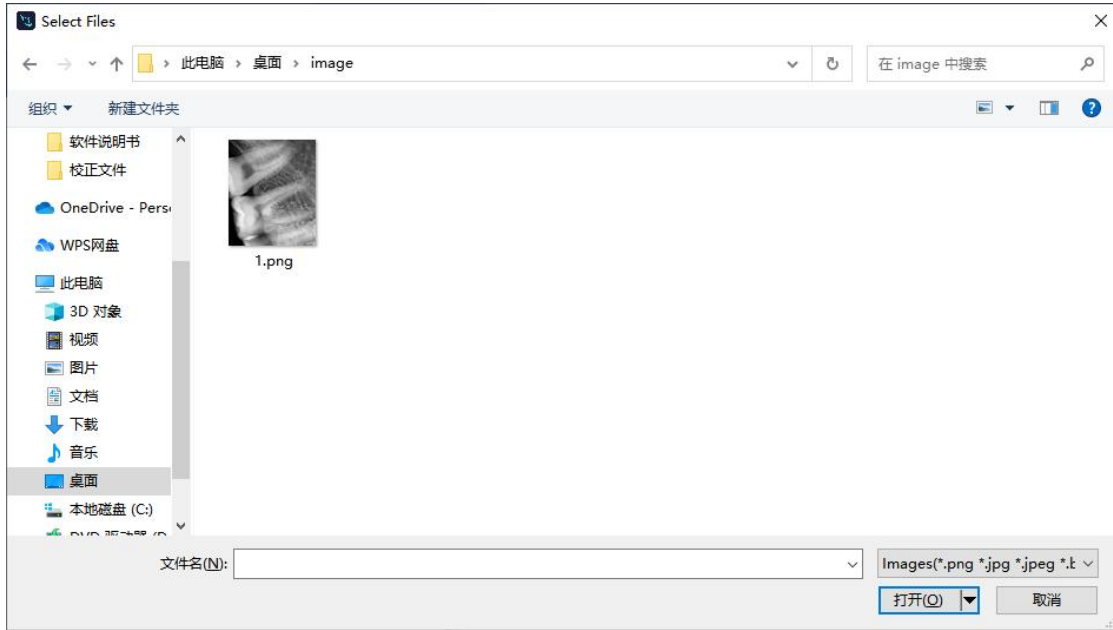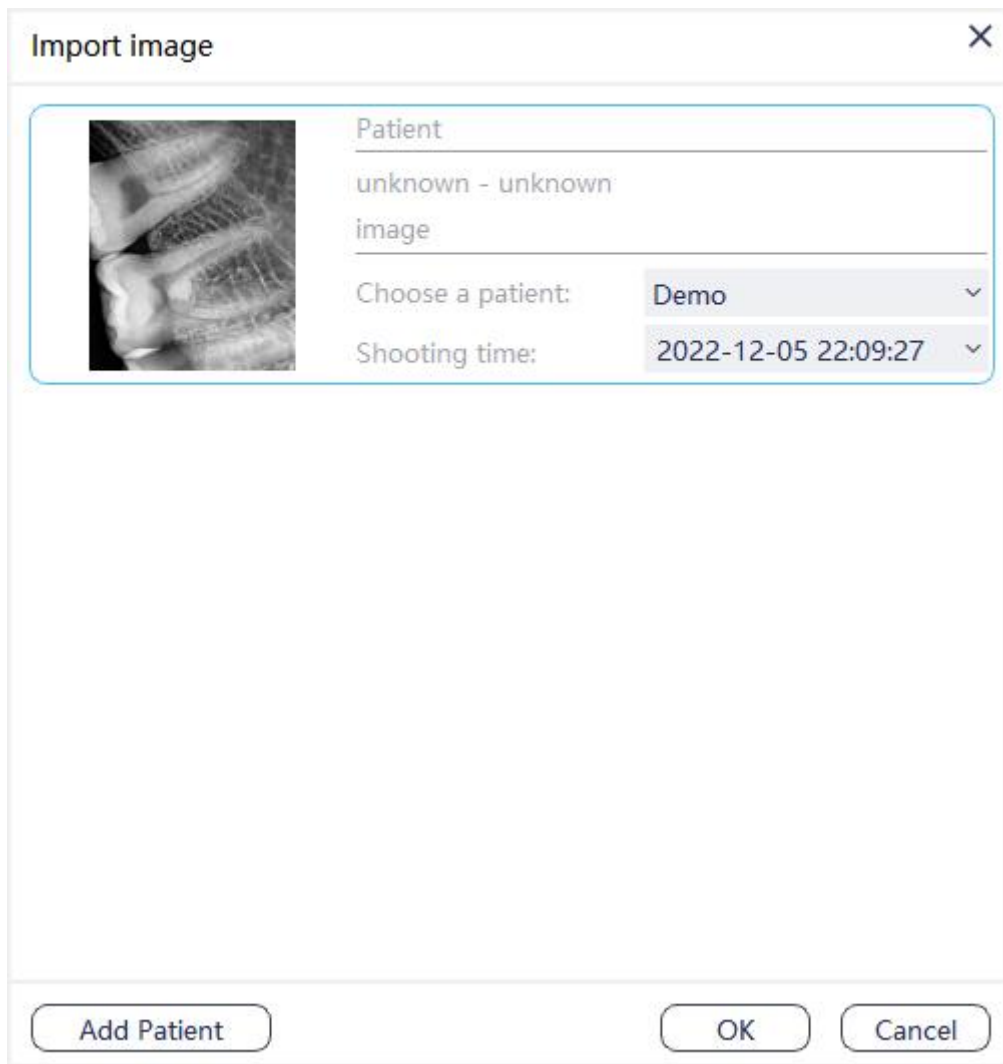
Figure 40

Figure 41

When the software is used for the first time, the user will be prompted to set the relevant parameters of the clinic's X-ray source. X-ray sources are divided into power frequency, medium frequency and high frequency. Select AC for power frequency and DC for medium and high frequency. The voltage and current are set according to the X-ray source parameters, as shown in Figure 42:
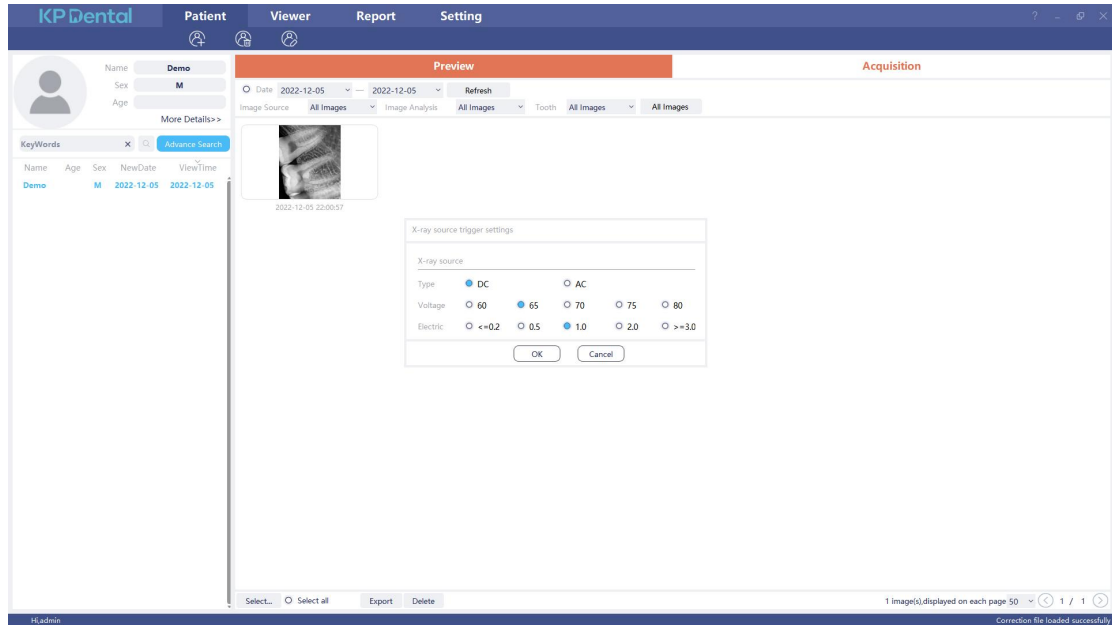

Figure 42

During the acquisition, problems such as network instability may be encountered, resulting in the failure of image saving. In this case, there is an image saving failure mark in the lower right corner of the image. Right-click the image and it can be exported to local and saved again, as shown in Figure 43 and Figure 44.
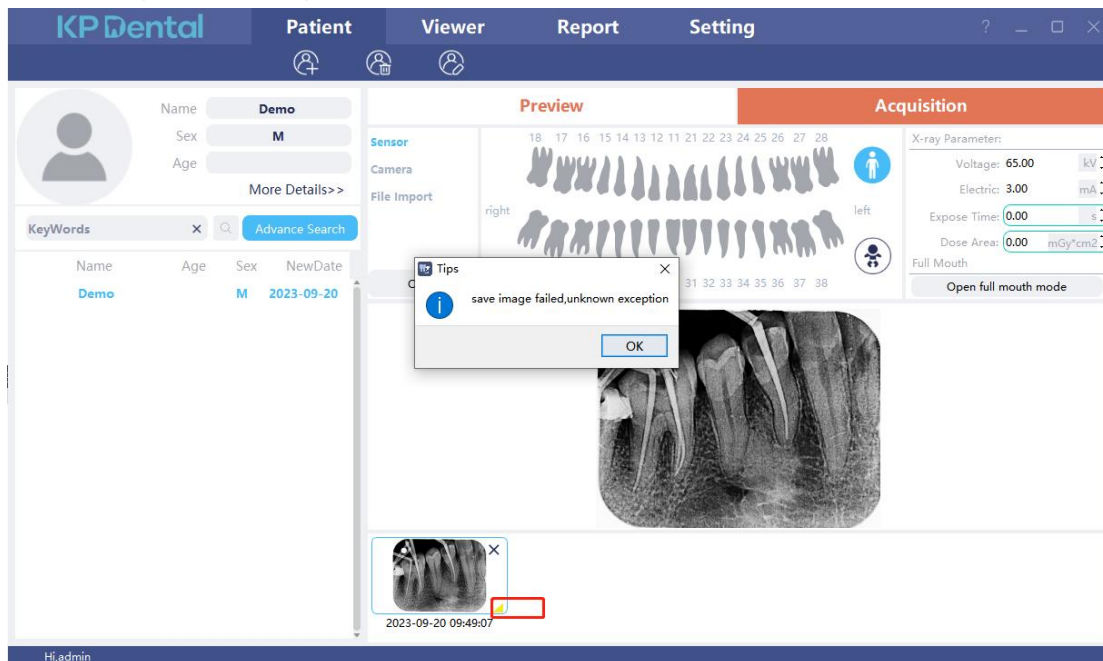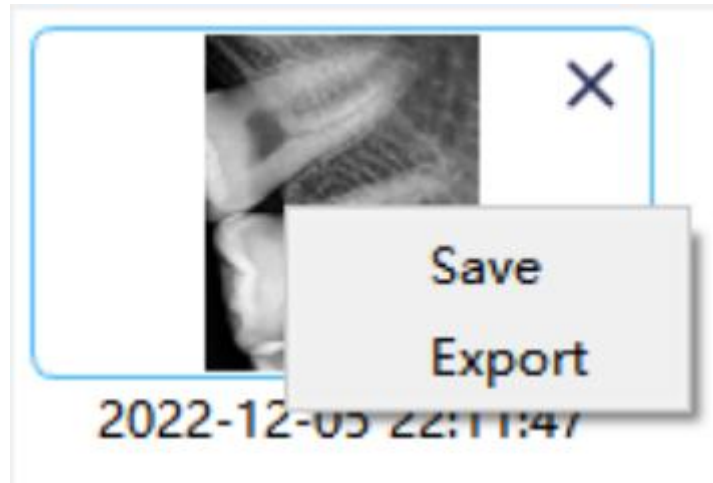

Figure 43

Figure 44

3.3.3 Image preview

Click the "Preview" button to view acquired images. Select an image, right-click and select "Export" to export the image to the local. Select "Information" to view the information of the image. Select "Delete" to delete the image after the user confirms to delete. Double-click the image to enter the viewer interface. If you want to delete or export multiple images, you can click "Select..." to select the images you want and then export or delete them. As is shown in Figure 45,46:

The image preview interface has filter image functions such as Date, Image Source, Image Analysis, Tooth Profile, All images, etc. Click the "Refresh" button, and the software will synchronize the latest image data of the patient and display it in the image list.
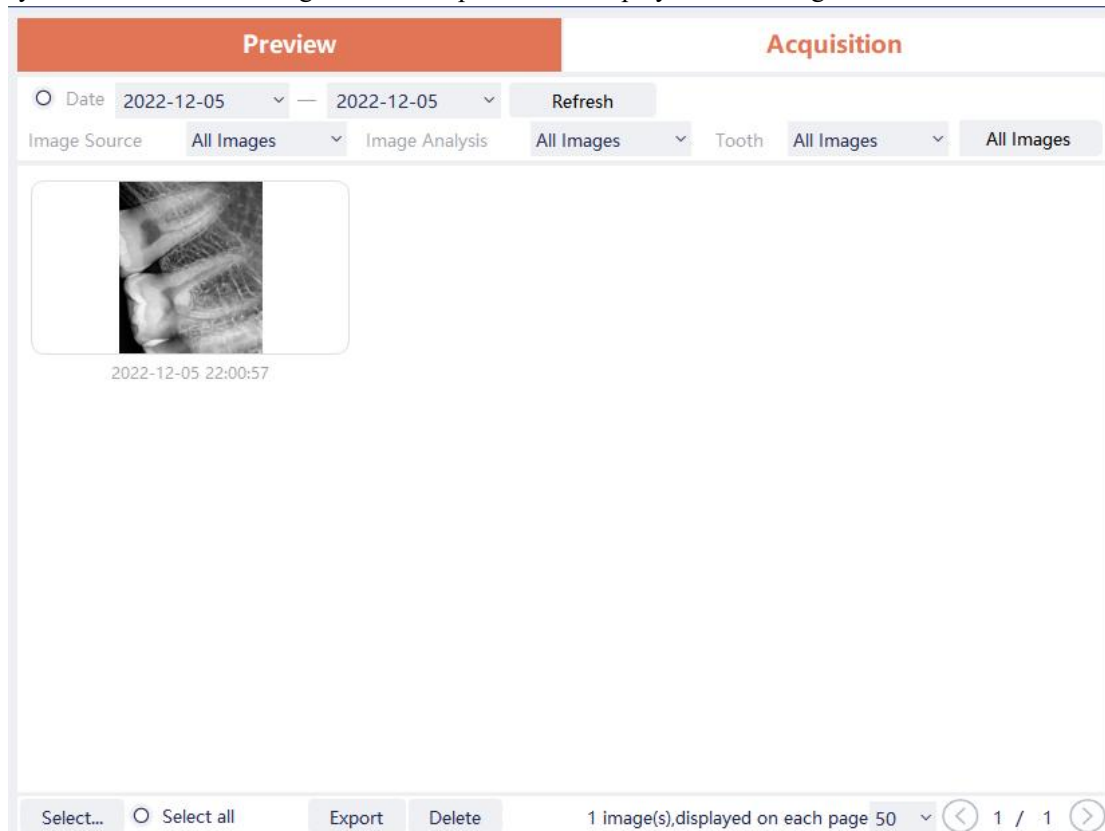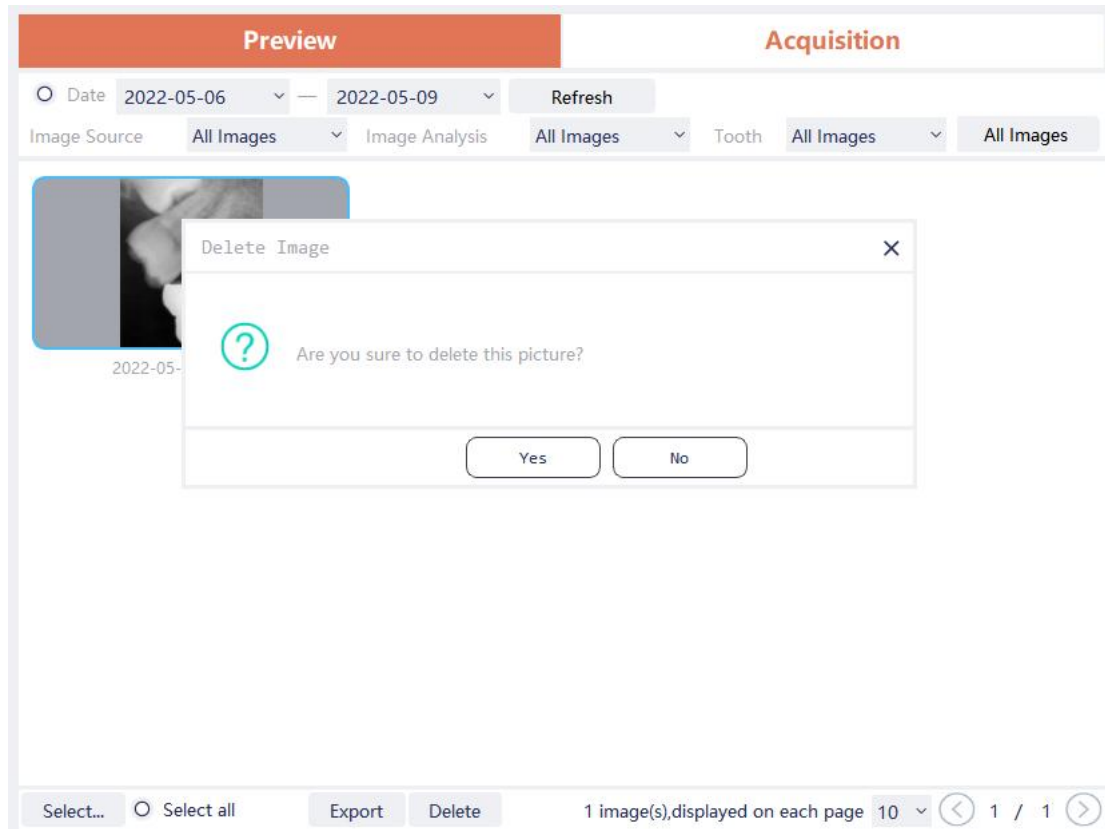

Figure 45

Figure 46

3.4 Viewer module

Click the "Viewer" button to enter the viewer module.

Click the image on the left to select an image to be processed. There are image processing tools on the right side of the viewer interface, such as Display, Image Correction, Measuring, View, Enhance, Sharpening, Histogram, Annotation, etc. Select the image processing tool and adjust the image quality to a satisfactory level. In the Enhance, click the "HD" button and the image will be enhanced. Click the "HD" button again to cancel the enhancement.

Use image processing tools to adjust image quality. Click the "Add Temporary State" button to save the image quality at this time. Select the temporary state in the drop-down box to reproduce the image.

There are delete, export, and image information functions above the processed image. These functions are similar to the corresponding functions of the patient module. When multiple images are selected for processing, click the "Clear" button to close them all.

Move the mouse wheel up and down to zoom in and out of the image. Hold down the right button and move the mouse up to increase contrast, move down to decrease contrast, move left to decrease brightness, and move right to increase brightness.

Select an image, and click the linear measurement icon (or angle measurement icon) in the Measuring. Click the left mouse button to form the starting point and move the mouse. Click the left mouse button again to form the end point and right-click the end point to end the measurement. The measurement line will be displayed on the image, and meanwhile the corresponding annotation of the measurement line will be displayed in the Annotation, as shown in Figure 47:

For images acquired by File Import, etc., the measured value may be inaccurate, and can be

calibrated through the calibration function. Select the measurement line, enter the actual length of the measurement line in the Measuring, and click the "Modify" button to perform calibration.
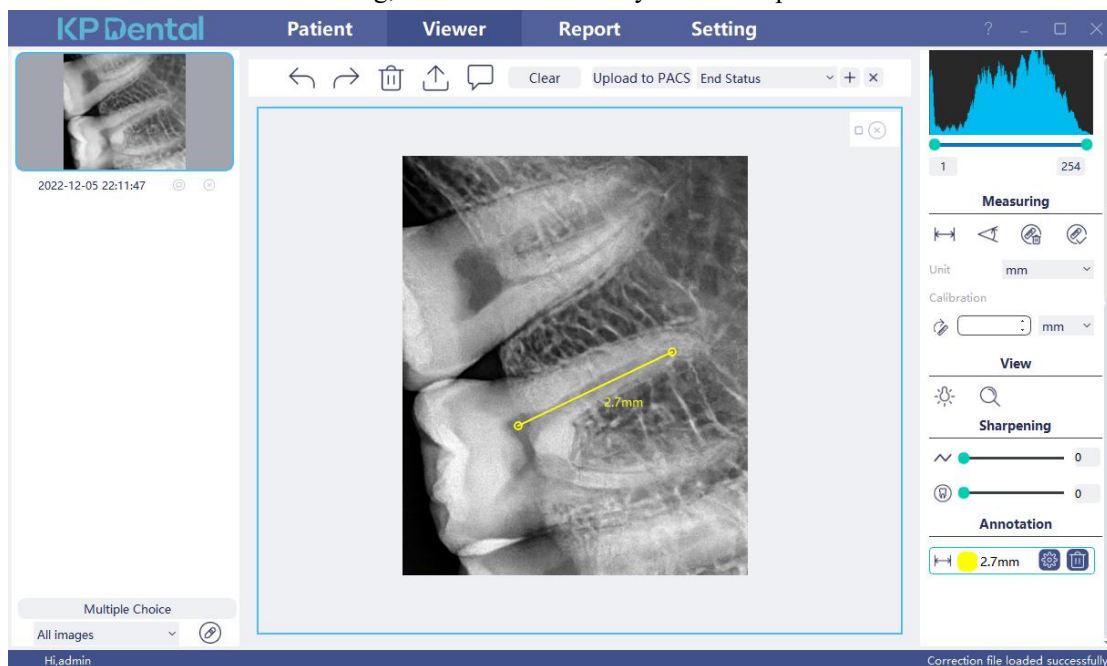

Figure 47

Image processing function list

⊕	Adapt to window
⊡	Zooming to 100%
↺	Forward rotation 90°
↻	Reverse rotation 90°
⊏↓	Left and right reverse
⊏↓	Up and down reverse
☼	Brightness
◑	Contrast
γ	Gamma
🎨	Pseudo-color
	Reverse
C	Intra-oral Caries

HD	Intra-oral High Definition
F	Intra-oral Fine
	Straight line measurement
	Angle measurement
	Delete measurement
	Scale
	Calibration line
	Flash lamp
	Magnifying lens
	Relief
	Contour enhancement

If it is an image captured by the u-Sensor sensor, the image processing toolbar has display, postprocessing, measurement, and annotation categories. There are 6 types of post-processing, namely automatic contrast enhancement, automatic sharpening enhancement, denoising, softening, normalization, and embossing, as shown in Figure 48.
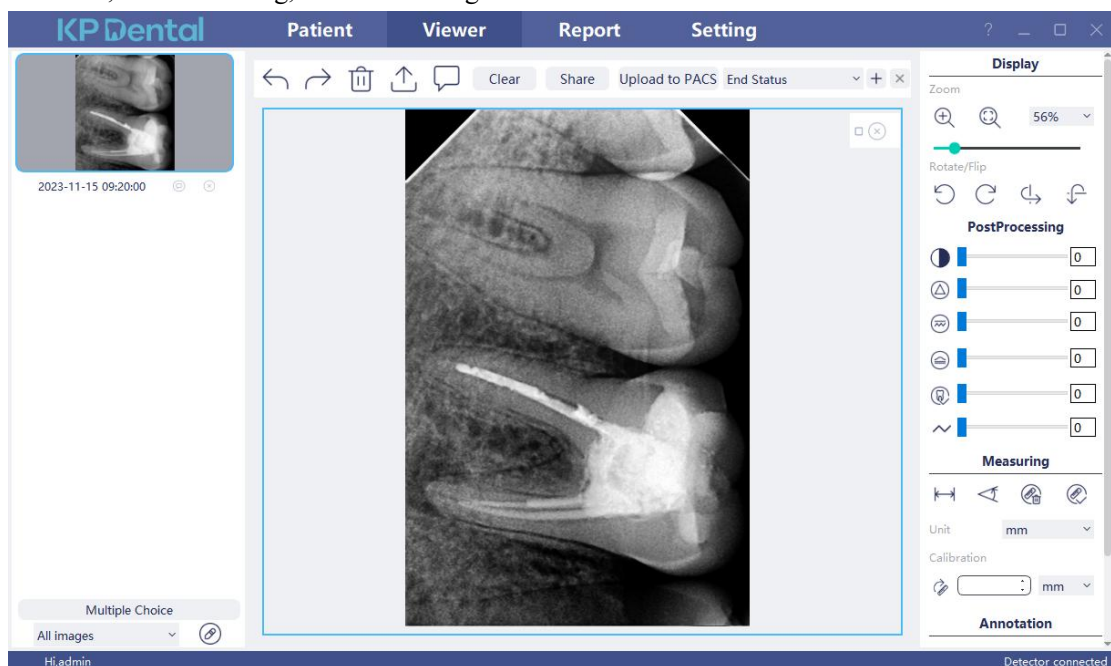
Figure 48

3.5 Report module

Click the "Report" button to enter the report module. Click the "New Report" button to create a new report template. Drag an image from the left to the image box, and enter the diagnosis result in the text box, etc. If you need more pages, click "Add Page", and a page will be added to the report. After writing the report, click the "Save to Server" button to save the report to the server. When you want to view the report, click "Open Report", select the report you want, and click "Open" to view. Click the "Export to PDF" button to export the report to the local. As is shown in Figure 49:
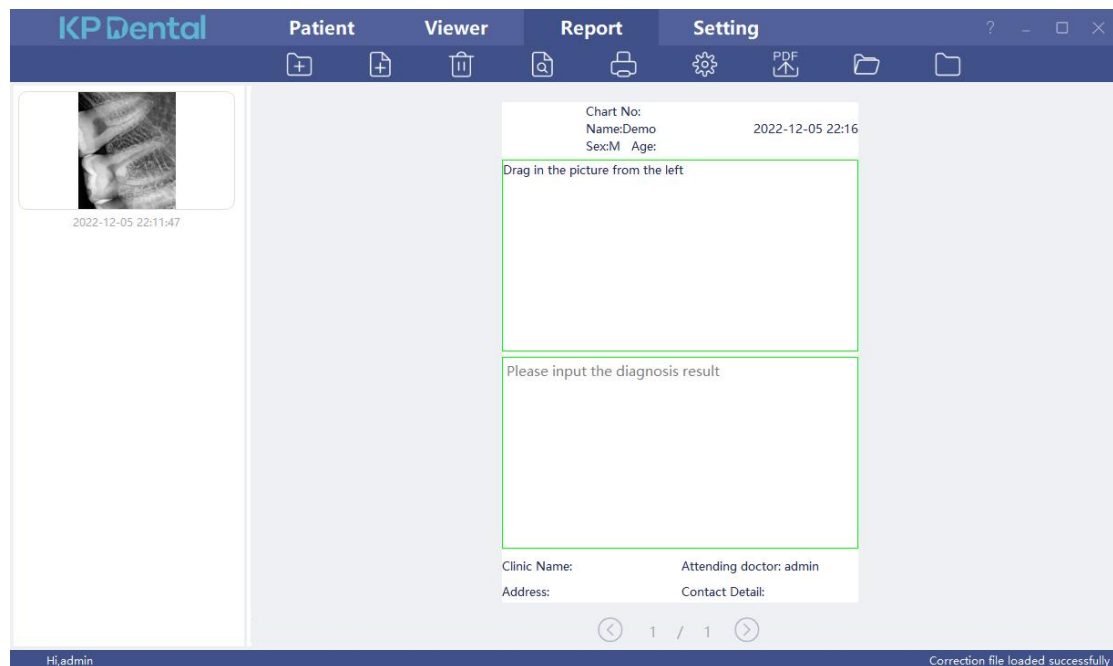
Figure 49

3.6 Setting module

Click the "Setting" button to enter the setting module.

3.6.1 Basic setting

Click the "Basic Setting" button to enter the basic setting page. Click the "Sign Out" button to return to the login interface. Click the language drop-down box to select the software language. Click the tooth profile drop-down box and select the tooth profile number. As is shown in Figure 50:
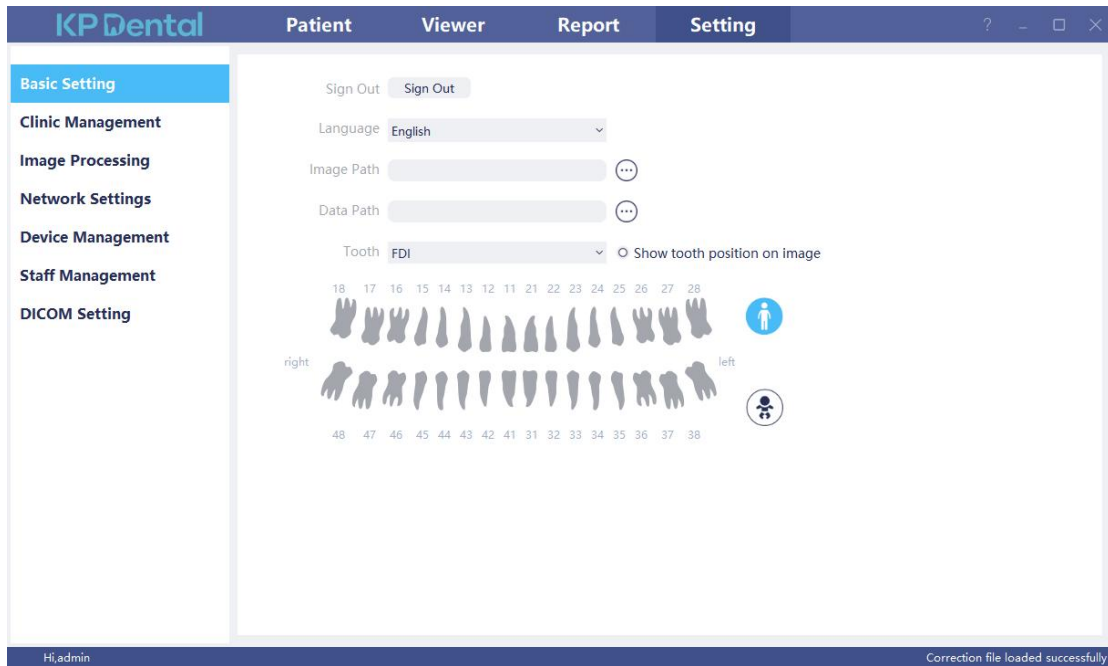
Figure 50

3.6.2 Clinic management

Click the "Clinic Management" to enter the clinic management interface and enter the clinic information, as shown in Figure 51:
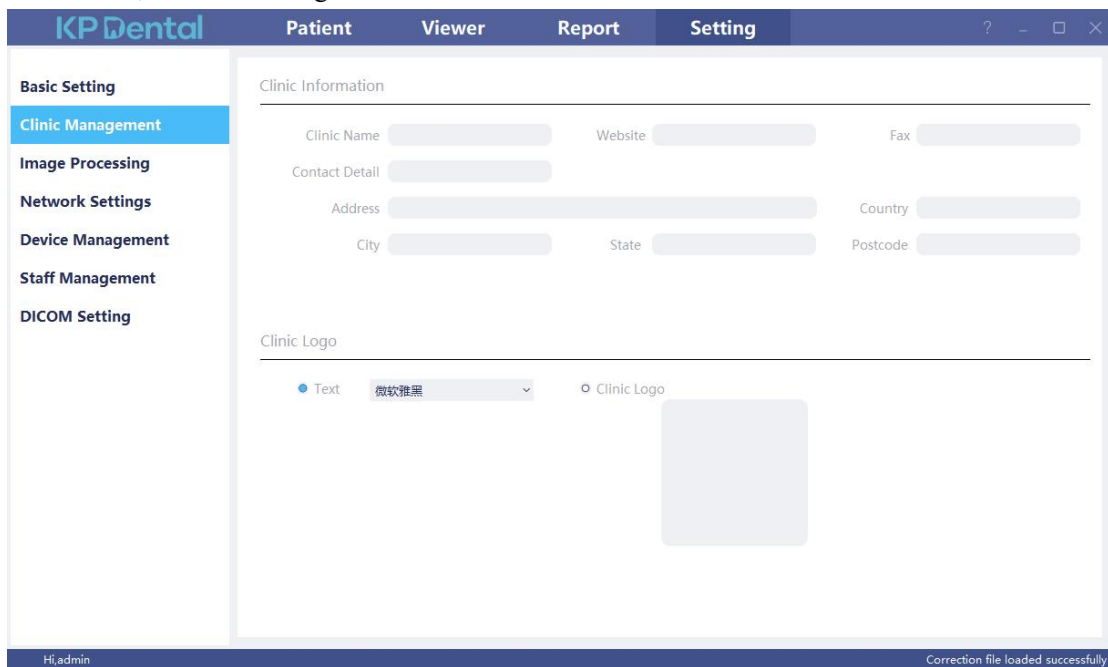
Figure 51

3.6.3 Image processing

Click the "Image Processing" button to enter the image processing interface. Select the HD checkbox, select "HD", and the acquired image will be initialized and HD processed automatically. Select "Fine" and the acquired image will automatically undergo initialization and fine processing.

Click the "Setting" button to set the initial color of the measurement line of the diagnostic module. As is shown in Figure 52:
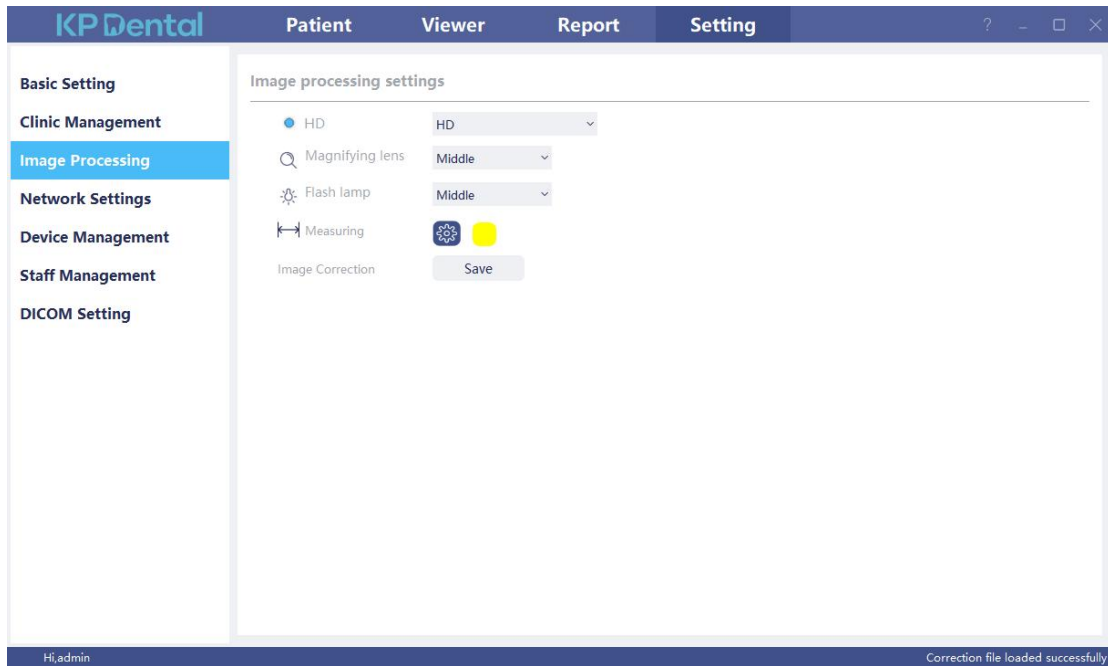
Figure 52

3.6.4 Network setting

Click the "Network Setting" button to enter the Network setting interface. Enter the IP address and port number. Click "Connection Test" to view the test result. Click "Modify" to switch the connected server, and the software need restarting at this time. As is shown in Figure 53:
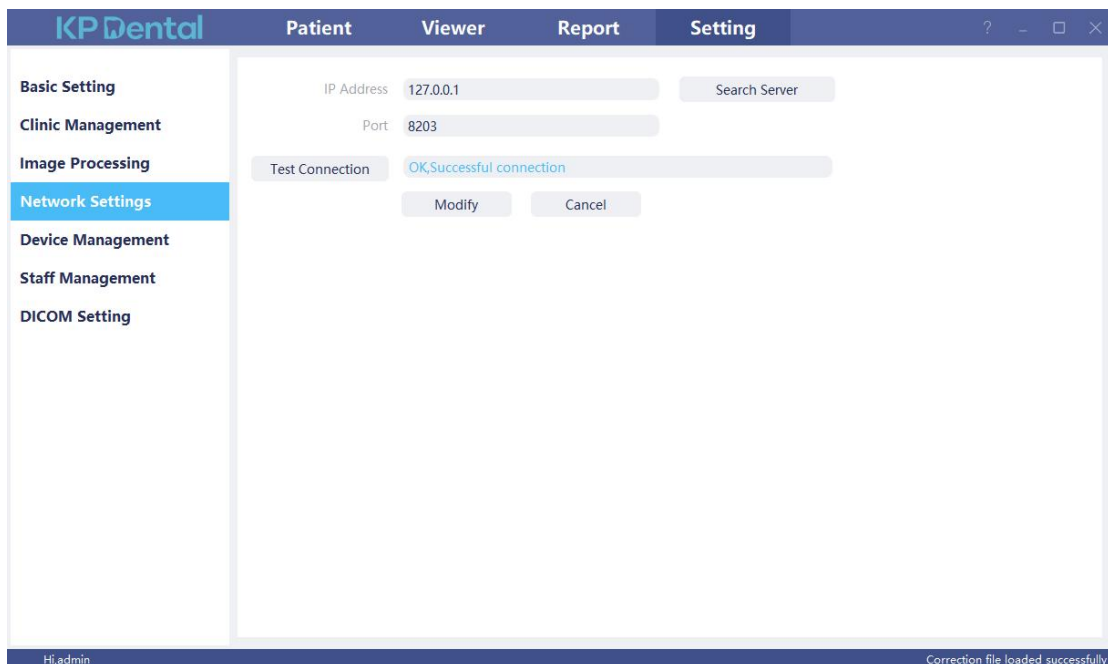
Figure 53

3.6.5 Device management

The related settings of k-Sensor and u-Sensor sensors are in the device management interface. If there is no sensor device connected, you cannot enter this interface, as shown in Figure 54

Figure 54

3.6.5.1 k-Sensor device management

After the k-Sensor is connected,Click the "Device Management" button to enter the device management interface, as shown in Figure 55:

Figure 55

Before using this function, you need to determine whether the sensor is successfully connected and whether "IO sensor connection successful, Please take images" is displayed in the lower right corner. If it does not appear, please go to the acquisition interface in the patient interface to connect the sensor. As is shown in Figure 56:
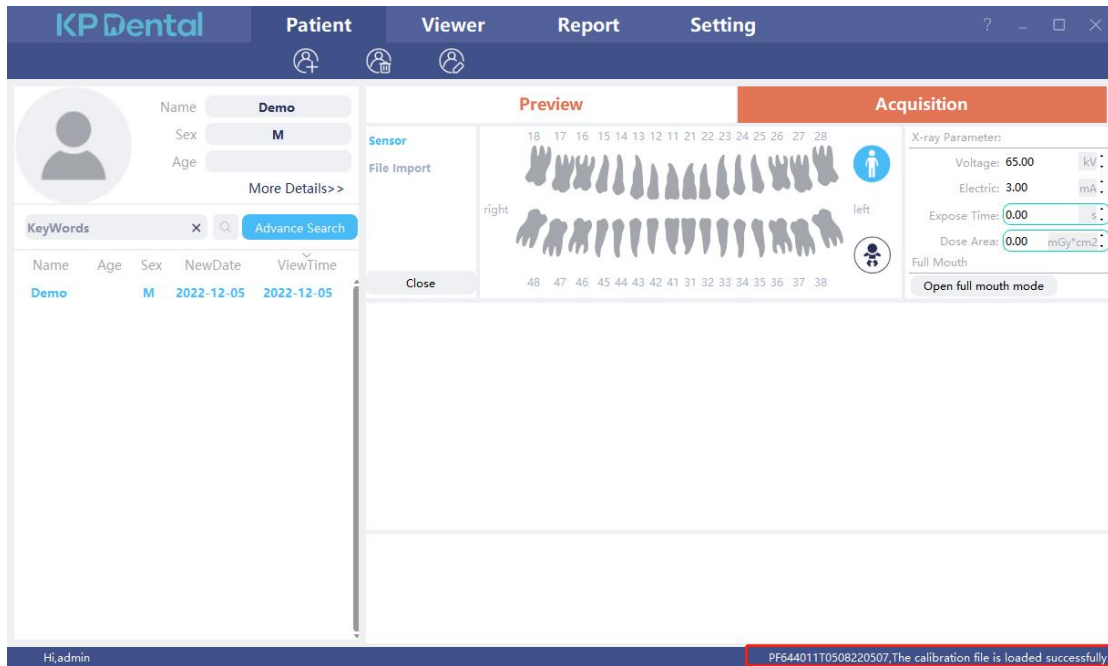
Figure 56

After the connection is successful, return to the device management interface in the setting interface to set the sensor parameters. Before setting new parameters, first determine whether the X-ray trigger mode is AC or DC. If it is DC mode, set "TriggerMode" to "Enm_TriggerMode_AED_DC", and "TriggerThreshold" to "Enm_TriggerThreshold_50uGy"; if it is AC mode, set "TriggerMode" to "Enm_TriggerMode_AED_AC", and "TriggerThreshold" to "Enm_TriggerThreshold_50uGy". Then click "Modify" and "Ok, Setup succeeded" will be displayed after the modification is successful. As is shown in Figure 57:
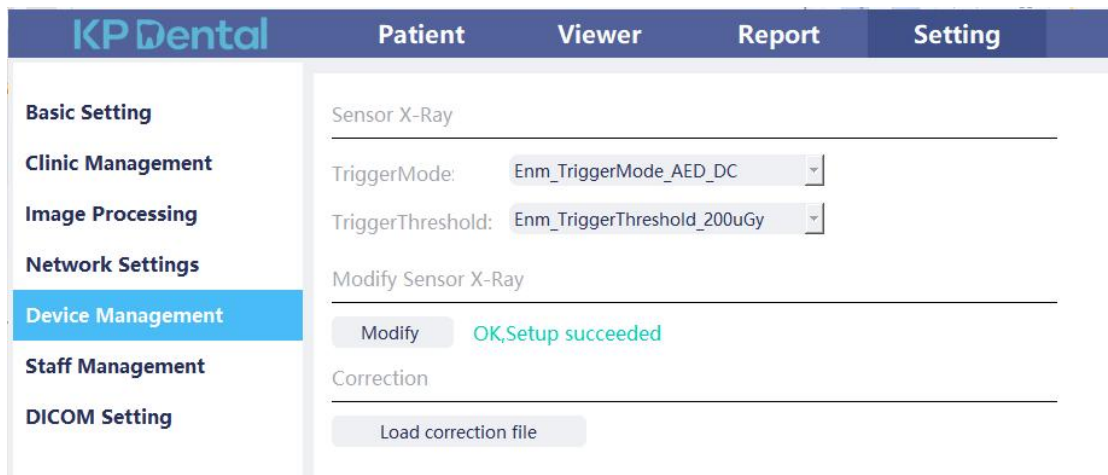
Figure 57

If there is no picture during the shooting process, the exposure time can be appropriately adjusted to re-expose. If the picture still cannot be produced, set "TriggerThreshold" to "Enm_TriggerThreshold_100uGy" or "Enm_TriggerThreshold_200uGy" for re-exposure. If the picture still cannot be produced, please contact the relevant personnel.

Note: If incorrect parameter settings are made or the sensor is not connected, "Sorry, Setup failed" will appear and the previous parameters will be displayed, as shown in Figure 58:
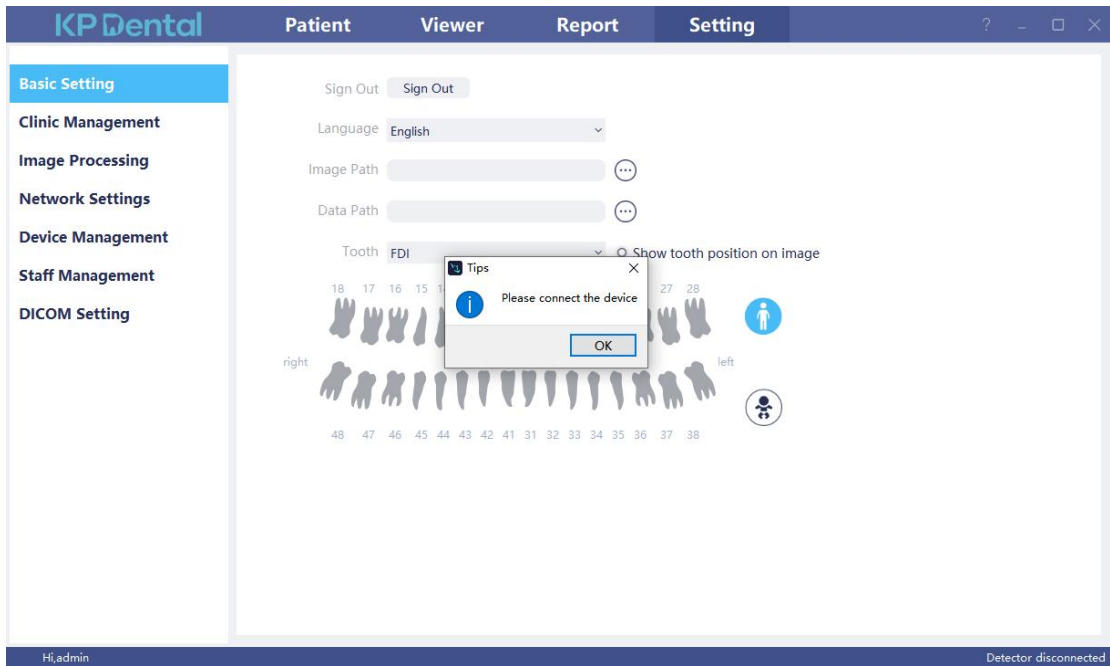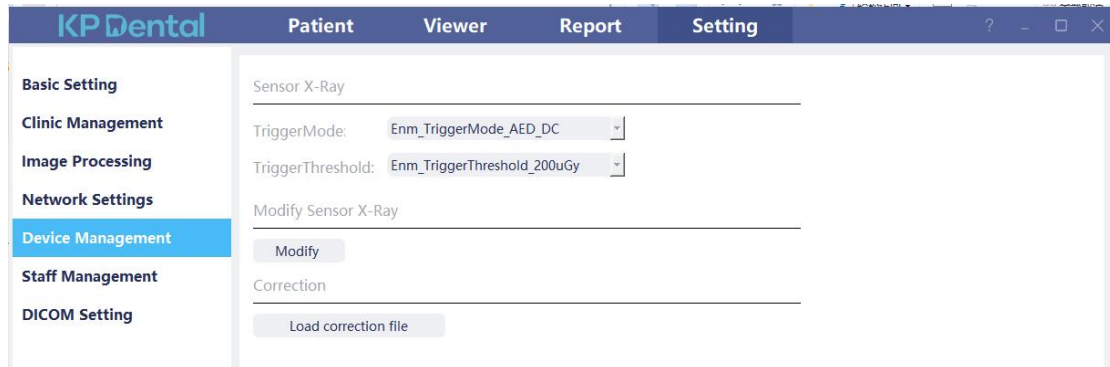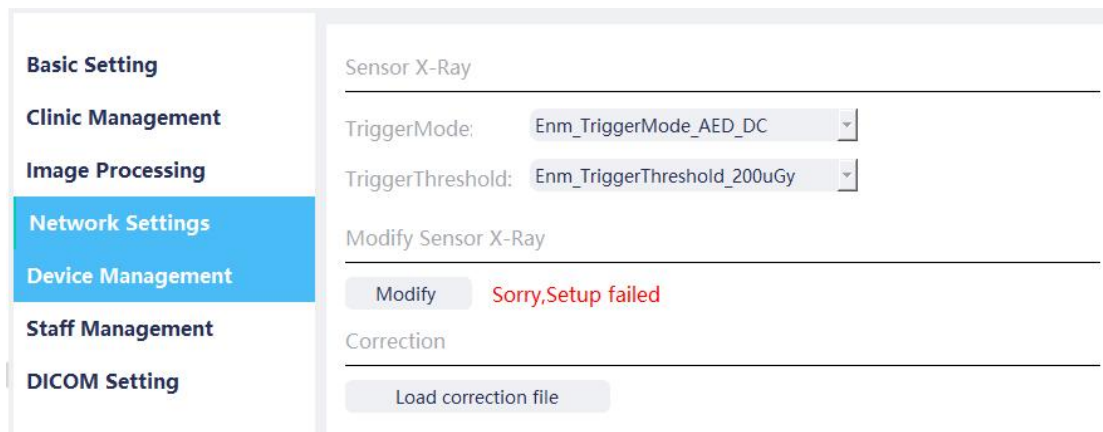
Figure 58

3.6.5.2 u-Sensor device management

After the u-Sensor is connected, click the device management button to enter the device management interface, as shown in Figure 59.
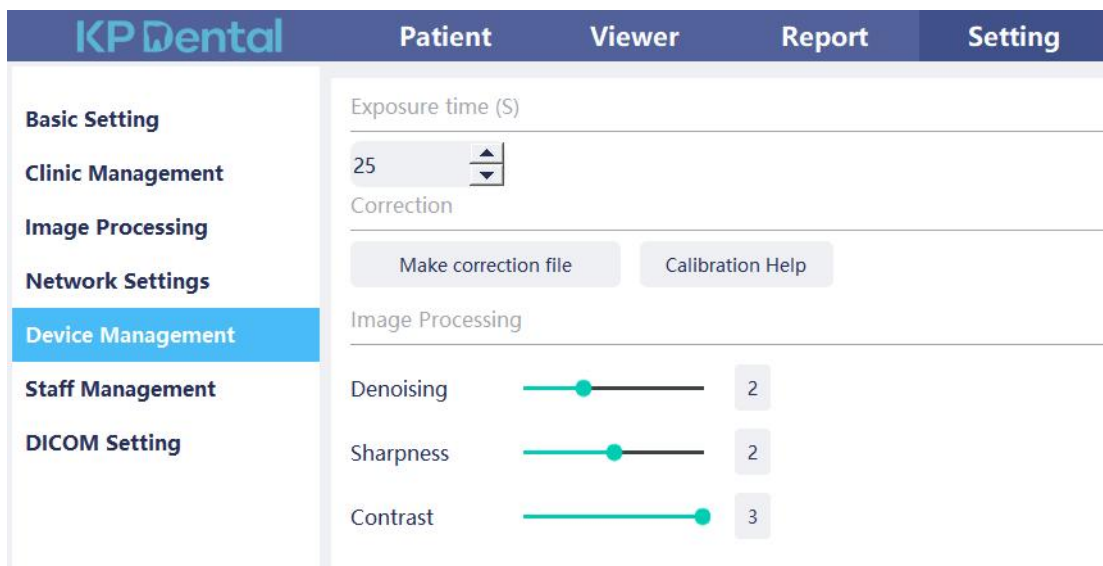
Figure 59

When the equipment is used for the first time, the correction file must be made manually,We recommend that users calibrate the device every six months, or when abnormal points, lines, or artifacts appear in the acquired images. Before starting the system, check the connection status of the USB cable with the digital sensor and computer to ensure that the connection is normal.

Please follow the steps below to complete the calibration procedure:

(1) Connect the intraoral digital X-ray imaging system to the software via USB, and place the detection surface of the sensor toward the center of the X-ray collimation window. Place a 6mm thick pure aluminum body film on the detection surface of the sensor. As shown in Figure 60 below:

Figure 60: Sensor and Aluminum Sheet Placement

Connect the sensor, Click [Settings] - [Device Management], click [Make Calibration File];
open the calibration window, as shown in Figure 61;

Figure 61: Acquisition of images

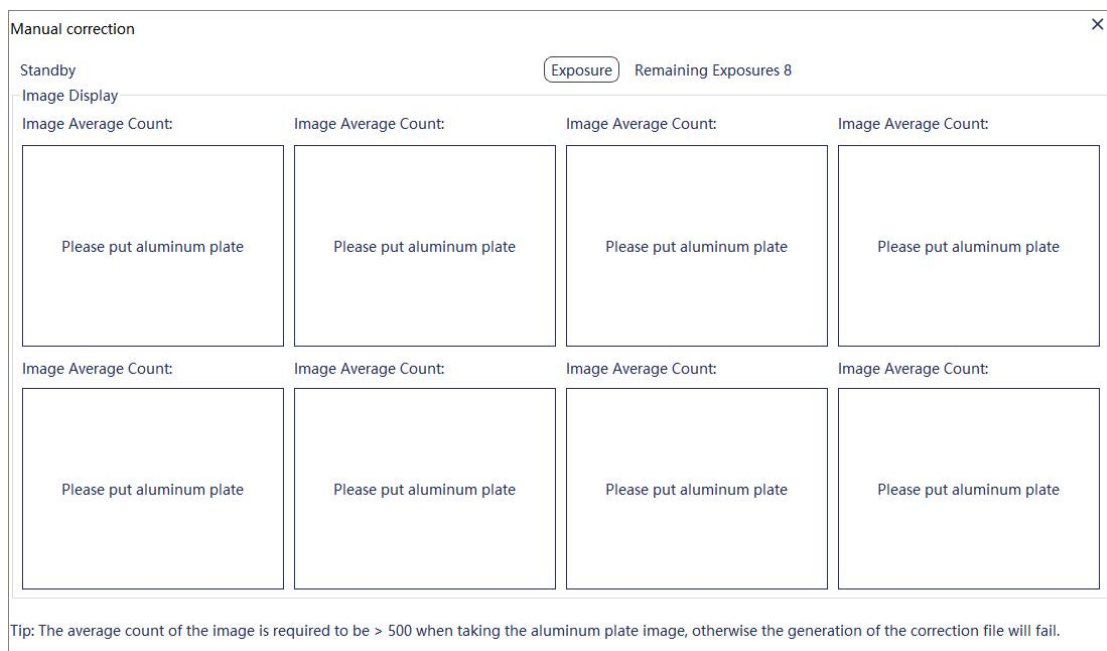(3) Perform image acquisition according to the following steps:

a. Select a setup view;

b. Click the [Exposure] button, as shown in Figure 62;

c. Set the corresponding exposure time based on the x-Ray tube current value.

≤0.2Ma	3.0s-5.0s
0.5Ma	1.0s-2.0s
1.0Ma	0.8s-1.5s
2.0Ma	0.4s-0.8s
≥3.0Ma	0.32s-0.8s

d. According to the status prompt, press the exposure handbrake to expose.

e. Perform operations a-c to sequentially acquire images to the remaining seven placement views. As shown in Figure 63:
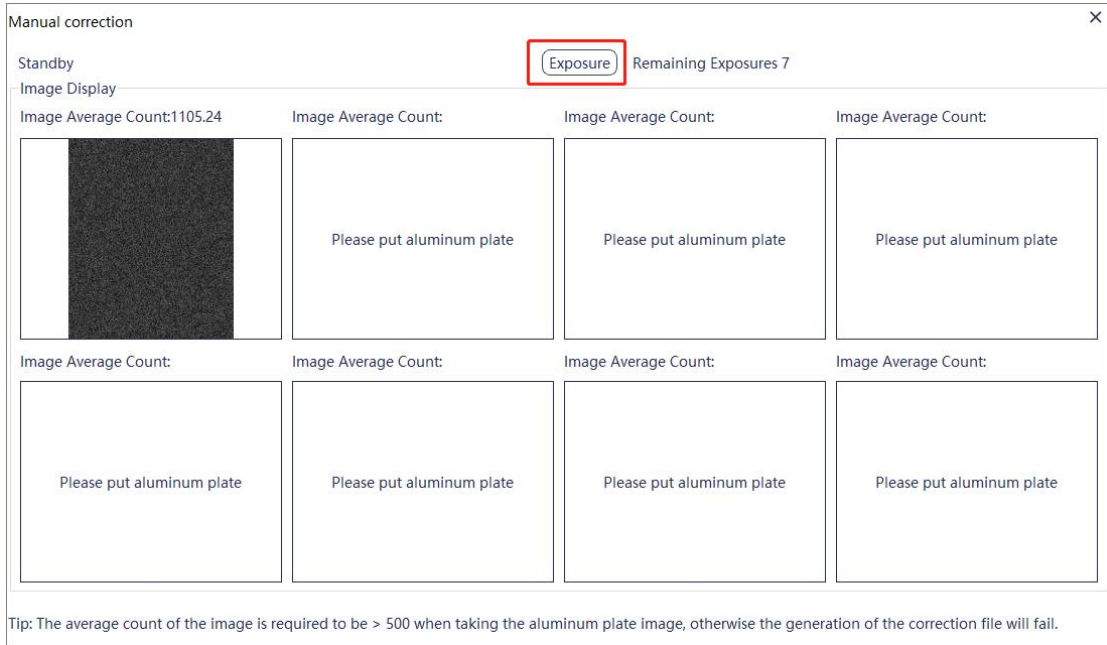
Figure 62: Image acquisition.

Figure 63: Acquisition complete

(4)Click the [Generate] button, After success, the software will automatically restart. As shown in Figure 64 and Figure 65 below:

Figure 64: Calibration complete

Figure 65: Loading correction file

Specifications of the aluminum plate: 99.9% pure aluminum; 6mm thick. If the plate is round, the diameter should be no less than 40mm; if the plate is rectangular, the width should be no less than 40mm.

Click Correction Help to view how to create correction files, as shown in Figure 66.

Figure 66: Calibration Help

3.6.6 Staff Management
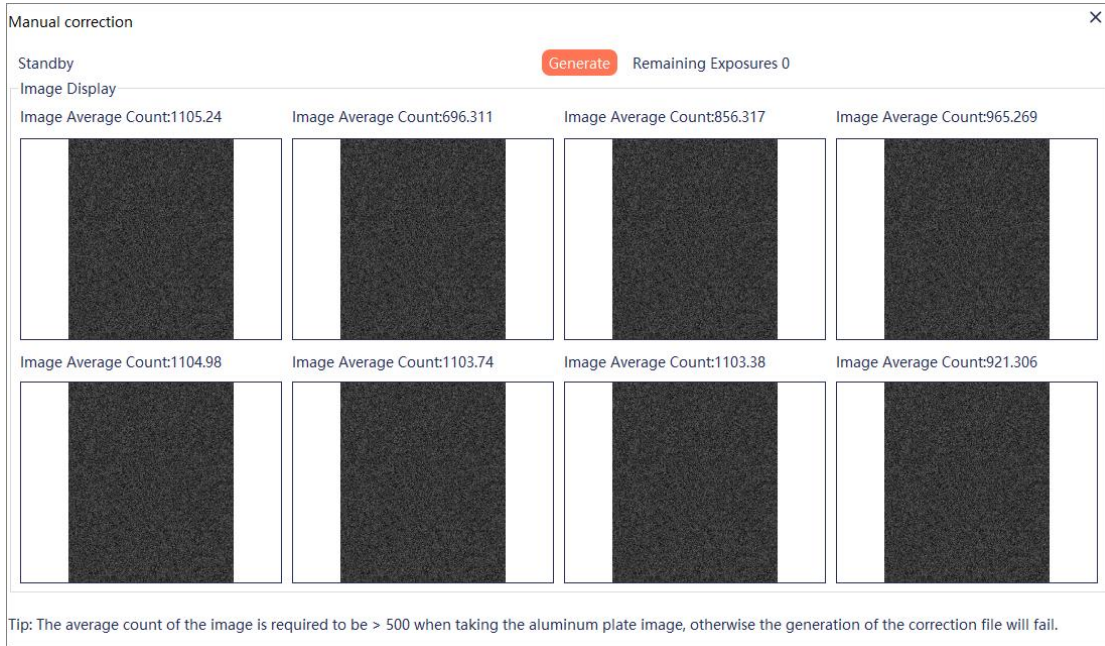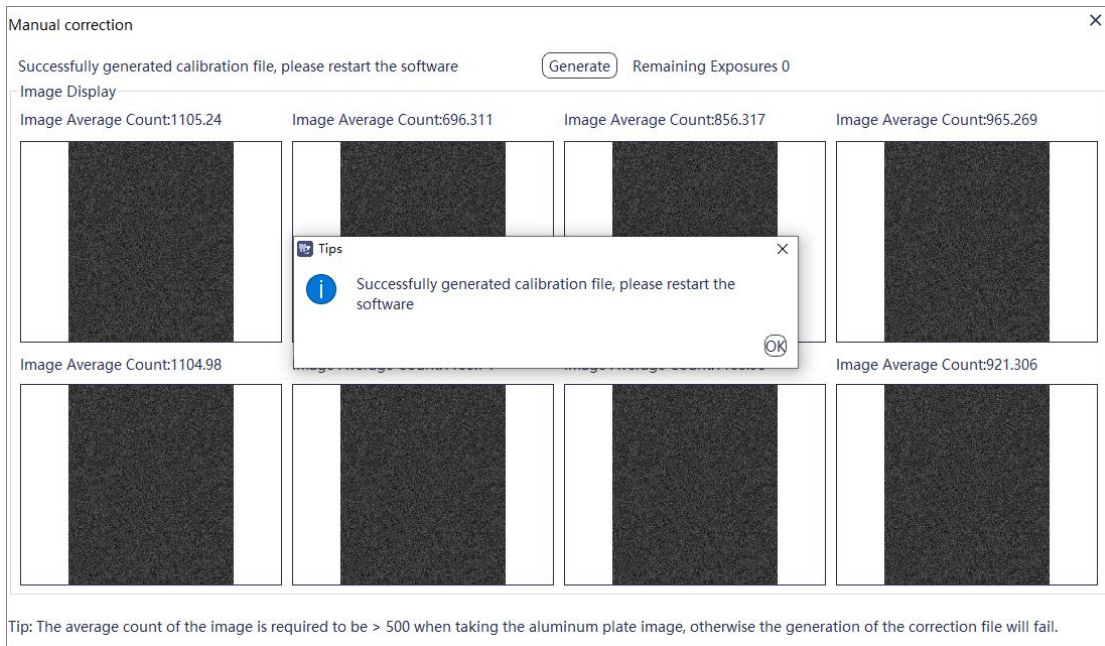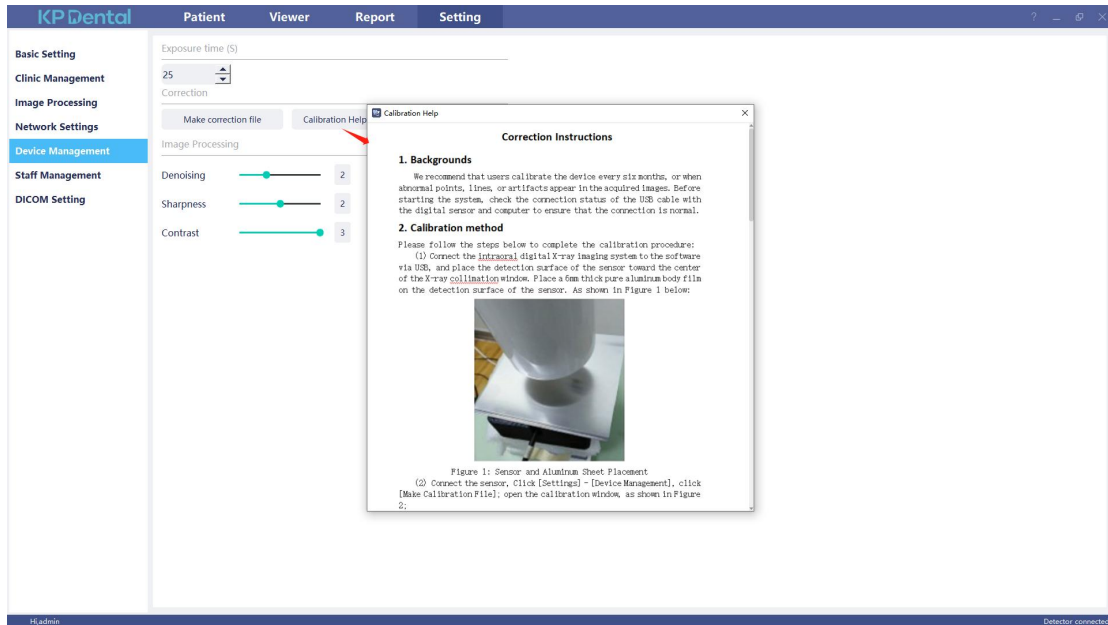
Only when the administrator account is logged in to the software, there will be a "Staff Management" button in the setting module. Click the "Staff Management" button to enter the staff management interface, as shown in Figure 67.

The staff management interface has the functions of New User, Delete User, Modify User and Search User. Click the New User and enter the User Name, Login Password, Confirm Password and other information, as shown in Figure 68. Enter the user name in the search bar to query the specified user. Double click the staff information bar to query the details of the user.

When the administrator forgets the login password, Open the login interface and click "forget?", Enter the security question and reset the password，as shown in Figure 69. If an ordinary user forgets the login password, double-click the staff information bar, and the staff information interface will pop up. Press and hold the password viewing button, the login password input box will display the staff's password, as shown in Figure 70. The problem of forgetting the password can also be solved by changing the staff's password.
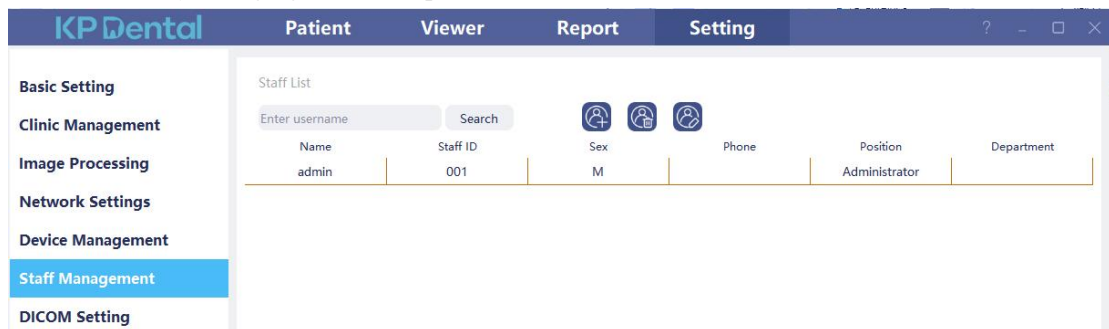

Figure 67

Figure 68

Figure 69

Figure 70

3.6.7 DICOM setting

3.6.7.1 Set the PACS system parameters

（1）Storage Host — setting the IP, PORT, and AETitle (the three are provided by the PACS system manufacturer) of the PACS system image storage server

（2）WORKLIST — setting the IP, PORT, and AETitle (the three are provided by the PACS system manufacturer) of the PACS system worklist server

（3）Local Host — setting the IP, PORT, and AETitle of KP Dental software. IP is the computer's IP address, PORT is "1234", and AETitle is "KPPACS". "IP", "PORT", and "AETitle" can be modified according to the actual situation.

（4）Upload

Upload Location: If you don't need to connect to PACS system, choose "KP Dental"; if you need to connect to "PACS system", choose "PACS" or "All". If you choose "PACS", the images will only be transferred to PACS system; if you choose "All", the images will be transferred to PACS system as well as saved on KP Dental system.

Upload Method: If you need to connect to PACS system, there are two ways to upload images: uploading a single image and uploading all images together.

After setting, click "Connection Test" to test whether the connection between the configured PACS system and KP Dental system is normal, and then click "Modify". As is shown in Figure 71.
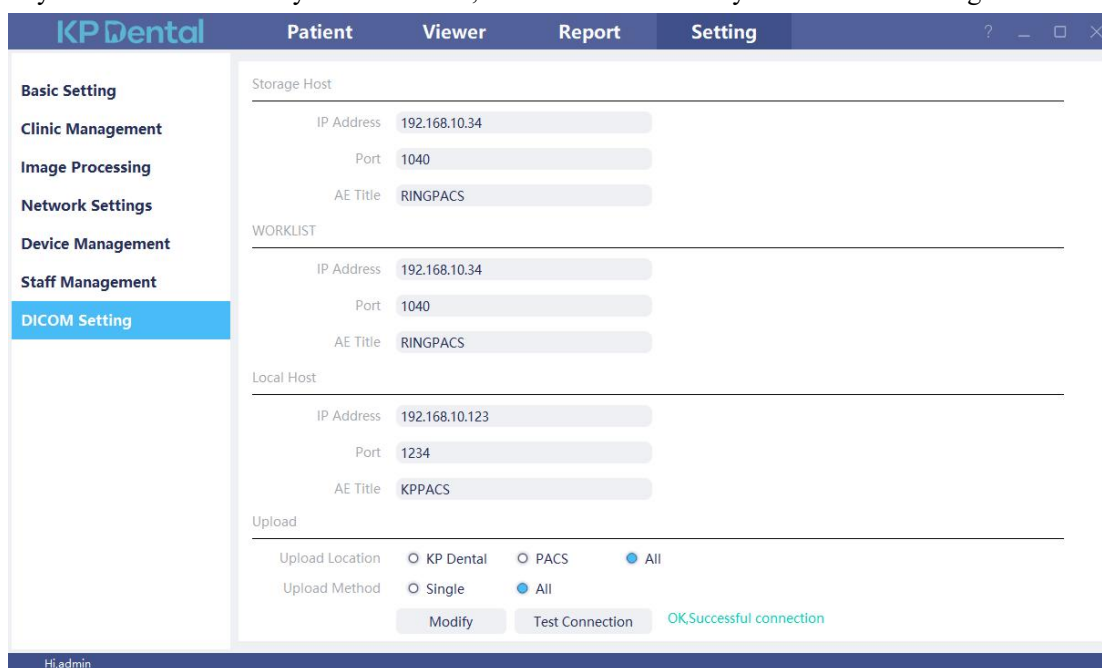

Figure 71

3.6.7.2 Connection to PACS system

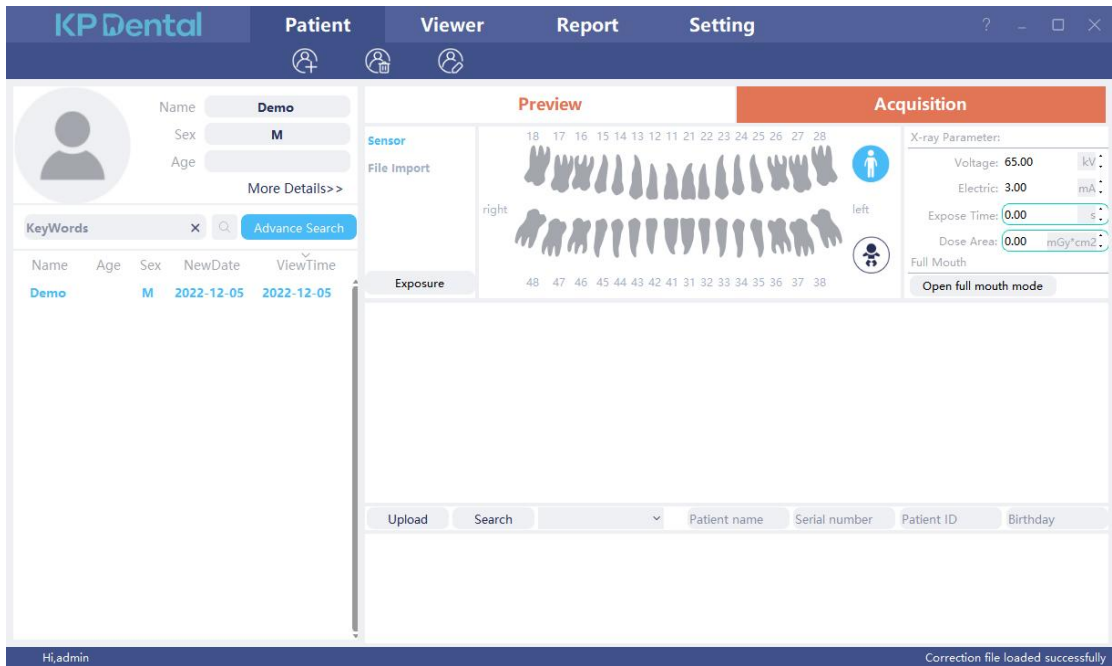Log in to the software, go to the main interface, and click "Acquisition", as shown in Figure 72.

Figure 72

Click "Search" to get the patient list of the PACS system. Find out the specified patient to display the patient-related information. Perform image acquisition, click "Upload" button to upload the images to the PACS system. As is shown in Figures 73 and 74.
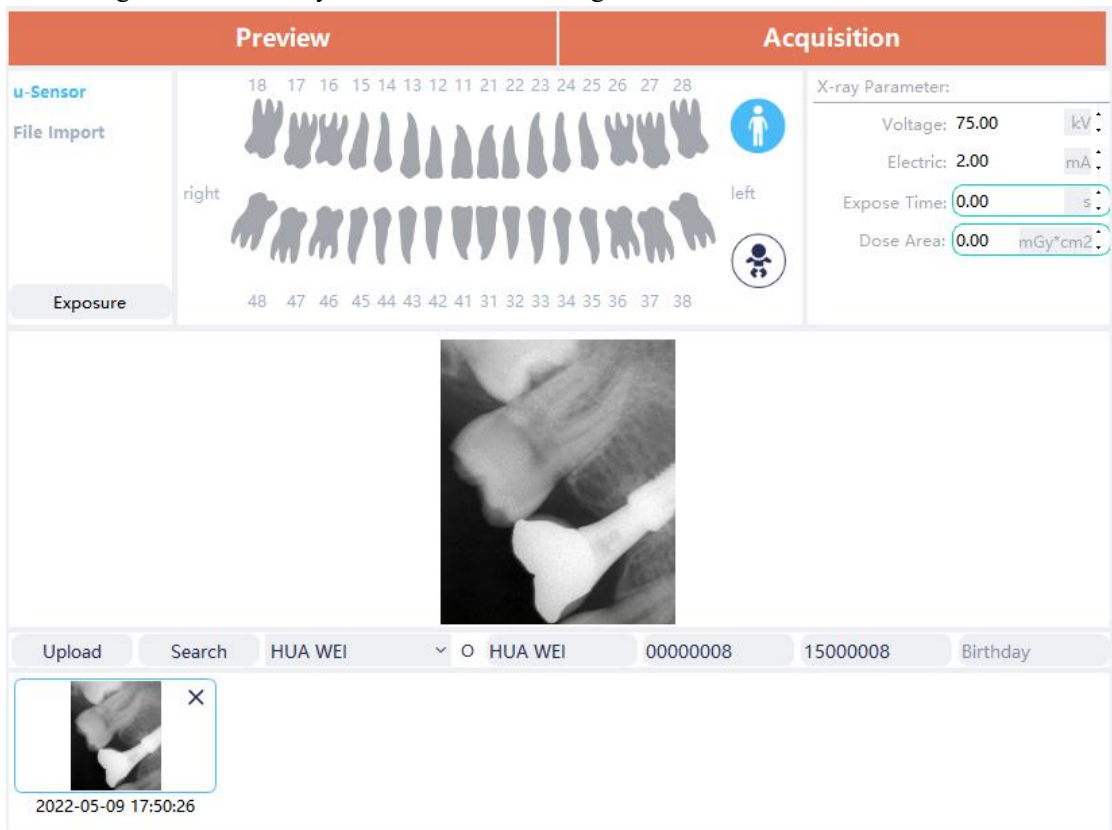

Figure 73
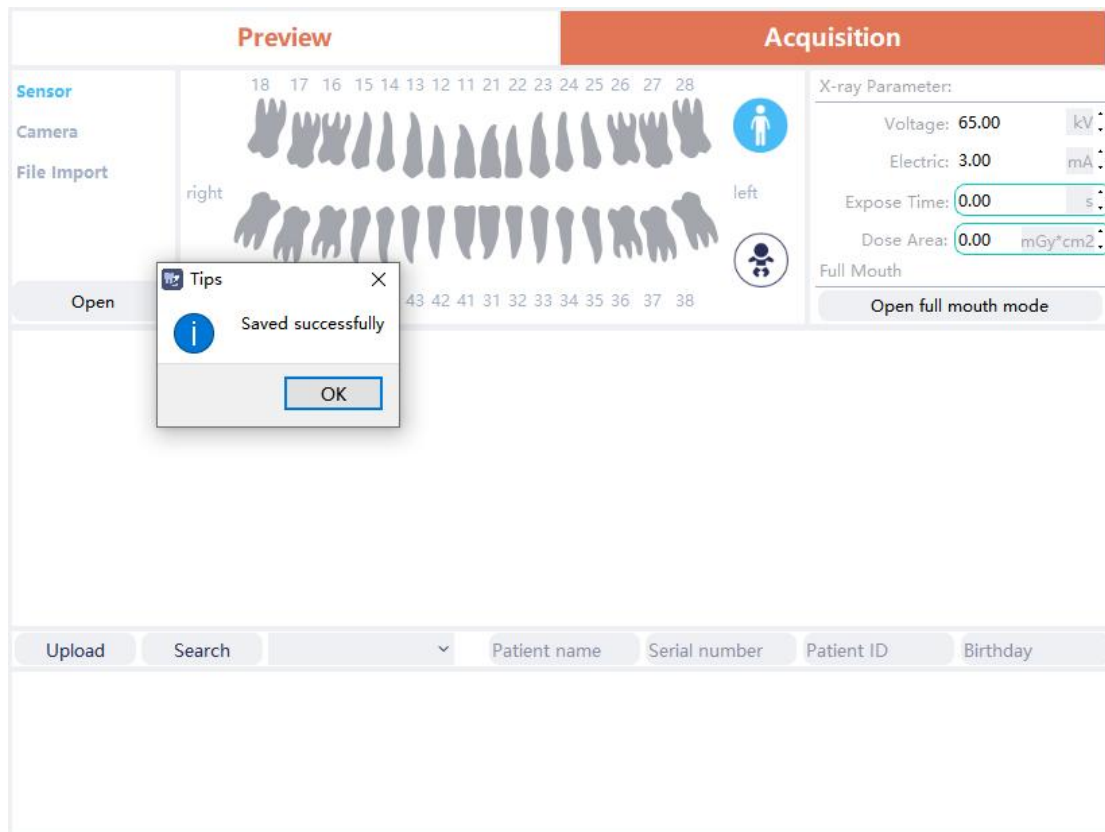
Figure 74

3.7 Help document

Log in to the main interface of the software and click "?" on the upper right corner. There are online help documents such as KP Dental manual, etc. In addition, click "Privacy Policy" to view and modify the privacy policy settings, as shown in Figure 75, "About KP Dental" can be clicked to check the software version. As is shown in Figure 76:
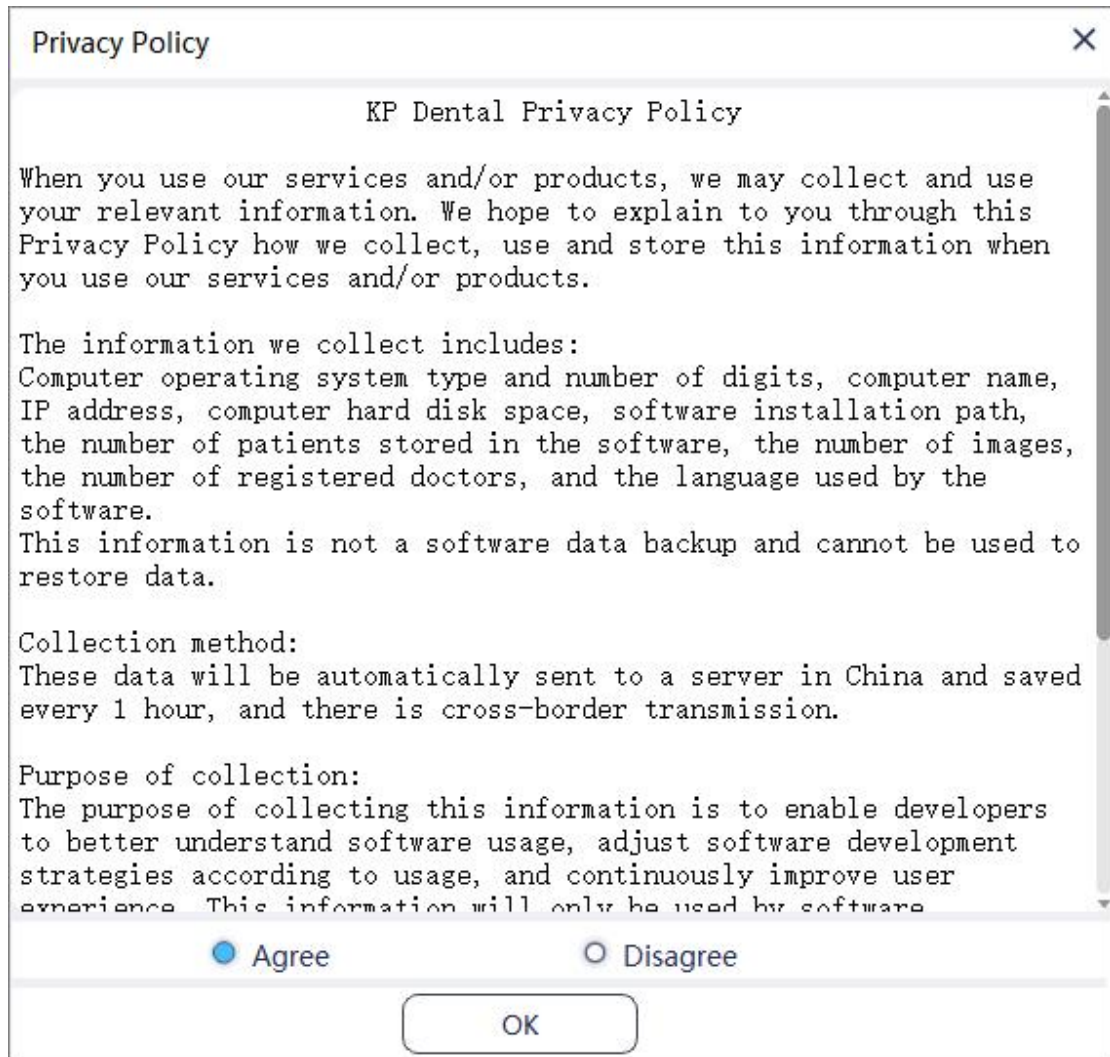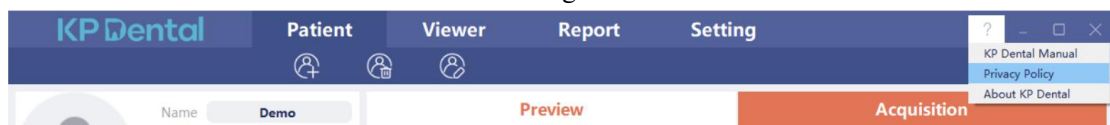
Figure75

Figure 76

3.8 Software upgrade

The software has an automatic upgrade function. If the KP Dental server is installed on the computer and the software can be upgraded, there will be a pop-up window indicating whether to upgrade. Click "Upgrade", as shown in Figure 77. After the upgrade is completed, click "Finish", as shown in Figure 78. After started, all clients connected to the server will receive the upgrade countdown 10s. The software will automatically close after 10s, and start to upgrade. Click "Cancel", the software will not be upgraded temporarily.
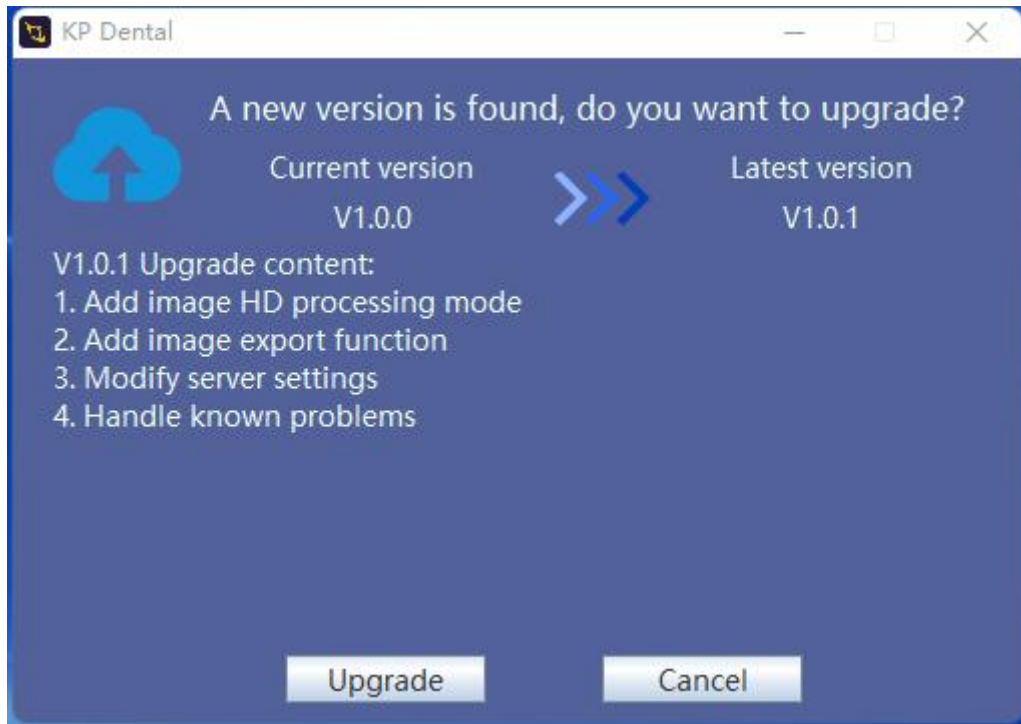
Figure 77

Figure 78

3.9 Exception handling

（1）In case of unclear image, please adjust the exposure time first.

（2）During the use of the software, when the server is unavailable due to some reasons, the software will enter the server disconnect interface, as shown in Figure 79. At this time, the user can check whether the network is normal or restart the server.

Figure 79

4. Training and maintenance

After the user purchases this product, the dealer will come to train the operator. If there are still questions, you can contact the dealer. In addition, users are not allowed to change the intended use of the product or software.

When there is a problem with the device or software, contact the dealer, who will contact KP and we will then arrange professional staff for maintenance.

5. Others

Please operate the device and software in good light so as not to interfere with viewing image details.

This software will collect patient and doctor related data, such as name, gender, and oral imaging. The data is stored on the user's device where the software is installed. Users are advised to take security measures for patient and doctor data to avoid data leakage.