Before using this software, be sure to read this manual and the separate Setup Guide thoroughly. Also, read the Digital Radiography CXDI series User’s Manual. Keep the manual where it is easily accessible.
To the Customers

Thank you for purchasing the Canon CXDI Control Software NE (hereinafter called this product). Operating instructions are divided into two volumes: the Operation Manual and the Setup Guide. Before using this product, be sure to read these manuals thoroughly in order to utilize this product more effectively.

Disclaimer

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Third Party Software

Third-party software will be installed on the image-capture computer when the control software is being installed by the service engineer. For details on the third-party software and its license agreements, consult your service engineer.
Safety Summary
Before using this product, read this safety summary thoroughly. This information will prevent the users and persons involved from sustaining physical harm and/or property damage. Read the separate Setup Guide and the Digital Radiography CXDI series User’s Manual as well.

Safety Notices
The following safety notices are used to emphasize certain safety instructions. This manual uses the caution symbol along with a caution message.

| CAUTION | This notice is used to identify conditions under which improper use of the product may cause minor personal injury. |
| CAUTION | This notice is used to identify conditions under which improper use of the product may cause property damage. |

Safety Precautions
Follow these safeguards and properly use the application software to prevent injury and damage to any equipment/data.

While preparing for examinations

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Be sure to confirm that the entered information (patient name, ID number, birth date, and sex) matches that of the patient. If the information is incorrect, the resulting patient mix-up and a misdiagnosis may cause harm to the patient.</td>
</tr>
<tr>
<td>• Be sure to use the [Emergency] button only for an emergency examination. If not heeded, the resulting patient mix-up and a misdiagnosis may cause harm to the patient.</td>
</tr>
</tbody>
</table>

While shutting down

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not turn the image-capture computer off before it automatically shuts down. Doing so may result in damage to the hardware and/or destruction of data.</td>
</tr>
</tbody>
</table>
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1 Getting Started

1.1 Introduction
1.2 Notations
1.3 Workflow diagram for a general radiographic examination
1.4 Part names of screens (Quick reference)
1.1 Introduction

The CXDI Control Software NE (hereinafter referred to as the “Software”) is designed to provide a steady and efficient workflow in the field of digital radiography when linked to an RIS/HIS network. Up to four CXDI detectors including wireless detectors can be recognized simultaneously by the software. Images captured using the CXDI detector are automatically processed by the software to achieve diagnostic image quality. Furthermore, the software offers advanced processing features with intuitive operability.

1.2 Notations

1.2.1 Screen names

In this manual, screens are identified by the titles of active tabs. For example, “[EXAM > Worklist] screen” indicates that the [EXAM] and [Worklist] tabs are selected in sequence.

1.2.2 Buttons

In this manual, the buttons on the software screen are written in square brackets, such as [OK] and [Cancel], or the icon is shown.

**Button appearance on the Software screen**

- **Enabled buttons**: Appear with a navy-blue background. (A)
- **Enabled buttons (prompted)**: Appear with a navy-blue background surrounded by a blinking line.
- **Disabled buttons**: Appear with a grayed-out key-top label. (B)
- **Selected buttons**: Appear highlighted in pale-blue surrounded by a white line. (C)
- **Toggle buttons**: Key-top label and color alternately change (e.g., / ) with each click. (D)

**NOTE:** Four types of screen color design are prepared for the Software: Warm Dark, Cool Dark, Warm Light, and Cool Light. Refer to 2.3.1 in the Setup Guide for details on setting the screen color design. In this manual, the Cool Light screen, that is the default setting, is used for explanation.
1.2.3 Mouse wheel operations

The mouse pointer may change to \( \text{\textbullet} \) while pointing on a list table, at a numeric entry field, or on a control slider. In such cases, rotating the mouse wheel scrolls through the list, enters values, or moves the slider. For a control slider, dragging the slider is an alternative operation.

1.2.4 Touch-screen display operations

This manual assumes that users are utilizing a mouse and keyboard. However, touch-screen displays are also available, and when using them, “click [OK]” is equivalent to “touch [OK].”

1.2.5 References

References to this manual:
Associated information in this manual is indicated by the section number or by the section number followed by the title, as seen below:

(See 3.1.5)
 See step 2 in 3.1.5 for details on operation.
 Proceed to “3.1.5 Configuring protocols.”

References to other documents:
Associated information in other manuals is indicated by the manual title or the section number followed by the manual title, as seen below:
Refer to the Operation Guide supplied with the power box.
For details, refer to the Setup Guide*.
(refer to 2.4.1 in the Setup Guide* for details on setting essential information items)

* “Setup Guide” refers to the CXDI Control Software NE Setup Guide.
1.3 Workflow diagram for a general radiographic examination

NOTE: The following example illustrates a case in which the Software is used under interoperability services with the HIS/RIS database.
- [PAST] mode screens
  - [PAST > View] screen
    - Post-Processing Images (see chapter 6)
    - Arranging images on film sheets to print out (see 7.1)
  - [PAST > Past List] screen
    - Reviewing images (see 5.2)
  - [EXAM] screen
    - Conducting Examinations (see chapter 4)
    - Exposure switch
    - Captured images
    - [Send]
    - [End Exam]
  - [EXAM > Examination] screen
    - [Before exposure]
    - [After exposure]
    - Reviewing Images (see 5.1)
    - Post-Processing Images (see chapter 6)
  - [Worklist]
  - [Past List]
  - [EXAM > Examination]
  - [EXAM > Examination]
  - [Manual]
  - [Examination]
  - [Suspend Exam]
1.4 Part names of screens (Quick reference)

NOTE: Screen details may differ depending on the settings of the Software.

1.4.1 [EXAM > Worklist] screen

A: HDD free space icon (→3.1.1, page 41)
B: System setup button (→2.1.1 in the Setup Guide)
C: Search For Study List pane (→3.1.1, page 40)
D: Study List (→3.1.1, page 40)
E: Data transfer indicator (→4.1, page 68)
F: [On Line]/[Off Line] (→2.4, page 35)
G: Patient information pane (→3.1.2, page 44)
H: Study information pane (→1.4.2, page 15) (→3.1.2, page 44)
I: [Start Exam] (→4.1, page 68)
1.4.2 Study information pane and protocols

A: Study title (Accession number) (→3.1.2, page 44) (→ “Study Information Display Setting” in 2.4.1 in the Setup Guide)

B: Protocol list (→ chapter 4, page 65)

C: Information button (→3.1.2, page 44) (→3.1.3, page 45)

D: Thumbnail

E: [Edit Exam] (→3.1.5, page 49)
1.4.3 Edit Exam screen

A: Body part selector (↬3.2.1, page 51)
B: [Search by Category] (↬3.2.2, page 51)
C: Frequently-used protocols tray (↬3.2.1, page 51)
D: Recently-used protocols tray (↬3.2.1, page 51)
E: Study information pane (↬1.4.2, page 15) (↬3.1.2, page 44)
F: [Start Exam] (↬4.1, page 68)
G: Examination history tray (↬3.2.1, page 51)
Category search mode

H: Category tabs (→3.2.2, page 54)
I: [Search by Body Part] (→3.2.2, page 54)
J: Protocol tray (→3.2.2, page 54)
K: [Category List] (→3.2.2, page 54)
1.4.4 [EXAM > Manual] screen

A: Patient information entry (→3.3.1, page 56)
B: Recent Patient List (→3.3.1, page 56)
C: [Delete] (→3.3.1, page 56)
D: [Emergency] (→3.4, page 62)
E: [Start Exam] (→4.1, page 68)
1.4.5 [EXAM > Examination] screen

A: View mode buttons (→5.1, page 84)
B: [Info] (→5.1, page 84)
C: Toolbar (→1.4.8, page 22) (→6.1, page 94)
D: Image view pane (→4.1, page 68)
E: [Retake] (→4.3, page 74),
   [Reject] (→4.4, page 75)
F: System status bar (→4.1, page 68)
G: Arrangement button/indicator (→7.1, page 124),
   Output setting button (→7.2, page 130)
H: Patient information pane (→3.1.2, page 44)
I: Study information pane (→1.4.2, page 15) (→4.1, page 68)
J: Image Processing dialog box (→1.4.9, page 23) (→6.2, page 108)
L: [Measurement] (→1.4.10, page 24) (→6.3, page 111)
M: [Annotation] (→1.4.11, page 24) (→6.4, page 118)
N: [End Exam] (→4.1, page 68)
O: [Send] (→4.1, page 68)
P: [Suspend Exam] (→4.5, page 76)
1.4.6 [PAST > Past List] screen

A: HDD free space icon (→3.1.1, page 41)
B: Search For Study List pane (→3.1.1, page 40)
C: Study List (→5.2, page 86)
D: Patient information pane (→3.3.2, page 60)
E: Study information pane (→1.4.2, page 15) (→5.2, page 86)
F: [Recall Exam] (→5.2, page 86)
1.4.7 [PAST > View] screen

A: View mode buttons (→5.1, page 84)
B: [Info] (→5.1, page 84)
C: Toolbar (→1.4.8, page 22) (→6.1, page 94)
D: Image view pane (→5.2, page 86)
E: Arrangement button/indicator (→7.1, page 124)
F: Output setting button (→7.2, page 130)
G: Patient information pane (→3.3.2, page 60)
H: Study information pane (→1.4.2, page 15) (→5.2, page 86)
I: [Back To List] (→5.2, page 86)
J: [Update ImageProc] (→5.2, page 86)
1.4.8 Toolbar

A: Rotation/Flip buttons (→6.1.1, page 96)
B: Panning button (→6.1.2, page 97)
C: [HQ] (→6.1.3, page 98)
D: Zoom in/out buttons (→6.1.3, page 98)
E: Fit button (→6.1.3, page 98)
F: [L]/[R] (→6.1.4, page 99)
G: [ROI] (→6.1.5, page 101)
H: Crop button (→6.1.6, page 102)
I: [Mask] (→6.1.7, page 105)
J: [Retake] (→4.3, page 74)
K: [Reject] (→4.4, page 75)
L: [Reset] (→6.1, page 94)
M: Undo button (→6.1, page 94)
1.4.9 Image Processing dialog boxes

**Basic image processing (Level 1)**

B: Histogram and LUT curve (→6.2.2, page 109)
C: Brightness and Contrast controls (→6.2.2, page 109)

**Advanced image processing (Level 2/3)**

D: Anatomical Part control (→7.3.2, page 136)
E: LUT control (→7.3.3, page 137)
F: Enhancement control (→7.3.4, page 139)
G: Dynamic Range Adjustment control (→7.3.5, page 141)
H: Noise Reduction control (→7.3.6, page 142)
I: Grid Suppression control (→7.3.7, page 143)
J: Sharpness Adjustment control (→7.3.8, page 144)
K: Peripheral Mask control (→7.3.9, page 145)
L: [Save as Default] (→7.3.1, page 134)
1.4.10 Measurement dialog box

A: Measure distance button (➞6.3.1, page 111)
B: Measure angle button (➞6.3.2, page 113)
C: Show/hide object selector (➞6.3, page 111)
D: Show/hide scale selector (➞6.3, page 111)
E: [Delete] (➞6.3, page 111)
F: Correction of Magnification option (➞6.3.1, page 111)
G: Measure height difference button (➞6.3.4, page 116)
H: Measure cobb angle button (➞6.3.3, page 114)

1.4.11 Annotation dialog box

A: [New] (➞6.4.1, page 118)
B: [Enlarge], [Reduce], [Delete] (➞6.4.1, page 118)
1.4.12 Stitch Screen

A: Image view pane (→8.3.1, page 158)
B: Toolbar (→8.3.1, page 158)
C: Image overview pane (→8.2, page 151)
D: [Auto] (→8.3.1, page 158)
E: Cursor buttons (→8.3.1, page 158)
F: Edge Enhancement control (→8.3.1, page 158)
2 Starting and Shutting Down the Software

2.1 Starting the Software
2.2 Shutting down the Software
2.3 Restarting the Software
2.4 Conducting offline examinations
2.5 Utilizing peripheral devices
This chapter explains how to start and shut down the Software.

Overview

Starting the Software

2.1 Starting the Software

2.4 Conducting offline examinations
2.2 Shutting down the Software
2.3 Restarting the Software

Inspecting/maintaining the system

NOTE: Regular inspection and maintenance of a medical imaging system is required to assure the strict image quality. For details on operation, refer to 3.5 in the Setup Guide.

The frequency of adjustment work required the QC Tool, such as calibration will differ depending on the detector type. For details, refer to the Digital Radiography CXDI series User's Manual.
2.1 Starting the Software

1 **Turn the power box and the image-capture computer on.**
   The start screen appears. For details on operation, refer to the hardware operation manual.

2 **Log in to the Software.**
   Select the user name, type the password, and then click [Log In].

   ![Start screen]
   - Click to shut down the Software.
   - User Name selector
   - [Log In]
   - Password text box

   **NOTE:** Another start option that does not require user authentication is also available. For details, consult your service engineer.
To modify the user authentication settings

The System Setup screen allows users to change, add or delete user names and change passwords. To add or delete user names, it is required in advance to log in to the Software under a user name that has the Administrator role. For details, refer to 2.2 in the Setup Guide.

Automatic logout function

The Software automatically logs out after 10 minutes of inactivity. To change the setting of the automatic logout function, refer to 2.3.1 in the Setup Guide.

The error button and warning button

An (error button) or (warning button) will appear at the top center of the screen if the Software experiences a problem. If this happens, see 9.1.
2.2 Shutting down the Software

If a study is currently being examined

Be sure to click [End Exam] in the examination screen before shutting down the Software. See step 6 in 4.1 for details on [End Exam].

1. Show the system setup screen.

Click [Logout].

[EXAM > Worklist] screen

System setup screen

Transfer All Data option

Backup Database option

[Shutdown]

Click to cancel shutdown.

NOTE: A dialog box related to image arrangement may appear. For details, see NOTE in step 4 in 7.1.1.
2 Shut down the Software and the image-capture computer.

Click , confirm that the Transfer All Data option is selected, and then click [Shutdown] in the Shutdown Confirmation Dialog Box. After all image data transfer is complete, the system will shut down.

**CAUTION**

Do not turn the image-capture computer off before it automatically shuts down. Doing so may result in damage to the hardware and/or destruction of data.

*To shut down the Software without data transfer*

Click , clear the Transfer All Data option, and then click [Shutdown] in the Shutdown Confirmation Dialog Box. Image data transfer in process will be suspended.

*To back up the Software database completely before shutdown*

Click , select the Backup Database option, and then click [Shutdown] in the Shutdown Confirmation Dialog Box.

*To log in under another user name*

Click [Logout], click [OK] in the confirmation dialog box, and then select another user name in the start screen to log in again.
2.3 Restarting the Software

If the Software is unexpectedly aborted and the background program screen appears, it is required to restart the Software to continue the interrupted operation.

1. **Restart the Software.**
   
   Click [Reboot]. For details on logging in the Software, see step 2 in 2.1.
2.4 Conducting offline examinations

When the Software is used in a mobile system, the Software can operate without connection to the HIS/RIS database. In such cases, follow the steps below.

1 Disconnect from the network.

Click [On Line]. Clicking the button toggles between [On Line] and [Off Line].

To resume connection

Click [Off Line].

NOTE: Switching to online mode again transfers the images captured during offline mode to the PACS database, storage device, and printer, and also exchanges the study history with the HIS/RIS database.
2.5 Utilizing peripheral devices

The Software supports the use of a bar-code reader and a magnetic card reader. For details on these devices, refer to the operation manuals supplied with these devices.
3 Preparing for Examinations

3.1 Selecting study orders (Worklist tab)
3.2 Selecting protocols
3.3 Creating study orders (Manual tab)
3.4 Creating emergency study orders (Emergency button)
This chapter explains how to prepare for examinations and how to check patient and study* information before capturing images. It is also possible to modify study information details if necessary.
* See 3.1 for details.

Workflow

Start screen
Starting the Software (see 2.1)

[EXAM > Worklist] screen
3.1 Selecting study orders (Worklist tab)

[EXAM > Manual] screen
3.3 Creating study orders (Manual tab)
3.4 Creating emergency study orders (Emergency button)

[EXAM > Examination] screen
Conducting Examinations (see chapter 4)
3.1.2 Checking patient/study information in detail
3.1.3 Modifying study information
3.1.4 Changing a workspace
3.1.5 Configuring protocols

3.2.1 Searching for a protocol by a body part
3.2.2 Searching for a protocol by category
3.1 Selecting study orders (Worklist tab)

Data exchange and updating services between the HIS/RIS database and modalities streamline the examination workflow and maintain steady operation. If the Software does not have these services, create study orders by manually entering patient/study information on the [EXAM > Manual] screen (see 3.3).

Before starting examinations, learn the following basic terms used in the Software.

**Study:** A request (order) for radiographic examination, consisting of patient information, schedule, and examination details, issued by a referring physician

**Exam:** A group of studies for one patient

**Protocol:** Details of examination procedures include the following information; workspace, grid, image processing parameters, DICOM attributes

**Workspace:** Details of a protocol that specify the detector used and the posture of the patient during the examination

### 3.1.1 Acquiring study orders from the HIS/RIS database

Study orders are automatically acquired from the HIS/RIS database and listed when the user logs in (see 2.1).

**NOTE:** An HIS/RIS database introduction is required to list study orders on the worklist. Consult your service engineer for details.

---

---

If the [EXAM > Worklist] screen does not appear

To sort the listed study orders

Click a sort item in the column header. To switch between ascending and descending sort order, click the same item again.

To arrange the order of the column headers

Drag an item and drop it in the target position. Dragging the column border also adjusts the width of the column header.

HDD free space icon

Past study data deletion that starts automatically in the background may affect the Software performance. To get a good performance of the Software during an examination, check the free HDD space on a regular basis using this icon. If the icon color changes from white to yellow, delete unnecessary studies in the image-capture computer. (If the free space decreases further, the color changes to red.) See 5.3 for details on study deletion and also see step 2 in 3.1.3 on image protection.

1 Narrow down the acquired list items to efficiently select target study orders if necessary.

Enter any narrowing conditions in the Search For Study List pane.

Name: Patient name

ACC#: The accession number is automatically given to each study order at the point of issue. This number can also serve as the study title. Refer to “Study Information Display Setting” in 2.4.1 in the Setup Guide).

ID: Patient ID

Study Status: Select a narrowing option. New Exam Only refers to study orders that are to be conducted. Pending Exam Only extracts the study orders that were suspended during examinations. To clear the narrowing conditions, select the All Exam option.
NOTE Patient name text box can be divided into five components for accommodating family name, given name, middle name, prefix, and suffix input. For details, refer to 2.4.1 in the Setup Guide.

If the target study orders are not found on the list

Click [Refresh] to restore the available study orders. If narrowing conditions are predetermined, narrowing down at the point of data acquisition aids in efficient study order selection. Click [Refresh Option] to show the Refresh Option dialog box.

NOTE: When [Refresh] and [Refresh Option] are disabled, click [Off Line] to resume connection with the HIS/RIS database.

Enter any narrowing conditions in the Refresh Option dialog box, and then click [OK].

ID: Patient ID  
Name: Patient name  
ACC#: The accession number is automatically given to each study order at the point of issue. This number can also serve as the study title. Refer to “Study Information Display Setting” in 2.4.1 in the Setup Guide.

Requested Procedure ID: Identifier that identifies the Requested Procedure in the Imaging Service Request.

Range: Period refers to the period of time in which the study orders are to be conducted. Relative refers to a period relative to the current time in which the study orders are to be conducted, specified by hours in the past/future. To clear the Range condition, select the All option.

Modality: Select one or two modality type from DX and CR.

CAUTION Be sure to confirm that the entered information (patient name, ID number, birth date, and sex) matches that of the patient. If the information is incorrect, the resulting patient mix-up and a misdiagnosis may cause harm to the patient.
2 Select the target study order.

Click the target study order to highlight. The selected study orders are listed in the study information pane.

Multi-selection for ease of operation

With a click of one study order in the list, study orders with the same descriptions for five categories - Patient ID, Name, Birth (date), Sex, and Input data type (either HIS/RIS originated or manually created data) - will automatically be selected. To deselect unwanted study orders from the selection, click each order in turn.

3 Start examination.

Proceed to “4 Conducting Examinations.”

If a dialog box appears indicating that the protocol includes an unknown code value

Consult your service engineer to create the protocol applicable to the unknown code value.
3.1.2 Checking patient/study information in detail

1 Select a study order.

Click a study order in the Study List.

2 Show the detailed information.

Click in the patient information pane or on the target study order. To hide the detailed information, click it again.
3.1.3 Modifying study information

If necessary, the ordered study information can be modified before examination.
1 **Show the Edit Study Information dialog box.**

Select the target study order in the Study List, and then click ![info_icon] on the target study in the study information pane, and then click [Edit].

2 **Modify the study information.**

Modify information in the Study Description text box (up to 64 characters). Note that grayed-out information in the Edit Study Information dialog box cannot be modified.
To protect the stored images

To maintain a certain amount of free space in the local storage directory of the image-capture computer, stored images except for those being reviewed on the [EXAM > Examination] or [PAST > View] screen will automatically be deleted on a study basis, beginning with the oldest one, as the amount of data exceedingly increases. To prevent images from being deleted, select the Protect Image option. To cancel, clear the option.

NOTE Other study information items such as Study Instance UID can be configured to be shown in this dialog and modified in this step. For details, refer to 2.4.1 in the Setup Guide.

3 End modification.

Click [OK].

3.1.4 Changing a workspace

If necessary, the ordered workspace can be changed before examinations. In cases where two or more detectors are connected to the system, detectors can be switched by changing the workspace.

![Diagram showing workspace changes]

- Thumbnail
- Protocol
- The selected study order is highlighted.
1 **Show the Select Workspace dialog box.**

Select a study order, and then double-click the target protocol in the study information pane.

![Select Workspace dialog box]

**NOTE:** A battery indicator and a signal strength indicator are shown on the workspace for wireless detectors. For the wireless detector, refer to the Digital Radiography CXDI series User’s Manual.

**Example of workspace indicator for wireless detectors**

**Battery indicator**
- : 60–100% charge
- : 9–59%
- : 5–8%*
- : 4% or less*

**Signal strength indicator**
- : Strong
- : Medium
- : Poor
- : No signal

* When the indication changes to or , a warning/error dialog box appears to prompt a battery recharge.

2 **Select the target workspace.**

Click the target workspace, and then click [OK].
3.1.5 Configuring protocols

Study orders are modified by including additional protocols, deleting existing protocols, or arranging the order of existing protocols.

1 Show available protocols.

Select a study order, and then click [Edit Exam] in the study information pane.
2 Configure protocols.

To include an additional protocol in the study order

Click a target protocol in a preferred protocol tray. The selected protocol appears at the bottom of the protocol list in the study information pane. To specify an insertion point, click to highlight a protocol in the study information pane before clicking the additional target protocol. The additional protocol is inserted just below the highlighted protocol.

NOTE: In body part search mode, up to three types of protocol trays (Frequently-used protocols, Recently-used protocols, and Examination history) are available for protocol selection. For details on tray operation, see 3.2, and on tray configuration, refer to Protocol Settings in 2.4.1 in the Setup Guide. In addition, category search mode is also available (see 3.2.2).

NOTE: The Recently-used protocols tray and Frequently-used protocols tray cannot be shrunk at the same time.

To delete a protocol

Click a target protocol in the study information pane, and then click [Delete].

To arrange the order of protocols

Click to highlight a target protocol in the study information pane, and then click [▲] or [▼]. Note that the protocols can be moved up or down within a single study.
3 Preparing for Examinations

3.2 Selecting protocols

This Software provides a variety of useful protocol selection methods so that users can easily prepare for examinations and configure protocols.

3.2.1 Searching for a protocol by a body part

Specify a target body part.

1. Click in the body part selector to highlight the target body part.
   The protocols in the enabled trays are narrowed down into the focused body part.

NOTE: Two or more parts can be selected.

To clear the body part conditions

Click the highlighted body part again.
Specify detailed narrowing conditions.

If necessary, click [Search options], and then click target condition buttons to highlight them in the Search options dialog box.

**Exposure type:** [Radiography] and [Stitch] are available.

**View Position:** Nine conditions are available.

**Protocol Name:** Type part or the entire protocol name in the text box and click [Search].
To clear the detailed conditions

Click the highlighted button again.

3 Select a target protocol.

If a target protocol appears in a protocol tray

Click the target protocol in the protocol tray.
The selected protocol appears at the bottom of the study information pane.

If a target protocol does not appear in a protocol tray (Select Workspace option)

Select the Select Workspace option to show the Select Workspace dialog box, and then select the target workspace.
The selected protocol with the desired workspace appears at the bottom of the study information pane.

Select Workspace option

Only the protocol names appear.

Select Workspace dialog box

Click to cancel workspace selection and return to the previous screen.
3.2.2 Searching for a protocol by category

NOTE: PrePack protocols (refer to 3.4.3 in the Setup Guide) can be selected only in category search mode.

1 Enable category search mode.

Click [Search by Category] in body part search mode.

To select a category tab

If necessary, click [▲] or [▼] to scroll tabs, and then click a target category tab.
To select a protocol tray using the category list

Click [Category List], and then click a target category in the list.

2 Select a target protocol.

Click a target protocol in the protocol tray. The selected protocol appears at the bottom of the study information pane.
3.3 Creating study orders (Manual tab)

Additional study orders can be created using the Software in radiology rooms, and the created studies as well as those acquired from the HIS/RIS database will be conducted.

3.3.1 Registering patient/study information

The [EXAM > Manual] screen appears when the user is logged in to the Software that does not have data exchange and updating services with the HIS/RIS database.

If the [EXAM > Manual] screen does not appear


CAUTION

Be sure to confirm that the entered information (patient name, ID number, birth date, and sex) matches that of the patient. If the information is incorrect, the resulting patient mix-up and a misdiagnosis may cause harm to the patient.

To delete patient information in Recent Patient List

Click unused patient information to highlight, click [Delete], and then click [OK] in the confirmation dialog box.
1 Enter patient information.

Enter any of the following information in the text boxes and select an option for the Sex of the patient.

- **Name:** Patient name
- **DoB/Age:** Birth date of a patient (Age will be automatically calculated based on this entry)/Age of a patient
- **ID:** Patient ID

When the target patient information already exists

Patient information previously created in the [EXAM > Manual] screen appears in the Recent Patient List pane. In such a case, click the target patient information on the list instead of performing step 1 above. For more efficient selection, it is advisable to narrow down the information on the list. Information entry in step 1 above also narrows the selection.

2 Set the information.

Click [Set ➞]. The Edit Exam screen appears and a new study order that contains no study information is created in the study information pane.

**NOTE:** Insufficient entry of ID and items marked with an “*” in step 1 disables [Set ➞] (refer to 2.4.1 in the Setup Guide for details on the setting of essential information items).
3 Show the Edit Study Information dialog box.

Click [i] on the newly created study order, and then click [Edit].

4 Enter study information for the newly registered/selected patient.

Enter the following information, including the Protect Image option if necessary, and then click [OK].

**ACC#:** Accession number. This number also serves as the study title.

**Referring Physician/Reading Physician:** Enter the relevant physician’s name, or click the arrow, and then select an option from the list.

**Study Description:** Users can freely enter study information.
5 Set the detailed study information.

Click [OK].

To add a study order

Click [Add Study].

To delete a study order

Click the target study order to highlight, click [Delete], and then click [OK] in the confirmation dialog box.

6 Configure protocols.

See step 2 in 3.1.5 for details on operation.

7 Start examination.

Proceed to “4 Conducting Examinations.”
3.3.2 Modifying patient information

1 Show the Edit Patient Information dialog box.

Click [Edit] in the patient information pane.

2 Modify the patient information.

See step 1 in 3.3.1 for details on operation.

3 Set the information.

Click [OK].

**CAUTION**

Be sure to confirm that the entered information (patient name, ID number, birth date, and sex) matches that of the patient. If the information is incorrect, the resulting patient mix-up and a misdiagnosis may cause harm to the patient.
3.3.3 Modifying study information

1. Show the Edit Study Information dialog box.
   Click  in the study information pane, and then click [Edit].

2. Modify the study information.
   See step 4 in 3.3.1 for details on operation.

3. Set the information.
   Click [OK].

3.3.4 Changing a workspace

See 3.1.4 for details on operation.
3 Preparing for Examinations

3.4 Creating emergency study orders (Emergency button)

In the case of an urgent patient, examinations can immediately be started for quick operation. However, patient information details are left unspecified. If necessary, the resulting images can be associated with the patient information on the HIS/RIS database at or after the end of the examination.

**CAUTION** Be sure to use the [Emergency] button only for an emergency examination. If not heeded, the resulting patient mix-up and a misdiagnosis may cause harm to the patient.

1. **Show the [EXAM > Manual] screen.**
   - Click the [EXAM > Manual] tab.

![EXAM > Manual] screen

2. **Create a study order.**
   - Click [Emergency]. A new study order (emergency study) is created in the study information pane, with a patient name and ID automatically entered by the Software.

3. **Select the target protocols.**
   - See step 2 in 3.1.5 for details on operation.
4 Start the examination.

Proced to “4 Conducting Examinations.”

To associate the resulting images with study information on the HIS/RIS database

Proced to “4.6 Associating study information with the images of an emergency study” after finishing the examination.
4 Conducting Examinations

4.1 Conducting radiographic examinations
4.2 Reprocessing an image using another uncompleted protocol
4.3 Recapturing images
4.4 Rejecting images
4.5 Suspending an examination
4.6 Associating study information with the images of an emergency study
4.7 Adding information to a complete protocol
This chapter explains how to conduct examinations and how to reprocess, retake, or reject images. Furthermore, data binding feature to associate study information with the images of emergency study is explained.

**Workflow**

- **[EXAM > Worklist] screen**: Preparing for Examinations (see chapter 3)
- **[EXAM > Examination] screen** (before capturing an image)
  - **4.1 Conducting radiographic examinations**
- **Image arrangement screen**: Arranging images on film sheets to print out (see 7.1)
- **[EXAM > Examination] screen**
  - **Reviewing Images** (see chapter 5)
  - **Post-Processing Images** (see chapter 6)
- **Select a data binding option dialog box** (only for emergency studies)
  - **4.6 Associating study information with the images of an emergency study**
4.3 Recapturing images
4.4 Rejecting images
4.5 Suspending an examination

[EXAM > Examination] screen
(after capturing an image)

4.2 Reprocessing an image using another uncompleted protocol
4.7 Adding information to a complete protocol
4.1 Conducting radiographic examinations

**CAUTION**

Be sure to confirm that the entered information (patient name, ID number, birth date, and sex) matches that of the patient. If the information is incorrect, the resulting patient mix-up and a misdiagnosis may cause harm to the patient.

1. Start examinations.

   Click [Start Exam].

   **NOTE:** If [Start Exam] does not work even if a study is selected, click [Edit Exam] and add the protocol to the study order.
NOTE: A battery indicator and a signal strength indicator are shown on the system status bar during an examination using a wireless detector. For the wireless detector, refer to the Digital Radiography CXDI series User’s Manual.

Example of the system status bar indication while using a wireless detector

* When the indication changes to \(\text{ or }\), a warning/error dialog box appears to prompt a battery recharge.

NOTE: When a wide display monitor (not a 4:3 monitor) is used, the image view pane in the [EXAM > Examination] screen can be expanded fully in the vertical direction by shifting the tabs and buttons located above the pane to the right. Consult your service engineer for details.

Protocol sort for efficient workflow

Users can arrange the order of uncompleted and completed protocols in the study information pane.

[Workspace Sort]:
Groups protocols that have the same workspace across the boundary between study orders.

[Study Sort]:
Restores the original order of protocols on the basis of study.

Clicking the button toggles it between [Workspace Sort] and [Study Sort].

NOTE: While image data is being transferred in the background, the data transfer indicator \(\text{ or }\) flashes (see 1.4.1). If the transfer has priority over the examination, wait until the \(\text{ or }\) indicator goes off, and then click [Start Exam].

\(\text{ : appears during transfer to the RIS/HIS database, storage devices, and printers}\)

\(\text{ : appears during transfer to the media storages}\)
2 Select the target protocol.

If necessary, click the uncompleted target protocol in the study information pane and confirm that the indicator changes from *Waiting* to *Ready* in the system status bar.

**NOTE:** If the *Not Ready* and *Readying* indicators appear in the system status bar, check that:
- the detector is attached to the system.
- the cable is securely connected.
- the power box is turned on.

**NOTE:** The user can choose to have the exposure summary displayed on the right side of the system status bar. For details, consult your service engineer.

3 Arrange the patient in the correct posture.

Arrange the patient so that the target body part fits appropriately in the irradiated field and instruct the patient not to move during the examination. If necessary, help the patient to maintain the proper posture.
4 Conducting Examinations

4 Perform exposure.

Press and release the exposure switch of the X-ray generator. The Ready indicator changes to Capturing, and then Not Ready in the system status bar. After processing is complete, a preview image appears in the image view pane, and then the next available protocol is automatically highlighted.

Automatic selection of protocols

After each protocol is complete, the next available protocol is automatically highlighted. If the user prefers to manually select a protocol, automatic selection can be disengaged and the user can click on an uncompleted protocol to select it. For details, refer to 2.4.1 in the Setup Guide.

NOTE: If an image transfer has been interrupted by a wireless detector communication error, wait until communication resumes or perform the following countermeasures without turning off the detector power, and then retry the transfer. Before retrying an image transfer, make sure that the signal strength is strong or medium by checking the signal strength indicator in the system status bar.

- Remove or change the position of the obstructive objects between the access point and wireless detector.
- Keep away from a WLAN signal interference source.

NOTE: Canceling image transfer on Confirmation dialog boxes that appear will erase the image.
5 Continue the examination.

If any uncompleted protocols remain, repeat steps 2 through 4.

**Before replacing the detector during the examination**

Click [Unselect] to disengage the Ready status of the protocol. Confirm that the indicator appears in the system status bar, and then replace the detector. To resume the Ready status, click on an uncompleted protocol.

**To perform image processing**

Proceed to “6 Post-Processing Images.”

**To review captured images during examinations**

Proceed to “5 Reviewing Images.”

**To transfer captured images to storage devices before ending examination**

Click [Send] to transfer all captured images to the designated storage devices. After transfer, the preview thumbnails on the transferred protocols turn sepia in color.

NOTE: The transferred images cannot be modified through the post-processing.

**To enter freely information on examination**

See 4.7.

**When a detector timeout occurred**

Depending on the detector type, when a detector is left unused for a certain period of time, the detector enters in sleep mode. The indicator appears in the system status bar, and all protocols are deselected. To restart the examination, select the protocols again.

NOTE: To reduce power consumption, the Ready status, shown in the system status bar, can be manually canceled. Click [Unselect].

6 End the examination.

Click [End Exam]. The image data will be transferred to a preset destination such as a printer (refer to 2.6 in the Setup Guide). During data transfer, the data transfer indicator or flashes (see 1.4.1). After ending an examination, captured images can be reviewed on [PAST > View] screen (see 5.2).

**When the image arrangement screen appears**

Proceed to “7.1.1 Arranging images automatically.”

NOTE: Users can end the examination even if uncompleted protocols remain.
4.2 Reprocessing an image using another uncompleted protocol

To reduce the integral dose applied to the patients in cases of wrong application of a protocol, an already captured image can be reprocessed using the parameters of another uncompleted protocol having the same workspace as it is used for the target image's protocol.

Perform reprocessing.

Drag the preview thumbnail of the original completed protocol and drop it on the target uncompleted protocol within the same study. The original completed protocol changes to an uncompleted protocol.
4.3 Recapturing images

After conducting an examination using a specific protocol, resulting inapplicable images require other applicable images with the same protocol.

1 Select the completed target protocol.

Select the completed target protocol. Image processing parameters at the previous exposure are applied for the retake even when the parameters of the captured image were modified through the post-processing.

**NOTE:** If a completed protocol cannot be selected, click [Unselect], and then click the completed protocol.

2 Start retaking the image.

Start retaking the image. Click [Retake] (Clicking the button changes [Reject] to [Restore]). The Series/Image Information dialog box appears.

3 Select the patient orientation.

Select the patient orientation. Click the Patient Orientation drop-down arrow, and select an option from the list.
4 **Describe the reason of rejection.**

Fill out the Reject Reason text box, and then click [OK]. The reason can be selected from the Reject Reason List as well as by direct typing in the text box. (For details on Reject Reason List editing, refer to 2.4.2 in the Setup Guide.) The preview thumbnail of the selected protocol is crossed out and a duplication of the original protocol appears as an uncompleted protocol.

**To restore the original image**

Click [Restore].

5 **Conduct the examination.**

See 4.1 for details on operation.

4.4 **Rejecting images**

Depending on the Software setup, the images of completed protocols are generally transferred to PACS, printers and so on for diagnosis and other purposes when [End Exam] is clicked. The transfer feature can be disabled for unnecessary images resulting from failed exposure and other reasons.

1 **Select the target image.**

Click the completed target protocol in the study information pane.

2 **Reject the image.**

Click [Reject] (Clicking the button changes [Reject] to [Restore]. See the figure in 4.3.). The selected preview thumbnail is crossed out.

**To restore the rejected images**

Click the target completed protocol to restore, and then click [Restore].
4.5 Suspending an examination

If necessary, an examination that includes uncompleted protocols can be suspended. The uncompleted protocols will remain in that examination and can be restarted later. A suspended examination, even if it was abnormally terminated, can be restarted later.

1 Suspend an examination currently being conducted.

Click [Suspend Exam].

Listing functionality for unexpectedly terminated examinations

Unexpectedly terminated examinations are listed in the [EXAM > Worklist] or [EXAM > Pending List] screen with Pending indications in the Study Status column.

NOTE: Examinations listed in red indicate that they were abnormally terminated during processes. Indications and operations for the listed items are identical with those for examinations that are suspended by clicking [Suspend Exam].

To restart the suspended study order

Select the suspended study order in the [EXAM > Worklist] or [EXAM > Pending List] screen, and then click [Start Exam].
4.6 Associating study information with the images of an emergency study

See also 3.4 for details on emergency study. When an emergency study is ended with [End Exam], the following dialog box appears.

NOTE: When the data exchange and updating services with the HIS/RIS database are not provided with the Software, [EXAM > Manual] screen appears instead of the dialog box above.

Select a data binding option.

Confirm the Add study information option is selected.

To associate the information later

Select the Do not add study information yet option, and then click [OK] to suspend the examination.
Later, restart the suspended emergency study (see 4.5 for details), click [End Exam] to show the above dialog box, and then select the Add study information option to associate the information.
4 Conducting Examinations

**Not to associate the information**
Select the Not add study information option, and then click [OK].

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be sure to confirm that the entered information (patient name, ID number, birth date, and sex) matches that of the patient. If the information is incorrect, the resulting patient mix-up and a misdiagnosis may cause harm to the patient.</td>
</tr>
</tbody>
</table>

2 **Select the target study information.**
Click the item in the Study Information list.

**To refresh or narrow down the information**
Click [Refresh] or [Refresh Option]. See step 1 in 3.1.1 for details of operation.

3 **Associate the study information with the image.**
Click [OK], and then click [OK] in the Confirm Study information to bind dialog box.

![Confirm study information to bind dialog box](image)

Click to go back to step 2.

**When the image arrangement screen appears**
Proceed to “7.1.1 Arranging images automatically.”
4.7 Adding information to a complete protocol

For further references in diagnosis, arbitrary information on the examination as well as the patient orientation can be added to the complete protocol.

1 Show Series/Image Information dialog box.

Click a completed target protocol in the study information pane.

2 Describe the information.

Fill out the Series Description text box.

3 Select the patient orientation.

Click the Patient Orientation drop-down arrow, and select an option from the list.

4 Set the information.

Click [OK].
5 Reviewing Images

5.1 Reviewing images on the [EXAM > Examination] screen
5.2 Reviewing images on the [PAST > View] screen
5.3 Deleting studies from the [PAST > Past List] screen
This chapter explains how to review images immediately after image capturing in the [EXAM > Examination] screen as well as later in the [PAST > View] screen.

**Workflow**

[EXAM > Examination] screen
(before capturing an image)

Conducting Examinations
(see chapter 4)

[PAST > Past List] screen

5.3 Deleting studies from the [PAST > Past List] screen
5.1 Reviewing images on the [EXAM > Examination] screen

5.2 Reviewing images on the [PAST > View] screen

Post-Processing Images (see chapter 6)

Arranging images on film sheets to print out (see 7.1)
5.1 Reviewing images on the [EXAM > Examination] screen

NOTE: It is best to disengage the Ready status of the next available protocol during a prolonged review. Click [Unselect] in the study information pane.

1 Select a target radiographic image thumbnail.

Click a preview thumbnail of a completed target protocol in the study information pane. The image appears in the image view pane in single view mode.
To overview images in the current Exam (multi view mode)

Click \( \text{multi view} \). Up to nine images of protocols from the current Exam appear in the image view pane at a time. To resume single view mode, double-click an image in multi view mode or click \( \text{single view} \).

To perform image processing

Proceed to “6 Post-Processing Images.”

To restart examinations after review

Click an uncompleted protocol and continue the examination (see step 2 in 4.1).
5.2 Reviewing images on the [PAST > View] screen

In previous section, the steps for reviewing images on the [EXAM > Examination] screen have been described. Images previously captured and saved in the directory in the image-capture computer can also be reviewed on the [PAST > View] screen. Completed studies can be selected from the Study List on the [PAST > Past List] screen.

To sort the listed study orders

Click a sort item in the column header. To switch between ascending and descending sort order, click the same item again.

To arrange the order of the column headers

Drag an item and drop it in the target position. Dragging the column border also adjusts the width of the column header.

Show the [PAST > Past List] screen.

Click the [PAST > Past List] tab and select Local DB for the directory option.

**Local DB:** The image-capture computer’s HDD

**Disk Storage:** The removable media storage or external HDD, etc.

**NOTE:** The directory options are displayed when external storage is specified on the Disk Storage tab (refer to 2.6.5 in the Setup Guide). If the directory options do not appear, it means that all of the listed studies are stored in the image-capture computer.
Image transfer results can be confirmed

In the Study List, completed studies are listed with image transfer results for the designated printer and data storage. The descriptions in the Trans Results (Storage/Printer) column are as follows: ✔ (success), ☑ (sending), ❌ (failure), and ☐ (no setup). For details on image transfer, see 7.2. The storage commitment results (✔ (committed), ☑ (committing), ❌ (failure), or ☐*) can also be confirmed in the SC column in the same list. For details on the storage commitment, refer to 2.6.1 in the Setup Guide.

* ☐ means that storage commitment is not configured in the study order.

To narrow down the list items

Enter any narrowing conditions in the Search For Study List pane.

Name: Patient name
ACC#: The accession number is automatically given to each study order at the point of issue.
ID: Patient ID
Study Date: A period specified using two dates

2 Select the target study.

Click to highlight a study. The selected study is listed in the study information pane.

3 Show the image.

Click [Recall Exam]. The image appears in the image view pane in single view mode.

[PAST > Past List] tab
Click to save changes for the current image.

[Back To List] button

[PAST > View] screen
To review other images

Click [Back To List] or the [PAST > Past List] tab, and then follow steps 2 and 3.

5.3 Deleting studies from the [PAST > Past List] screen

This Software is configured to delete automatically past study data that is stored in the image-capture computer in chronological order from old to recent. To prevent useful reference study data from being deleted, check the HDD free space icon (see 3.1.1) and delete unnecessary studies before the available HDD space decreases too much.

NOTE: The target reducing capacity text box and [Delete] are available only when the user who has the Security Administrations privilege logs in the Software. For details, consult your service engineer.

1

Switch the Study List for the target directory.

Click one of the target directory options.

Directory options

[Select All Studies]

[PAST > Past List] screen

NOTE: When the Disk Storage option is selected, the Software automatically enters study deletion mode. Therefore, users do not need to click in step 2.
2 Select the target studies.

Click to enter study deletion mode, and then click the target studies in the list.

**NOTE:** Studies with in the Protect column cannot be deleted as the Protect Image option is selected. For details on the Protect Image option, see step 2 in 3.1.3. Also, see 2.4.1 in the Setup Guide for the Column Headers setting.

**To select multiple studies (keyboard and mouse operation)**

Click one study and then shift-click the second one. The two clicked studies and all studies between them are selected. Control-click enables another multiple selection. All the control-clicked studies are selected.

**To select multiple studies (touch panel display operation)**

Touch [Enable additional selection] and then continue touching studies on the list. All touched studies are selected.

**NOTE:** The software keyboard may not be displayed, depending on the Software configurations. For details, consult your service engineer.

**To select all studies at the same time**

Click [Select All Studies].

**To clear the selection**

Click a highlighted study to clear other selections. Control-click a highlighted study to clear the selection. When all studies are selected, click [Select All Studies] to clear all selections.

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Continued
5 Reviewing Images

To specify the target capacity to be deleted (Local DB option only)

Enter a value in the target reducing capacity text box. If the actually deleted capacity does not reach the target amount, an alert will appear.

To exit study deletion mode for the Disk Storage

Click the Local DB option.

3 Delete the target studies.

Click [Delete], and then click [OK] in the Warning dialog box.

Warning dialog box when the target capacity is not specified

Warning dialog box when the target capacity is specified
6 Post-Processing Images

6.1 Using the toolbar (Basic processing)
6.2 Using the Image Processing dialog box (Level 1)
6.3 Using the Measurement dialog box
6.4 Using the Annotation dialog box
This chapter explains how to modify captured images for more effective image interpretation during diagnosis. Furthermore, measurement results (distance and angle), including values, units, and line segments, can be superimposed over images in the image view pane.

Workflow

[EXAM > Examination] screen
Conducting Examinations (see chapter 4)
Reviewing Images (see chapter 5)

[PAST > View] screen
Reviewing images on the [PAST > View] screen (see 5.2)

Shutting down the Software (see 2.2)

Image arrangement screen
Arranging images on film sheets to print out (see 7.1)
6.1.1 Rotating/flipping images
6.1.2 Panning images
6.1.3 Zooming images
6.1.4 Embedding laterality markers in images
6.1.5 Adjusting the overall brightness on the ROI basis
6.1.6 Cropping images
6.1.7 Masking the peripheral area

6.2.1 Adjusting the brightness of highlights and shadows
6.2.2 Adjusting the overall brightness and contrast

6.3.1 Measuring the distance between two specific points
6.3.2 Measuring the angle of a specific part
6.3.3 Measuring the Cobb angle
6.3.4 Measuring the height difference

6.4.1 Creating/editing annotations
6.1 Using the toolbar (Basic processing)

When reviewing images, the following buttons are available.

To undo the previous operation

Click . Note that some operations, such as panning, cannot be undone.

To restore the original processing settings of the current protocol

Click [Reset]. All modifications made for the current image are canceled.
To switch the toolbar

If [Tool1] or [Tool2] appears at the bottom of the toolbar, two types of toolbar have already been configured.
Click [Tool1] or [Tool2].

NOTE: Refer to 2.4.3 in the Setup Guide for details on toolbar customization.
6.1.1 Rotating/flipping images

1 Rotate or flip the image.

- : Click to rotate the image clockwise 90 degrees.
- : Click to rotate the image counterclockwise 90 degrees.
- : Click to flip the image vertically.
- : Click to flip the image horizontally.

NOTE: Generally, the preview image before clicking or is a view from the X-ray generator. The image will be reversed after clicking one of these buttons.
6 Post-Processing Images

6.1.2 Panning images

To more easily view certain parts of an image, click inside a cropped or magnified image and drag it to change the viewing boundaries. The panned position of the image will not be kept when the image data is transferred to external storages, the printer, and so on.

1 Pan the image.

Click , and then drag the image to any position, keeping the center of the image within the boundaries of the image view pane.

To end panning

Click [OK].
6.1.3 Zooming images

Images can be magnified for review in detail and then reduced to the original size (at the same time, the original position will be resumed). Pixel-to-pixel and high-resolution display modes are also available.

NOTE: The change in magnification does not affect the size of the image that is transferred to external storages or printers.

1 Zoom in the image.

Click \( \text{🔍} \). The image is enlarged from the center of the cropped image in four steps.

To enable pixel-to-pixel display mode

Click \( \text{🔍} \) repeatedly until \( \text{🔍} \) changes to \( \text{1.1} \), and then click \( \text{1.1} \).

![Image with zoom in and pixel-to-pixel display mode]

To review images in high-resolution mode

Click \( \text{🔍} \) to highlight [HQ] and then click [HQ]. Fine textures will be clearly displayed.

NOTE: Usually, the resolution of a reduced image is automatically adjusted depending on the image magnification. In such cases, [HQ] enables original resolution display at the same magnification. On the other hand, \( \text{🔍} \) magnifies the image, keeping the automatically adjusted resolution.

To zoom out the image

Click \( \text{🔍} \). The enlarged image display is reduced until the zooming is reset.
To fit the image to the image view pane boundary

Click . The image returns to the center of image view pane and the zooming is reset.

6.1.4 Embedding laterality markers in images

In general, laterality markers can automatically be embedded on an image by presetting protocols. This section explains manual embedding procedures for captured images. Though these markers generally indicate DICOM laterality, they can also be used simply to indicate left and right of the image (refer to “Protocol Settings” in 3.4.1 in the Setup Guide). Annotations other than “L” and “R” can also be embedded (see 6.4).
1 Embed a laterality marker in the image.

   Click [L] or [R]. The “L” or “R” mark appears at the preset position. (For details on the position settings, refer to “Protocol Settings” in 3.4.1 in the Setup Guide.)

To change the position of an embedded laterality marker

   If necessary, click a laterality marker to show its boundaries in orange, and then click a destination point on the image view pane. The marker appears at the click point.
6.1.5 Adjusting the overall brightness on the ROI basis

Use this function if details in shadows or highlights are missing. The brightness of the overall image can be adjusted based on the mean brightness of the specified area (ROI).

1 Enable overall brightness adjustment mode.
   Click [ROI].

2 Specify an area to serve as the adjustment control.
   Drag the pointer on the image view pane to make a rectangular selection that covers the target area (ROI). The specified area is surrounded by a yellow rectangle, and the brightness of the overall image is adjusted. Clicking a pair of diagonally opposite corners of a rectangle is another way to make an area selection.
6 Post-Processing Images

To adjust the specified area

Click [Select], point any handle to change the cursor to \( \bigtriangleup \) (resize cursor), and then drag the handle.

To cancel the selection

Click [Delete].

3 Exit adjustment mode.

Click [OK].

6.1.6 Cropping images

A green frame indicating a preset cropping area to be output to a storage device or a printer appears on preview images after exposure is complete. The preset cropping area can be modified using \( \bigtriangleup \).

Note: Preset cropping area is specified in the Common Cropping Area options in the System Settings tab (refer to 2.3.1 in the Setup Guide), or the Cropping Area Options in the Protocol Workspace Settings screen (refer to 3.4.1 in the Setup Guide).

1 Enable cropping mode.

Click \( \bigtriangleup \). A crop frame and handles (at the corners and the middle of each side) appear on the preview image.
2 Specify the area to be kept.

Drag any handle to adjust the cropping area. Clicking diagonally opposite points is another way to specify a new cropping area.

To adjust the specified area

Point any handle to change the cursor to (resize cursor), and then drag the handle.

To move the specified area

If necessary, click [Select] to highlight it, and then click the cursor buttons. There is another way to move the specified area. Move the pointer on the rectangle border to change the pointer to (move pointer), and then drag the rectangle.
To rotate the cropping area

Click \( \text{\textcircled{c}} \) to rotate the area clockwise 90 degrees.

**NOTE:** In cases where Custom Area is selected for the Cropping Area option in Protocol Workspace Settings (refer to 3.4.1 in the Setup Guide), when \( \text{\textcircled{c}} \) is clicked, the setting for the Alignment option will be applied to the cropping area.

To cancel the selection and return to the area specified in Protocol Workspace Settings

Click [Reset]. For details, refer to 2.3.1 and 3.4.1 in the Setup Guide.

To specify an area with a single click of a button

Click one of the following buttons to cancel the selection and specify the preset area. Three preset areas can be specified.

- (Detected Irradiated Field): Crops only the irradiated field.
- (Custom Area): Resumes default custom cropping area.
- (Effective Area): Crops the effective area of the detector.

3 Set the area and exit cropping mode.

Click [OK].

To mask outside the specified area

Click \( \text{\textcircled{m}} \). Only when in masking mode, \( \text{\textcircled{m}} \) is available.
6.1.7 Masking the peripheral area

The area outside a specified polygonal area can be masked (see also 7.3.9).

NOTE: Unlike its appearance on the screen, the masked area appears black on the images transferred to storage devices, media storages, and printers.

1 Enable mask edit mode.

Click [Mask].

2 Show the specified area.

Click  to highlight. The currently specified area appears enclosed by a dotted line. A new area can also be specified.

NOTE: The area on an image masked immediately after an exposure is the same area as that outside the detected irradiated field.

To hide the specified area

Click .
3 Specify the area to be kept.

Click repeatedly on the image view pane to create boundary points for the area to be kept, and then enclose the area by either clicking [Preview] or the initial click point. Double-clicking the last boundary point will also enclose the area. Up to 12 boundary points can be created.
To select a rectangular area

Click a point on the image view pane, and then double-click the diagonally opposite point.

To fit the specified area to the cropping area

Click . Outside the current cropping area will be masked.

To cancel the selection and return to the area specified when the mask edit is started

Click [Reset].

4  

Apply the masking effect to the image and exit mask edit mode.

Click [OK].

To cancel the masking effect and exit mask edit mode

Click , and then click [OK]. The masked area will not be displayed, but the area itself will be saved.

NOTE: Changes made to the masking effect using do not affect the state of the Mask check box (see 7.3.9).
6.2 Using the Image Processing dialog box (Level 1)

When reviewing images, fine adjustment of the brightness and contrast is available using the Image Processing dialog box.

**NOTE:** Depending on the image, the adjustable range of the following image processing parameters may be restricted. In such cases, the preview image may not change even if the sliders are moved past a certain point.

### Imaging parameter adjustment restrictions

Most of the advanced imaging parameters are preset when the Software is installed, and their access privileges are classified into two levels, 2 and 3. These levels may be restricted to administrative users. The advanced parameters for level 2 and 3 modes are explained in Chapter 7.

**If the Image Processing dialog box does not appear**

Click [ImageProc]. To hide the dialog box, click it again.

#### 6.2.1 Adjusting the brightness of highlights and shadows

These parameters are available for all access level. However, at all level modes, adjustments are not needed for normal use, since appropriate pre-processing is applied to the images.

**NOTE:** For further information on auto brightness adjustment applied to highlights and shadows, refer to Appendix 5.2.3 “Dynamic Range Analysis” and Appendix 5.3.2 “Dynamic Range Adjustment” in the Setup Guide.

**NOTE:** These adjustments are not available when the REX option is selected for Brightness Adjustment mode (see 7.3.3).
1 Increase or decrease the brightness of highlights.
To increase, drag the highlight adjustment slider to the right.
To decrease, drag the highlight adjustment slider to the left.

2 Increase or decrease the brightness of shadows.
To increase, drag the shadow adjustment slider to the right.
To decrease, drag the shadow adjustment slider to the left.

6.2.2 Adjusting the overall brightness and contrast

1 Adjust the brightness.
Rotate the scroll wheel on the mouse or click the arrows of the Brightness control.
To increase, move the slider to the right.
To decrease, move the slider to the left.

NOTE: Fine-adjust the brightness in a range of -10 to +10 relative to the Base Brightness value.
The supported adjustment range depends on the Base Brightness value. In some cases, the range may be narrower than -10 to +10.
For details on Base Brightness control, see 7.3.3.
2 Adjust the contrast.

Rotate the scroll wheel on the mouse or click the arrows of the Contrast control.
To increase, move the slider to the right.
To decrease, move the slider to the left.

NOTE: Fine-adjust the contrast in a range of -10 to +10 relative to the Base Contrast value.
The supported adjustment range depends on the Base Contrast value. In some cases, the range may be narrower than -10 to +10.
For details on Base Contrast control, see 7.3.3.

LUT (look up table) curve
The raw data generated by the sensor of the detector is automatically processed using one of the preset imaging parameters (LUT curves) that suit several anatomical parts and is shown in the image view pane as a film-like image. The LUT curve changes, reflecting changes made using the Brightness and Contrast controls. The stronger the contrast, the steeper the curve becomes, and the weaker the contrast, the flatter the curve becomes. Note that this curve serves as a rough indicator.

Histogram
This indicates the pixel value distribution of the raw data generated by the sensor of the detector, and is used as a rough indicator of the X-ray dose. The x-axis of this histogram is logarithmic. The more the histogram leans toward the right, the higher the exposure. The adjustment of processing controls will not affect the histogram.
6.3 Using the Measurement dialog box

When reviewing images, measurement objects such as line/angle objects, values, and units are superimposed over the images on the image view pane, and these objects are embedded in the image data to be transferred to external storage devices, the printer, or other locations.

To enable measurement mode

Click [Measurement].

6.3.1 Measuring the distance between two specific points

NOTE: The measurement unit and the scale shown at the bottom of the image view pane can be selected on the system setup screen. For details, refer to 2.4.1 in the Setup Guide.
1 **Enable distance mode.**

Click .

**NOTE:** Once distance mode is enabled, operations other than step 2 below are disabled. Be sure to complete operations through step 2.

2 **Measure the distance between two specific points.**

Click two points on the image view pane. A line object indicating the measured distance between the points appears.

3 **Perform other distance measurements.**

Repeat steps 1 and 2.

**To modify a line object**

Click on the line object so that handles appear on both ends of the object. Drag the middle of the object to move, or drag either handle to lengthen or shorten the line object.

**To delete a line object**

Click on the line object so that handles appear on both ends of the object, and then click [Delete].

**To correct the measured values and the scale**

The measured values can be corrected using the magnification ratio based on the SOD (source object distance) and SID (source image distance) values. The values preset for the protocol (refer to 3.4.1 in the Setup Guide) or executed values received from the X-ray generator are displayed in the SOD and SID text boxes in the Correction of Magnification option. The scale displayed at the bottom of the image view pane also changes.

![Measurement dialog box]

To correct the measured values, input or modify the values in the SOD and SID text box, and then click [Correct].

**NOTE:** The measured value in height difference mode (see 6.3.4) will also be corrected.
Exit measurement mode.

Click [Measurement].

6.3.2 Measuring the angle of a specific part

1. Enable angle mode.

Click [Angle].

NOTE: Once angle mode is enabled, operations other than step 2 below are disabled. Be sure to complete operations through step 2.

2. Measure the angle of a specific part.

Click three points on the image view pane so that an angle is formed by two line segments. An angle object, with indicators for the measured angles (both interior and exterior) appears.
3 Perform other angle measurements.

   Repeat steps 1 and 2.

To modify an angle object

Click on the angle object so that handles appear at the angle and the two endpoints of the object. Drag a line to move it, or drag either handle to modify the angle object.

To delete an angle object

Click on the angle object so that handles appear at the angle and the two endpoints of the object, and then click [Delete].

4 Exit measurement mode.

   Click [Measurement].

6.3.3 Measuring the Cobb angle

The Cobb angle is used to evaluate the curvature of the spine in a diagnosis of scoliosis. For long-length images that capture the entire spine and/or lower extremities, see chapter 8.
NOTE: The measurement unit and the scale shown at the bottom of the image view pane can be selected on the system setup screen. For details, refer to 2.4.1 in the Setup Guide.

1 Enable Cobb angle mode.

Click . Help for measurement location settings is available at the top of the image view pane.

NOTE: Once Cobb angle mode is enabled, operations other than step 2 below are disabled. Be sure to complete operations through step 2.

2 Measure the Cobb angle of a specific part.

Click six points on the image view pane in the order shown in the figure below to form a Cobb angle. A Cobb angle object, with indicators for the measured angles (both interior and exterior) appears.

To modify a Cobb angle object

Click on the Cobb angle object so that handles appear at the angle and the four end points of the object. Drag a line to move it, or drag either handle to modify the Cobb angle object.

To delete a Cobb angle object

Click on the Cobb angle object so that handles appear at the angle and the four end points of the object, and then click [Delete].

3 Perform other Cobb angle measurements.

Repeat steps 1 and 2.

4 Exit measurement mode.

Click [Measurement].
6.3.4 Measuring the height difference

In preoperative/postoperative diagnosis for knee replacement arthroplasty, the height differences between the right-and-left sides of the pelvis or kneecaps are measured to check the alignment of the body. For long-length images that capture the entire spine and/or lower extremities, see chapter 8.

NOTE: The measurement unit and the scale shown at the bottom of the image view pane can be selected on the system setup screen. For details, refer to 2.4.1 in the Setup Guide.

Enable height difference mode.

Click [Measurement]. Help for measurement location settings is available at the top of the image view pane.

NOTE: Once height difference mode is enabled, operations other than step 2 below are disabled. Be sure to complete operations through step 2.
2 Measure the height difference between two specific points.

Click four points on the image view pane to determine a reference line and two measurement points. A line object indicating the measured height between the points appears.

3 Perform other height difference measurements.

Repeat steps 1 and 2.

To modify the height measurement object

Click the height measurement object so that handles appear at the four points of the object. Drag a line to move it, or drag either handle to modify the height measurement object.

To delete the height measurement object

Click the height measurement object so that handles appear at the four points of the object, and then click [Delete].

To correct the measured value and the scale

See step 3 in 6.3.1 for details.

4 Exit measurement mode.

Click [Measurement].
6.4 Using the Annotation dialog box

Free annotations created in the following steps are embedded on both the screen preview images and film sheet images.

6.4.1 Creating/editing annotations

1 Enable annotation mode.

Click [Annotation].
2 Create a new annotation or select a preset annotation.

Click [New] to show the Input New Annotation dialog box, type an annotation, and then click [OK]. The new annotation, with a dashed red border, appears on the image view pane. New annotations can be created on the System Setup screen. For details, refer to 2.5.2 in the Setup Guide. Selections can be made by clicking an annotation in the list box.

To add the new annotation to the input list box

If the newly created annotation is expected to be frequently used, select the Add List option before clicking [OK].

To select/deselect an annotation

An annotation highlighted with dashed red border is selected and active. Before performing other operation, be sure to deselect an active annotation by dragging it to the same position. Clicking an inactive annotation makes it active.
3 **Change the position of an annotation.**
Select an annotation, and then drag it to any position or click any point within the image view pane.

4 **Change the size of an annotation.**
Click an annotation to select, and then click [Enlarge] or [Reduce] repeatedly until the desired size is reached.

*To delete an annotation*
Click an annotation to select, and then click [Delete].

5 **Continue to edit other annotations.**
Repeat steps 2 through 4.

6 **Exit annotation mode.**
Click [Annotation].
Other Functions

7.1 Arranging images on film sheets to print out
7.2 Managing image data transfer (Output Settings)
7.3 Using the Image Processing dialog box (Levels 2 and 3)
This chapter explains how to arrange images, and how to print or transfer images. Advanced image processing features for administrative users are also explained.

**Workflow**

[EXAM > Examination] screen
- Conducting Examinations (see chapter 4)
- Reviewing Images (see chapter 5)

[PAST > View] screen
- Reviewing images on the [PAST > View] screen (see 5.2)

Shutting down the Software (see 2.2)
Image arrangement screen

7.1 Arranging images on film sheets to print out

7.2 Managing image data transfer (Output Settings)

7.3 Using the Image Processing dialog box (Levels 2 and 3)
7 Other Functions

7.1 Arranging images on film sheets to print out

For more efficient workflow, an automatic image arrangement feature for printing on film sheets is available. Specific images selected from a single study can also be manually arranged for image comparison during diagnosis. When [Arrangement] is highlighted, the results of the automatic arrangement can be confirmed and modified (refer to Step 5 in 2.6.2 in the Setup Guide). When [Arrangement] is not highlighted, images are automatically printed under preset conditions without any confirmation.

7.1.1 Arranging images automatically

![Diagram of image arrangement process]

[EXAM > Examination] screen

[OK] Click to cancel and exit image arrangement mode.

[Insert Page] Click to delete the current page.

[Delete All Page] [Printable area adjustment]

Image arrangement screen

Printer options

Arrangement preview pane

Page arrows, current page/total pages

Image List

[Add Page]

[Auto Layout]

Study tab (ACC#)

[End Exam]

[Add Page]

[Insert Page]

[Delete Page] [Delete All Page] [Printable area adjustment]
1 Enable image arrangement mode.

Depending on the Software settings (refer to Step 5 in 2.6.2 in the Setup Guide), the image arrangement screen automatically appears after ending an examination by clicking [End Exam] or at the end of the manual printing procedure (see 7.2.1).

To confirm the automatic arrangement

Click [End Exam] or perform manual printing (see 7.2.1). All images to be printed (refer to Step 5 in 2.6.2 in the Setup Guide) from the current Exam are arranged in the arrangement preview pane.

To manually enable image arrangement mode

Click ✅ to highlight in the [EXAM > Examination] or [PAST > View] screen (if necessary), and then click [End Exam] or perform manual printing (see 7.2.1).

NOTE: Automatic arrangement is performed based on the order of the Studies. Although blank segments may remain on some pages depending on the image size and shape, this is the best result and does not indicate a malfunction of the Software.

2 Select the target study.

Click a study tab. Images in a single study are arranged under a single study tab. So, there appear just as many study tabs for the studies as there are in the current Exam.

3 Change arrangement and modify the printer/arrangement options.

The following operations and settings are available for achieving the best prints.

To exclude an image from arrangement

Drag an image from the arrangement preview pane to the Image List.

To exchange positions of two images

Drag one image to the other.
To specify printer and arrangement options

Click the page arrows to show the target page, and then specify the following printer and arrangement options. These options can be set for each page.

**Size:**
Click on the drop-down arrow and select an option from the list. The next **Destination Printer** option will be selected automatically depending on the configuration made in the Printer tab (refer to 2.6.2 in the Setup Guide).

**Fit Style:**
Select a scaling option from among **Fit** (the image is shrunk or enlarged to fit the image box keeping its aspect ratio) and **Fixed Ratio** (the image is placed at the center of the image box at the specified zoom ratio).

**Zoom Ratio:**
When Fixed Ratio is selected for the Fit Style option above, it is necessary to specify the ratio in %.

**NOTE:** Settings for this feature can be preset for each protocol. Refer to “Protocol Workspace Settings” in step 2 of 3.4.1 in the Setup Guide for details on position settings.

To check and adjust the printable area

When the output image size is larger than the printable area, the area is automatically set at the center/top/bottom of the image. Click [Printable area adjustment] and check the area shown in the orange rectangle. Adjust the position using the area adjustment buttons and then click [OK] to apply the adjustment.

**NOTE:** Settings for this feature can be preset for each protocol. Refer to “Protocol Workspace Settings” in step 2 of 3.4.1 in the Setup Guide for details on position settings.
4 **Print the arranged images.**

Click [OK].

**NOTE:** If a dialog box indicating “Arrange all images on the Image List.” appeared (refer to step 5 in 2.6.2 in the Setup Guide for details on the Common Output Setting options), drag all images to the arrangement preview pane, and click [OK].

**Example of automatic arrangement**

Layout templates are automatically selected according to the size and order of the images.
7 Other Functions

7.1.2 Arranging images manually

It is possible to create printouts of specified images arranged side by side on film sheets.

1 Enable image arrangement mode.

Follow step 1 of 7.1.1, and then click [Delete All Page]. All images in the current Exam appear in the Image List.

2 Create a page and select a target layout template.

Click [Add Page], click on a target layout template in the template pallet that appears, and then click [Next].

3 Select the film size and scaling options.

Select the following options and click [OK].

Size: Click on the drop-down arrow and select an option from the list. The next Destination Printer option will be selected automatically depending on the configuration made in the Printer tab (refer to 2.6.2 in the Setup Guide).

Fit Style: Select a scaling option from among Fit (the image is shrunk or enlarged to fit the image box keeping its aspect ratio) and Fixed Ratio (the image is placed at the center of the image box at the specified zoom ratio).

Zoom Ratio: When Fixed Ratio is selected for the Fit Style option above, it is necessary to specify the ratio in %.

When pages have already been created, the newly created page is added after the last page.
To insert a page before the current page
Click [Insert Page], and then click on a layout template on the list that appears.

4 Arrange the images.
Drag an image from the Image List to a destination segment in the arrangement preview pane.

NOTE: When all images on the Image List do not blink, add a new page before dragging the images.

5 Continue arrangement.
Repeat steps 2 through 4.

To automatically arrange the rest of the images
Click [Auto Layout].

6 Print the arranged images.
Click [OK].
7.2 Managing image data transfer (Output Settings)

Depending on the Software settings, in many cases images captured and processed on the [EXAM > Examination] screen are automatically transferred to destination servers such as HIS/RIS databases, data storage, a local disk directory and/or a printer when [End Exam] is clicked. Aside from these automated workflows, flexible data transfer capabilities are available.

**NOTE:** Images cannot be printed from the [PAST > Past List] screen.

*Not available in the [PAST > Past List] screen.*
Conditions for printing or data transfer

The range of images to be printed or transferred will vary depending on conditions. When starting in the [EXAM > Examination] screen, images in the current Exam will be printed or transferred. When starting in the [PAST > Past List] screen, images in the selected Exam will be printed or transferred. When starting in the [PAST > View] screen, either the current image or images in the current Exam will be printed or transferred.

To save changes made in the Output Settings dialog box

Click [Save Setting].

7.2.1 Manually printing images

Images can be printed manually from the [EXAM > Examination] and [PAST > View] screens.

1 Show the Output Settings dialog box.

Click 🎨.

2 Enable the preset printer.

Select the Print Output option. To cancel image data transfer to a printer, clear the check box in the printer option.

3 Start printing.

In the [EXAM > Examination] screen:

Click [OK] to print the images in the current Exam.

In the [PAST > View] screen:

Click [Send Image] to print the current image or click [Send Exam] to print the images in the current Exam.

4 Confirm or modify the arranged images.

For details, see 7.1.
7.2.2 Manually transferring images to external storage devices or a local disk directory

In the system setup screen, users can specify external storage devices, or a local disk directory, in which the Software itself is installed, to save images. For details on the setting for the destination storage devices or local disk directory, refer to 2.6.1 or 2.6.5 in the Setup Guide.

**When starting on the [PAST > Past List] screen**

Click the target Exam in the Study List.

To select all studies.

Click to select all studies.

[PAST > Past List] screen

*To select multiple studies*

Follow step 2 in 5.3, but do not click at the start of the operation.

1 **Show the Output Settings dialog box.**

Click .

2 **Enable preset external storage devices or a local disk directory.**

Select the Storage/Disk Storage name check box(es) for the Storage/Disk Storage option. To cancel image data transfer to storage devices, clear the check boxes in the Storage and Disk Storage options.
3 Start data transfer.

In the [EXAM > Examination] screen:
Click [OK] to transfer the images in the current Exam.

In the [PAST > Past List] screen:
Click [Send Exam] to transfer the images in the selected Exam.

In the [PAST > View] screen:
Click [Send Image] to transfer the current image or click
[Send Exam] to transfer the images in the current Exam.
7.3 Using the Image Processing dialog box (Levels 2 and 3)

The following selections and controls available in levels 2 and 3 mode select and adjust imaging parameters for advanced image processing.

NOTE: In general, users do not need to use controls in level 3 mode.

If the Image Processing dialog box does not appear

Click [ImageProc]. To hide the dialog box, click it again.

7.3.1 Switching access levels

Selection [3] of the access level selector/indicator is available only in level 2 mode.

If the Authorization dialog box appears

To perform restricted image processing, enter a user name with image processing privilege and password, and then click [OK]. For the image processing privilege, refer to 2.2 in the Setup Guide.
1 **Enter level 2 mode.**

   Click [2] of the access level selector/indicator.

2 **Enter level 3 mode.**

   Click [3] of the access level selector/indicator.

   **To save changes in the parameter settings for the current protocol**

   Click [Save as Default] in level 3 mode. In addition to the parameter changes made using the Image Processing dialog box, those of the toolbar will also be saved.
7.3.2 Automatically processing images by specific anatomical part (Anatomical Part control)

This control is available only in level 3 mode. A set of processing parameters optimized for certain anatomical parts and their orientations can be applied to an image for automatic and efficient processing.

1. **Narrow down the Anatomical Part options.**
   
   Click on the Category drop-down arrow, and select an option from the list.

2. **Specify the target Anatomical Part and Direction options.**
   
   Click on the Anatomical Part and Direction drop-down arrow, and select an option from each list.
7.3.3 Adjusting the brightness gradation of the overall image (LUT control)

The Curve Shape, Brightness Adjustment mode, REX, Base Brightness, and Base Contrast selectors/controls are available only in level 3 mode.

1. Select a preset LUT curve.

   Click on the Curve Shape drop-down arrow, and select an option from the list.

   **SA:** This s-shaped curve has characteristics of standard radiographic films.

   **SB:** This s-shaped curve enhances the contrast in bright regions compared to SA.

   **SC:** This s-shaped curve enhances the contrast in dark regions compared to SA.

   **LN:** This linear shaped LUT applies a set contrast gain evenly over the overall image.
2 Select Brightness Adjustment mode.

Click on the Brightness Adjustment drop-down arrow, and select a mode from the list.

**Auto:** Mode for automatic tone curve adjustment, for uniform brightness in the region of examination regardless of X-ray dose

**REX:** Mode for tone curve adjustment to change brightness of the region of examination based on X-ray dose

*When the REX option is selected*

Click the REX control text box and type a value. [+] and [-] can be used for the value specification.

The higher the value, the brighter the image.

The lower the value, the darker the image.

3 Adjust the Base Brightness.

Rotate the scroll wheel on the mouse or click the arrows of the Base Brightness control.

To increase, move the slider to the right.

To decrease, move the slider to the left.

*NOTE:* These adjustments are not available when the REX option is selected for Brightness Adjustment mode (see 7.3.3).

4 Adjust the Base Contrast.

Rotate the scroll wheel on the mouse or click the arrows of the Base Contrast control.

To increase, move the slider to the right.

To decrease, move the slider to the left.

*NOTE:* The value of Base Brightness and Base Contrast are used as a reference value for the Brightness control and Contrast control (see 6.2.2).
7.3.4 Enhancing contrast for anatomical part shape definition (Enhancement control)

This control is available only in level 2 and 3 modes, with Auto mode selected for the LUT control.

Adjust the amount of enhancement.

Select the Edge Enhancement check box to enable this control, and then rotate the scroll wheel on the mouse or click the arrows. To increase, move the slider to the right. To decrease, move the slider to the left.

To disable edge enhancement control mode and cancel the effect

Clear the Edge Enhancement check box. The on/off setting of the Edge Frequency control and the Contrast Boost control (see the following steps) are subject to that of this control.
2 Specify parts rendered with higher spatial frequency to be enhanced.

Rotate the scroll wheel on the mouse or click the arrows of the Edge Frequency control.
To increase reference spatial frequency, move the slider to the right. (Applicable for vessel and trabecula imaging)
To decrease reference spatial frequency, move the slider to the left. (Applicable for organ and bone imaging)

3 Adjust the amount of enhancement applied to parts rendered with lower spatial frequency.

Rotate the scroll wheel on the mouse or click the arrows of the Contrast Boost control.
To increase, move the slider to the right. (Applicable for trunk imaging)
To decrease, move the slider to the left. (Applicable for extremity and cephalic imaging)
7.3.5 Expanding or narrowing the brightness range (Dynamic Range Adjustment control)

This control is available only in level 2 and 3 modes, with Auto mode selected for the LUT control.

1 Adjust the dynamic range in the dark region.

Select the Dark Region check box to enable this control, and then rotate the scroll wheel on the mouse or click the arrows.
To narrow, move the slider to the right.
To expand, move the slider to the left.

To disable dark region control mode and cancel the effect
Clear the Dark Region check box.

2 Adjust the dynamic range in the bright region.

Select the Bright Region check box to enable this control, and then rotate the scroll wheel on the mouse or click the arrows.
To narrow, move the slider to the right.
To expand, move the slider to the left.
To disable bright region control mode and cancel the effect

Clear the Bright Region check box.

7.3.6 Reducing noise in images (Noise Reduction control)

This control is available only in level 2 and 3 modes, with Auto mode selected for the LUT control.

1. Adjust the power of noise reduction.

Select the Effect check box to enable this control, and then rotate the scroll wheel on the mouse or click the arrows.
To increase, move the slider to the right.
To decrease, move the slider to the left.

To disable noise reduction control mode and cancel the effect

Clear the Effect check box.
7.3.7 Reducing grid lines (Grid Suppression control)

This control is available only in level 3 mode.

1 Enable grid line suppression mode.

Select the Grid Suppression check box.

Grid Name selector

When the grid in use is different from the one specified for the current protocol, select the name of the grid in use from the drop-down list. Also refer to 3.4.1 in the Setup Guide for details on the Protocol Workspace Settings option.

To disable grid line suppression mode and cancel the effect

Clear the Grid Suppression check box. Some details of the image may be restored.
7.3.8 Adjusting the image sharpness (Sharpness Adjustment control)

This control is available only in level 3. This control increases the sharpness of an entire image for an effective diagnosis.

1. Adjust the sharpness of the image.

   Select the Effect check box, and then rotate the scroll wheel on the mouse or click the arrows.
   To increase sharpness, move the slider to the right.

To disable sharpness adjustment control mode and cancel the effect

   Clear the Effect check box.
7.3.9 Masking the outside of the irradiation field (Peripheral Mask control)

This control is available only in level 3 mode. This control switches on and off the mask processing applied to images in the [EXAM > Examination] screen immediately after every exposure. [Mask] in the toolbar can temporarily switch the setting as well (see 6.1.7).

Enable the mask processing.

Select the Mask check box. Mask processing is enabled.

To disable peripheral mask processing

Clear the Mask check box. Mask processing is disabled.

NOTE: Even if this setting is changed after exposure, mask processing applied to captured images cannot be canceled.
8 Stitching images
(Long-length imaging)

8.1 What is long-length imaging?
8.2 Capturing and stitching images
8.3 Realigning, modifying, and stitching partial images
This chapter explains how to create a long-length image that shows the entire spine or the entire lower extremities (full spine or full leg) in a single image by stitching together two or more original images. Automatic image alignment and other manual adjustment features are also explained.

Workflow

8.2 Capturing and stitching images

8.3.2 Modifying stitched images

Arranging images on film sheets to print out (see 7.1)
8.3.1 Aligning captured partial images
8.1 What is long-length imaging?

The long-length imaging feature generates image such as full spine and full leg images. These images are used to diagnose scoliosis or knee osteoarthritis - genu varum and genu valgum, and to measure the Cobb angle or the angle that the upper and lower legs make.

The software automatically aligns captured (partial) images to stitch and generate a long-length image, while fine adjustments can be made using the manual controls. As an example, a diagnosis of scoliosis is used in the following explanations.

**NOTE:** The long-length feature accommodates only X-ray generators whose X-ray tubes rotate or tilt for serial radiography. If the detector and the X-ray tube move along parallel paths during long-length imaging, the quality of the generated image may deteriorate, resulting in the necessity of an additional examination.

**NOTE:** Be sure to capture images from top to bottom or bottom to top (keeping the same direction during an examination), with each image in portrait orientation. This imaging can be performed for a patient in the recumbent or upright position.

**NOTE:** Be sure to use 3 to 5 mm diameter small metal balls as stitching markers. Markers other than the specified ones cannot be detected in long-length imaging.

**Stitching protocol**

A protocol in which long-length images can be generated by stitching captured partial images. Up to four partial images can be stitched during a single examination.
8.2 Capturing and stitching images

A previous review of chapters 3 and 4 for details on DX protocol selection and examination procedures is recommended to better understand the stitching protocol examination workflow.

When the system is not linked to a large RIS/HIS network, be sure to manually create a necessary study order (see 3.3) to start an examination.

NOTE: This section explains an examination method that uses stitch markers for image alignment. For details, refer to 2.3.1 in the Setup Guide.

1 Select a target study order that includes a stitching protocol.

[EXAM > Worklist] screen
To add a stitching protocol to the current study order

Click [Edit Exam] on the [EXAM > Worklist] screen to show the Edit Exam screen, and then click the category tab that includes stitching protocols for selection. For details on the Edit Exam screen, see 3.1.5 through 3.2.2.

2 Start the examination.

Click [Start Exam].
3 Select the target stitching protocol.

Confirm that the Waiting... indicator changes to Ready in the system status bar and that a ready thumbnail appears in the target protocol.

![System status bar and ready thumbnail](image)

**NOTE:** If the indications on both the system status bar and the protocol do not automatically change to Ready status, click to select the target protocol.

**NOTE:** Depending on the X-ray generator, the preset number of partial images can be reduced from the X-ray generator side.

4 Arrange the patient in the correct posture.

Arrange the patient so that the stitch markers are positioned appropriately within the area to be irradiated and instruct the patient not to move during the examination.
5 Perform exposure.

Press and release the exposure switch on the X-ray generator. The Ready indicator changes to Capturing, and then to Not Ready in the system status bar. After processing is complete, a preview image appears in the image view pane, and the next ready thumbnail is automatically highlighted.

NOTE: The number of partial images required for a long-length image is preset for each stitching protocol within a range of two to four.

6 Continue the long-length imaging examination.

Repeat steps 3 and 5 quickly, instructing the patient to maintain the posture.
To recapture partial images

Click [Retake]. A duplication of the original protocol appears next to the rejected protocol, which is marked with a red X (see 4.3).

NOTE: The partial images of the rejected protocol cannot be used for the duplicated protocol.

When [Retake] is clicked after the first capture

To reject partial images

Click [Reject]. The rejected protocol is marked with a red X (see 4.4).

NOTE: The partial images of the rejected protocol cannot be used for the resumed protocol.

To suspend an examination

Be sure to capture all the necessary partial images, and then click [Suspend Exam] (see 4.5).

NOTE: Further image capturing is not available for the suspended protocol.

NOTE: Depending on the X-ray generator, if two or more images have already been captured, the examination can be ended from the X-ray generator side.
7 Check the automatically aligned images.

Check that the pair of stitch markers for overlapped images are matched fully on the Stitch screen. For details, see 8.3.1.

NOTE: If stitch marker detection fails, an error message and images with the corresponding markers not matched appear. In such cases, manually align the partial images. For details on manual alignment, see 8.3.1.

When the last required partial image is captured (Automatic alignment feature)

Partial images automatically aligned based on the detected stitch markers appear in the Stitch screen. If necessary, this feature can be canceled. For details, refer to 2.3.1 in the Setup Guide.

To combine the captured partial images manually

Even if all the necessary partial images are not captured, image combining can be started. Click [Stitch] after two or more images are captured. Images automatically aligned based on the detected stitch markers appear in the Stitch screen.

NOTE: If [Stitch] is clicked before capturing all the necessary partial images, further image capturing is not available.

To stitch images of the suspended stitching protocol

Select the target suspended stitching protocol in the [EXAM > Worklist] screen (or [EXAM > Pending List] screen if HIS/RIS interoperability services are not used), and then click [Start Exam]. Click the target stitching protocol in the [EXAM > Examination] screen, and then click [Stitch]. For details, see 8.3.1.
8 **End the stitching protocol.**

Click [OK]. The [EXAM > Examination] screen returns and a stitched image preview thumbnail appears in the stitching protocol. If necessary, repeat steps 3 through 7 to perform the remaining protocols.

---

**To post-process long-length images**

For details, see “6 Post-Processing Images.” See also 6.3.3 for the Cobb angle measurement and 6.3.4 for the height difference measurement.

---

9 **End the examination.**

Click [End Exam]. The image data will be transferred to a preset destination such as a printer (refer to 2.6 in the Setup Guide).
8.3 Realigning, modifying, and stitching partial images

The following procedures (available after partial image capture or after stitching) are performed in the dedicated Stitch screen.

8.3.1 Aligning captured partial images

When the last required partial image is captured, the Stitch screen automatically appears so that the resulting long-length image can be checked (see step 7 in 8.2). If partial image alignment is not successfully realized, realign the images manually. Image cropping and rotating features are available for perfect alignment.

1 Check the automatically aligned images.

Check that the pair of stitch markers for overlapped images are fully matched.

To scale the image in the preview pane

Click [Fit in pane], and then click on the area where close observation is required.

Click [Maximum magnification], and then click on the area where close observation is required.

Click [Zoom in], and then click on the preview pane to zoom out.

Click [Zoom out], to fit the image to the preview pane.

2 Select a target partial image for an arrangement.

Click a target partial image. Small squares appear at the image corners.
To select two or more partial images

Shift-click partial images one by one. To clear a selected image, shift-click it again.

To clear all image selection

Click on a blank space in the preview pane.

3 Arrange the selected partial image.

Drag a partial image to overlap the stitch markers.

To adjust the position properly

While the image is selected, click cursor buttons. Each click corresponds to a pixel move in the cursor button direction.

To reproduce an automatic partial images alignment

Click [Auto]. The auto alignment feature is effective only when the stitch markers are successfully detected.
To crop a partial image

Click the target partial image to select it, and then click [Select]. The image edges change to green.
Click [Select] to show the handles on the edges, drag the handles in turn to crop the image, and then click [OK] to enter the change.

To rotate a partial image 90 degrees

Click the target partial image, and then click [Select] or [OK]. Each time the buttons are clicked, the partial image rotates clockwise or counterclockwise 90 degrees.
To freely rotate a partial image

Click , then click on the target partial image to specify a pivot point, and drag on the image preview pane to rotate the image while viewing it.

To enhance the edge for an image aligning aid

Rotate the mouse wheel on the Edge Enhancement control or click the arrow on the control.
To increase, move the slider to the right.
To decrease, move the slider to the left.

NOTE: The changes for edge enhancement are valid only on the Stitch screen and cannot be saved for a long-length image.

4 Close the Stitch screen.

Click [OK] to save the changes and generate the stitched image.

NOTE: When [Cancel] is clicked to close the Stitch screen, images cannot be stitched.
8.3.2 Modifying stitched images

Partial images for an already stitched long-length image can be aligned again on the Stitch screen to generate a new image.

1 Show an image.

See steps 1 through 3 in 5.2 for details on operation.
2 Show the target stitching image on the Stitch screen.

Click [Stitch] in the target protocol. For details on operations on the screen, see 8.3.1.

When two or more completed protocols are shown in the study information pane

Click the preview thumbnail of the target protocol, and then click [Stitch].

3 Close the Stitch screen.

Click [OK] to save the changes for the stitched image.

NOTE: When [Cancel] is clicked to close the Stitch screen, images cannot be stitched.
9 Troubleshooting Remedies

9.1 Confirming details of the problem
9 Troubleshooting Remedies

If the error persists

If you encounter an error that is not described in this chapter, or if an error persists after trying the measures described in this chapter, contact your service engineer.

Before making your inquiry, make a note of the error type, error code, and other details referring to the error dialog described below or the Log Viewer screen (refer to 3.2 in the Setup Guide).

9.1 Confirming details of the problem

If an error occurs, (error button) or (warning button) will appear at the top of the screen.

If appears, click it to show the error dialog box. Search for a solution in the error and warning lists by error type, error code, and description.

NOTE: Usually, appears accompanied with an error dialog box, except in cases where an examination is in progress. If only appears, click it to show the error dialog box after the examination is ended.

If the error persists

If you encounter an error that is not described in this chapter, or if an error persists after trying the measures described in this chapter, contact your service engineer.

Before making your inquiry, make a note of the error type, error code, and other details referring to the error dialog described below or the Log Viewer screen (refer to 3.2 in the Setup Guide).

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<table>
<thead>
<tr>
<th>Button</th>
<th>Error type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FATAL (see 9.1.1)</td>
</tr>
<tr>
<td></td>
<td>ERROR (see 9.1.2)</td>
</tr>
<tr>
<td></td>
<td>WARNING (see 9.1.3)</td>
</tr>
</tbody>
</table>
9.1.1 Fatal error list

F030100005

Required COM+ servers are not installed. Contact a service engineer.

➞ Inform a service engineer of the error code. Click [OK] to close the dialog box, and then shut down the Software (see 2.2).

F03020200E

Memory allocation failed. Restart the system. If the problem is not resolved after restarting, contact a service engineer.

F03020201B

Failed to upload calibration data. Restart the system. If the problem is not resolved after restarting, contact a service engineer.

F03020201C

Failed to transfer the image data. Restart the system. If the problem is not resolved after restarting, contact a service engineer.

F03020201F

A detector error occurred. Restart the system. If the problem is not resolved after restarting, contact a service engineer.

➞ Click [OK] to close the dialog box, and then shut down and restart the Software (see 2.2 and step 2 in 2.1). If this error occurs again, inform a service engineer of the error code.

F030202021

The control software/controller is not compatible with the current detector firmware. Update the control software/controller firmware.

F030202022

The Jumbo packet settings are incorrect or a network card not compatible with Jumbo packet is used. Contact a service engineer.

F030202023

The detector firmware may have been updated after registration of the detector. Register the detector again.

➞ Inform a service engineer of the error code. Click [OK] to close the dialog box, and then shut down the Software (see 2.2).

F03020FFFF

An internal error occurred. Restart the system. If the problem is not resolved after restarting, contact a service engineer.

➞ Click [OK] to close the dialog box, and then shut down and restart the Software (see 2.2 and step 2 in 2.1). If this error occurs again, inform a service engineer of the error code.
F040300048

The control software/controller is not compatible with the current detector firmware. Update the control software/controller firmware.

F040300049

The detector firmware may have been updated after registration of the detector. Register the detector again.

F040300050

The Jumbo packet settings are incorrect or a network card not compatible with Jumbo packet is used. Contact a service engineer.

Inform a service engineer of the error code.

Click [OK] to close the dialog box, and then shut down the Software (see 2.2).

F040400003

Failed to acquire the system settings. Restart the system. If the problem is not resolved after restarting, contact a service engineer.

Inform a service engineer of the error code.

Click [OK] to close the dialog box, and then shut down and restart the Software (see 2.2 and step 2 in 2.1).

If this error occurs again, inform a service engineer of the error code.

F040700100

The system memory settings are invalid. Check the setting information.

Inform a service engineer of the error code.

Click [OK] to close the dialog box, and then shut down the Software (see 2.2).

F050502009

A detector communication error occurred. Restart the system. If the problem is not resolved after restarting, contact a service engineer.

Inform a service engineer of the error code.

Click [OK] to close the dialog box, and then shut down and restart the Software (see 2.2 and step 2 in 2.1).

If this error occurs again, inform a service engineer of the error code.
9.1.2 Error list

**E020201003**

Detector cannot be used because the battery has lost its charge. Charge the detector battery.

→ Click [OK] to close the dialog box and charge the battery of the wireless detector. Or, if the optional wired connection is available, switch to the connection. For the wireless detector, refer to the Digital Radiography CXDI series User's Manual.

**E020201004**

Unexpected error has occurred. Gamma adjustment is not available. Restart the system. If the problem is not resolved after restarting, contact a service engineer.

→ Click [OK] to close the dialog box, and then shut down the Software (see 2.2). Then restart the Software (see 2.1) and perform gamma adjustment (refer to 2.3.2 in the Setup Guide). If this error occurs again, inform a service engineer of the error code.

**E020201005**

Failed to connect to the barcode reader. Check that the barcode reader cable is connected properly and restart the system. If the problem is not resolved after restarting, contact a service engineer.

→ Click [OK] to close the dialog box, and check that the barcode reader is connected properly. Then shut down (see 2.2) and restart the Software (see 2.1). If this error occurs again, inform a service engineer of the error code.

**E020201006**

Cannot start specified examination. Return to the Exam screen and retry the failed examination.

→ Click [OK] to close the dialog box and retry the previous operation on the [EXAM > Worklist] screen or the [EXAM > Manual] screen. If this error occurs again, inform a service engineer of the error code.

**E020201007**

A detector communication error occurred. Please retake this protocol. If the problem is not resolved, contact a service engineer.

→ Click [OK] to close the dialog box and retry the examination for the same protocol. If this error occurs again, inform a service engineer of the error code.
9 Troubleshooting Remedies

**E020201008**

The detector temperature has reached dangerous levels. Images cannot be captured until the temperature has dropped.

→ Suspend the examination (see 4.5) and wait until the temperature decreases. Then restart the suspended study order.

**E020201009**

Failed to start up the OverwrapSoftware. Restart the system. If the problem is not resolved after restarting, contact a service engineer.

→ Inform a service engineer of the error code. Click [OK] to close the dialog box, and then shut down the Software (see 2.2).

**E030100001**

No calibration data. Perform calibration in the QC Tool.

→ Click [QC Tool] on the system setup screen, and perform calibration for the target workspace (refer to 3.5.1 in the Setup Guide).

**E030201002**

Periodic noise detected in acquisition data. The grid must be removed in calibration.

→ Click [OK] to close the dialog box. Remove the grid from the detector, and then calibrate the detector (refer to 3.5.1 in the Setup Guide).

**E030201003**

The cooling unit has been attached or detached. Processing was halted.

→ Click [OK] to close the dialog box and retry the examination. If this error occurs again, inform a service engineer of the error code.

**E030201005**

Generator is disconnected. Enable the generator connection with [Connect GEN] on the system setup screen. Restart the system if the generator connection has failed. If the problem is not resolved after restarting, contact a service engineer.

→ Click [Connect GEN] on the system setup screen (refer to 2.1.1 in the Setup Guide). If the connection with the X-ray generator device continues to be disabled, shut down and restart the Software (see 2.2 and step 2 in 2.1). If this error occurs again, inform a service engineer of the error code.
E030201007
Failed to enter the image capture ready condition. Restart the system. If the problem is not resolved after restarting, contact a service engineer.
→ Exit the QC Tool mode and click [Connect GEN] on the system setup screen (refer to 2.1.1 in the Setup Guide). If the connection with the X-ray generator device continues to be disabled, shut down and restart the Software (see 2.2 and step 2 in 2.1). If this error occurs again, inform a service engineer of the error code.

E030201008
Detector cannot be used because the battery has lost its charge. Processing was halted.
→ Click [OK] to close the dialog box and suspend the examination (see 4.5). Then charge the battery of the wireless detector and restart the suspended study order. For the wireless detector, refer to the Digital Radiography CXDI series User’s Manual.

E030201009
The detector temperature has reached dangerous levels. Processing was halted.
→ Suspend the examination (see 4.5) and wait until the temperature decreases. Then restart the suspended study order.

E030201010
No battery is attached to the detector. Attach the battery.
→ Click [OK] to close the dialog box and attach the battery pack to the detector.

E040100008
An invalid detector has been specified. Check the setting information. If the problem is not resolved, contact a service engineer.
→ Click [OK] to close the dialog box and retry the previous operation. If this error occurs again, inform a service engineer of the error code.

E040100023
Generator communication failed. Enable the generator connection with [Connect GEN] on the system setup screen. Restart the system if the generator connection has failed.
→ Click [OK] to close the dialog box, and then click [Connect GEN] (refer to 2.1.1 in the Setup Guide). If the generator is not connected, shut down and restart the Software (see 2.2 and step 2 in 2.1). If this error occurs again, inform a service engineer of the error code.
**E040100053**

The detector issued an error. Try again. If the problem is not resolved, contact a service engineer.

→ When using a wireless detector, show Additional Information to check the Error Code number (detector error code) to be shown and then click [OK] to close the dialog box. Refer to the “Troubleshooting” in the “User’s Manual” of the Digital Radiography and check the operation corresponding to the Error Code number. Perform the operation and retry the examination. If this error occurs again, inform a service engineer of the error code.

When using a detector other than wireless detector, click [OK] to close the dialog box and retry the previous operation. If this error occurs again, show Additional Information to check the Error Code number (detector error code) to be shown and then inform a service engineer of the error code.

---

**E040100054**

The detector issued a fatal error. Restart the system. If the problem is not resolved after restarting, contact a service engineer.

→ Click [OK] to close the dialog box, and then shut down the Software (see 2.2). Then restart the Software (see 2.1) and perform the previous operation. (However, users can continue examinations without restarting the Software by switching to another available detector.) If this error occurs again, inform a service engineer of the error code.

---

**E040100056**

Generator is disconnected. Enable the generator connection with [Connect GEN] on the system setup screen. Restart the system if the generator connection has failed. If the problem is not resolved after restarting, contact a service engineer.

→ Click [OK] to close the dialog box, and then click [Connect GEN] (refer to 2.1.1 in the Setup Guide). If the generator is not connected, shut down and restart the Software (see 2.2 and step 2 in 2.1). If this error occurs again, inform a service engineer of the error code.

---

**E040500003**

Exceeded the maximum number of the study order acquisitions. If you want to change the number of maximum study order acquisitions, contact a service engineer.

→ Click [OK] to close the dialog box. When the target study orders have been acquired, start the examination. Otherwise, acquire the target order by narrowing down the study orders using [Refresh Option] (see 3.1.1). To change the maximum number of orders that can be listed, contact a service engineer.
**E040500004**

Invalid studies contained in the acquired data are not displayed. Check the data identical to the acquired ones on the RIS database, etc.

→ Show Additional Information to check the number of the invalid orders and then click [OK] to close the dialog box.
Check the study orders that failed to be shown. The Patient ID and Study Instance UID of the orders may be invalid. In that case, correct the study order information and retry the acquisition (see 3.1.1). If this error occurs again, inform a service engineer of the error code.

**E040500005**

Invalid values in the received tag have been replaced with blanks. Check the data identical to the acquired ones on the RIS database, etc.

→ Show Additional Information to check the study orders that failed to be shown and then click [OK] to close the dialog box. Correct the study order information and retry the data acquisition (see 3.1.1). If this error occurs again, inform a service engineer of the error code.

**E040500006**

Received data includes characters that do not exist in the CXDI system's character set. The characters may not be displayed correctly. If the problem is not resolved, contact a service engineer.

→ Click [OK] to close the dialog box.
Supplementary Chinese characters contained in the acquired study order were replaced with “?.”
Do not use the supplementary Chinese characters for study order creation on RIS database for this control software does not support these characters.

**E040500008**

A date entry before 1753 is included in the acquired Exam. Check the date.

→ Check the data information and retry a data entry.

**E04050000C**

Failed to read DICOMDIR file. Check the target disk and retry reading.

→ Click [OK] to close the dialog box. Check the removable disk and read the files again. If this error occurs again, files in the DICOMDIR directory may be corrupted. Check the original files.
**E04050000D**

A transmission error occurred. Locate the failed study in the [PAST > Past List] and retransmit the study.

→ Resend the image from the [PAST > View] or [PAST > Past List] screen (see 7.2) and delete the data transmission error log from the Process Viewer (refer to 3.3 in the Setup Guide).

---

**E040501011**

Cannot continue the processing because a file already exists at the specified storage destination. Check the setting information.

→ Click [OK] to close the dialog box, and then check the storage directory on the Disk Storage tab (refer to 2.6.5 in the Setup Guide). Delete all files in the specified folder, or change the directory. Then retry the previous operation.

---

**E040501012**

Cannot continue the processing because access to the specified storage destination was denied. Check the setting information.

→ Click [OK] to close the dialog box, right-click the destination folder, select Property > Security tab, change the access privileges, and then retry the operation from the start. If the destination folder cannot be identified, consult the system administrator. If this error occurs again, inform a service engineer of the error code.

---

**E040501013**

Cannot continue the processing because there is not enough space at the specified storage destination. Check the setting information.

→ Change the destination folder. Or ensure enough HDD's free space and retry the operation.

---

**E040501014**

DICOM GSPS output was halted because the object image transfer was incomplete. Try again after object image transfer.

→ Click [OK] to close the dialog box.

Select the halted transmission task, and then click [Retry] on the process viewer to retry the task (refer to 3.3 in the Setup Guide).

If the above remedy does not work, try to reconfigure the Storage tab settings (refer to 2.6.1 in the Setup Guide), and manually try to transmit the image starting on the [PAST > View] screen (see 7.2.2).
**E040501016**

Data communication between the hospital network was interrupted during file transmission. Check the setting information.

→ Click [OK] to close the dialog box, and then check that the destination server and the network are functioning normally.

---

**E040501017**

The CXDI system read an unsupported DICOMDIR file. Check the target disk and retry reading.

→ Check that the DICOMDIR file in the disk storage was made only with the Software and retry the previous operation.

---

**E040501018**

A transmission error occurred. Try again. If the problem is not resolved, contact a service engineer.

→ Click [OK] to close the dialog box, and then retry the data transmission from the Process Viewer (refer to 3.3 in the Setup Guide). Or resend the image from the [PAST > View] or [PAST > Past List] screen (see 7.2). If this error occurs again, inform a service engineer of the error code.

---

**E040502002-040502004**
**E04050200D-04050200F**
**E040502010-040502014**

Association negotiation failed. There may be a problem in the settings of the system or that of the other communication party. Check the setting information.

---

**E04050201B-E040502020**

Association was stopped. There may be a problem in the settings of the system or that of the other communication party. Check the setting information.

---

**E040502021**
**E040502023**
**E040502058**

Association negotiation failed. There may be a problem in the settings of the system or that of the other communication party. Check the setting information.

→ Click [OK] to close the dialog box and check the properties of Host Name, Port or Called AE Title on the Connection tab screens (refer to 2.6 in the Setup Guide).

Check that destination server and the network are functioning normally. If the problem cannot be resolved, contact the system administrator. The problem may be resolved by checking the destination server or the DICOM conformance statement. If this error occurs again, inform a service engineer of the error code.
An error occurred in DICOM communication. Try again. If the problem is not resolved, contact a service engineer.

→ Click [OK] to close the dialog box. Click [Refresh] to acquire the study orders (see 3.1.1).

If the problem cannot be resolved, contact the system administrator.
The problem may be resolved by checking the destination server or the DICOM conformance statement.
If this error occurs again, inform a service engineer of the error code.

A response error occurred in DICOM communication. Check the destination modality or server, etc.

→ Click [OK] to close the dialog box, and then contact the system administrator.
The problem may be resolved by checking the destination server or the DICOM conformance statement.
If this error occurs again, inform a service engineer of the error code.

An error occurred in DICOM communication. Try again. If the problem is not resolved, contact a service engineer.

→ Click [OK] to close the dialog box. Click [Refresh] to acquire the study orders (see 3.1.1).

If the problem cannot be resolved, contact the system administrator.
The problem may be resolved by checking the destination server or the DICOM conformance statement.
If this error occurs again, inform a service engineer of the error code.

A response error occurred in DICOM communication. Check the destination modality or server, etc.

→ Click [OK] to close the dialog box, and then contact the system administrator.
The problem may be resolved by checking the destination server or the DICOM conformance statement.
If this error occurs again, inform a service engineer of the error code.
**E04050501B**

An error occurred in DICOM communication. Try again. If the problem is not resolved, contact a service engineer.

→ Click [OK] to close the dialog box. Click [Refresh] to acquire the study orders (see 3.1.1).
If the problem cannot be resolved, contact the system administrator.
The problem may be resolved by checking the destination server or the DICOM conformance statement.
If this error occurs again, inform a service engineer of the error code.

**E04050501F**

An error occurred in DICOM communication. Contact the system administrator.

**E040505020**

A response error occurred in DICOM communication. Check the destination modality or server, etc.

**E040505027**

An error occurred in the DICOM printer output. Contact the system administrator.

→ Click [OK] to close the dialog box, and then contact the system administrator.
The problem may be resolved by checking the destination server or the DICOM conformance statement.
If this error occurs again, inform a service engineer of the error code.

**E040505028**

An error occurred in the DICOM printer output. Try again later.

→ Click [OK] to close the dialog box, and retry the data transmission from the Process Viewer (refer to 3.3 in the Setup Guide).
If the problem cannot be resolved, contact the system administrator. The problem may be resolved by checking the DICOM conformance statement. If this error occurs again, inform a service engineer of the error code.

**E040505029**
**E04050502A**
**E04050502E**

An error occurred in the DICOM printer output. Contact the system administrator.

→ Click [OK] to close the dialog box, and then contact the system administrator.
The problem may be resolved by checking the destination server or the DICOM conformance statement.
If this error occurs again, inform a service engineer of the error code.
**E04050502C  E04050502F**

An error occurred in the DICOM printer output. Try again later.

→ Click [OK] to close the dialog box, and then retry the data transmission from the Process Viewer (refer to 3.3 in the Setup Guide).

If the problem cannot be resolved, contact the system administrator. The problem may be resolved by checking the DICOM conformance statement. If this error occurs again, inform a service engineer of the error code.

**E040506001**

The transmission was interrupted as the CXDI system received a FAILURE status from the destination DICOM printer. Check the DICOM printer.

→ Check the DICOM printer. For details of Printer Status, refer to Annex C.13.9.1 in the DICOM standard Part3: Information Object Definitions or the DICOM conformance statement.

**E040507001**

DICOM StorageCommitment failed. Try again. If the problem is not resolved, contact a service engineer.

→ Click [OK] to close the dialog box, and then retry the data transmission from the Process Viewer (refer to 3.3 in the Setup Guide). Or resend the image from the [PAST > View] or [PAST > Past List] screen (see 7.2).

If this error occurs again, inform a service engineer of the error code.

**E040507002-040507005**

DICOM StorageCommitment failed. If the problem is not resolved, contact a service engineer.

→ Click [OK] to close the dialog box, and then retry sending the image from the [PAST > View] or [PAST > Past List] screen (see 7.2).

If this error occurs again, inform a service engineer of the error code.

**E040507006**

DICOM StorageCommitment failed. Try again. If the problem is not resolved, contact a service engineer.

→ Click [OK] to close the dialog box, and then retry the data transmission from the Process Viewer (refer to 3.3 in the Setup Guide). Or resend the image from the [PAST > View] or [PAST > Past List] screen (see 7.2).

If this error occurs again, inform a service engineer of the error code.
**E040507007**

**DICOM StorageCommitment failed. If the problem is not resolved, contact a service engineer.**

→ Click [OK] to close the dialog box, and then retry the data transmission from the Process Viewer (refer to 3.3 in the Setup Guide). Or resend the image from the [PAST > View] or [PAST > Past List] screen (see 7.2). If this error occurs again, inform a service engineer of the error code.

---

**E040600008**

**Failed to access the target disk. Check the disk drive and retry from the Process Viewer.**

→ Check that the destination storage disk or device is functioning normally. Then, retry the data transmission from the Process Viewer (refer to 3.3 in the Setup Guide).

---

**E040600009**

**The process was interrupted as there was not enough free disk space. Replace the disk with a new one and retry from the Process Viewer. If recording is in progress, wait until the process is completed and replace the disk.**

→ Exchange the current disk with one containing sufficient free space. Then, retry the data transmission from the Process Viewer (refer to 3.3 in the Setup Guide).

---

**E04060000B**

**Cannot retry the process as an error occurred. Delete the failed process in the process viewer, locate the process in the [PAST > Past List], and then retransmit the process.**

→ Click [OK] to close the dialog box, and then delete the data transmission error log from the Process Viewer (refer to 3.3 in the Setup Guide). Then, resend the image from the [PAST > View] or [PAST > Past List] screen (see 7.2). If this error occurs again, inform a service engineer of the error code.

---

**E040700006**

**Failed to load the image file. If the problem is not resolved, contact a service engineer.**

→ Click [OK] to close the dialog box, and then retry the previous operation.
E040800100

Cannot start the examination as an invalid protocol exists in the study. Delete the invalid protocol and retry the examination.

→ Click the suspended examination including the target protocol in [EXAM > Worklist] and then [Edit Exam] to delete it (see 3.1.5).

E040D00001F

Failed to free up the hard disk. If the problem is not resolved after restarting, contact a service engineer.

→ Deselect the Protect Image check box of the study order in the [PAST > Past List] (see 3.1.3). Then click the examination to delete the data transmission error log or resend the image from the Process Viewer (refer to 3.3 in the Setup Guide). If this error occurs again, inform a service engineer of the error code.

E040E01000

Image analysis processing failed. Adjust the image processing parameters manually.

→ If the brightness of selected area is not appropriate, click [ROI] to specify the target area (see 6.1.5).

If the selected area is not cropped appropriately, click  to specify the target area (see 6.1.6).

If the selected area is not masked appropriately, click [Mask] to specify the target area (see 6.1.7).

E040E01001

Failed to load the extra defect correction file. If the problem is not resolved, contact a service engineer.

→ Click [OK] to close the dialog box, and then perform calibration (refer to 3.5.1 in the Setup Guide). If this occurs again, inform a service engineer of the error code.

E041000004

Invalid studies are acquired. Check the examination file.

→ Check if the study order is valid. Acquire the study order again from the HIS/RIS database.

E041000005

Entered information has invalid value. Invalid values are replaced with blanks. Check the examination file.

→ Check if the study order is valid. Acquire the study order again from the HIS/RIS database.
**E041000006***

Specified ID is not found in the examination file. Check the examination file.

→ Check if the study order is valid. Acquire the study order again from the HIS/RIS database.

---

**E041000008***

An error was discovered while checking the user input by the script. If the problem is not resolved, contact a service engineer.

→ Inform a service engineer of the error code.

---

**E041000010***

An error has occurred in CCRHIS library. Try again. If the problem is not resolved, contact a service engineer.

→ Show Additional Information to check the error details and click [OK] to close the dialog box. Then retry the previous operation depending on the error details. If this error occurs again, inform a service engineer of the error code.

---

**E041100004***

Failed to start up CxdlInfo. Check the setting information.

→ Inform a service engineer of the error code.

---

**E050501006***

The internal temperature of the detector exceeds the upper limit. Images cannot be captured until the temperature has dropped.

→ Suspend the examination (see 4.5) and wait until the temperature decreases. Then restart the suspended study order.

---

**E050501008**

**E050501009**

A drive circuit error occurred. Contact a service engineer.

---

**E05050100A**

**E05050100B**

An abnormality was detected in the detector structure. Contact a service engineer.
A control line connection error was detected in the detector. Contact a service engineer.

Inform a service engineer of the error code.

Failed to transfer the image data. Try again. If the problem is not resolved, contact a service engineer.

Click [OK] to close the dialog box, and then retry the image transmission. If this error occurs again, inform a service engineer of the error code.

An abnormality was detected in the analog power supply for the detector. Contact a service engineer.

A grid error was detected. Contact a service engineer.

The firmware is different. Contact a service engineer.

Inform a service engineer of the error code.

A detector communication error occurred. The cable may be disconnected or there may be power discontinuity in the detector. Check that the cable is correctly connected and restart the detector. If the problem is not resolved after restarting, contact a service engineer.

Click [OK] to close the dialog box, check the cable connection to the detector, and restart the detector. If this error occurs again, inform a service engineer of the error code.
9.1.3 Warning list

**W020202001**
The detector temperature has reached warning levels.

**W020202002**
The detector temperature has reached dangerous levels.
→ Suspend the examination (see 4.5) and wait until the temperature decreases. Then restart the suspended study order.

**W020202003**
The detector is not available. Irradiation has finished.
→ Click [OK] to close the dialog box and then continue the operation.

**W020202004**
The detector battery is weakening. Charge the detector battery.
→ Click [OK] to close the dialog box and charge the battery of the wireless detector. If the optional wired connection is available, switch to the connection. For details on the wireless detector, refer to the Digital Radiography CXDI series User's Manual.

**W020202005**
The specified disk space could not be cleaned up.
→ Retry the deletable capacity and click [Delete] (see 5.3).

**W030203003**
The internal temperature of the detector exceeds the upper limit.
→ Suspend the examination (see 4.5) and wait until the temperature decreases. Then restart the suspended study order.

**W040100045**
Calibration data is invalid. Update the calibration data.
→ Click [OK] to close the dialog box and then calibrate the detector (refer to 3.5.1 in the Setup Guide).

**W040100052**
The detector issued a warning.
→ Click [OK] to close the dialog box and then continue the operation.
W040500007

Characters which do not match the current character code are used in this data. This character code will be properly changed automatically. Check the setting information.

→ Click [OK] to close the dialog box.

Characters that do not match the current character code will be replaced with “?”.

Continue the operation when the replacement is acceptable.

To disable the replacement, inform a service engineer of the error code.

W040500009

Failed to copy a tag to C-STORE. Check the tag information and the C-STORE communication log.

If the problem is not resolved, contact a service engineer.

→ Click [OK] to close the dialog box, and check the original DICOM tag and the C-STORE communication. Then correct the original tag and retry the previous operation. If this error occurs again, inform a service engineer of the error code.

W04050000A

Failed to copy tag to the DicomFile. Check the original data. If the problem is not resolved, contact a service engineer.

→ Click [OK] to close the dialog box, and then check the original DICOM tags of the DicomFile and the DICOM communication. Correct the original tags. If this error occurs again, inform a service engineer of the error code.

W040505003
W04050500A
W04050501C-04050501E

An error occurred in DICOM communication.

→ Contact the system administrator.

The problem may be resolved by checking the destination server or the DICOM conformance statement. If the problem cannot be resolved, inform a service engineer of the error code.

W040505030

The transmission was complete normally. However, the CXDI system received WARNING status from the destination DICOM printer. Check the DICOM printer.

→ Check the DICOM printer. For details on Printer Status, refer to Annex C.13.9.1 in the DICOM standard Part3: Information Object Definitions or the DICOM conformance statement.
W050501002-050501004

A Flash ROM error was detected in the detector. Contact a service engineer.
→ Click [OK] to close the dialog box, and then shut down and restart the Software (see 2.2 and step 2 in 2.1).
   If this error occurs again, inform a service engineer of the error code.

W050501005

A grid error may have caused an image abnormality.
→ Click [OK] to close the dialog box. There may be a problem in the captured image. Check the image and retry the examination.

W050501007

The internal temperature of the detector is close to the upper limit. Do not leave the detector in the Ready condition.
→ Click [OK] to close the dialog box, click [Unselect], and wait until the temperature decreases.

W050501011

The transfer of the image data was stopped.
→ Click [OK] to close the dialog box. There may be a problem in the captured image. Check the image and retry the examination.

W050501013

A grid ID loading error was detected.
→ Check if the grid is properly attached.
   If the problem cannot be resolved, inform a service engineer of the error code.

W050501015

A grid error may have caused an image abnormality.
→ Click [OK] to close the dialog box, and check the captured image.
   If there is a problem in the image, inform a service engineer of the error code.
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