User's Manual

RadiCS®
RadiCS® LE

Quality Control Software

Ver.4.6

Important

Please read this User's Manual carefully to familiarize yourself with safe and effective usage.

EIZO®

CONTENTS

Chapter 1 Introduction

RadiCS is a software tool that helps with medical standard-compliant advanced monitor quality management.You can use this software to perform calibration, acceptance test, constancy test, and other types of tests of monitors.
RadiCS LE is monitor quality management software designed to calibrate monitors and manage their calibration histories.
RadiCS has "User Mode" in which simplified management tasks, such as visual checks and monitor status checking, are performed and "Advanced mode" in which advanced quality management and detailed settings are to be performed by the user.
The functions that can be executed vary depending on the application and mode that you are using. For details, refer to “1-2. Functions and Structure of Software” (page 6).

1-1. Features

- Manages up to eight monitors per client
- Monitor quality control features
  - Optical sensor or backlight sensor-based calibration
  - Visual checks
  - Acceptance testing
  - Consistency testing
  - Hands-off check
  - Scheduled task execution
  - History management
  - Generates reports.
- Monitor operation features
  - Reduces monitor power consumption (Backlight Saver)
  - Switching CAL Switch mode (Auto CAL Switch / Manual CAL Switch)
  - Switching screen display
  - Moving mouse pointer
  - Switching between displaying and hiding the PinP sub window (Hide-and-Seek)
  - Switching the PC used to operate USB devices (Switch-and-Go)
  - Assigning a desired CAL Switch mode to a part of the screen (Point-and-Focus)

1-2. Functions and Structure of Software

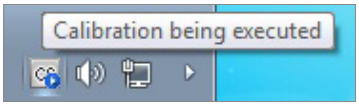
This section explains the structure of RadiCS / RadiCS LE and their functions.

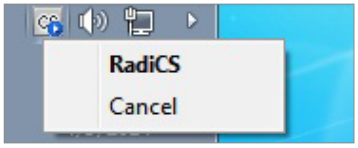
Note

- After installing RadiCS / RadiCS LE, the RadiCS icon will be displayed in the task tray. This icon appears differently depending on the status.

	Operating normally.
	Task execution failed
	An ambient illuminance alert is displayed.
	Task execution failed, and an ambient luminance alert is displayed.
	Executing a task.

- When hovering the mouse pointer over the icon in the task tray, the name of the task being executed will be displayed in the following cases.
  - Warming up for executing a scheduled task is in progress, or a task is in progress.
  - A task is being executed remotely from RadiNET Pro.
- Right-click the icon in the task tray to display the menu.
  - RadiCS: Start RadiCS / RadiCS LE.
  - Cancel: Cancel the task being executed.





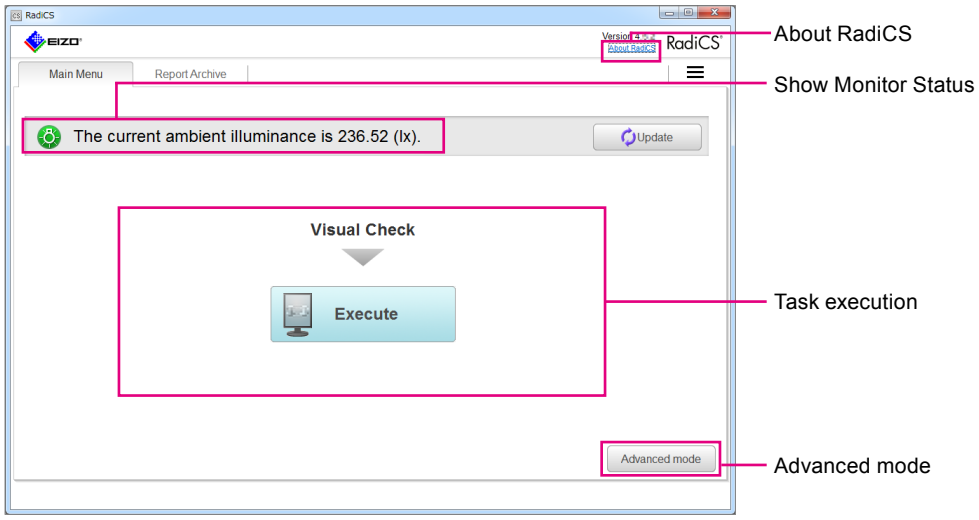
- On RadiCS / RadiCS LE, the following icons identify the status of the monitor:

Icon	Status
	User Mode: Execute Monitor Detection. Advanced mode: The auto error analysis result is available.
	Checking connection with the monitor.
	Successfully connected to the monitor.
	Failed to connect with the monitor.
	Task execution passed.
	Task execution failed.
	The measurement value of ambient illuminance is displayed.
	The ambient Illuminance exceeds the allowable limits.
	The currently selected CAL mode is displayed.
	The settings have been imported into RadiCS.
	The settings have been imported into RadiCS. The imported settings are restored on start and exit of RadiCS.

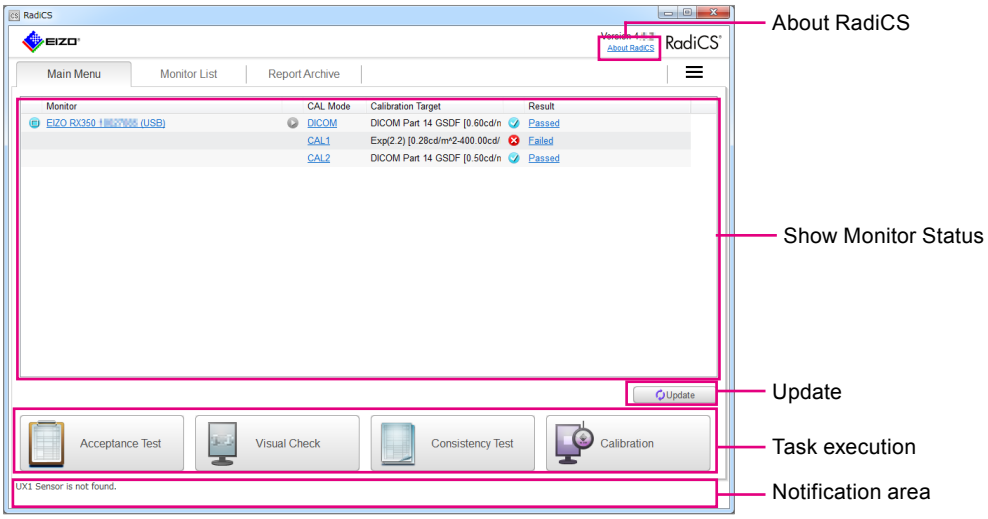
● RadiCS

Main Menu

Shows the monitor status. The user is allowed to execute tasks.



RadiCS (User Mode)



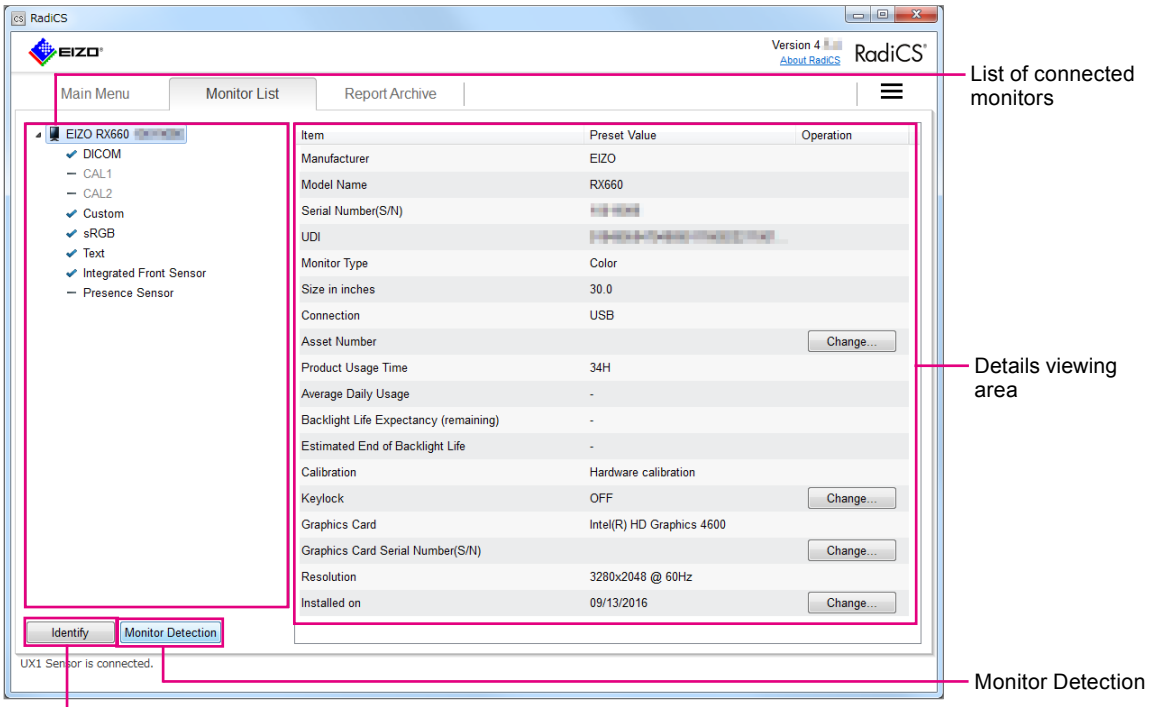
RadiCS (Advanced mode)

√: Supported, -: Not supported

Function		User Mode	Advanced mode	Overview
Show Monitor Status		√	√	Shows the monitor status. In the user mode, items you want to view can be set. (“Chapter 6 Checking Monitor Status” (page 81)) In the advanced mode, the following items are displayed. • Monitor status • Monitor information (manufacturer, monitor name, serial number, connection) • Managed CAL mode • Calibration target value • Task execution results
Update		√	√	Updates monitor status.
Task execution	Acceptance Test	-	√	Performs an acceptance test. (“3-2. Performing Acceptance Test” (page 50))
	Visual Check	√	√	Performs a daily test. (“3-3. Performing Visual Check” (page 54))
	Consistency Test	-	√	Performs a consistency test. (“3-4. Performing a Consistency Test” (page 57))
	Calibration	-	√	Performs a calibration. (“5-2. Calibration” (page 74))
Notification area		-	√	Displays the following information: • Sensor connection • Application of policy • Auto error analysis result
About RadiCS		√	√	Displays the following information: (“12-5. Viewing the RadiCS Information (About RadiCS)” (page 145)) • Version • Compatible monitors • Plug-In
Advanced mode		√	-	Displays the Advanced Mode screen.

Monitor List

This list allows you to review or set detailed information on the monitor and CAL mode. "Monitor List" is displayed only in the advanced mode.



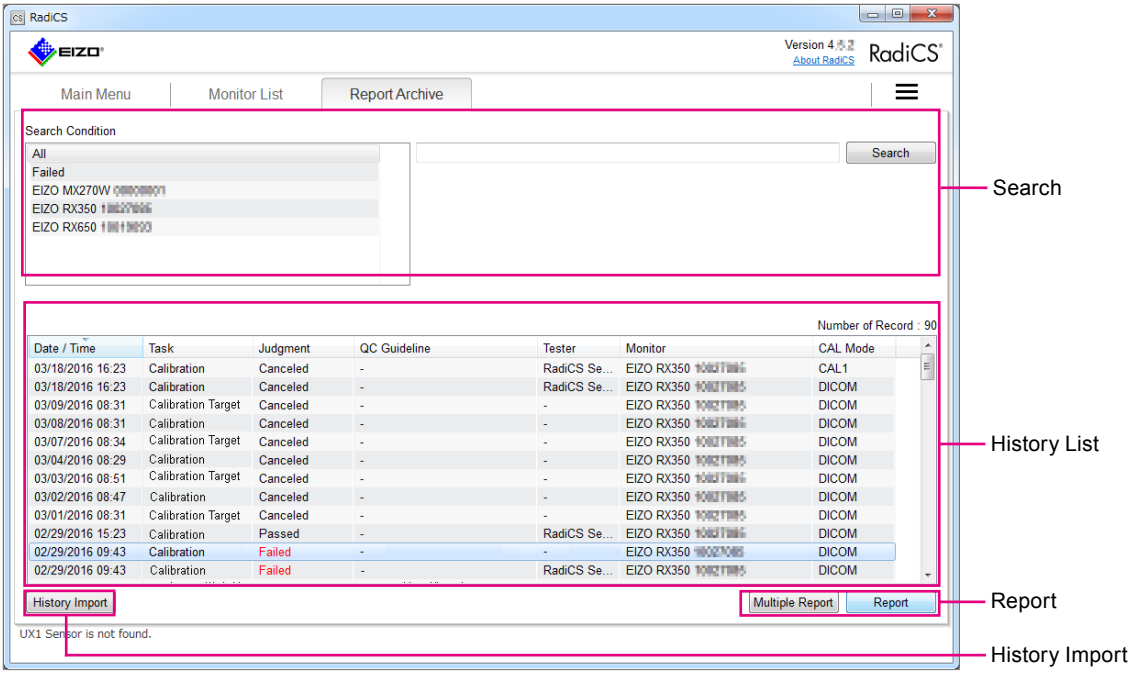
RadiCS (Advanced mode)

√: Supported, -: Not supported

Function	User Mode	Advanced mode	Overview
List of connected monitors	-	√	Displays managed monitors and their CAL mode. The CAL mode shown with ✔ is a RadiCS control target.
Identify	-	√	Displays monitor information (manufacturer, model name, serial number) on the monitor screen.
Monitor Detection	-	√	Detects a monitor. (“2-6. Monitor Detection” (page 29))
Details viewing area	-	√	Displays detailed information on the items selected in the list of connected monitors. • Monitor properties Displays monitor information and status when a monitor is selected from the list of connected monitors. (“11-1. Editing the Monitor Properties” (page 130)) • CAL Switch mode properties Displayed when a CAL Switch mode is selected from the list of connected monitors. Specify whether a monitor is to be set as the RadiCS control target. If it is possible to calibrate it, set QC guidelines and calibration target. (“11-2. Editing the CAL Switch Mode Properties” (page 132))

Report Archive

A history of executed tasks is listed. You can create a report from the history.

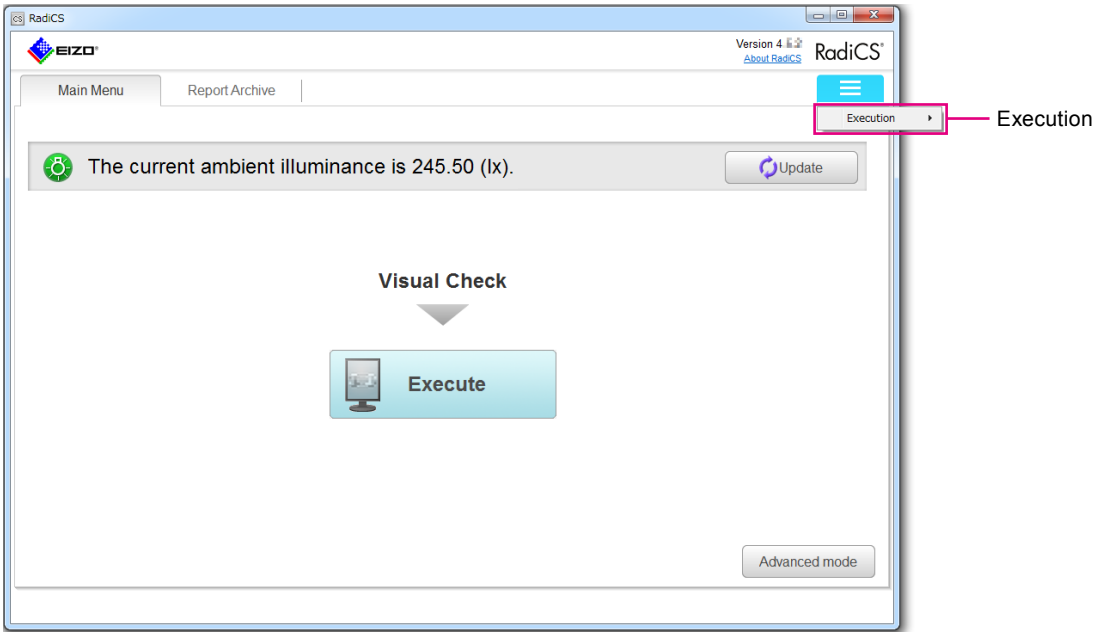


RadiCS (Advanced mode)

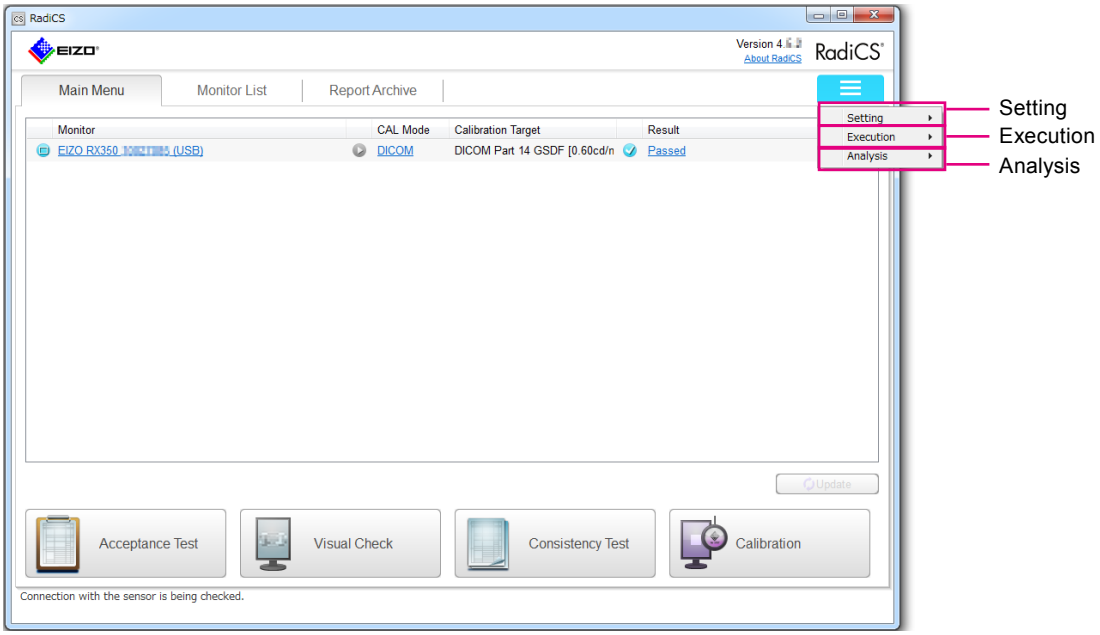
√: Supported, -: Not supported

Function	User Mode	Advanced mode	Overview
Search	√	√	Select a condition in "Search Condition" or enter a keyword in the text box to refine histories displayed in the history list.
History List	√	√	A history of executed tasks is displayed.
History Import	-	√	Imports backup of history file. (“History Import” (page 63))
Report	√	√	Generates a report. • Report Generates a report on the selected history. (“Report” (page 64)) • Multiple Report Generates reports together on the tasks, displayed in the history list, that meet specific conditions. (“Multiple Report” (page 66))

Menu icon (☰)



RadiCS (User Mode)



RadiCS (Advanced mode)

√: Supported, -: Not supported

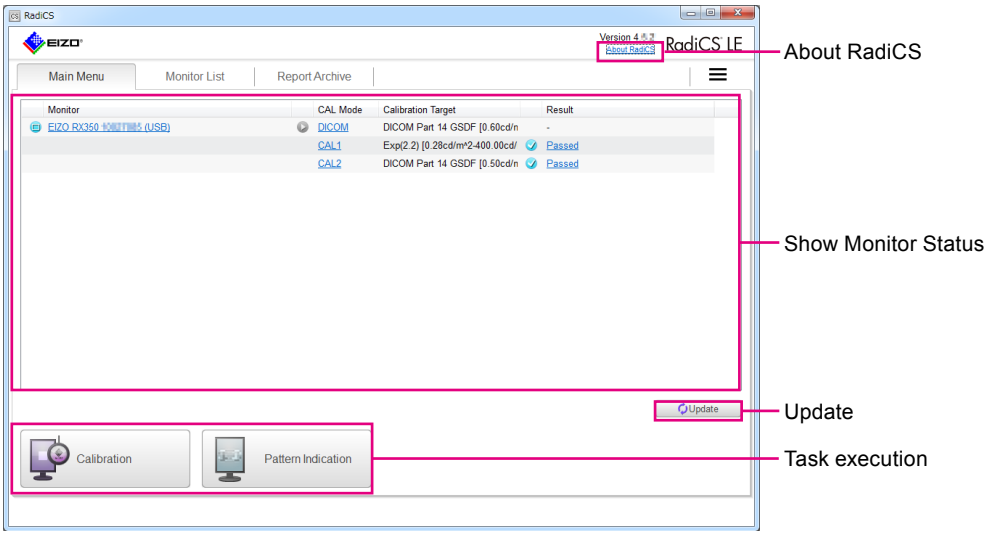
Function		User Mode	Advanced mode	Overview
Setting	Configuration	-	√	Set the following items. • Registration Information (“12-1. Registration Information” (page 135)) • Schedule (“Chapter 7 Schedule Settings” (page 92)) • RadiCS SelfQC (“RadiCS SelfQC” (page 133)) • Sensor (“Setting up a Luminance Sensor” (page 37)) • RadiCS Management (“12-3. Changing the Password” (page 143)) • RadiNET Pro (“Chapter 8 Using RadiNET Pro” (page 97)) • User Mode (“12-4. Configuring the Startup Settings” (page 144)) • History (“4-3. Backing Up the History” (page 68)) • Ambient Light Watchdog (“Watching Ambient Light” (page 84)) • RadiLight (“10-9. Configuring the RadiLight Area Settings” (page 128))
	QC Guideline	-	√	Edit or add QC guidelines. (“Creating QC Guidelines” (page 41))
	Backlight Saver	-	√	Set Backlight Saver (power saving function). (“9-2. Setting Up Power Saving Function (Backlight Saver)” (page 101))
	ScreenManager	-	√	Configure the following settings related to the monitor operations. • Auto CAL Switch (“Switching according to the application (Auto CAL Switch)” (page 104)) • Manual CAL Switch (“Switching on the monitor screen (Manual CAL Switch)” (page 106)) • Switch signal (“10-2. Switching the Input Signal Using the Keyboard” (page 109)) • Mouse pointer moves (“10-3. Setting the Mouse Pointer Behavior” (page 112)) • Image Rotation Plus (“10-4. Rotating the Display Direction According to the Installation Direction (Image Rotation Plus)” (page 114))
	Work-and-Flow	-	√	Configure the following settings related to the monitor operations. • Hide-and-Seek (“10-5. Switching Between Display / Hide the PinP Sub Window (Hide-and-Seek)” (page 116)) • Switch-and-Go (“10-6. Switching the PC to be Operated (Switch-and-Go)” (page 120)) • Point-and-Focus (“10-8. Displaying a Desired CAL Switch Mode to a Part of the Screen (Point-and-Focus)” (page 124))
	Export settings	-	√	Exports the current RadiCS settings (RadiCS setting file), and creates and exports an EIZO monitor setting file. (“12-2. Exporting / Importing Settings” (page 137))

√: Supported, -: Not supported

Function		User Mode	Advanced mode	Overview
Execution	Monitor status check	√	√	Measure ambient illuminance. (“6-2. Measuring Ambient Illuminance” (page 83)) Perform luminance check and grayscale check.
	Task	-	√	Perform the following tasks. (“6-1. Performing Tasks” (page 81)) • Acceptance Test • Visual Check • Consistency Test • Calibration • Uniformity Measurement • Hands-off Check • Luminance Check • Grayscale Check
	Manual Measurement/ Pattern Indication	-	√	Display and output pattern images and perform manual measurement of luminance. (“6-5. Displaying / Outputting a Pattern” (page 88), “6-6. Manually Measuring Luminance” (page 91))
	Video Source Input/ LUT Selection	-	√	These functions only support specific monitors. (“12-6. Model-Depending Monitor Support Functions” (page 147))
	Create/Restore Backup Data	-	√	
	Extract Calibration Data	-	√	
	Backlight/ISS	-	√	
Analysis	Backlight Meter/ Status Analyzer	-	√	Monitors the status of backlight. (“6-3. Watching Monitor Luminance (Backlight Meter / Status Analyzer)” (page 85))
	Automatic Error Analysis	-	√	If a task fails, RadiCS automatically analyzes the cause and displays the cause identified and solution. (“6-4. Checking Auto Error Analysis Result” (page 87))

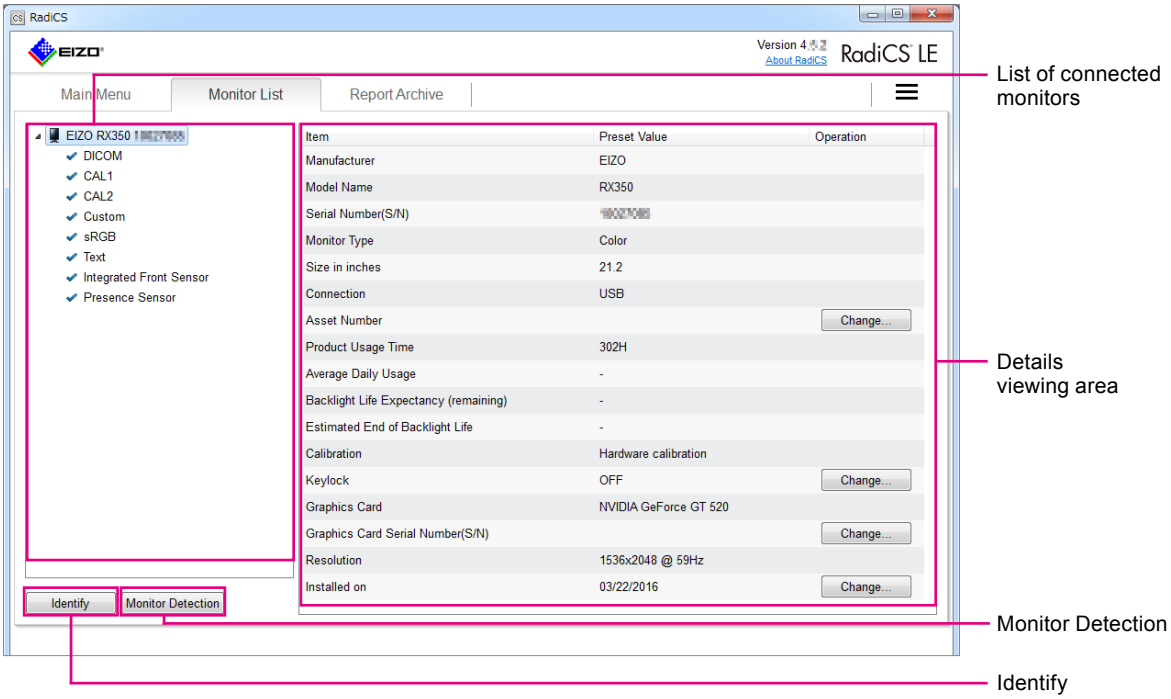
● RadiCS LE

Main Menu



Function		Overview
Show Monitor Status		Shows the monitor status. • Monitor status • Monitor information (manufacturer, monitor name, serial number, connection) • Managed CAL mode • Calibration target value • Task execution results
Update		Updates monitor status.
Task execution	Calibration	Performs a calibration. (“5-2. Calibration” (page 74))
	Pattern Indication	Displays TG18-QC pattern on the monitor screen.
About RadiCS		Displays the following information: (“12-5. Viewing the RadiCS Information (About RadiCS)” (page 145)) • Version • Compatible monitors • Plug-In

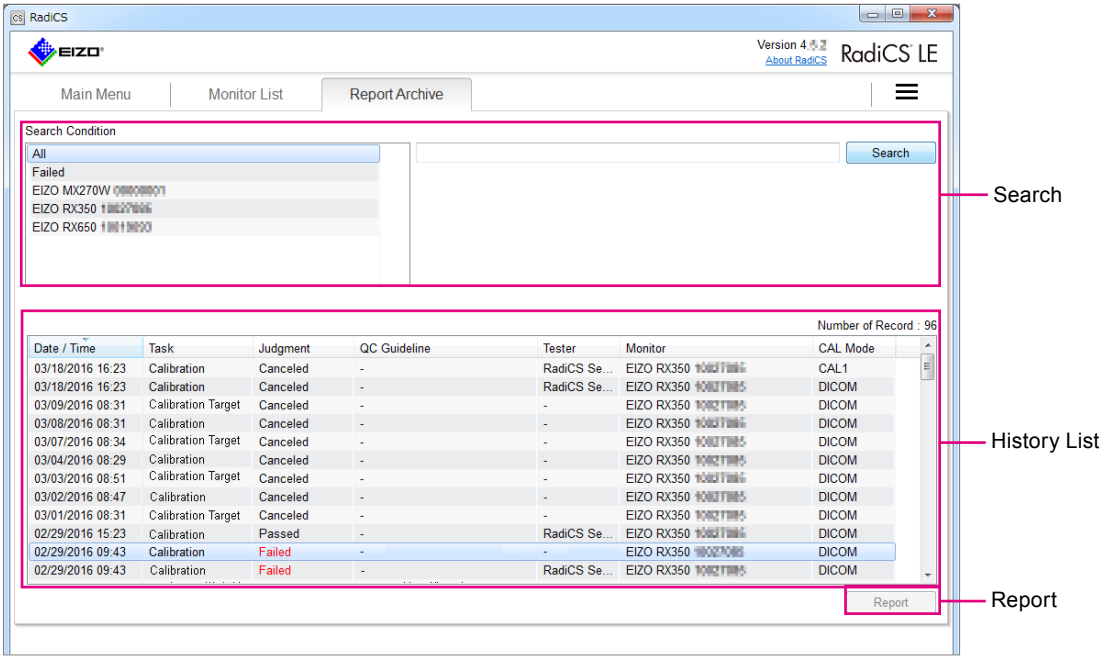
Monitor List



Function	Overview
List of connected monitors	Displays managed monitors and their CAL mode. The CAL mode shown with ✔ is a RadiCS control target.
Identify	Displays monitor information (manufacturer, model name, serial number) on the monitor screen.
Monitor Detection	Detects a monitor. (“2-6. Monitor Detection” (page 29))
Details viewing area	Displays detailed information on the items selected in the list of connected monitors. • Monitor properties Displays monitor information and status when a monitor is selected from the list of connected monitors. (“11-1. Editing the Monitor Properties” (page 130)) • CAL Switch mode properties Displayed when a CAL Switch mode is selected from the list of connected monitors. Specify whether a monitor is to be set as the RadiCS control target. If it is possible to calibrate it, set calibration target. (“11-2. Editing the CAL Switch Mode Properties” (page 132))

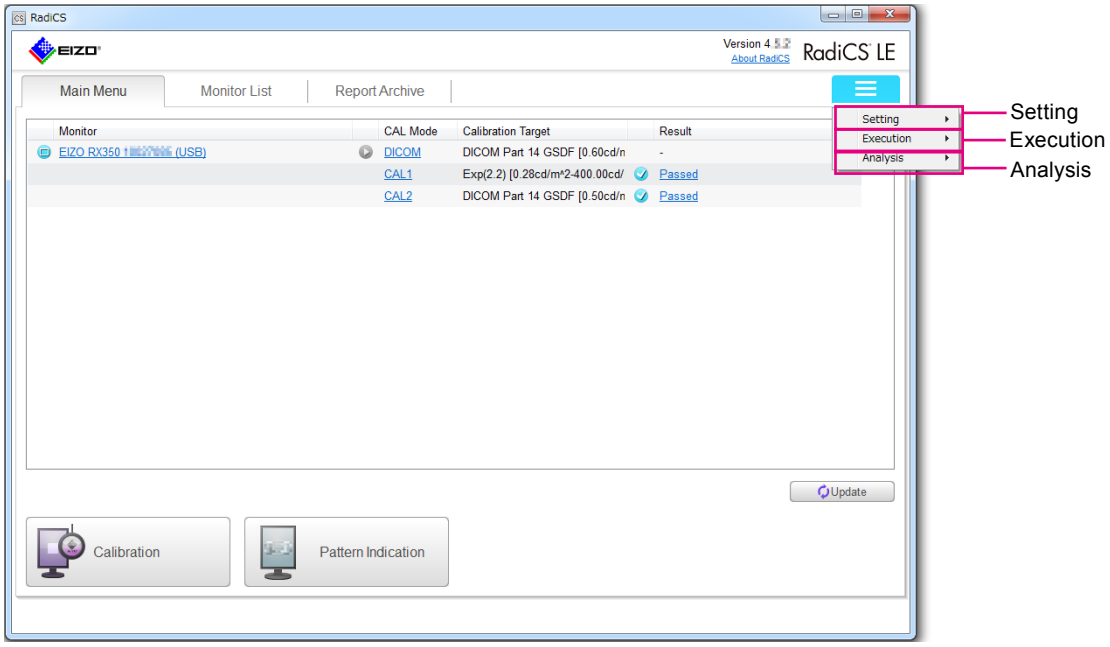
Report Archive

A history of executed tasks is listed. You can create a report from the history.



Function	Overview
Search	Enter a keyword in "Search Condition" or in the text box to refine histories displayed in the history list.
History List	A history of executed tasks is displayed.
Report	Generates a report. • Report Generates a report on the selected history. (“Report” (page 64))

Menu icon (☰)


RadiCS
EIZO
Version 4.
About RadiCS
RadiCS LE
Main Menu
Monitor List
Report Archive
Setting
Execution
Analysis
Monitor
CAL Mode
Calibration Target
Result
EIZO RX350 (USB)
DICOM
DICOM Part 14 GSDF [0.60cd/n
-
CAL1
Exp(2.2) [0.28cd/m^2-400.00cd/
Passed
CAL2
DICOM Part 14 GSDF [0.50cd/n
Passed
Update
Calibration
Pattern Indication
Setting
Execution
Analysis

Function		Overview
Setting	Configuration	Set the following items. • Registration Information (“12-1. Registration Information” (page 135)) • Schedule (“Chapter 7 Schedule Settings” (page 92)) • RadiCS SelfQC (“RadiCS SelfQC” (page 133)) • Sensor (“Setting up a Luminance Sensor” (page 37)) • RadiCS Management (“12-3. Changing the Password” (page 143)) • RadiNET Pro (“Chapter 8 Using RadiNET Pro” (page 97)) • User Mode (“12-4. Configuring the Startup Settings” (page 144)) • History (“4-3. Backing Up the History” (page 68)) • Ambient Light Watchdog (“Watching Ambient Light” (page 84)) • RadiLight (“10-9. Configuring the RadiLight Area Settings” (page 128))
	Backlight Saver	Set Backlight Saver (power saving function). (“9-2. Setting Up Power Saving Function (Backlight Saver)” (page 101))
	ScreenManager	Configure the following settings related to the monitor operations. • Auto CAL Switch (“Switching according to the application (Auto CAL Switch)” (page 104)) • Manual CAL Switch (“Switching on the monitor screen (Manual CAL Switch)” (page 106)) • Switch signal (“10-2. Switching the Input Signal Using the Keyboard” (page 109)) • Mouse pointer moves (“10-3. Setting the Mouse Pointer Behavior” (page 112)) • Image Rotation Plus (“10-4. Rotating the Display Direction According to the Installation Direction (Image Rotation Plus)” (page 114))
	Work-and-Flow	Configure the following settings related to the monitor operations. • Hide-and-Seek (“10-5. Switching Between Display / Hide the PinP Sub Window (Hide-and-Seek)” (page 116)) • Switch-and-Go (“10-6. Switching the PC to be Operated (Switch-and-Go)” (page 120)) • Point-and-Focus (“10-8. Displaying a Desired CAL Switch Mode to a Part of the Screen (Point-and-Focus)” (page 124))
Execution	Monitor status check	Measure ambient illuminance. (“6-2. Measuring Ambient Illuminance” (page 83))
	Task	Perform the following tasks. (“6-1. Performing Tasks” (page 81)) • Calibration • Hands-off Check
	Manual Measurement/ Pattern Indication	Display and output pattern images and perform manual measurement of luminance. (“6-5. Displaying / Outputting a Pattern” (page 88), “6-6. Manually Measuring Luminance” (page 91))
Analysis	Backlight Meter/Status Analyzer	If a task fails, RadiCS automatically analyzes the cause and displays the cause identified and solution. (“6-4. Checking Auto Error Analysis Result” (page 87))

Chapter 2 Setup

2-1. System Requirements

RadiCS / RadiCS LE (software) requires the following system environment:

● Windows version

PC

OS

- Windows 10 (32 bit / 64 bit)
- Windows 8.1 / Windows 8 (32 bit / 64 bit)
- Windows 7 / Windows 7 Service Pack 1 (32 bit / 64 bit)

CPU

- 1 GHz or higher 32-bit (x86) or 64-bit (x64) processor

Memory

- 1 GB or more (32 bit)
- 2 GB or more (64 bit)

Graphics board

- Color
  - Color: 24 bits or more
  - Monochrome: 8 bits or more
- Resolution: 1280 × 1024 or higher

Hard disk

- 1 GB for software installation
- Approx. 1 GB for history storage (recommended)

Interface

- Communication with a monitor
  - USB
  - DDC
  - DDC/CI
  - RS-232C
- Communication with a sensor
  - USB
  - RS-232C

Software

- Security software
  - Antivirus
  - Firewall

Other communication devices

- Devices including the following are required to set up an appropriate communication environment:
  - Router
  - Firewall

Compatible sensors

√: Supported, -: Not supported

Sensor	Calibration	Luminance Check Grayscale Check Uniformity Check
EIZO UX2 Sensor	√	√
EIZO UX1 sensor	√	√
EIZO ASLM	√	√
EIZO SSM	√ *3	√
EIZO Built-in Swing Sensor	√	√ *5
EIZO Integrated Front Sensor	√	√ *5
EIZO Clip-On Swing Sensor G2 *2	√	√ *5
LX-Can *1	-	√
LX-Plus *1	-	√
LS-100 *1	-	√
CD-Lux (Firmware version 1.95 and later are supported) *1	-	√
CD mon *1, 4	-	√
MAVO-SPOT 2 USB *1, 4	-	√
Raysafe X2 Light	-	√

*1 Only supported by RadiCS.
*2 The support depends on the monitor. For more information, visit our web site.
*3 Only supported by monochrome monitors.
*4 Cannot be used in Windows 8.1 / Windows 8 / Windows 10.
*5 Only supports Luminance Check and Grayscale Check.

Attention

- Available functions depend on the sensor used.
- Select sensors to be used according to the QC guideline or standards. For details, refer to "Sensors" in “13-2. RadiCS Software” (page 153).
- The “EIZO sensor” referred to on the software screen indicates the following sensors:
  - EIZO UX2 Sensor
  - EIZO UX1 Sensor
  - EIZO ASLM
  - EIZO SSM

Note

- When you have selected EIZO Built-in Swing Sensor, EIZO Integrated Front Sensor, or EIZO Clip-On Swing Sensor G2 for the sensor, annual correlation with a calibrated external sensor is recommended in order to maintain measurement accuracy. Refer to “Correlation” (page 73) for information on how to perform correlation.

Compatible monitors (models / platforms)

- Confirm the relevant information in "Monitor" of "About RadiCS" (see “12-5. Viewing the RadiCS Information (About RadiCS)” (page 145)), or visit our web site.

● Mac version

PC

Attention

- When using a MacBook Pro Retina display, part of the RadiCS screen may be cut off. In that case, move the RadiCS screen to a monitor other than a MacBook Pro monitor.
- When using a monitor that supports the PbyP function, disable “Displays have separate spaces” in the Mission Control settings.

OS

- macOS Sierra (10.12)
- OS X El Capitan (10.11)

CPU

- Must satisfy the system requirements of your OS.

Memory

- 2 GB or more

Graphics board

- Color
  - 16.70 million colors or more
- Resolution: 1280 × 1024 or higher

Hard disk

- 1 GB for software installation
- Approx. 1 GB for history storage (recommended)

Interface

- Communication with a monitor
  - USB
- Communication with a sensor
  - USB

Software

- Security software
  - Antivirus
  - Firewall

Other communication devices

- Devices including the following are required to set up an appropriate communication environment:
  - Router
  - Firewall

Compatible sensors

- EIZO UX2 Sensor
- EIZO UX1 sensor
- EIZO Integrated Front Sensor

Attention

- Available functions depend on the sensor used.
- The “EIZO sensor” referred to on the software screen indicates the following sensors:
  - EIZO UX2 Sensor
  - EIZO UX1 Sensor

Note

- When you have selected EIZO Integrated Front Sensor for the sensor, annual correlation with a calibrated external sensor is recommended in order to maintain measurement accuracy. Refer to “Correlation” (page 73) for information on how to perform correlation.

Compatible monitors (models / platforms)

- Confirm the relevant information in "Monitor" of "About RadiCS" (see “12-5. Viewing the RadiCS Information (About RadiCS)” (page 145)), or visit our web site.

2-2. Connecting Monitors Before Software Installation

Before installing the software, connect the PC to the monitors. (The connection differs depends on the monitor.)
To use any one of the following monitors, install a driver when connecting the monitor to the PC.

- EX190
- LX300W
- RX150
- SCD19102
- SMD19102

Note

- When the operating system of the PC is Windows 10, Windows 8.1, or Windows 8, and the PC is connected to the Internet, the driver is automatically installed by Windows Update. If the driver is not installed, install it manually.
- When the operating system of the PC is Windows 7, Windows 10, Windows 8.1, or Windows 8 and the PC is not connected to the Internet, install the driver manually.

Procedure

1. Insert the “RadiCS DVD-ROM” into the appropriate drive.
2. Open “Device Manager” on the PC.
   For details on how to open “Device Manager”, refer to the user’s manual of the PC.
3. Right-click “USB<->Serial*1” in “Other devices”. Then select “Update Driver Software”.
   The “Update Driver Software” window is displayed.
   *1 The device name may be different.
4. Click “Browse my computer for driver software”.
5. Click “Browse...”.
   The “Browse Folders” window is displayed.
6. Select “USB_to_RS232C_Converter_Driver” from drive E, and click “OK”.
7. Click “Next”.
   The software installation commences.
8. Click “Close”.
9. Follow steps 3 to 7 to install the “USB Serial Port” driver.

Attention

- If, in an environment where any of the EIZO monitors listed below is connected along with other EIZO monitors, USB interface is used to connect one of the following monitors, be sure to use a USB port directly built in the computer. Otherwise, the computer may not be able to control the monitor through the USB.
  - R11, R21, R22, G11, G11-S, G20, G20-S, G21, G21-S, G31, G31-S, G31-G, G51, G51-BLS, G51-CLS, G51-BLG, G51-CLG, L375, L367, L567, L685, L685EX, L695, L767, L985EX
- If a monitor has two USB upstream ports, connect the PC used for monitor quality control and operation to “USB-1” on the monitor.

Note

- For information on how to install a sensor, refer to the user’s manual for the sensor.
- If you are already using the software and want to connect a new monitor, check the "About" screen for its version information before connecting the monitor (see “12-5. Viewing the RadiCS Information (About RadiCS)” (page 145)).

2-3. Installing the Software

● Windows version

Procedure

1. Insert the "RadiCS DVD-ROM" into the appropriate drive.
   The menu automatically opens.

Note

- If the menu does not open automatically, double-click "Launcher.exe" in the DVD-ROM.

2. Click “Install RadiCS” or ”Install RadiCS LE”.

The installer starts, and the installation wizard appears.

Note

- The ScreenManager Pro for Medical function is added for 4.5.2 and later versions of RadiCS / RadiCS LE. If ScreenManager Pro for Medical has been installed, it is uninstalled at the installation of RadiCS / RadiCS LE.

Attention

- To install RadiCS / RadiCS LE, your user account must have Administrator authority. For information on the authority of your account, contact your system administrator.
- If the software has already been installed, the existing software is uninstalled during the installation process.
- The settings of uninstalled ScreenManager Pro for Medical are not applied to RadiCS / RadiCS LE.

3. Click "Next".
   The "License Agreement" screen appears.

4. Check the contents and select "I accept the terms of your license agreement".
5. Click "Next".

   "Set Password" appears for RadiCS.

   For RadiCS LE, "Select RadiCS Display Language" appears. Proceed to Step 8.

6. To change the password, select the "Change Password" check box and enter a new password in the text box.

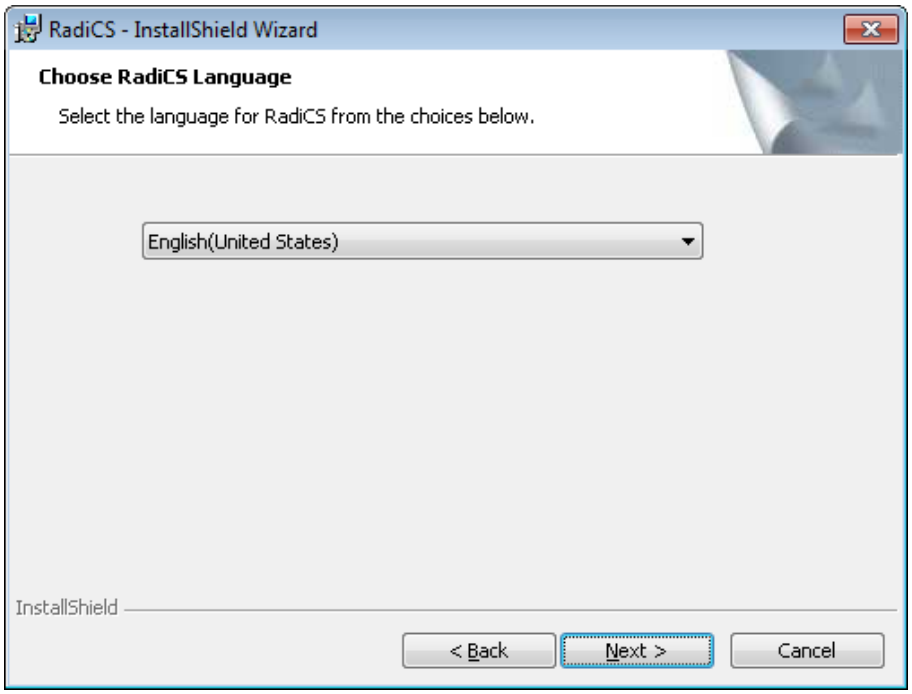
Attention

- The set password is necessary to start RadiCS in advanced mode. Keep it in a safe place.

Note

- The initial password is “password”. To change the password after installing the software, refer to “12-3. Changing the Password” (page 143).

7. Click "Next".



"Choose RadiCS Language" is displayed.

8. Select a language from the list, and click "Next".

   The "Destination folder" is displayed. To change the destination, click "Change...". Select a destination folder, and click "OK".

9. Click "Next".
10. Click "Install".

    The installation commences.

    Follow the instructions on the screen to install the software.

Note

- Reboot the PC and then start RadiCS. The icon will appear in the task tray.

● Mac version

Procedure

1. Insert the "RadiCS DVD-ROM" into the appropriate drive.
   An icon appears on the desktop.
2. Double-click the icon.
3. Double-click “RadiCS.pkg” icon on the window.
   The installer starts, and the installation wizard appears.

Attention

- To install RadiCS / RadiCS LE, your user account must have Administrator authority. For information on the authority of your account, contact your system administrator.
- If the software has already been installed, the existing software is uninstalled during the installation process.

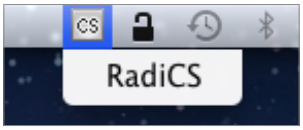
Note

- The initial password is “password”. To change the password, refer to “12-3. Changing the Password” (page 143).

4. Install the software.
   Follow the instructions on the screen to install the software.

Note

- Reboot the PC and then start the software. The icon will appear in the menu bar.



2-4. Uninstalling the Software

● Windows version

Windows 10

Procedure

1. Select "Start" - "Settings" - "Apps".
2. Select "RadiCS" from the list, and click "Uninstall".
3. Follow the on-screen instructions to uninstall the software.

Windows 8.1

Procedure

1. Click ⓓ at the bottom of the "Start" screen.
   The "Apps" screen appears.
2. Select "Windows System" - "Control Panel" - "Programs" - "Uninstall a program".
3. Select and double-click "RadiCS" in the list.
4. Follow the on-screen instructions to uninstall the software.

Windows 8

Procedure

1. On the "Start" screen, right-click on a position where there are no tiles.
   App commands appear at the bottom of the screen.
2. Select "All Apps" - "Windows System" - "Control Panel" - "Programs" - "Uninstall a program".
3. Select and double-click "RadiCS" in the list.
4. Follow the on-screen instructions to uninstall the software.

Windows 7

Procedure

1. Select "Start" - "Control Panel" - "Programs" - "Uninstall a program".
2. Select and double-click "RadiCS" in the list.
3. Follow the on-screen instructions to uninstall the software.

● Mac version

Procedure

1. Double-click the "/Library/Application Support/EIZO/RadiCS4/Uninstaller/RadiCS Uninstaller" icon.

2-5. Start and Exit

Start the software after installation is completed. Once started, the software resides in the task tray.

● Starting the software

Windows version

Procedure

1. Double-click the RadiCS icon in the task tray.

Note

- If the RadiCS icon does not appear in the task tray, follow the steps below to start RadiCS.
  Windows 10
  - Click "Start" - "EIZO" - "RadiCS".
  Windows 8.1
  - On the "Start" screen, click ⊕, and select "RadiCS" on the "Apps" screen.
  Windows 8
  - Click "RadiCS" on the "Start" screen.
  Windows 7
  - Click "Start" - "All Programs" - "EIZO" - "RadiCS".

2. At the initial software startup, "Monitor Detection" is executed automatically (see “2-6. Monitor Detection” (page 29)).
   Depending on the usage environment, the "Monitor Detection" wizard appears. If the wizard appears, follow the screen instructions to configure the monitor information.

   The main window appears.
   For RadiCS, "Main Menu" in "User Mode" appears.
   At the initial startup of RadiCS (Advanced mode) / RadiCS LE, "Monitor Detection" is executed automatically.
   Depending on the usage environment, the "Monitor Detection" wizard appears. If the wizard appears, follow “2-6. Monitor Detection” (page 29) to configure the monitor information.

Mac version

Procedure

1. Double-click "RadiCS" in the "Application" folder.
   The “RadiCS” icon appears in the menu bar and then the main window appears.
   The main window appears.
   For RadiCS, "Main Menu" in "User Mode" appears.
   At the initial startup of RadiCS (Advanced mode) / RadiCS LE, the "Monitor Detection" wizard appears automatically. Follow “2-6. Monitor Detection” (page 29) to configure the monitor information.

● Exit

Procedure

1. Click  in the main window.

Note

- RadiCS resides in the task tray after the main window has been exited.

2-6. Monitor Detection

Monitor Detection makes it easier to configure monitor information necessary to use the software.
When any of the following conditions is met, "Monitor Detection" is performed and the monitor information is configured automatically during the initial startup of the software or a change of the monitor configuration.

- No Clip-On Swing Sensor G2 is connected, and the screen type is "independent".
- No Clip-On Swing Sensor G2 is connected, at least one RadiCS compatible monitor of the PbyP screen type is connected, and the monitor name and serial number can be acquired.

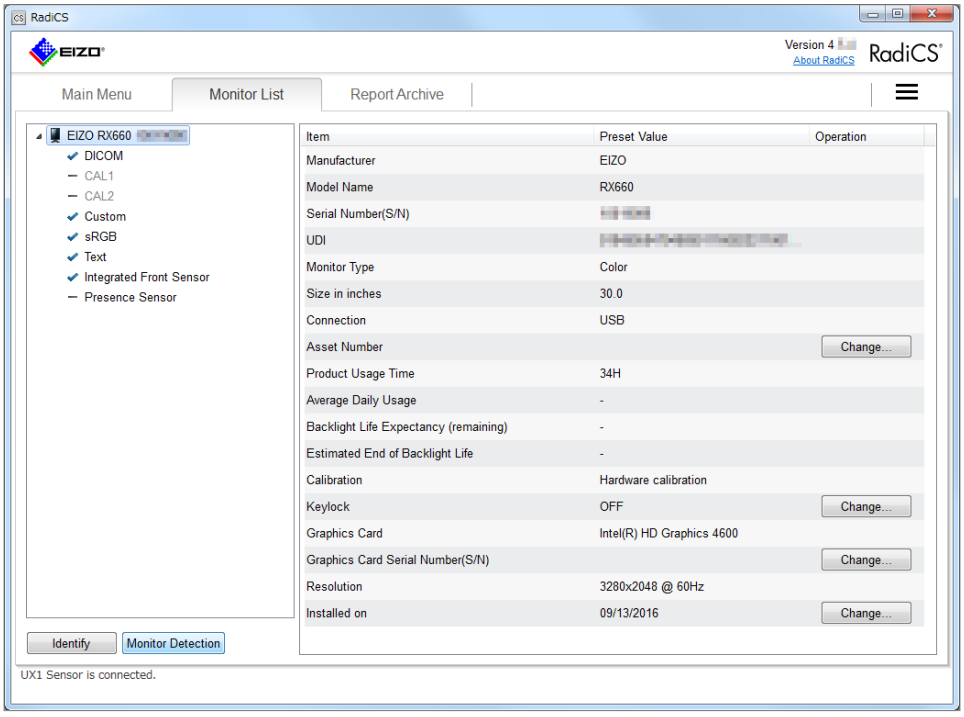
Attention

- "Monitor Detection" is intended to allow you to configure general settings easily. Therefore, the software may automatically provide some fields with their default values. To configure advanced settings according to your actual environment, use an appropriate setup menu for each function.
- Be sure to execute Monitor Detection manually if you have a Wide View or Mirroring environment or are using a Clip-On Swing Sensor G2.

Note

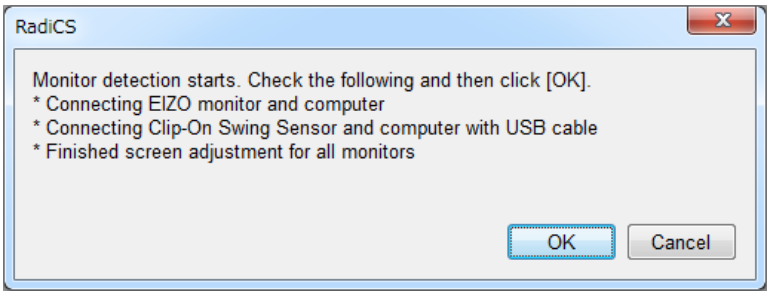
- You can start "Monitor Detection" by clicking "Monitor Detection" on the Monitor List screen of RadiCS (Advanced mode) / RadiCS LE.

1. Click "Monitor Detection" on the "Monitor List" screen of RadiCS (Advanced mode) / RadiCS LE.



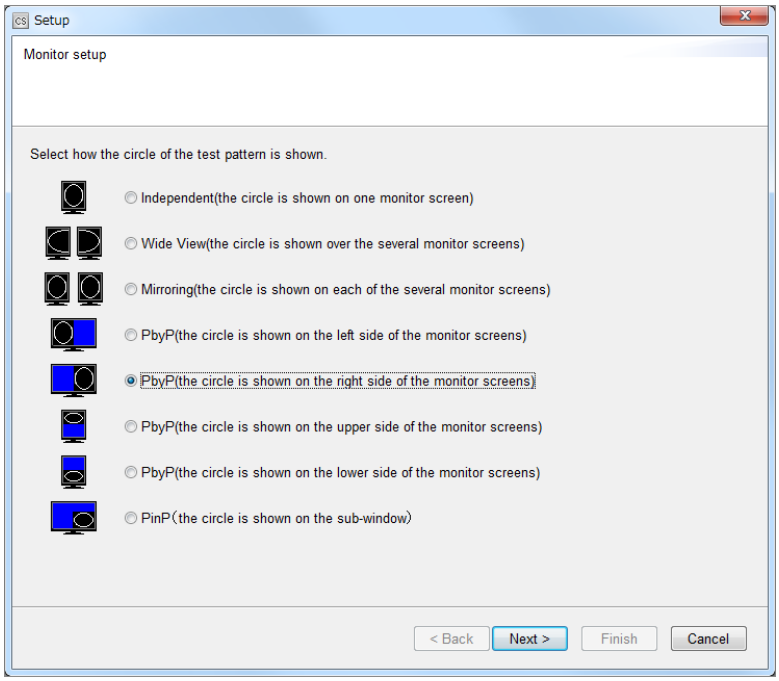
The confirmation screen for starting Monitor Detection appears.

2. Click "OK".



"Monitor setup" appears, and a circle is displayed on the monitor currently connected.

3. Select a state displayed on the monitor, and click "Next".



Note

- If Wide View or Mirroring is selected, specify the following values, and click “Next”.
  - Wide View: Number of monitors where a circle is displayed and their configuration
  - Mirroring: Number of monitors where a circle is displayed

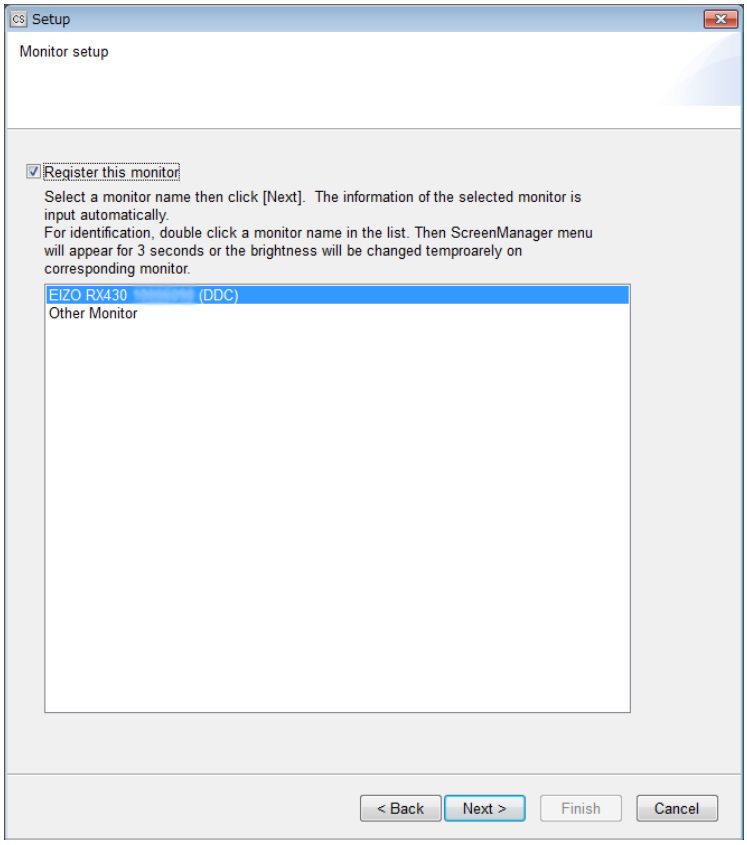
The monitor registration screen appears.

The monitor registration screen displays a list of monitors that have been detected by RadiCS and monitors registered in RadiCS.

4. From the list, select the monitor where a circle is displayed, and click “Next”.

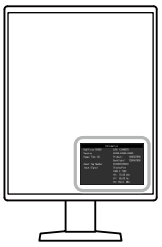
If the target monitor is not displayed in the list, select “Other Monitor”, and click “Next”.

If you do not want to register the monitor with RadiCS, clear the "Register this monitor" check box.



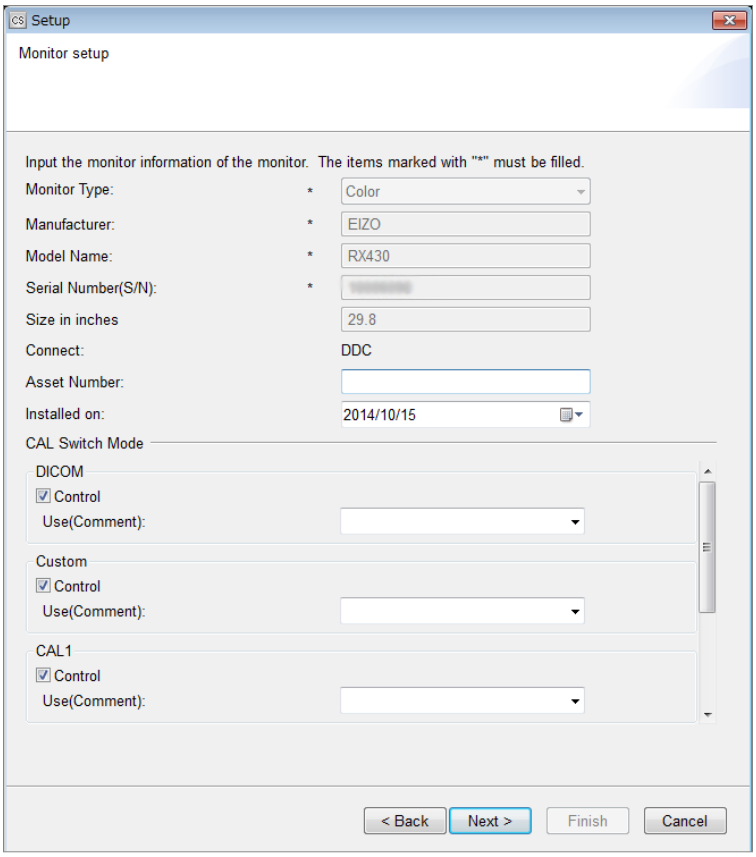
Note

- When you double-click the desired monitor in the list, monitor information is displayed on the monitor screen (monitor information is not displayed and the screen brightness is changed in some models). This allows you to identify the target monitor in the list.



- When you specify Mirroring or Wide View, select as many monitors as the number of monitors where a circle is displayed.

5. The Monitor Setup screen appears. Set the required items, and click "Next".



Monitor Type		Select Color or Monochrome.
Manufacturer, Model Name, Serial Number(S/N)		Enter the manufacturer, model name, and serial number (S/N).
Size in inches		Enter the size in inches.
Asset Number		Enter the asset management number.
Installed on		Select the date the monitor was installed.
CAL Switch Mode		The calibration-capable CAL modes are displayed. Select the "Control" check box of each CAL Switch mode to let the software manage the mode. **Attention** • For GS521-ST, only Mode1 can be set. **Note** • The number of modes displayed differs depending on the monitor.
	Use	Choose from CT, DR, DSA, MMG, MR, NM, PACS, and US. You can enter any strings in the "Use(Comment):" field.
Back		Returns to the monitor type judgment dialog box.

Note

• When the screen display is Wide View, Mirroring, or PbyP, the next monitor moves to Monitor Detection.

For an EIZO monitor

"Monitor Type", "Manufacturer", "Model Name", and "Serial Number(S/N)" are automatically entered. Fill other fields as necessary.

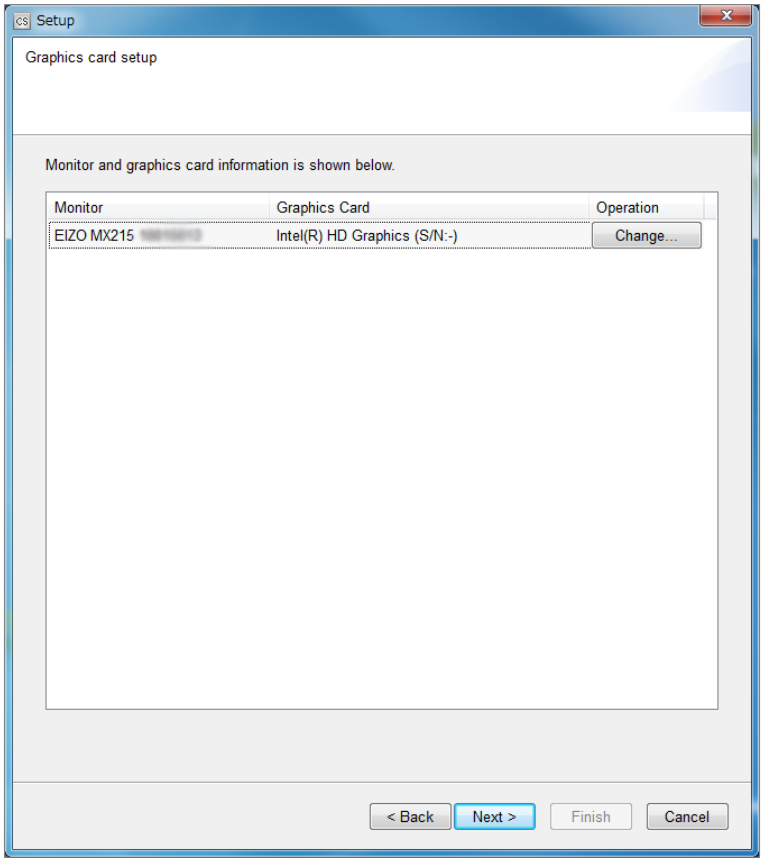
For a non-EIZO monitor

Enter "Monitor Type", "Manufacturer", "Model Name", and "Serial Number(S/N)". Fill other fields as necessary.

6. If all of the following conditions are satisfied, the Graphics Card Setup screen appears. Check the content, and click "Next".

- "Monitor Detection" is executed manually.
- The QC guideline for the selected monitor includes DIN 6868-157 / DIN / QS-RL / ONR 195240-20 information.

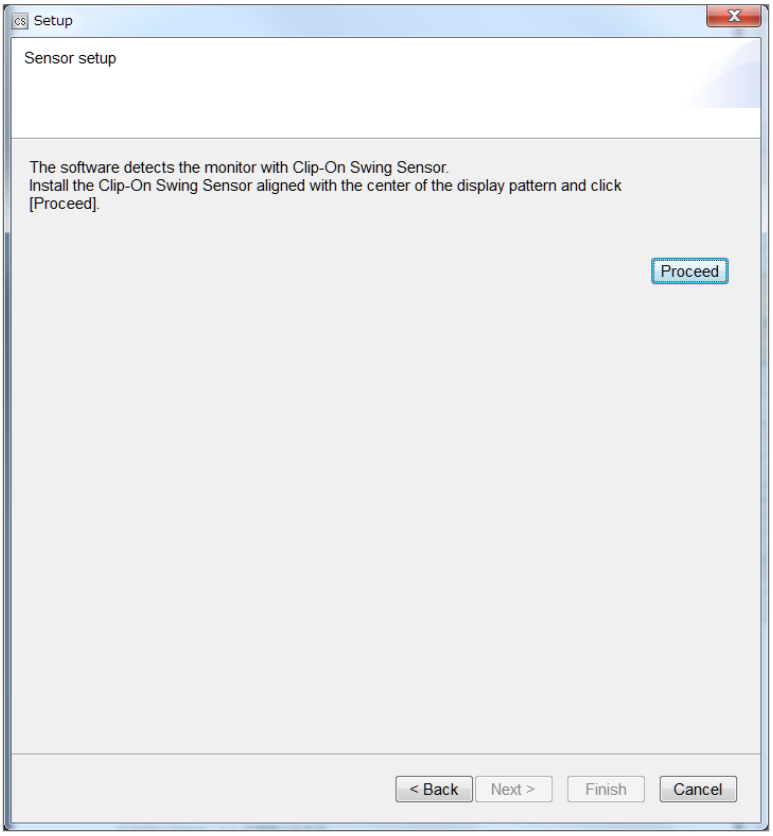
The serial number of the graphics board can be entered or changed by clicking “Change...”.



7. If a Clip-On Swing Sensor G2 is included, the Sensor Setup screen appears. Perform the following procedure to set up the sensor.

Procedure

1. Install the Clip-On Swing Sensor G2 with the center of the displayed pattern, and click "Proceed".
   The software detects the monitor with the Clip-On Swing Sensor G2.



2. Execute correlation between Clip-On Swing Sensor G2 and an external sensor. Click "Correlation".
3. Attach the EIZO sensor at the center of the measurement window, and click "Proceed".
   Start correlation. This takes approximately 13 minutes for a monochrome monitor, or approximately 3 minutes for a color monitor (for a Clip-On Swing Sensor G2).

8. Click "Finish".

The monitor is registered with RadiCS.

9. If you have multiple monitors to be managed, perform the same steps for each monitor.

Monitor Quality Control (Basics)

Chapter 3 Performing Tests

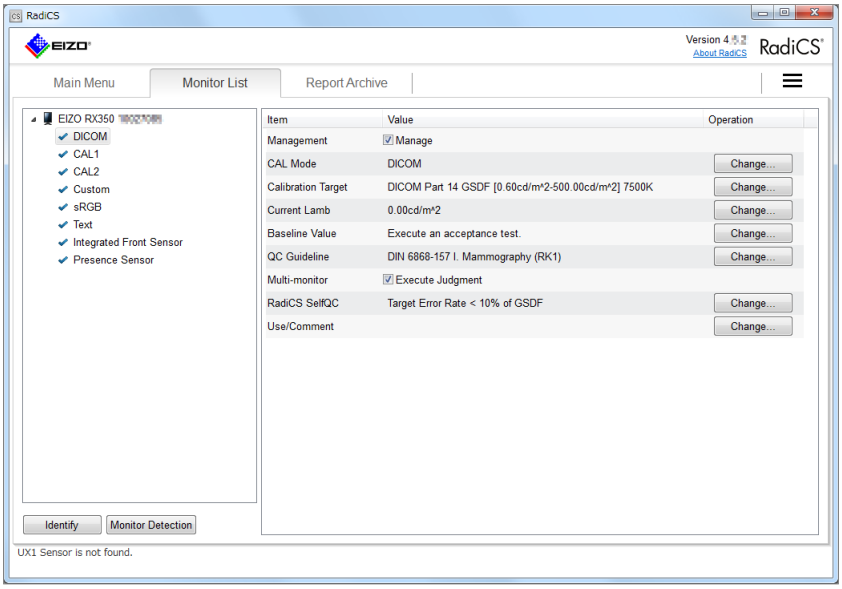
This chapter explains how to perform tests to maintain monitor quality and how to prepare for tests.

3-1. Preparing for Tests

● Changing CAL mode to be managed by RadiCS

Procedure

1. Click the “Monitor List” tab.
2. Select a CAL mode from the list of connected monitors.
   CAL mode properties appear in the right pane.



3. Select the check box of the CAL mode to be managed, or clear the check box.
   Select the check box of the CAL mode to let RadiCS manage the mode.

Note

- The ✔ mark appears for CAL modes that can be managed.

● Setting up a Luminance Sensor

Set up a luminance sensor used to perform tests.

The luminance sensors available on RadiCS are categorized as follows. Determine into which category your sensor belongs.

External sensors

- EIZO UX2 Sensor
- EIZO UX1 Sensor
- EIZO ASLM
- EIZO SSM
- LX-Can
- LX-Plus
- LS-100
- CD-Lux
- CD mon
- MAVO-SPOT 2 USB
- Raysafe X2 Light

Built-in sensors

- EIZO Built-in Swing Sensor
- EIZO Integrated Front Sensor
- EIZO Clip-On Swing Sensor G2

Attention

- When multiple EIZO sensors are connected to the computer at the same time, the software only recognizes the sensor detected first. To use another sensor, remove all the sensors once and then connect the sensor to be set up.

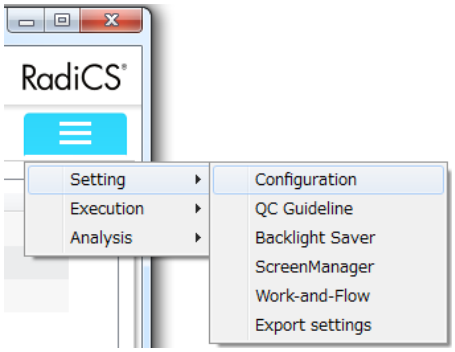
Note

- If you select an already selected sensor again, the software checks the link state of the sensor again.
- To create calibration, correlation and backlight sensor data, use an EIZO sensor.

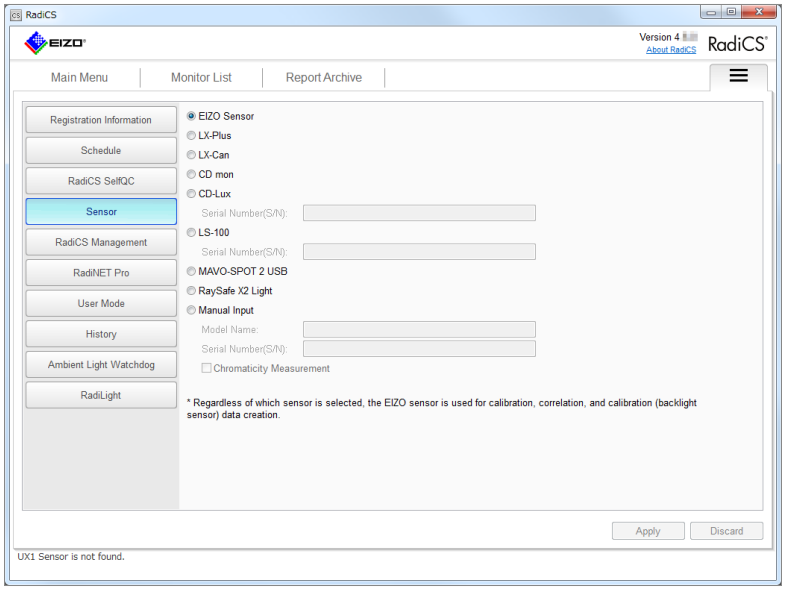
When using an EIZO sensor

Procedure

1. Click the ☰ tab, and click "Configuration" from "Setting".



2. Click "Sensor".



3. Select the sensor you want to use.

   If you select CD-Lux, LS-100 or Manual Input, enter the serial number of the sensor.

Attention

- For the Mac version, only the EIZO sensor (UX2 / UX1) and manual input can be selected.
- An EIZO sensor (UX2 / UX1 / ASLM) cannot be used for Acceptance Testing when DIN, DIN6868-157, QS-RL, or ONR 195240-20 is selected as the Acceptance Test standard.
- RaySafe sensor is only available when .NET 4 Client Profile has been installed.

4. Click "Apply".

   When the communication with the selected sensor is available, "xxx is connected." is displayed on the status bar. When RadiCS cannot communicate with a selected sensor, "xxx is not found." is displayed.

Note

- xxx indicates a sensor name.
- If a built-in sensor is used, no message appears in the status bar.

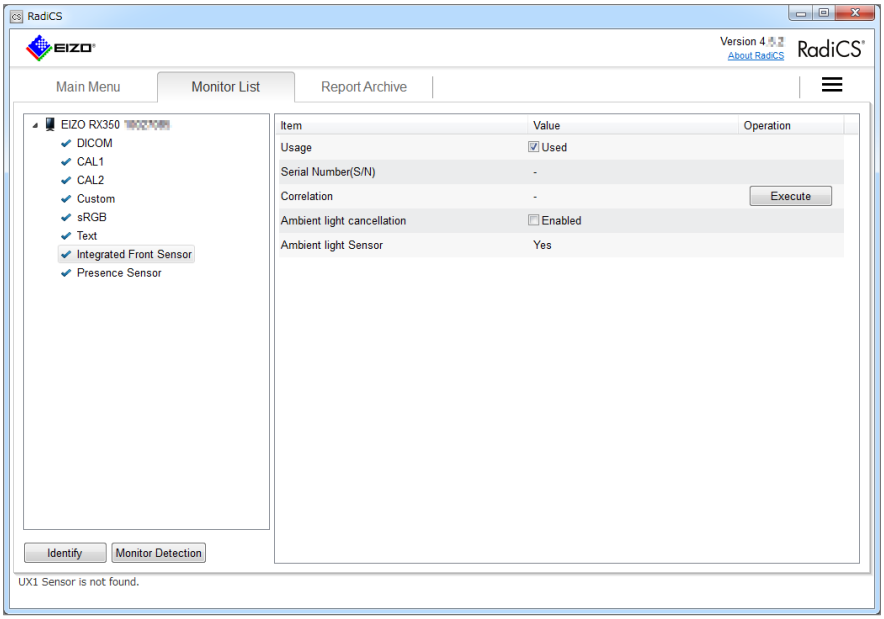
When using a built-in sensor

Attention

- The Integrated Front Sensor (slide type) cannot be used depending on the panel protector to be attached. If the sensor cannot be used, unselect the "Used" check box of the Integrated Front Sensor.

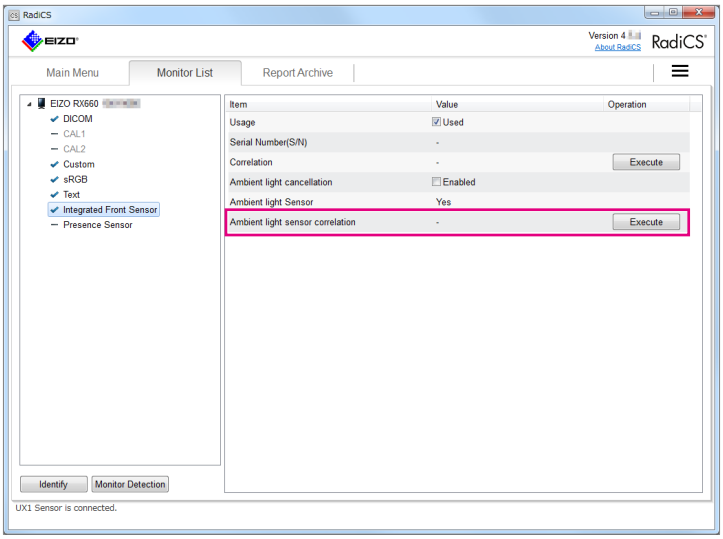
Procedure

1. Click the "Monitor List" tab.
2. Select "Swing Sensor" or "Integrated Front Sensor" from the list of connected monitors.
   The sensor information is displayed in the right pane.
3. Select the "Used" check box.
   "Swing Sensor" or "Integrated Front Sensor" is enabled.



Note

- Annual correlation with a calibrated external sensor is recommended in order to maintain measurement accuracy of the built-in sensor. For information on how to perform correlation, refer to “Correlation” (page 73).
- For a monitor with the Integrated Front Sensor (slide type) installed, "Ambient light cancellation" can be enabled or disabled. If the monitor is used in a location where it is affected by ambient light, select the check box. The effect of ambient light on the monitor can be reduced.
- When DIN6868-157 or ONR195240-20 is selected as the acceptance test standard, you can manually perform correlation between the ambient light sensor and illuminometer. Refer to “Correlation of the Ambient Light Sensor” (page 49) for information on how to perform the correlation.



● Selecting a QC guideline

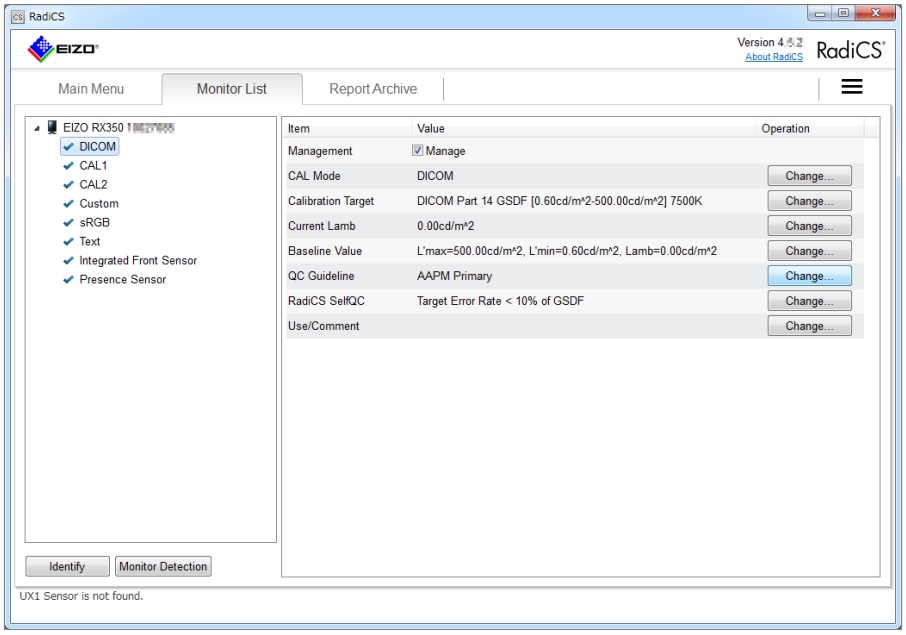
Select the QC guideline which you want to use for acceptance or constancy test.

Procedure

1. Click the "Monitor List" tab.
2. From the list of connected monitors, select the CAL mode for which you want to set a QC guideline.

   CAL mode properties appear in the right pane.

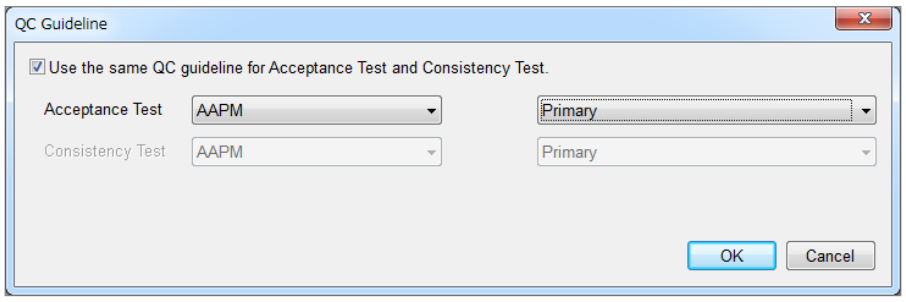
3. Specify the appropriate QC guideline. Click "Change...".



   The QC guideline setting screen appears.

4. From the pull-down menu, select QC guidelines to use.

   To use the same QC for acceptance and consistency tests, select the "Use the same QC guideline for Acceptance Test and Consistency Test." check box.



Note

- The visual checks use the same QC guideline as that specified for the Consistency Test.
- You may need to select the category and room category depending on the QC guideline.
- For details on QC guidelines, refer to “Chapter 13 Information” (page 148).

5. Click "OK".

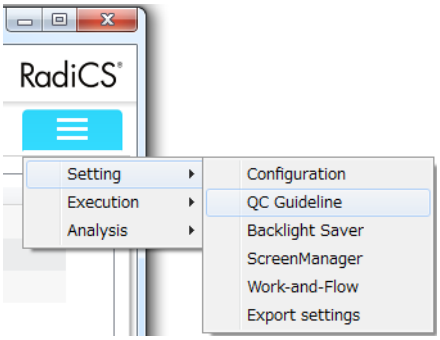
   Your settings are saved.

Creating QC Guidelines

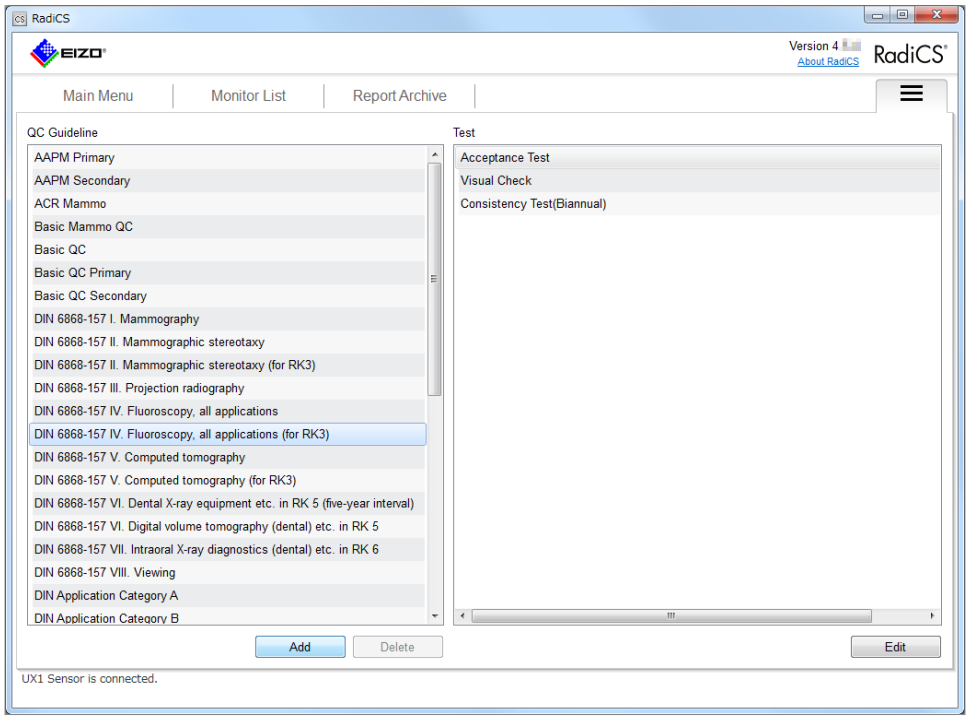
RadiCS allows you to create customized QC guidelines based on QC guidelines that support the medical standard. For customized QC guidelines, acceptance and consistency tests and visual checks can be set.

Procedure

1. Click the ☰ tab, and select "QC Guideline" from "Setting".

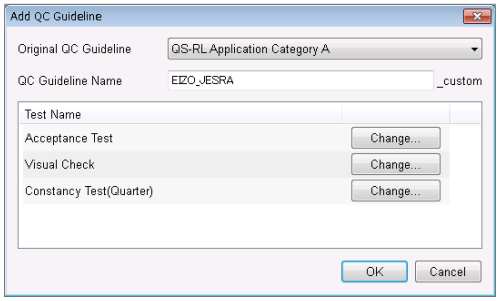


2. Click "Add".



The Add QC Guideline screen appears.

3. Select the original QC guideline from the pull-down menu, and enter the QC guideline name.



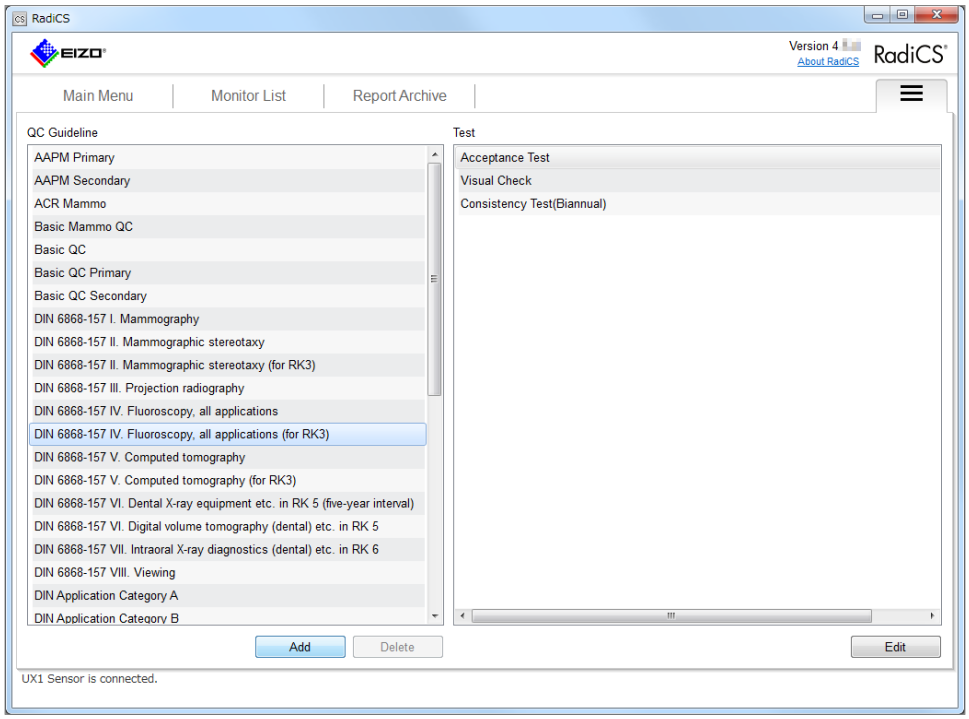
The list displays the tests that are to be performed under the original QC guidelines. Check that the list contains tests you you want to customize.

Clicking "Change..." allows you to change the test name.

4. Click "OK".

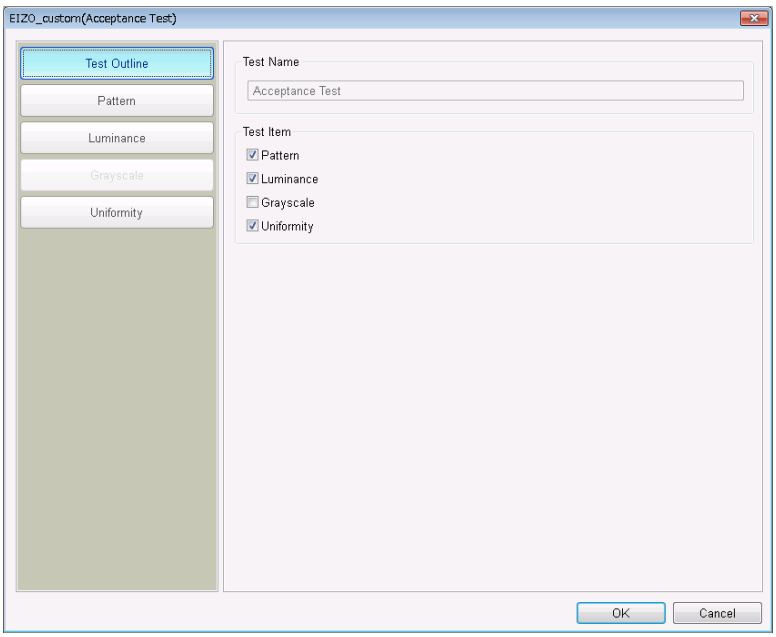
   The Edit QC Guideline screen appears. The QC guideline you created is displayed with the name "QC guideline name_custom" in the list of QC guidelines.

5. Select the created QC guideline from the list of QC guidelines.
6. Select the test name and click "Edit".



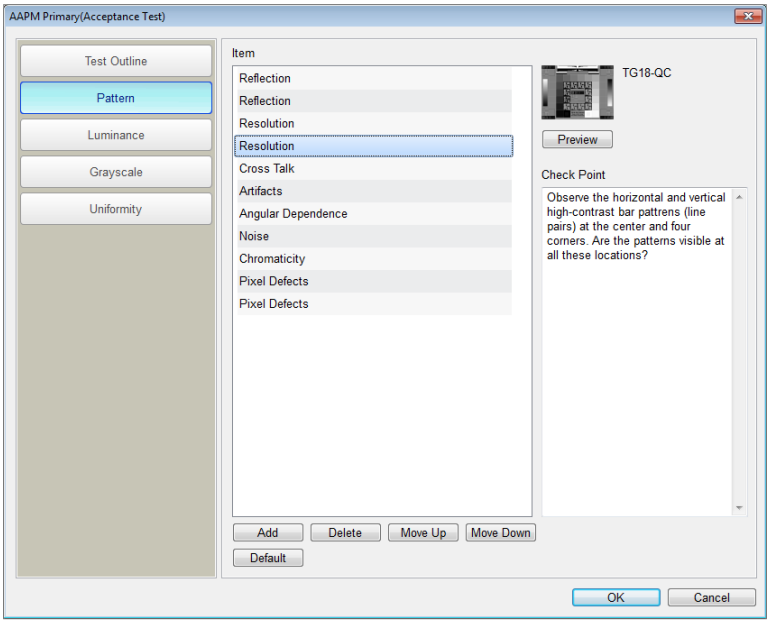
7. Click "Test Outline".

   Select the test to be executed.



8. Click "Pattern".

   Select the pattern you want to use.



Item	Lists the patterns that can be used in the pattern check.
Add	Adds a pattern used in the pattern check. From the "Add Pattern" screen, select the pattern you want to use in the pattern check.
Delete	Deletes the selected pattern from the pattern list. The deleted pattern is not used in the pattern check.
Move Up	Moves the selected pattern one position higher in the list of patterns. The patterns are listed from high to low in the pattern check.
Move Down	Moves the selected pattern one position lower in the list of patterns.
Default	Sets the selected pattern as the default.
Preview	Displays a preview image of the selected pattern.
Check Point	Allows you to edit the text which asks about the pattern selected in the pattern list. Enter the text in the Check Point field. The total text length must be 450 characters or less.

Attention

- If a question which may appear during pattern check is true, you respond with "Yes". Otherwise, respond with "No". Observe the following rules when making questions:
  - The text must be in question form. e.g. "Is convergence adjusted correctly?"
  - The answer to the question must not affect the pattern check result if the question is responded with "Yes".

Note

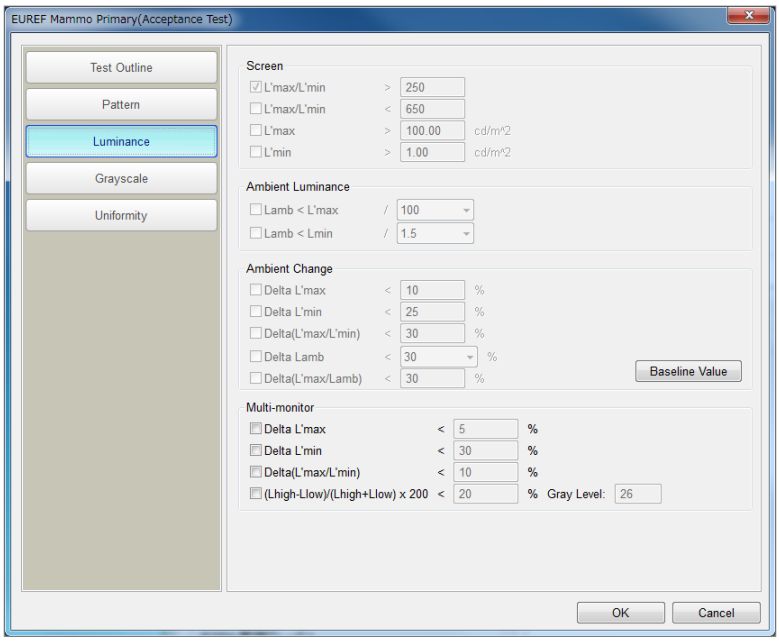
- A pattern can be added using the following procedure.
  1. Prepare a pattern.
  2. Create a folder in any location, and then make a copy of the prepared pattern.
  3. Click "Add" on the Pattern Settings screen.
  4. The Add Pattern screen appears. Click "Add Pattern".
  5. Select the folder created in step 2.

     A pattern is added on the Add Pattern screen, and the thumbnail is displayed.
  6. Enter the appropriate item name, and click "OK".

     The pattern is added to the pattern setting screen, and it can be used for the pattern check.

9. Click "Luminance".

   To enable judgment, select the appropriate check box and set values.



Screen

L'max/L'min	Enter the contrast ratio required. (0 to 999)
L'max (cd/m^2)	Enter the maximum luminance value required. (0.00 to 999.00)
L'min (cd/m^2)	Enter the minimum luminance value required. (0.00 to 99.00)

Ambient Luminance

Lamb < L'max/Setting values	Select the Lamb judgment method from the pull-down menu. The L'max/Lamb> setting values has been changed (setting values: 100, 40).
Lamb < Lmin/Setting values	Select the Lamb judgment method from the pull-down menu. The Lmin/Lamb> setting values has been changed (setting values: 4, 1.5, 1, 0.1).

Ambient Change

Delta L'max (%)	Enter the maximum allowable difference as a percent ratio (0 to 100) between the Lmax and Baseline Value.
Delta L'min (%)	Enter the maximum allowable difference as a percent ratio (0 to 100) between the Lmin and Baseline Value.
Delta (L'max/L'min) (%)	Enter the maximum allowable difference as a percent ratio (0 to 100) between the L'max/L'min and Baseline Value.
Delta Lamb (%)	Select the maximum allowable difference between the Lamb and Baseline Value (setting values: 30, 25).
Delta (L'max/Lamb) (%)	Enter the maximum allowable difference as a percent ratio (0 to 100) between the L'max/L'min and Baseline Value.

Multi-monitor

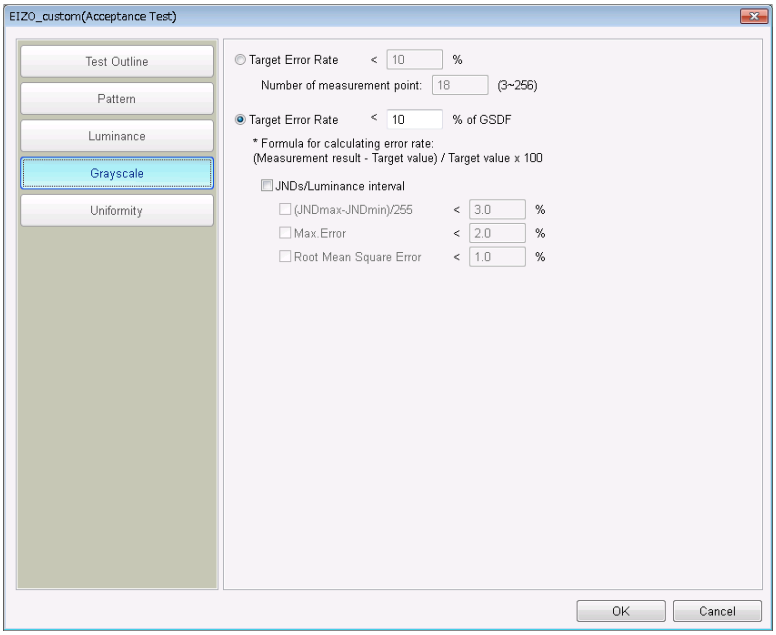
Delta L'max (%)	Enter the maximum allowable difference as a percent ratio (0 to 100) between the Lmax values of monitors.
Delta L'min (%)	Enter the maximum allowable difference as a percent ratio (0 to 100) between the Lmin values of monitors.
Delta (L'max/L'min) (%)	Enter the maximum allowable difference as a percent ratio (0 to 100) between the Lmax and Lmin values of monitors.
(Lhigh - Llow)/(Lhigh + Llow) x 200 (%)	Enter the maximum allowable difference as a percent ratio (0 to 100) between the (Lhigh - Llow)/(Lhigh + Llow) x 200 values of monitors.

Note

- Clicking "Baseline Value" in the Ambient Change allows you to view the baseline values of each monitor.
- For a multi-monitor, monitors of the same model can be compared.

10. Click "Grayscale".

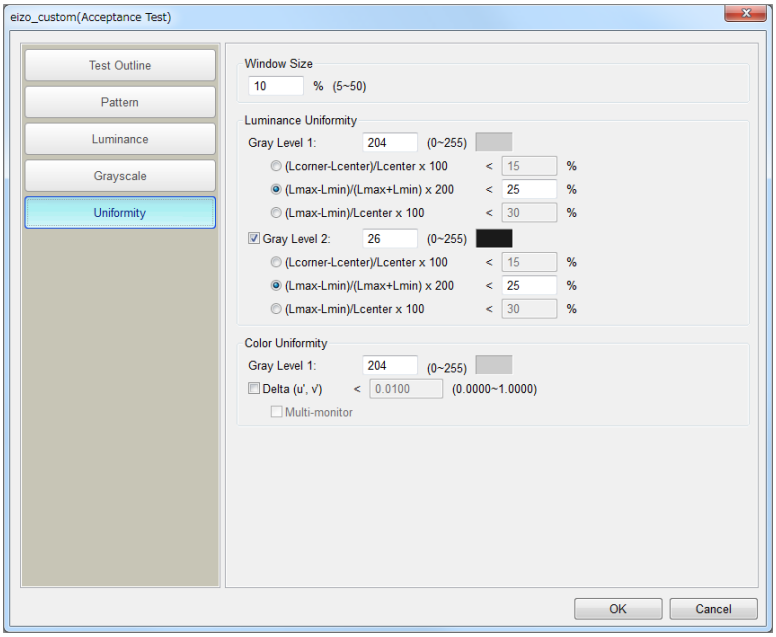
The error check setting is performed.



Target Error Rate (%)	• Enter the error rate, from 0 to 100, when the target error rate is calculated in terms of the ratio of error to measured value (cd/m^2). Enter the number of measurement points on the screen, from 3 to 256. • Enter 0 to 100 in the error rate when the error rate of GSDF (contrast response) is calculated. - JNDs/Luminance interval Measure 256 points, and evaluate the JND per grayscale difference. Enter the judgment value for each item, from 0.0 to 3.0.

11. Click "Uniformity".

    The measurement level is specified.



Window Size (%)	Set up the measurement window size in a range between 5 and 50.
Luminance Uniformity	Set up error judgment standard of luminance uniformity. An error judgment standard can be set for each of the two grayscale preset values. To execute the error check, select the check box.
Color Uniformity	Set up the error judgment standard of white screen uniformity. To execute the multi-monitor check, select the check box.

12. Click "OK".

    Your settings are saved.

Setting a Pattern to be used in Pattern Check

For a QC guideline that supports the medical standard, you can set a pattern used in the pattern check.

Procedure

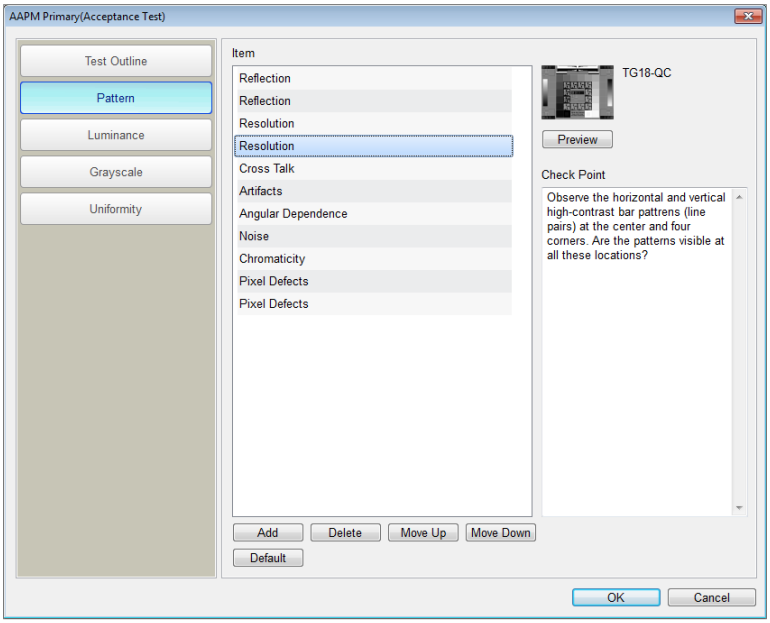
1. Click the ☰ tab, and select "QC Guideline" from "Setting".

   The Edit QC Guideline screen appears.

2. Select a QC guideline you want to set from the list of QC guidelines.
3. Select the test name and click "Edit".

4. Click "Pattern".

   Select the pattern you want to use.



Item	Lists the patterns that can be used in the pattern check.
Add	Adds a pattern used in the pattern check. From the "Add Pattern" screen, select the pattern you want to use in the pattern check.
Delete	Deletes the selected pattern from the pattern list. The deleted pattern is not used in the pattern check.
Move Up	Moves the selected pattern one position higher in the list of patterns. The patterns are listed from high to low in the pattern check.
Move Down	Moves the selected pattern one position lower in the list of patterns.
Default	Sets the selected pattern as the default.
Preview	Displays a preview image of the selected pattern.
Check Point	Allows you to edit the text which asks about the pattern selected in the pattern list. Enter the text in the Check Point field. The total text length must be 450 characters or less.

Attention

- If a question which may appear during pattern check is true, you respond with "Yes". Otherwise, respond with "No". Observe the following rules when making questions:
  - The text must be in question form. e.g. "Is convergence adjusted correctly?"
  - The answer to the question must not affect the pattern check result if the question is responded with "Yes".

Note

- A pattern can be added using the following procedure.
  1. Prepare a pattern.
  2. Create a folder in any location, and then make a copy of the prepared pattern.
  3. Click "Add" on the Pattern Settings screen.
  4. The Add Pattern screen appears. Click "Add Pattern".
  5. Select the folder created in step 2.

     A pattern is added on the Add Pattern screen, and the thumbnail is displayed.
  6. Enter the appropriate item name, and click "OK".

     The pattern is added to the pattern setting screen, and it can be used for the pattern check.

5. Click "OK".

   Your settings are saved.

Specifying Judgment (Multi-monitor)

For a QC guideline that supports the medical standard, you can specify multi-monitor judgment.

Procedure

1. Click the ☰ tab, and select "QC Guideline" from "Setting".
   The Edit QC Guideline screen appears.
2. Select a QC guideline you want to set from the list of QC guidelines.
3. Select the test name and click "Edit".
4. Click "Luminance".
   Specify Judgment (Multi-monitor). For the QC guideline that supports the medical standard, only multi-monitor judgment can be specified.

Multi-monitor

Delta L'max (%)	Enter the maximum allowable difference as a percent ratio (0 to 100) between the Lmax values of monitors.
Delta L'min (%)	Enter the maximum allowable difference as a percent ratio (0 to 100) between the Lmin values of monitors.
Delta (L'max/L'min) (%)	Enter the maximum allowable difference as a percent ratio (0 to 100) between the Lmax and Lmin values of monitors.
(Lhigh - Llow)/(Lhigh + Llow) x 200 (%)	Enter the maximum allowable difference as a percent ratio (0 to 100) between the (Lhigh - Llow)/(Lhigh + Llow) x 200 values of monitors.

Note

- For a multi-monitor, monitors of the same model can be compared.

5. Click "OK".
   Your settings are saved.

● Correlation of the Ambient Light Sensor

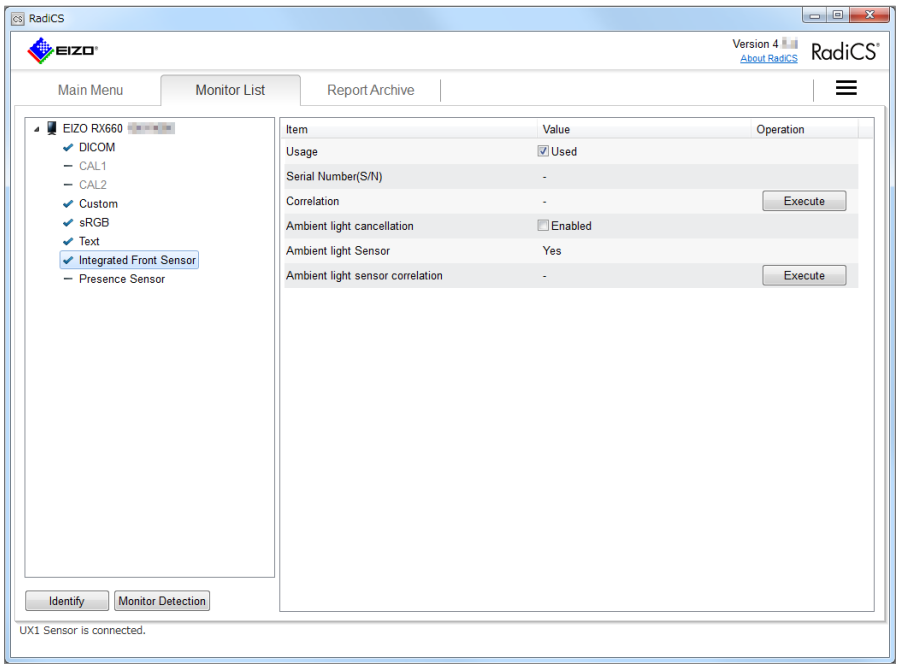
When DIN6868-157 or ONR195240-20 is selected as the QC Guideline used for acceptance tests and consistency tests, you can manually perform correlation between the monitor ambient light sensor and illuminometer.

Note

- When DIN6868-157 or ONR 195240-20 is selected as the QC Guideline, you can perform ambient light sensor correlation when conducting acceptance tests.

Procedure

1. Click the “Monitor List” tab.
2. Select Swing Sensor or Integrated Front Sensor of the monitor for which you want to perform ambient light sensor correlation.



The sensor information is displayed in the right pane.

3. Click “Execute” for ambient light sensor correlation.

   The ambient light sensor correlation screen appears.
4. Measure indoor illuminance using the illuminometer.

   Note

   - To measure illuminance using the illuminometer, align the illuminometer with the center of the monitor, and position it in the same orientation as light is received by the ambient light sensor.
5. Enter the illuminometer measurement result on the ambient light sensor correlation screen, and click “Execute”.

   Ambient light sensor correlation starts. When the correlation process finishes, the ambient light sensor correlation completion screen appears.
6. Click “OK”.

   Note

   - While measuring, do not put your face or any objects close to the monitor or illuminometer, or do not look directly into the light-receiving unit. Doing so may seriously alter the ambient light entering the light-receiving unit, which may affect the measurement results.
   - If the measured values from the ambient light sensor and the illuminometer are significantly different, an error message appears. Measure the ambient light using the illuminometer and perform ambient light sensor correlation again.

3-2. Performing Acceptance Test

An acceptance test is used to determine whether the quality of a monitor satisfies the requirements of QC guidelines before using it. If a monitor is newly installed or replaced, it is recommended that you perform the acceptance test before using it in your daily operation.
The acceptance test includes pattern, luminance, grayscale, and uniformity checks. The check items depend on the QC guideline you use.

Pattern Check

Visually check the monitor display.

Luminance Check

Performs black and white luminance check.

Grayscale Check

Performs grayscale check.

Uniformity Check

Performs the color and brightness uniformity check for the whole screen.

Attention

- Execute the tests at the actual temperature and illuminance of the monitor usage environment.
- The ambient light may affect the measurement accuracy of the sensor. Be careful of the following points to maintain the environment during measurement.
  - Use a curtain or the like to block any windows so that natural (outside) light does not enter the room.
  - Ensure that the lighting in the room does not change during measurement.
  - While measuring, do not bring the face or an object close to the monitor, do not look into the sensor.

Note

- The test items of the acceptance test vary, depending on the QC guideline you use. Follow the instructions on the screen to proceed with the test. For details on how to set QC guidelines, see “Selecting a QC guideline” (page 40).
- When all the following conditions are met while the acceptance test is being performed, the baseline value can be set.

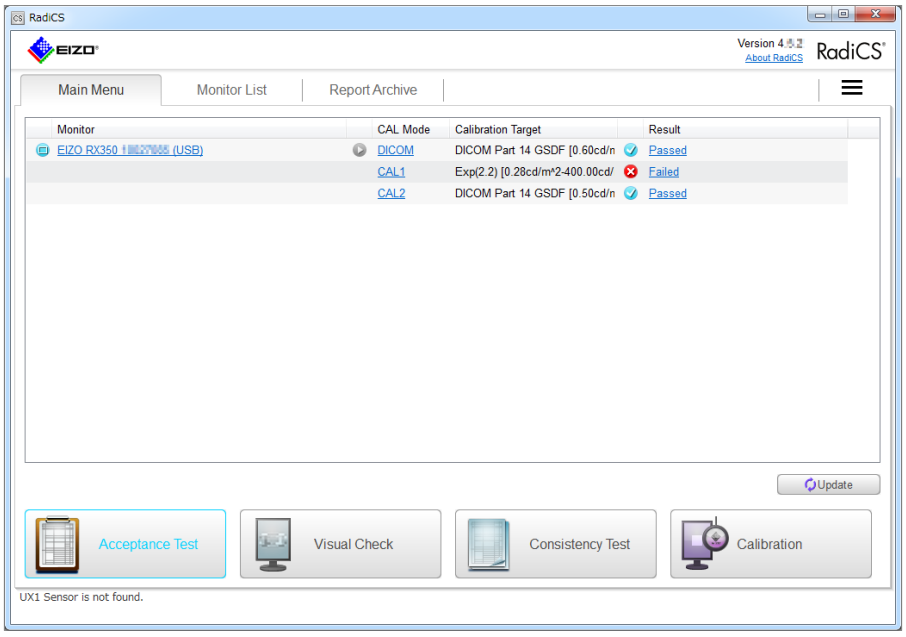
When the QC Guideline is QS-RL, DIN, or ONR 195240-20

- Judgment of the acceptance test is "Passed".
- The setting for executing a luminance check or grayscale check is selected.
- The QC guideline that uses the baseline value for a Luminance check is selected for the settings of the Acceptance Test or Consistency Test (when any check box of "Ambient Change" is selected)

When the QC Guideline is DIN 6868-157

- The setting for executing a luminance check or grayscale check is selected.
- The QC guideline that uses the baseline value for a Luminance check is selected for the settings of the Acceptance Test or Consistency Test (when any check box of "Ambient Change" is selected)

1. Click "Acceptance Test" in "Main Menu".



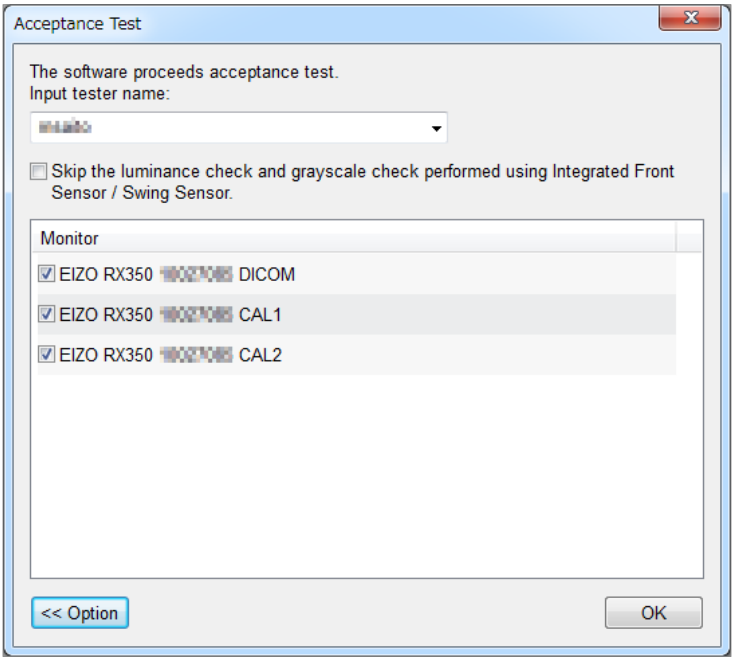
“Input tester name” appears.

Note

- Instead, you can execute the Acceptance Test from "Task" in "Execution" on the ☰ tab.

2. Enter the tester name.

Clicking "Option" lists the CAL modes in which acceptance test is performed. You can select whether to perform the acceptance test or not by selecting or unselecting the check box.



Attention

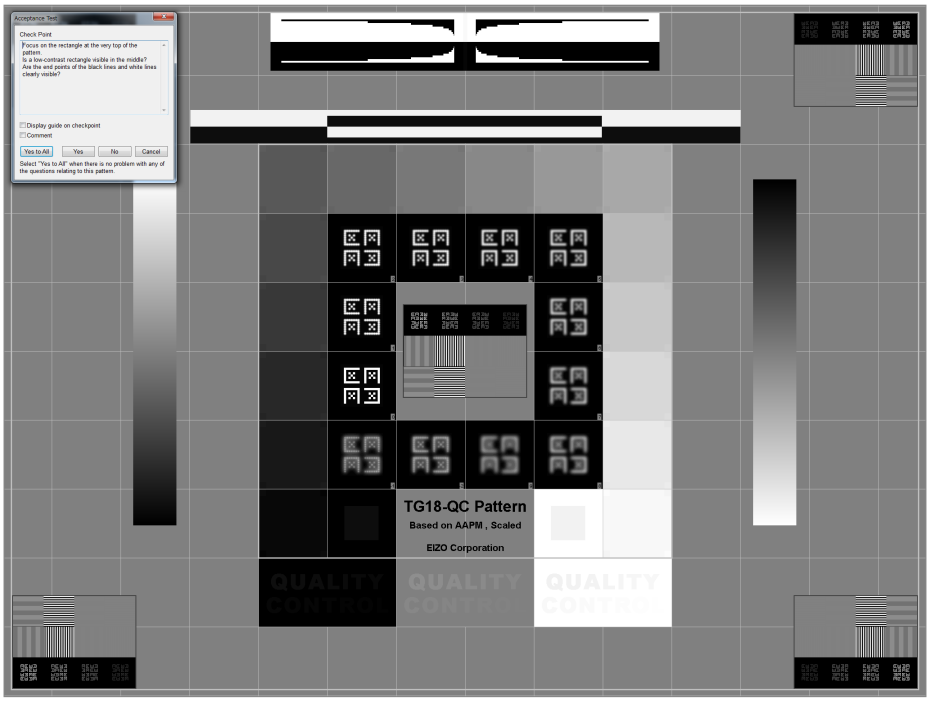
- The entered tester name must be up to 31 characters long.

Note

- All check boxes for the CAL mode are selected by default.

3. Click "OK".

The test pattern and check point are displayed.



Note

- You can set a pattern to be used in the pattern check. For details, refer to “Setting a Pattern to be used in Pattern Check” (page 46).

4. If the question shown under Check Point is true, click "Yes". Otherwise, click "No".

If there are multiple check items on one screen, clicking "Yes to All" allows you to set them as confirmed.

Note

- In case of DIN 6868-157, a confirmation screen appears asking whether the condition for executing the test has been satisfied. Click "Detail" to display the condition details.
- To hide the check point and display the pattern in full screen, click the left mouse button on the pattern with the check point displayed. When you click the left mouse button again, the check point reappears.
- Selecting the "Display guide on checkpoint" check box displays a guide which indicates a point to be checked on the pattern.
- For a monitor that meets the simultaneous pattern check conditions for multiple monitors, the “This monitor only” check box is displayed. When the check box is selected, the judgment of the pattern check is made only on that monitor.

5. If the pattern check has passed, the subsequent test is performed. Follow the instructions on the screen to perform the test.

If "No" is selected for any of the questions shown under Check Point, the Failed screen appears. Click "Retry" to perform the pattern check again. Click "OK" to perform the subsequent test is performed.

When the acceptance test been completed, the results are listed.

6. Click "OK".

Attention

- If the acceptance test has failed, retry the test. If the re-test has failed, calibrate the monitor before retrying the test.

Note

- If QS-RL, DIN, DIN 6868-157, or ONR 195240-20 is selected for the QC guideline, the report information registration screen appears after the acceptance test has been performed.

3-3. Performing Visual Check

A visual check is used to judge the image quality of a monitor (pattern check). This check must be done before using a monitor.

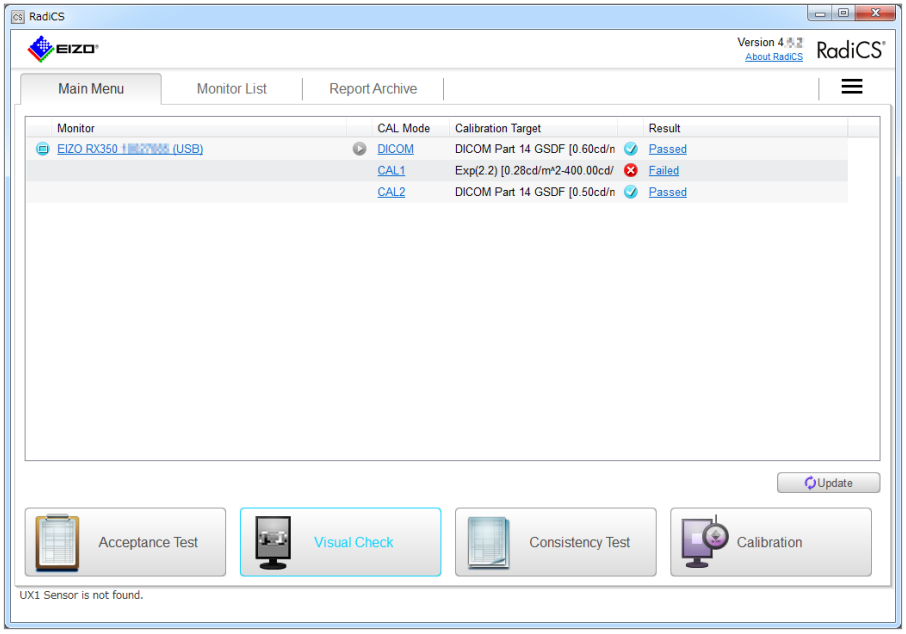
Attention

- Execute the tests at the actual temperature and illuminance of the monitor usage environment.

Note

- The visual checks use the same QC guideline as that specified for the Consistency Test. For details on setting QC guidelines and on setting a pattern used for pattern check, refer to “Setting a Pattern to be used in Pattern Check” (page 46).
- Scheduling allows you to set up a schedule to perform the task periodically (refer to “Chapter 7 Schedule Settings” (page 92)).

1. Click "Visual Check" in "Main Menu".



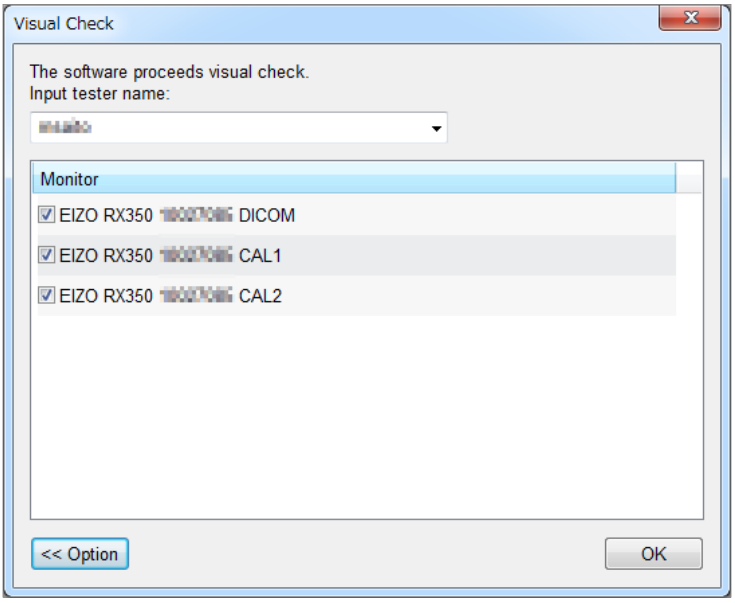
“Input tester name” appears.

Note

- Instead, you can execute the Visual Check from "Task" in "Execution" on the ☰ tab.

2. Enter the tester name.

Clicking "Option" lists the CAL modes in which visual check is performed. You can select whether to perform visual check or not by selecting or unselecting the check box.



Attention

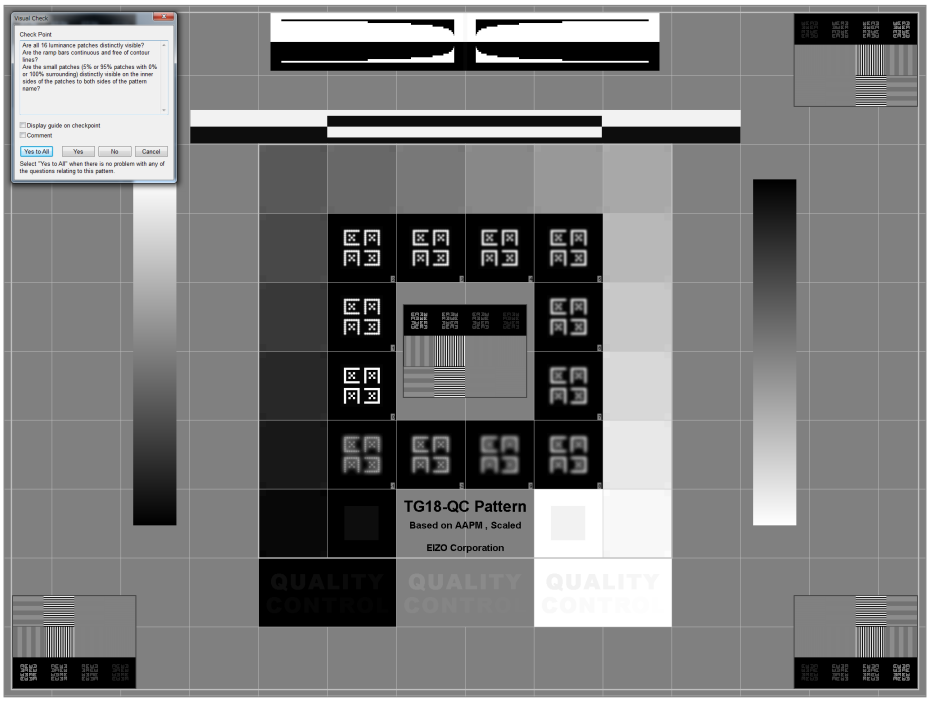
- The entered tester name must be up to 31 characters long.

Note

- All check boxes for the CAL mode are selected by default.

3. Click "OK".

The test pattern and check point are displayed.



4. If the question shown under Check Point is true, click "Yes". Otherwise, click "No".

If there are multiple check items on one screen, clicking "Yes to All" allows you to set them as confirmed.

If there is a "No", Failed screen appears. Click "Retry" to perform the pattern check again. Click "OK" to perform the subsequent test in the CAL mode.

Note

- In case of DIN 6868-157, a confirmation screen appears asking whether the condition for executing the test has been satisfied. Click "Detail" to display the condition details.
- To display the pattern in full screen, click the left mouse button on the pattern with the check point displayed. When you click the left mouse button again, the check point reappears.
- Selecting the "Display guide on checkpoint" check box displays a guide which indicates a point to be checked on the pattern.
- For a monitor that meets the simultaneous pattern check conditions for multiple monitors, the “This monitor only” check box is displayed. When the check box is selected, the judgment of the pattern check is made only on that monitor.

5. When the visual test been completed, the results are listed. Click "OK".

Attention

- If the visual check has failed, retry the check. If the re-test has failed, calibrate the monitor before retrying the test.

3-4. Performing a Consistency Test

A consistency test is used to determine that the image quality of the monitor is maintained. It is required to perform it at intervals specified by the QC guideline you use. The consistency test includes pattern, luminance, grayscale, and uniformity checks. The test items depend on the QC guideline you use.

Pattern Check

Visually check the monitor display.

Luminance Check

Performs black and white luminance check.

Grayscale Check

Performs grayscale check.

Uniformity Check

Performs the color and brightness uniformity check for the whole screen.

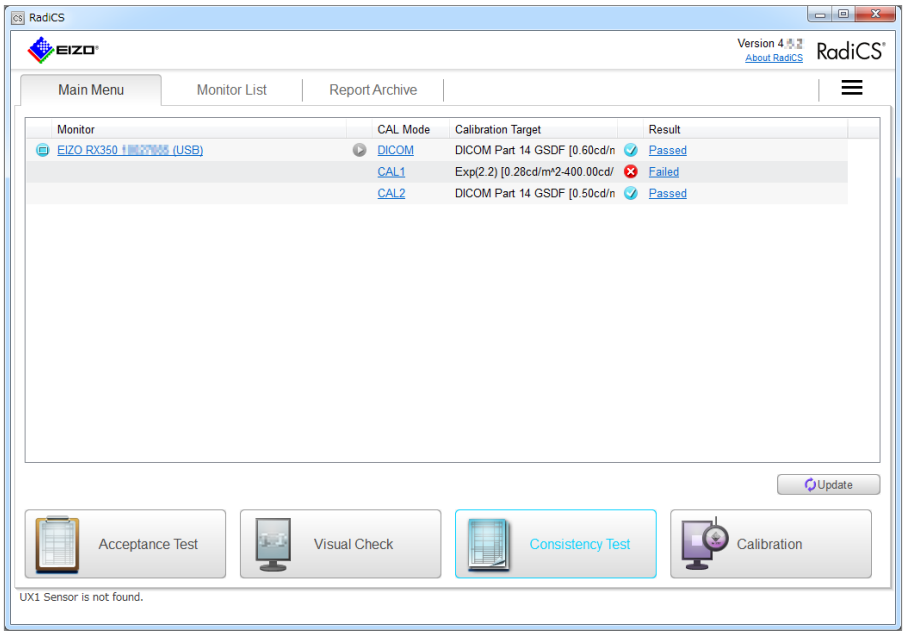
Attention

- Execute the tests at the actual temperature and illuminance of the monitor usage environment.
- The ambient light may affect the measurement accuracy of the sensor. Be careful of the following points to maintain the environment during measurement.
  - Use a curtain or the like to block any windows so that natural (outside) light does not enter the room.
  - Ensure that the lighting in the room does not change during measurement.
  - While measuring, do not bring the face or an object close to the monitor, do not look into the sensor.

Note

- The test items of the consistency test vary, depending on the QC guideline you use. Follow the instructions on the screen to proceed with the test. For details on how to set QC guidelines, see “Selecting a QC guideline” (page 40).
- Scheduling allows you to set up a schedule to perform the task periodically (refer to “Chapter 7 Schedule Settings” (page 92)).

1. Click "Consistency Test" in "Main Menu".



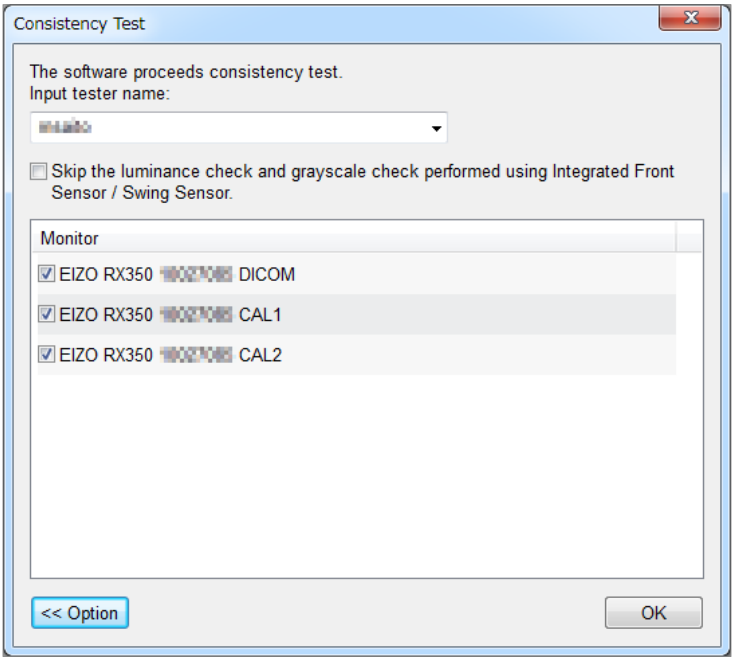
“Input tester name” appears.

Note

- Instead, you can execute the consistency test from "Task" in "Execution" on the ☰ tab.

2. Enter the tester name.

Clicking "Option" lists the CAL modes in which consistency test is performed. You can select whether to perform the consistency test or not by selecting or unselecting the check box.



Attention

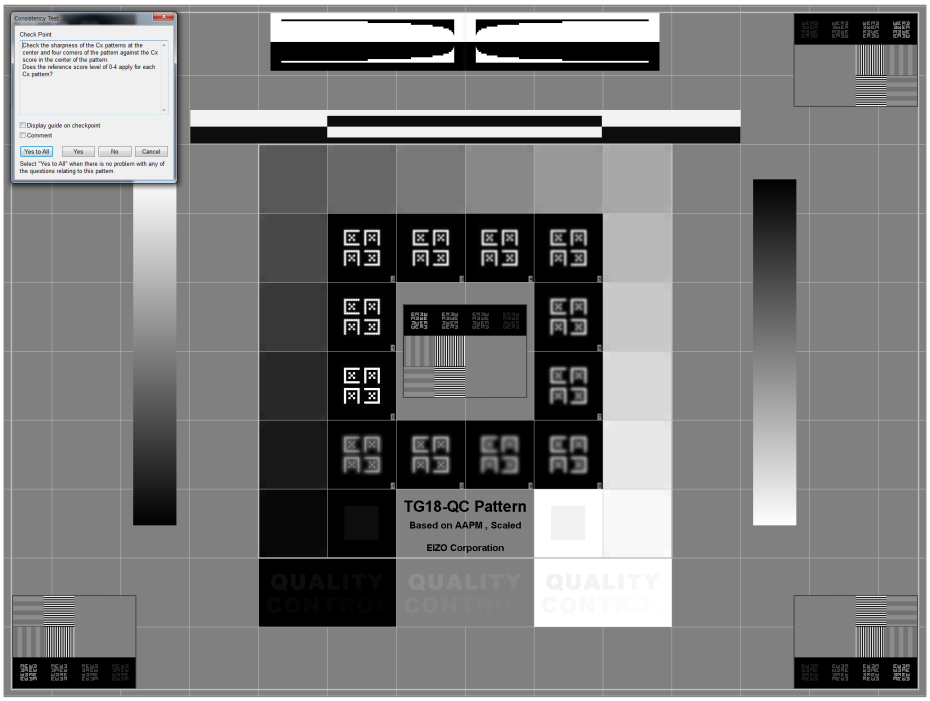
- The entered tester name must be up to 31 characters long.

Note

- All check boxes for the CAL mode are selected by default.

3. Click "OK".

The test pattern and check point are displayed.



Note

- You can set a pattern to be used in the pattern check. For details, refer to “Setting a Pattern to be used in Pattern Check” (page 46).

4. If the question shown under Check Point is true, click "Yes". Otherwise, click "No".

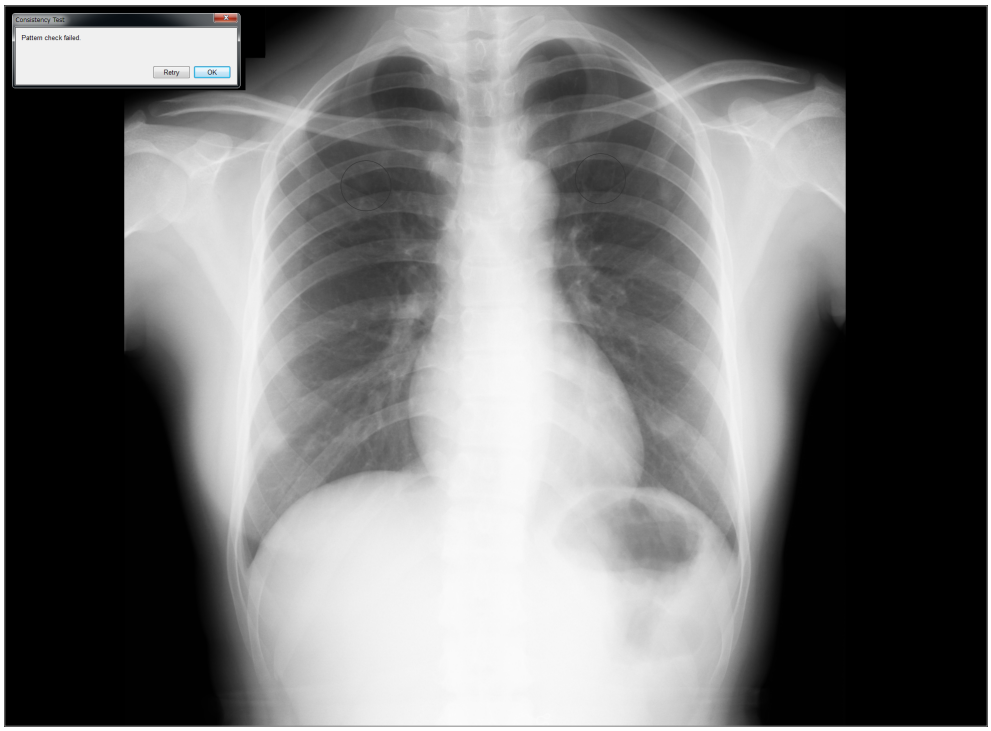
If there are multiple check items on one screen, clicking "Yes to All" allows you to set them as confirmed.

Note

- In case of DIN 6868-157, a confirmation screen appears asking whether the condition for executing the test has been satisfied. Click "Detail" to display the condition details.
- To display the pattern in full screen, click the left mouse button on the pattern with the check point displayed. When you click the left mouse button again, the check point reappears.
- Selecting the "Display guide on checkpoint" check box displays a guide which indicates a point to be checked on the pattern.
- For a monitor that meets the simultaneous pattern check conditions for multiple monitors, the “This monitor only” check box is displayed. When the check box is selected, the judgment of the pattern check is made only on that monitor.

5. If the pattern check has passed, the subsequent test is performed. Follow the instructions on the screen to perform the test.

If "No" is selected for any of the questions shown under Check Point, the Failed screen appears. Click "Retry" to perform the pattern check again. Click "OK" to perform the subsequent test is performed.



When the consistency test been completed, the results are listed.

6. Click "OK".

Attention

- If the consistency test has failed, retry the test. If the re-test has failed, calibrate the monitor before retrying the test.

Note

- If QS-RL, DIN, DIN 6868-157, or ONR 195240-20 is selected for the QC guideline, the report information registration screen appears after the consistency test has been performed.

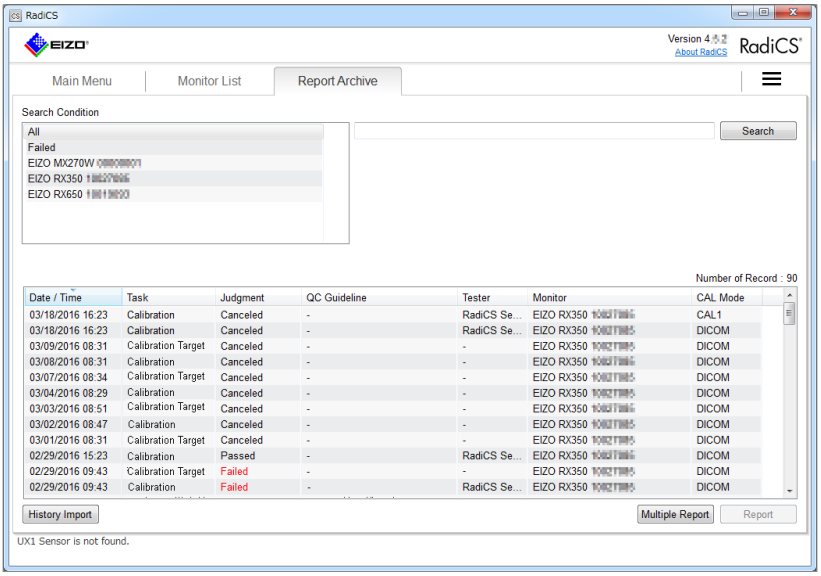
Chapter 4 History Management / Report

After completing a task, the results are recorded as a history record for each monitor. In History List, you can check the execution result of a task, or output the result as a report.

4-1. Displaying a History List

1. Click the "Report Archive" tab.

A history list of executed tasks is displayed.



Example: RadiCS

Note

- You can also display a history list by clicking "Result" in the Main Menu.

Item	Description
Date / Time	Shows the date and time the task was executed.
Task	Shows the name of the executed task. • Acceptance Test • Consistency Test • Visual Check • Calibration • Hands-on Check • Uniformity Measurement • Hands-off Check • RadiCS SelfQC • Calibration Target • Luminance Check • Grayscale Check • Ambient light sensor correlation

Item	Description
Judgment	Shows the judgment result of the task. • Passed: Indicates that the monitor passed the test. • Failed: Indicates that the monitor failed the test. • Canceled: Indicates that the scheduler-based execution of the task was canceled. • Error: Indicates that an error occurred during scheduler-based execution of the task. • -: Indicates no applicable standard.
QC Guideline*1	Indicates the QC guideline used to execute the task. • AAPM Primary • AAPM Secondary • ACR Mammo • Basic QC • Basic Mammo QC • Basic QC Primary • Basic QC Secondary • JESRA Grade 1A • JESRA Grade 1B • JESRA Grade 2 • DMG QC Manual • EUREF Mammo Primary • EUREF Mammo Secondary • IPEM • DIN Application Category A • DIN Application Category B • DIN 6868-157 III. Projection radiography • DIN 6868-157 IV. Fluoroscopy, all applications • DIN 6868-157 V. Computed tomography • DIN 6868-157 VI. Digital volume tomography (dental) etc. • DIN 6868-157 VII. Intraoral X-ray diagnostics (dental) etc. • DIN 6868-157 I. Mammography • DIN 6868-157 II. Mammographic stereotaxy • DIN 6868-157 II. Mammographic stereotaxy (for RK3) • DIN 6868-157 IV. Fluoroscopy, all applications (for RK3) • DIN 6868-157 V. Computed tomography (for RK3) • DIN 6868-157 VI. Digital volume tomography (dental) etc. in RK 5 • DIN 6868-157 VII. Intraoral X-ray diagnostics (dental) etc. in RK 6 • DIN 6868-157 VI. Dental X-ray equipment, etc. in RK 5 (five-year interval) • DIN 6868-157 VIII. Viewing • NYC PDM – Clinical sites • NYC PDM – Hospitals • NYC PDM – Mammography • NYS PDM – Diagnostic • NYS PDM – Mammography • ONR 195240-20 Application Category A • ONR 195240-20 Application Category B • ONR 195240-20 Application Category A Mammo • ONR 195240-20 Application Category B Dentistry • QS-RL Application Category A • QS-RL Application Category B • QS-RL Application Category A Mammo (PAS1054)
Tester	Shows the name of the tester entered when executing the task.
Monitor	Shows the name of the manufacturer registered in the monitor information in the format "Manufacturer name Model S/N: Serial Number".
CAL Mode	Shows the name of the CAL mode in which the task was executed.

*1 This does not appear in RadiCS LE.

Note

- Clicking a title column in the history list sorts the records in the column according to the clicked column' values.
- Dragging and dropping a title column in the history list allows you to rearrange columns.

● History Search

Select a condition in the "Search Condition" list or enter a condition in the text box and click "Search".

Note

- The History Condition list contains "All", "Failed", and the monitor name.

● Displaying data generated by an older version

Clicking "Old Version" activates a viewer that allows you to view history data generated by an older version.

Attention

- This function is not supported by the Mac version.

Note

- The "Old Version" is displayed under the following conditions.
  - The older version of RadiCS is installed on the computer to which the monitor is connected.
  - SMFitLogViewer is installed on the computer to which the monitor is connected.

● History Import

Clicking "History Import" allows you to import backup of the history file. For information on the history backup procedure, refer to “4-3. Backing Up the History” (page 68).

Attention

- This function is not supported by the Mac version.

● Delete

Deletes the selected record(s) from the history list.

Procedure

1. From the history list, select an execution history to be deleted, and right-click it.
   The menu appears.
2. Click "Delete".
   The confirmation screen appears.
3. Click "OK".
   The execution history is deleted from the history list.

● Judgment exception

Specifies that the task execution result in the Main Menu is not to be shown if the selected history record indicates that the monitor failed the task test.

4-2. Generating a Report From the History List

● Report

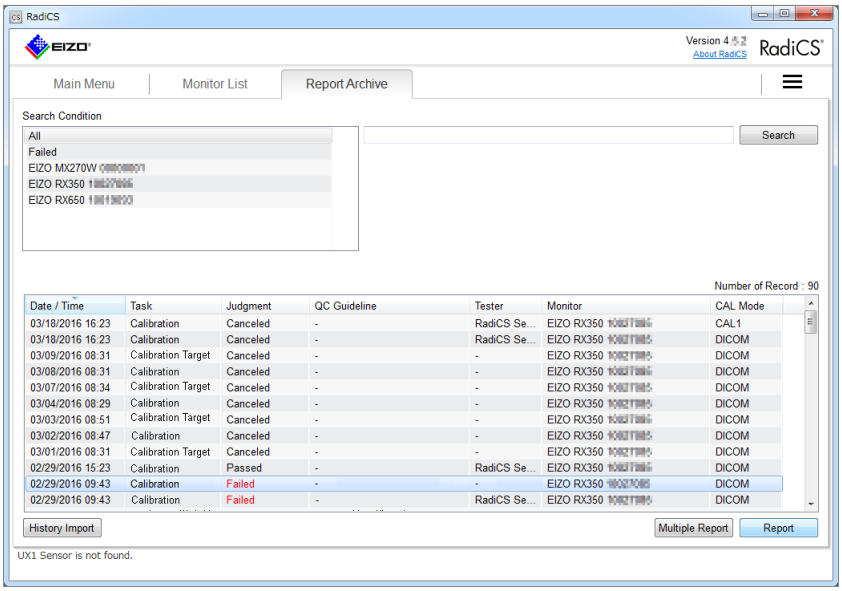
You can create a report of the task execution results.

Note

- Instead, a report can also be generated by:
  - Selecting and double-clicking a history record.
  - Right-clicking a history record and selecting "Show details" from the menu.

Procedure

1. Select the task execution history for which you want to create a report, and click "Report".

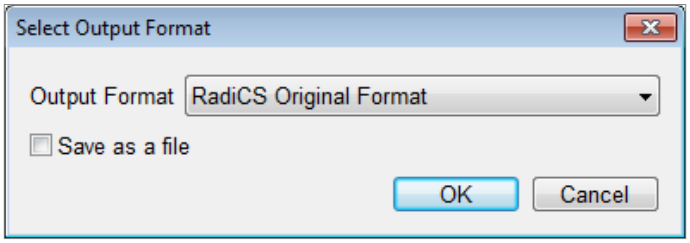


2. When an acceptance, consistency, or daily test record is selected, the "Select Output Format" screen appears. Select the output format from the pull-down list.

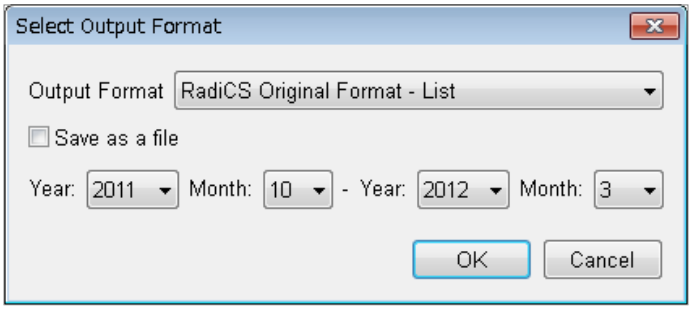
   The following are available as output formats. (The items that can be selected depend on the selection history.)

   - RadiCS Original Format
   - RadiCS Original Format - List
   - Luminance Check
   - Grayscale Check
   - QC Guideline

If a QC guideline is selected, the report is output in the appropriated format determined by the QC guideline. When "RadiCS Original Format - List" is selected, specify the history period (start and end months) for report output.



"RadiCS Original Format" (PDF)



"RadiCS Original Format - List"

Note

- When outputting QS-RL, DIN, DIN 6868-157 and ONR 195240-20 reports in PDF format, you can select the language.
  - QS-RL, DIN, DIN 6868-157: English / French / German / Italian
  - ONR 195240-20: English / German
- If "Save as a file" check box is selected, you can specify where the file is to be saved.
- When "Luminance Check" or "Grayscale Check" is selected, the file cannot be saved.
- When multiple histories are selected, "Luminance Check" and "Grayscale Check" are not displayed.

● Multiple Report

You can create multiple reports of the task execution results that meet the conditions from the history list.

Attention

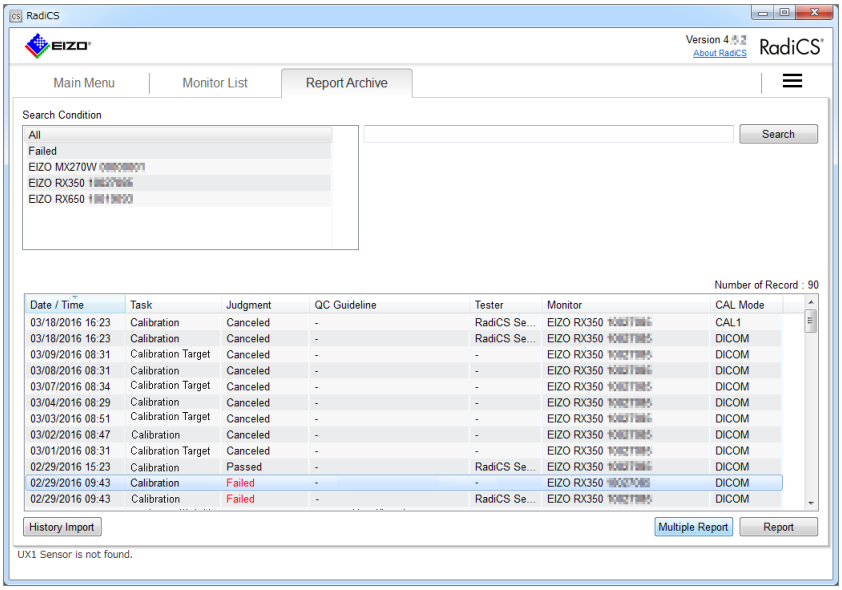
- RadiCS LE does not provide these functions.

Note

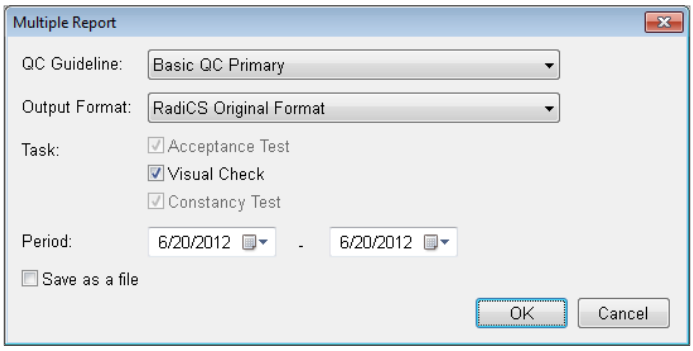
- For history records that meet any of the following conditions, the multiple report cannot be generated.
  - The "Task" is other than the acceptance test, daily test, or constancy test.
  - The "Judgment" is error or canceled.
  - The history records have been deleted from the report archive.

Procedure

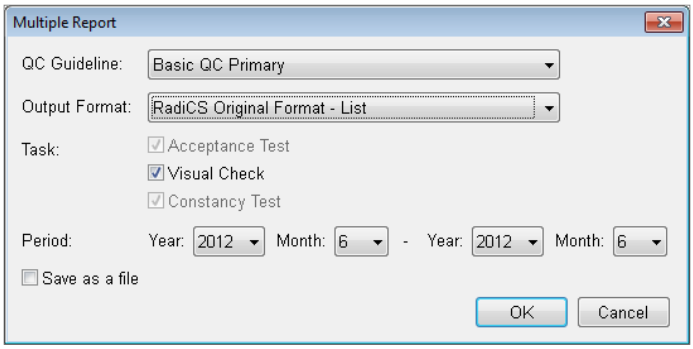
1. Click "Multiple Report".



2. Specify the "QC Guideline:", "Output Format:", "Task:", and the history period (start and end months) for report output.
   All history data that meet the specified conditions are output on a task basis.



"RadiCS Original Format"



"RadiCS Original Format - List"

Note

- When outputting QS-RL, DIN, DIN 6868-157 and ONR 195240-20 reports in PDF format, you can select the language.
  - QS-RL, DIN, DIN 6868-157: English / French / German / Italian
  - ONR 195240-20: English / German
- If "Save as a file" check box is selected, you can specify where the file is to be saved.
- The period when the output is available within 3 years.

● Edit report

When QS-RL, DIN, DIN 6868-157 and ONR 195240-20 is used, the registered report information can be edited.

Procedure

1. Select the task execution history for which you want to edit a report, and right-click it.
   The menu appears.
2. Click "Edit report".
   The report information registration screen appears.
3. Edit the report information.

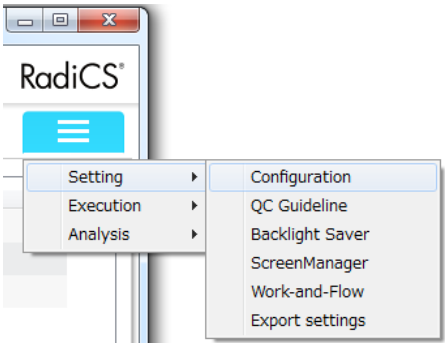
4-3. Backing Up the History

You can back up / output the history as a file.

Attention

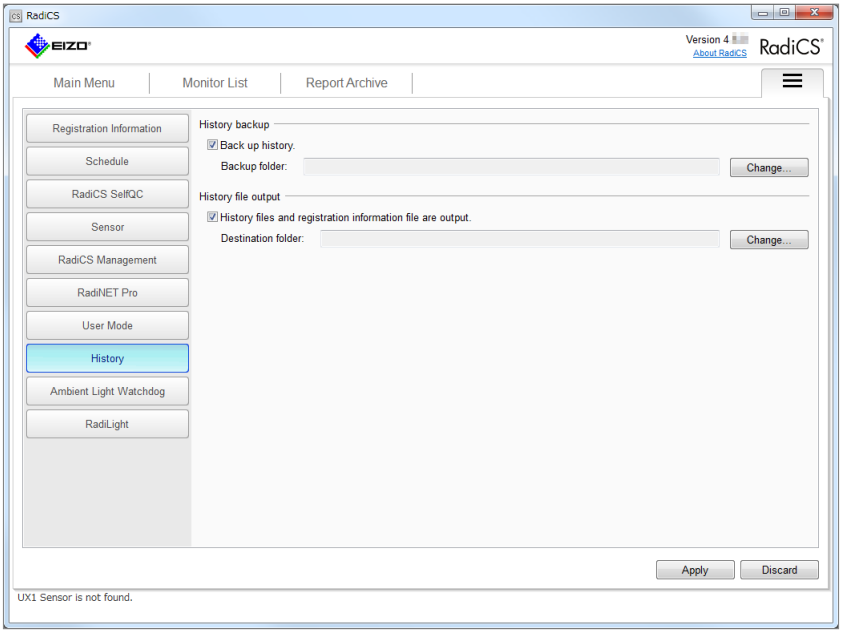
- This function is not supported by the Mac version.

1. Click the ☰ tab, and select "Configuration" from "Setting".



The Configuration screen appears.

2. Click "History".



The history backup / file output screen appears.

3. Select the check box for the item to be executed.

History backup

Backup of the history is created and saved in the specified folder.

Note

- The saved backup file can be imported. For details, refer to “History Import” (page 63).

History file output

The history details and registration information are output as an XML file to the specified folder.

4. Click "Change...", and set the save location.

5. Click "Apply".

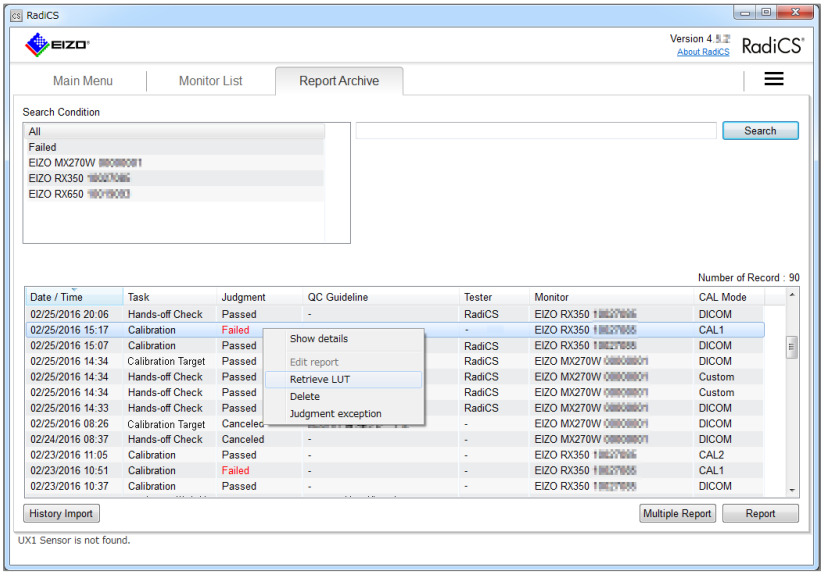
The file is saved. After the file is saved, when a history record is created, the history information is saved automatically to the specified file.

● Writing a correction value to the monitor from the task execution history (Retrieve LUT)

You can set the data of the correction value applied to the calibration to the monitor.

Procedure

1. Select a calibration history, and right-click it.
   The menu appears.
2. Click "Retrieve LUT".



   The confirmation screen appears.
3. Click "Yes".
   The correction value applied to the selected calibration is applied to the monitor.

Attention

- Depending on the usage condition of the monitor, the screen status after the calibration differs from the screen status after the correction value is applied. To set the correct display status, it is recommended that calibration is executed.

Note

- This function is not available if more than one history record is selected.

Chapter 5 Calibration

A monitor needs to be calibrated periodically so that the screen is always displayed normally and stably. Also, if there is a change in monitor connection due to new installation or replacement of a monitor, it is recommended that monitor calibration be performed.

Attention

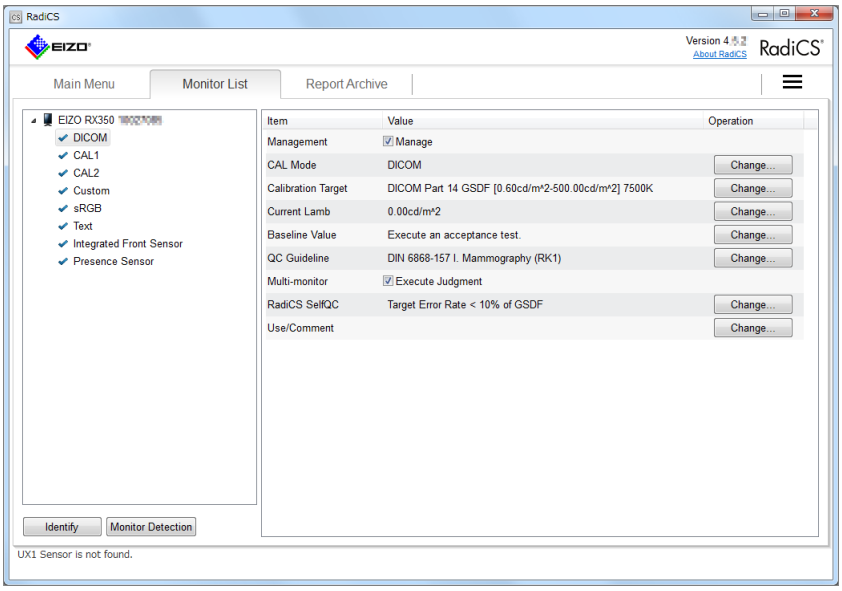
- The ambient light may affect the measurement accuracy of the sensor. Be careful of the following points to maintain the environment during measurement.
  - Use a curtain or the like to block any windows so that natural (outside) light does not enter the room.
  - Ensure that the lighting in the room does not change during measurement.
  - While measuring, do not bring the face or an object close to the monitor, do not look into the sensor.

Note

- Perform an acceptance test or consistency test (refer to “3-2. Performing Acceptance Test” (page 50)) after calibration and check the display status. Execute the tests at the actual temperature and illuminance of the monitor usage environment.

5-1. Calibration Settings

1. Click the "Monitor List" tab and select the CAL mode you want to set from the list of connected monitors.



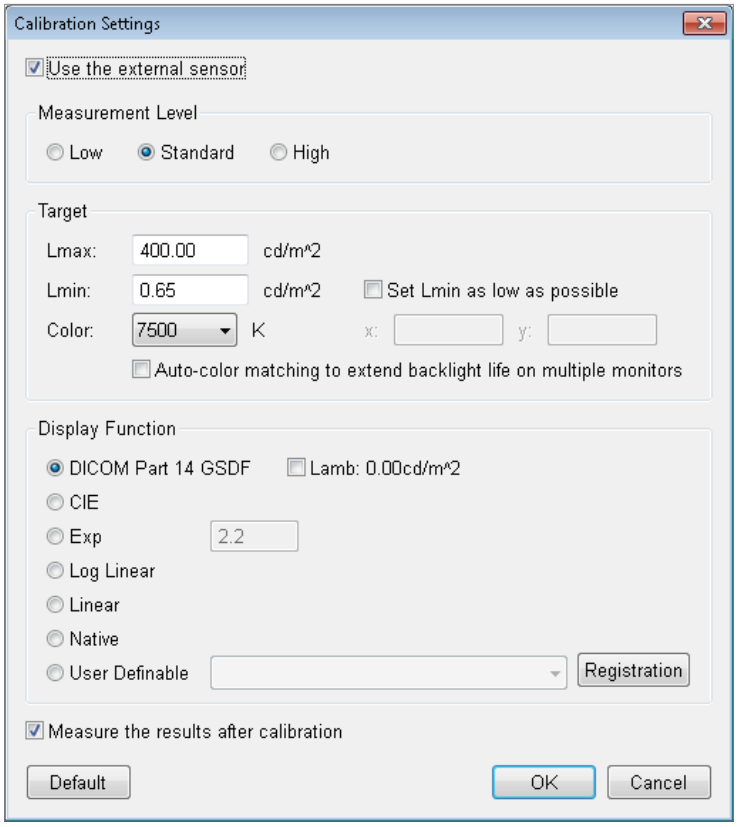
2. Click "Change..." in "Calibration Target".

The "Calibration Settings" screen appears.

3. Set the following items, and click "OK".

Note

- The valid value ranges of Lmax and Lmin depend on the monitor model.
- Click "Default", to set the current value as the default value.
- The specified Lmax, Lmin, and Lamb values are applied to the reference value under the following conditions (except for QS-RL, DIN, DIN 6868-157 and ONR 195240-20).
  - After calibration is executed
  - When the RadiCS SelfQC history is acquired from the monitor



Use the external sensor

If selected, the external sensor (EIZO sensor or built-in sensor) is used for calibration. If unselected, the backlight sensor built into the monitor is used to execute simple calibration (brightness and grayscale correction) (calibration with a Backlight Sensor).

Attention

- Only the RadiCS compatible monitor can be selected. Calibration of other monitors can only be executed using EIZO sensors.

Measurement Level

Set the calibration measurement accuracy for the external sensor.

Low	Select if you want to shorten the measurement time. The measurement accuracy is reduced.
Standard	The default setting of RadiCS. The standard measurement accuracy of RadiCS.
High	Select if you want to perform calibration with a high level of accuracy. It takes longer to complete measurement.

Target

Set the calibration target value.

Attention

- For a monochrome monitor, the color temperature cannot be set.
- The chromaticity cannot be set if "Auto-color matching to extend backlight life on multiple monitors" is enabled.

Lmax	Set a maximum luminance target. Enter a value that does not include ambient luminance.
Lmin	Set a minimum luminance target. If you want to set Lmin to the minimum luminance value of the monitor being measured, select the “Set Lmin as low as possible” check box and enter a value that does not include ambient luminance.
Color	Select a color temperature target value from the pulldown menu for a color monitor. To set the color (x: 0.2000 to 0.4000, y: 0.2000 to 0.4000), select “Custom”. To set the original color of a LCD panel, select “OFF”.

Auto-color matching to extend backlight life on multiple monitors

If the "Auto-color matching to extend backlight life on multiple monitors" check box is selected, to extend the lifetime of the monitor, measure the luminance and chromaticity, then set the target chromaticity and perform calibration. The target chromaticity is applied to the same model monitors. Calibration can be performed when all of the following conditions are met.

- Monitor (RadiCS compatible monitor)
- Color monitor
- Monitor with Integrated Front Sensor
- "Use the external sensor" is enabled

Display Function

Select the DICOM display function (grayscale characteristics).

DICOM Part 14 GSDF	This setting complies with DICOM Part14. If the "Lamb" check box is selected, the ambient light value is used in calibration. Lmax + Lamb = Maximum Luminance Target Lmin + Lamb = Minimum Luminance Target
CIE	Uses a display function which complies with CIE LUV and CIE LAB.
Exp	Enter a gamma value in the range from 1.6 to 2.4.
Log Linear	Uses a log linear function.
Linear	Uses a linear function.
Native	Uses the settings reflecting the original characteristics of the panel.
User Definable	You can select a file by clicking "Registration".

Measure the results after calibration

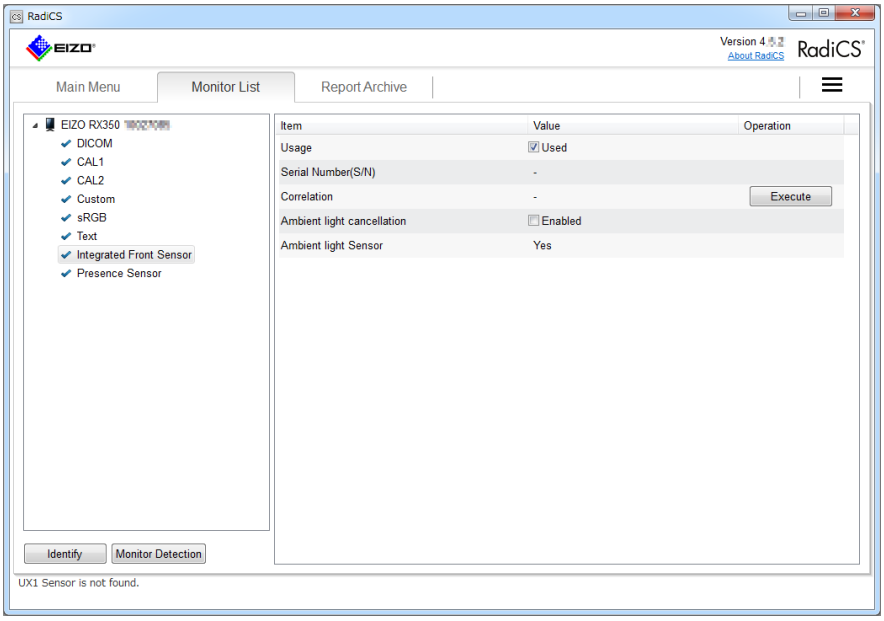
Specifies whether the post-calibration results are measured.

● Correlation

When using the built-in sensor for the test, you must periodically perform correlation with the external sensor. Correlation allows you to calculate the correct state of the monitor at the central portion from the measurement portion of the built-in sensor.

Procedure

1. Click the "Monitor List" tab.
2. Select Swing Sensor or Integrated Front Sensor of the monitor for which you want to perform correlation.



The sensor information is displayed in the right pane.

3. Click "Execute" for Correlation.
   A correlation message and a measurement window appear on the monitor screen.

4. Attach the EIZO sensor by aligning it at the center of the measurement window, and click "Execute".
   The correlation starts.

Attention

- If the SSM sensor is used, correlation cannot be executed with the color monitor or Integrated Front Sensor installed monitor.

5-2. Calibration

Two different calibration methods are available: one using an external sensor, and the other involving calibration with a Backlight Sensor built in to a monitor.
The calibration method using the external sensor differs between the RadiCS compatible monitor and other monitors.

For RadiCS compatible monitor

Correct the brightness and display function on the monitor side (hardware calibration). For the RadiCS compatible monitor, refer to “12-5. Viewing the RadiCS Information (About RadiCS)” (page 145).

For monitors other than RadiCS compatible monitor

Correct the signal level to be output from the graphics board (software calibration). If you are using an EIZO-recommended graphics board in an independent monitor environment, you can perform software calibration.

Attention

- For the Mac version, the calibration cannot be executed.
- If you are using a DirectDraw compatible graphics board, you can only perform software calibration.
- When using a color mode that does not allow luminance adjustment, software calibration is performed after changing to a color mode that allows luminance adjustment.

Note

- You can change LUT data settings after calibrating the monitor with the graphics board.
  1. Click the "Monitor List" tab and select the monitor name you want to set from the left pane.
  2. Select the "Software calibration" check box in Calibration.

     If “Software Calibration” is selected (that is, checked on), grayscale data generated at the calibration is set as LUT data. If it is unselected, the default is used. Software Calibration is automatically turned on each time calibration is executed.

1. Turn the monitor on to warm it up before calibration.

Note

- The required warm up time differs depending on the monitor. For more details, the user's manual of the monitor.

2. To use the external sensor, connect an EIZO sensor.

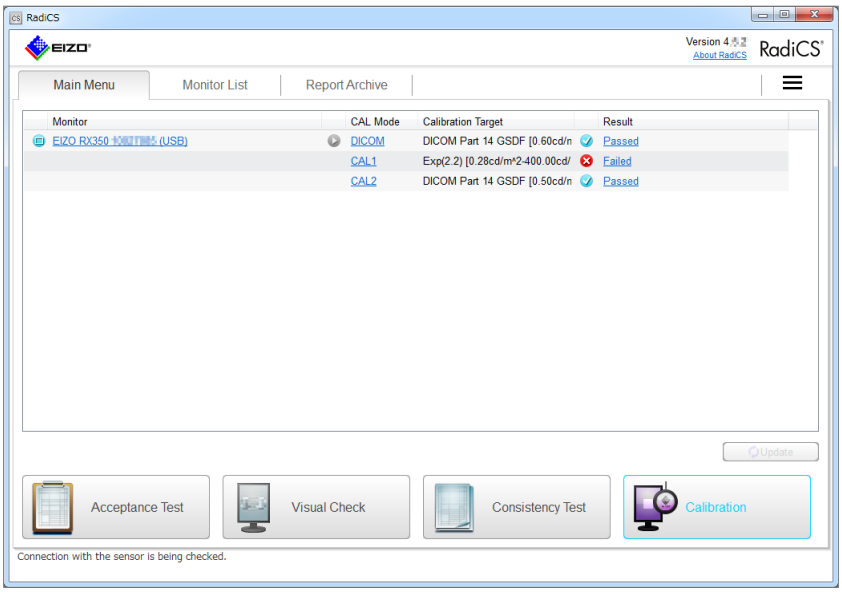
Note

- To use the built-in sensor or to perform calibration with a Backlight Sensor, it is not necessary to connect an EIZO sensor.

Attention

- The SSM sensor can be used for monochrome monitors only.

3. Click "Calibration" in "Main Menu".



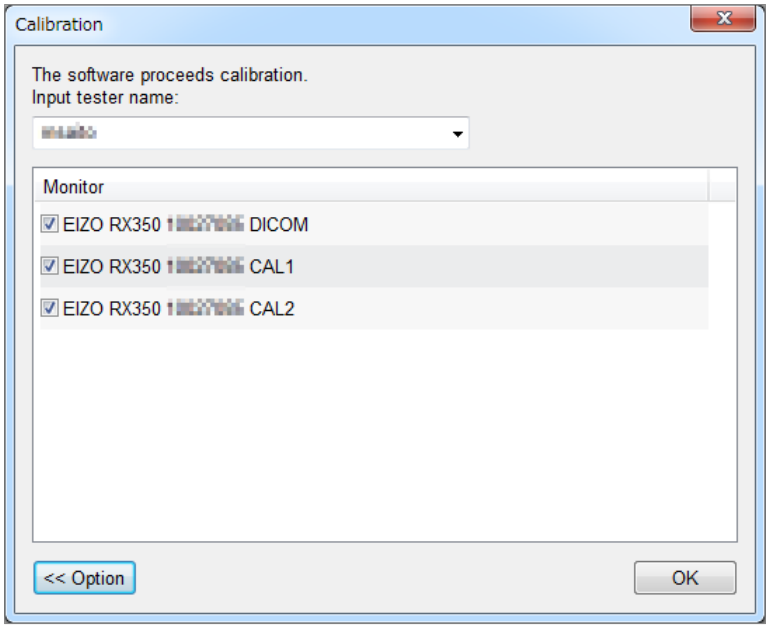
"Input tester name" appears.

Note

- Instead, you can perform this from "Task" in the "Others" tab.

4. Enter the tester name.

Clicking "Option" allows you to select the CAL mode of calibration. You can also select whether or not to perform calibration by selecting or unselecting the check box.



Attention

- The entered tester name must be up to 31 characters long.

Note

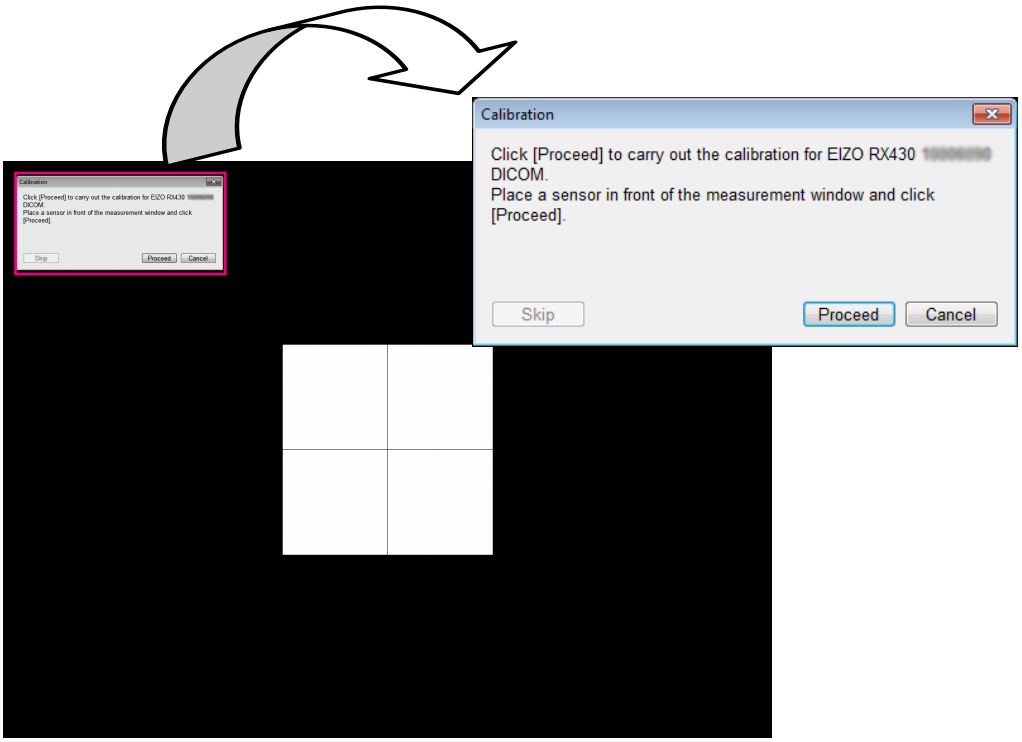
- All check boxes for the CAL mode are selected by default.

5. Click "OK".

When the external sensor is used, a calibration message and a measurement window appear on the monitor screen.

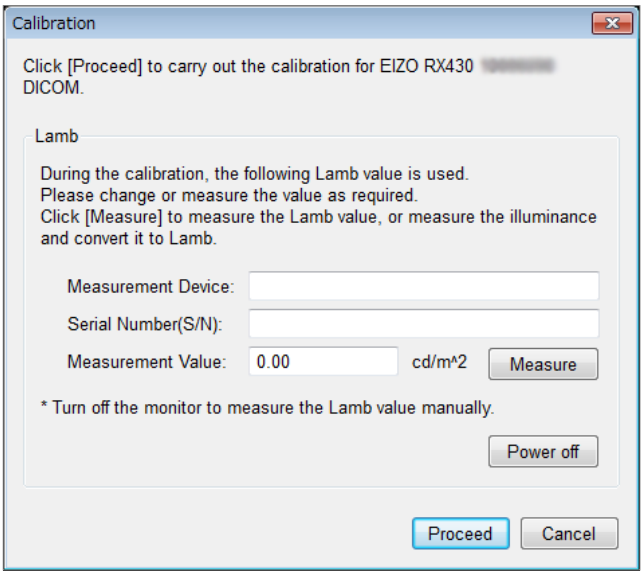
Note

- If the built-in sensor is used or the calibration with a Backlight Sensor is performed, no measurement window appears.



Note

- When "DICOM Part 14 GSDF" is selected from the display function of the "Calibration Settings" and the "Lamb" check box is selected, the ambient luminance can be set (page 71).
- RadiCS compatible monitors can also measure the ambient luminance. (For the Mac version, the ambient luminance cannot be measured.)



6. To use the external sensor, attach the sensor on the measurement window.

7. Click "Proceed".

When ambient luminance is set, values are saved.

Note

- When performing calibration in an environment with multiple monitors connected, the procedure will differ depending on the sensor used.

When an EIZO sensor is used

- The calibration message and measurement window appear on all monitors one by one. Perform calibration one monitor at a time. If the message and measurement window appear on a monitor that is not to be calibrated, click "Skip". The message appears on the next monitor.

When an Integrated Front Sensor is used

- The calibration message appears simultaneously on all connected monitors. When you click "Proceed" on one of the monitors on which the calibration message appears, calibration will be performed for all of the monitors at once.

8. Follow the message instruction to proceed with the calibration.

These results are only displayed when the "Measure the results after calibration" check box is selected in "Calibration Target".

For monitors other than RadiCS compatible monitor, the Lmax adjustment screen appears. Perform the calibration according to the following procedure.

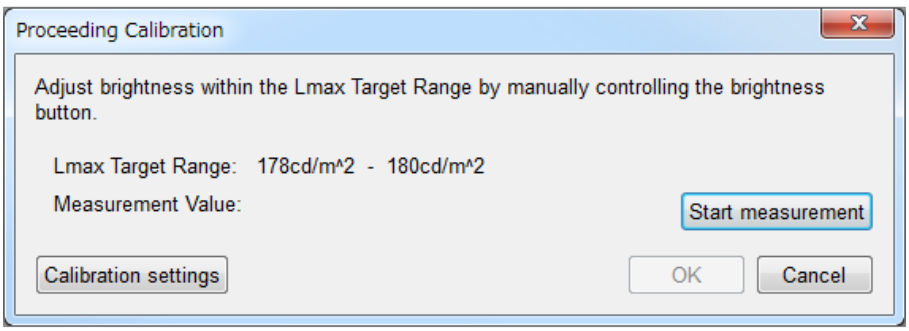
Procedure

1. Click "Start measurement".

   The luminance is automatically measured by the sensor and the measurement value is displayed.

   Note

   - The calibration target value must be set depending on the monitor. Click "Calibration settings" and then set the target (Lmax:).



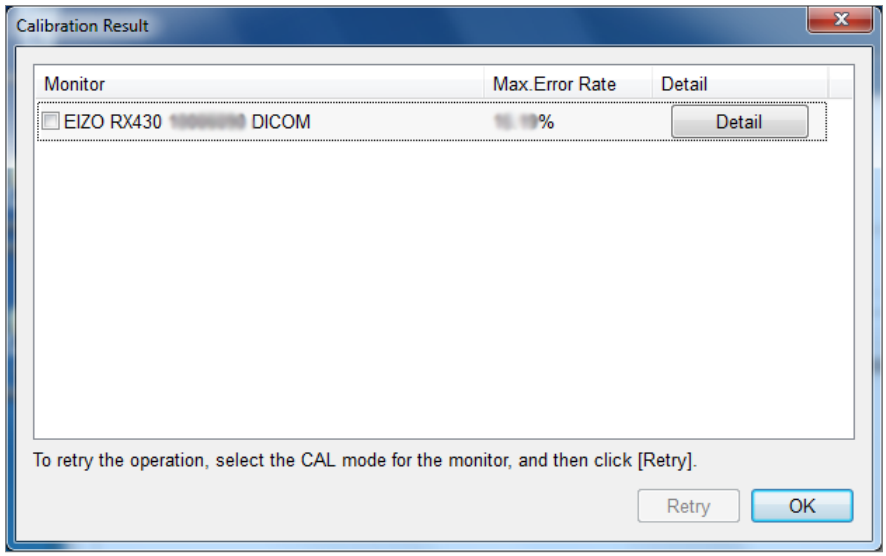
2. Use the monitor brightness adjustment function to set the luminance to the target range displayed in the Lmax adjustment screen.

   The luminance is automatically measured until the "OK" button is clicked.

   The "OK" button becomes active when the value of "Measurement Value:" reaches the Lmax target range.

3. Click "OK".

9. "Calibration Result" appears. Click "OK".



Attention

- After calibration is complete, the monitor adjustment function is locked.
- If you want to make adjustment again, use either of the following methods to unlock the lock:
  - Select a monitor name from "Monitor List". Click "Change..." for Keylock to unlock the lock. (see “Keylock” (page 131)).
  - Unlock the lock on the monitor (For details, refer to the user’s manual of the monitor).

Note

- These results are only displayed when the "Measure the results after calibration" check box is selected in "Calibration Settings".

Monitor Quality Control (Application)

Chapter 6 Checking Monitor Status

6-1. Performing Tasks

The following tasks can be performed on any CAL mode.

- Acceptance Test*1
  For details, refer to “3-2. Performing Acceptance Test” (page 50).
- Visual Check*1
  For details, refer to “3-3. Performing Visual Check” (page 54).
- Consistency Test*1
  For details, refer to “3-4. Performing a Consistency Test” (page 57).
- Calibration
  For details, refer to “Chapter 5 Calibration” (page 70).
- Uniformity Measurement*1
  Performs the color and brightness uniformity check for the whole screen.
- Hands-off Check
  Obtains luminance information from the monitor and judges whether the current luminance is managed properly.
  If the luminance is judged to be low, a message prompting the calibration settings to be change and calibration to be executed appears.
- Luminance Check*1
  Performs black and white luminance check.
- Grayscale Check*1
  Performs grayscale check.

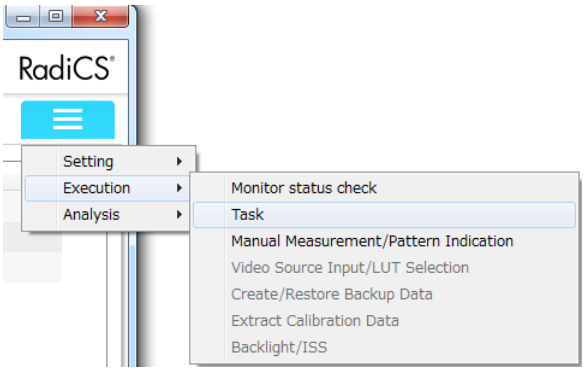
*1 RadiCS LE cannot execute this.

Note

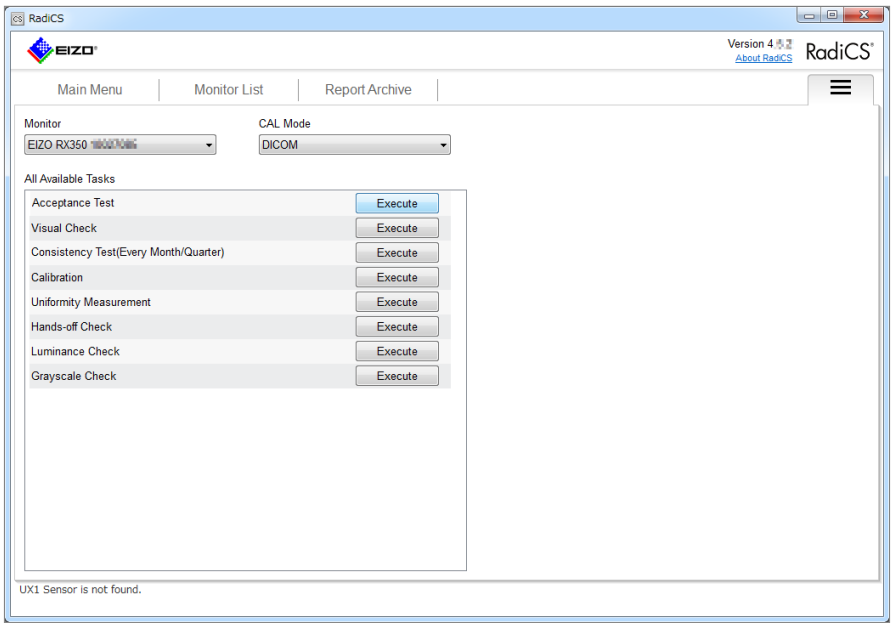
- You can execute any of Acceptance Test, Visual Check, Consistency Test, and Calibration from the main menu.
- Instead, you can execute Luminance Check and Grayscale Check from "Monitor status check" in "Setting" on the ☰ tab.

1. Click the ☰ tab, and select "Task" from "Execution".

The Task screen appears.



2. Select "Monitor" on which you want to perform tasks and select "CAL Mode".



3. Click the "Execute" button for tasks you want to perform.

The selected tasks are performed.

Follow the instructions on the screen to perform the tasks.

4. When the tasks have been completed, the results are listed. Click "OK".

6-2. Measuring Ambient Illuminance

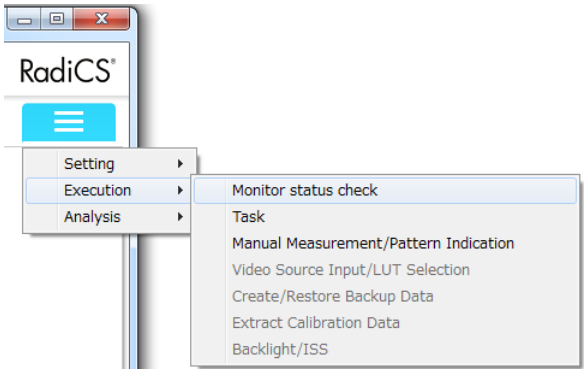
● Measuring Ambient Illuminance

Attention

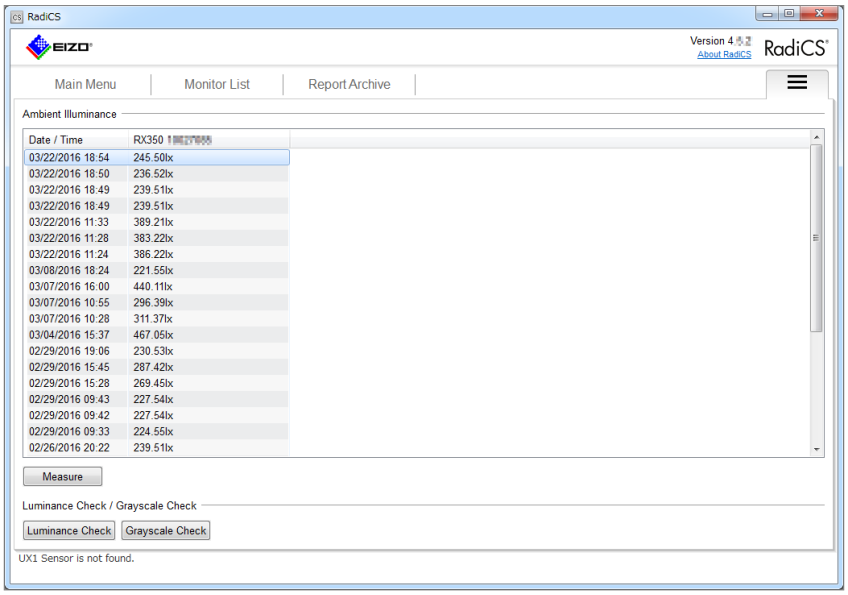
- This function is available when a Clip-On Swing Sensor G2 is installed or the monitor contains an ambient light sensor (except MX270W/MX215).
- The ambient light may affect the measurement accuracy of the sensor. Be careful of the following points to maintain the environment during measurement.
  - Use a curtain or the like to block any windows so that natural (outside) light does not enter the room.
  - Ensure that the lighting in the room does not change during measurement.
  - While measuring, do not bring the face or an object close to the monitor, do not look into the sensor.

Procedure

1. Click the ☰ tab, and select "Monitor status check" from "Execution".



2. Click "Measure".



The current ambient illuminance is measured, and the measurement result is saved.

Note

- The measurement result is also saved when "Display ambient illuminance." is selected in "12-4. Configuring the Startup Settings" (page 144) and "Update" in "Main Menu" is clicked.

● Watching Ambient Light

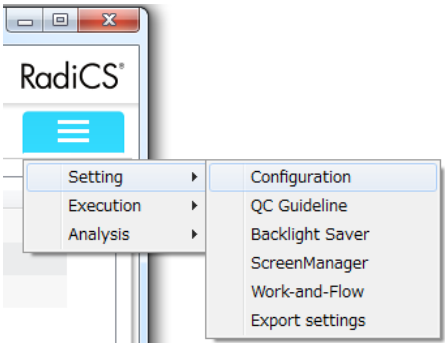
If Ambient Light Watchdog is enabled, the ambient illuminance is measured at set intervals. If the ambient illuminance falls outside the allowable range, an alert can be displayed.

Note

- This function is available when a Clip-On Swing Sensor G2 is installed or the monitor contains an ambient light sensor (except MX270W/MX215).
- When the following tasks are performed on a monitor with a built-in sensor installed, this function monitors the change of the illuminance before and after the tasks are executed. If there is a major change in the illuminance value before and after the task execution, an alarm is displayed. If the alarm is displayed, check environmental conditions such as the ambient light and use the illuminance under an appropriate environment.
  - Luminance Check
  - Grayscale Check
  - Calibration
  - Correlation

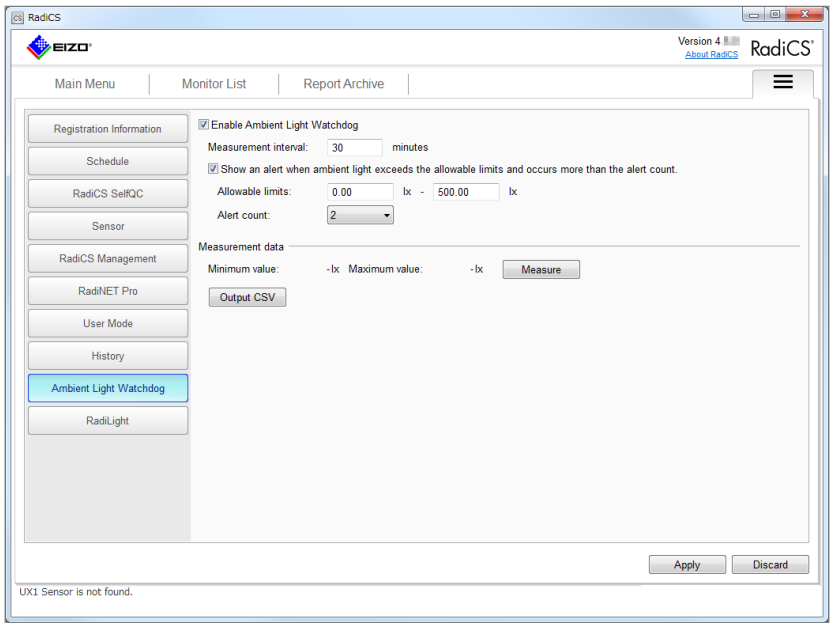
Procedure

1. Click the ☰ tab, and select "Configuration" from "Setting".



The Configuration screen appears.

2. Click "Ambient Light Watchdog".



The Ambient Illuminance screen appears in the right pane.

3. Select the "Enable Ambient Light Watchdog" check box and set the following items.

Measurement interval

Sets the interval at which the ambient illuminance is measured.

Show an alert when ambient light exceeds the allowable limits and occurs more than the alert count

When the check box is selected, RadiCS shows an alert if the following conditions are exceeded.

Allowable limits	Sets the upper and lower limits on the allowable ambient illuminance.
Alert count	Sets the number of times at which the ambient illuminance value exceeds the allowable limit, causing an alert to be displayed.

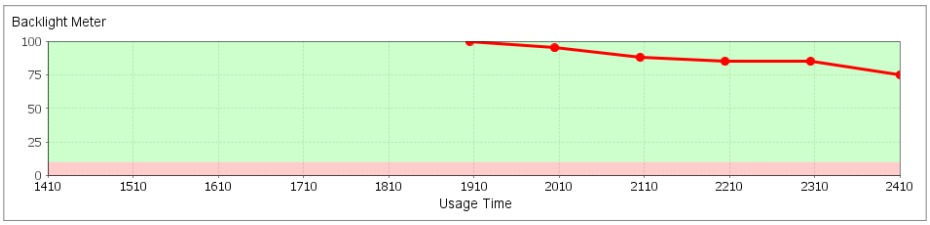
Note

- Click "Output CSV" to save the ambient illuminance measurement data to a CSV file.
- Click "Measure" to immediately measure the ambient illuminance, regardless of the set times in "Measurement interval:". These measurement data are reference data for setting the allowable range. They are not saved.

6-3. Watching Monitor Luminance (Backlight Meter / Status Analyzer)

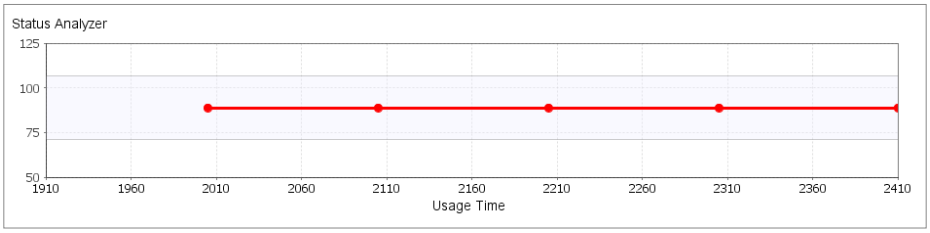
With the following two functions, the monitor status is monitored and the results are displayed. Also, a hands-off check can be executed. Please use this data for your reference.

Backlight Meter



The monitor life (the remaining time during which the recommended brightness can be maintained) is estimated to display the backlight status in graph format. The portion of the graph where the background is red shows that the backlight status value is below the threshold.

Status Analyzer

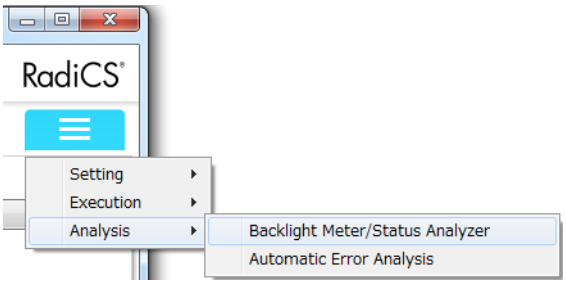


Acquires the monitor brightness information and displays the brightness in graph format from the execution of calibration to the present. The portion of the graph where the background is white shows that the brightness has significantly changed from the information that was acquired immediately after calibration. If this occurs, it is recommended that calibration be executed again.

Attention

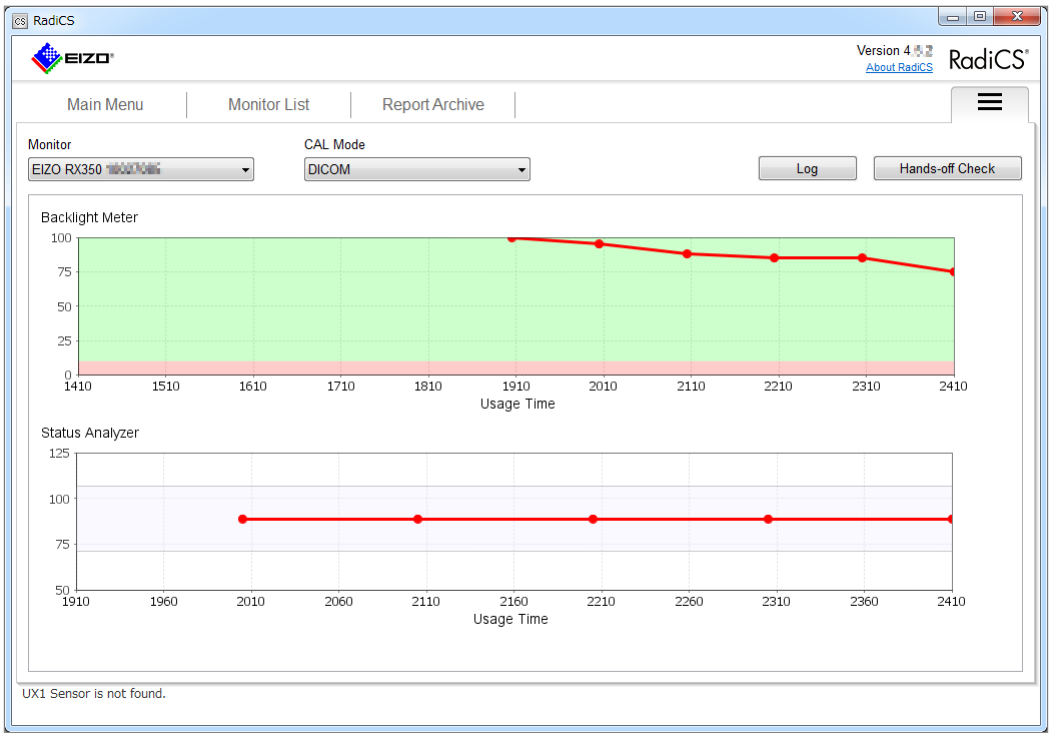
- The graph for "Status Analyzer" is reset when calibration is executed.

1. Click the ☰ tab, and select "Backlight Meter / Status Analyzer" from "Analysis".



2. Select "Monitor" and "CAL Mode".

A graph is displayed.



Note

- A hands-off check is automatically executed 35 minutes after logon.
- Clicking "Hands-off Check" allows you to execute a hands-off check.
- Clicking "Log" displays the execution results for a hands-off check.

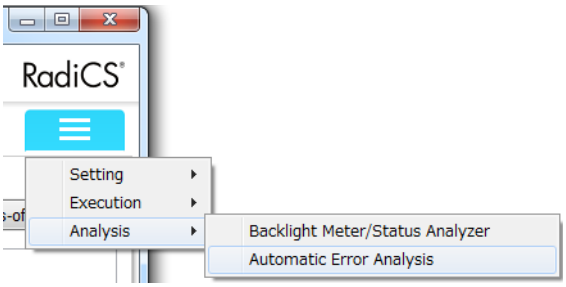
6-4. Checking Auto Error Analysis Result

If the result of the acceptance test, consistency test, visual check, calibration, luminance check, or grayscale check fails, error analysis will be performed automatically. You can use the analysis to pinpoint the cause and confirm what solution to take to address the error.

Note

- Error analysis is performed automatically on starting RadiCS, or when you click "Update" in the main menu.

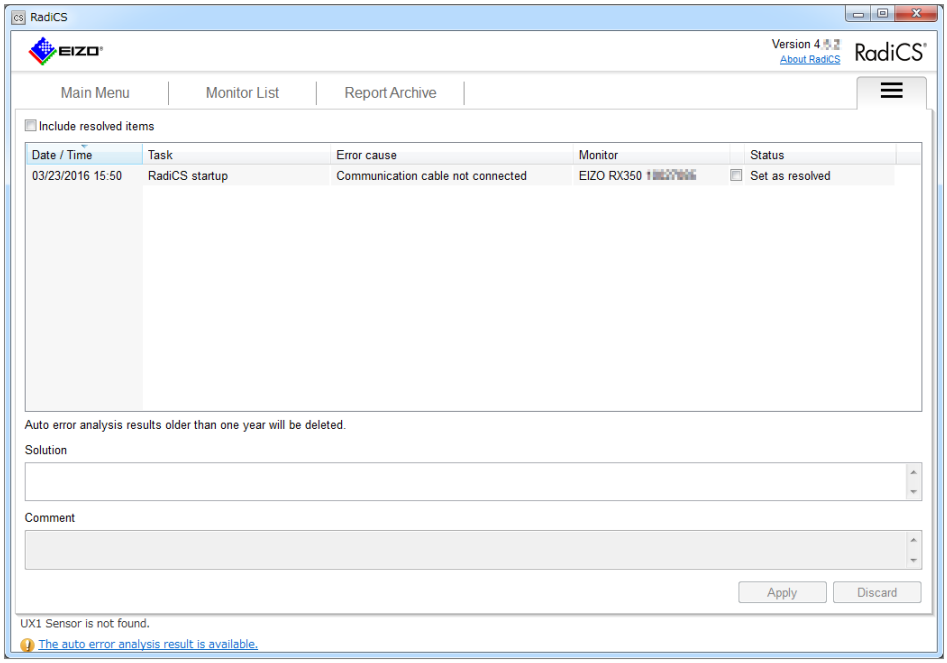
1. Click the ☰ tab, and select "Automatic Error Analysis" from "Analysis".



The Automatic Error Analysis screen appears.

2. Select the result you want to check.

The solution is displayed.



3. Refer to the error cause and solution and take appropriate action, and then select "Set as resolved".

This will change the status to "Resolved".

Note

- If any unresolved analysis results exist, The following message appears on the lower left of the RadiCS screen. Clicking the message displays the Automatic Error Analysis screen.

  The auto error analysis result is available.

- Selecting "Include confirmed errors" allows you to list the results of auto error analysis you have changed their status to "confirmed".

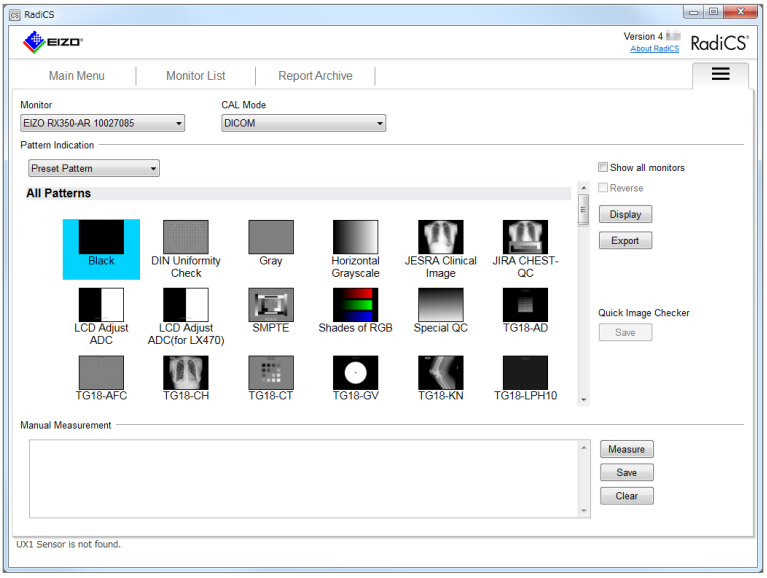
6-5. Displaying / Outputting a Pattern

● Pattern indication

Allows you to display a pattern image on the screen of a monitor or all connected monitors. This function only displays a selected pattern and does not have setup or pattern check capabilities.

Procedure

1. Click the ☰ tab, and select "Manual Measurement / Pattern Indication" from "Execution".



2. Select the monitor and CAL mode you want to use.
3. Select "Preset Pattern" from the "Pattern Indication" pull-down menu.

Attention

- Select one pattern you want to display. You cannot display any pattern if multiple patterns have been selected.

4. Select the pattern image you want do display and click "Display".

   The selected pattern image is displayed on the entire screen.

   Selecting the check boxes allows you to invert the pattern image or display the pattern on all monitors.

Reverse	Inverts the black and white of the pattern. This check box is available only when the selected pattern supports inverted display.
Show all monitors	Displays the pattern image on all monitors.

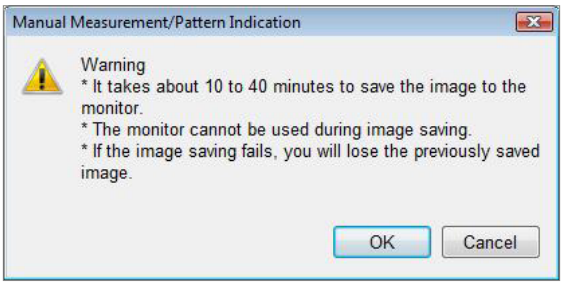
Attention

- Select one pattern you want to display. You cannot display any pattern if multiple patterns have been selected.

Note

- For a GS521-ST monitor which does not display a pattern image, a black image appears on the entire screen.
- For the monitors with the Quick Image Checker function, the selected pattern image can be saved to each monitor.
  1. Click the displayed "Save" button for Quick Image Checker.

     The following message appears.



  2. Click "OK".

     The selected pattern image is displayed, and is saved to the monitor. It takes about 10 to 40 minutes to save pattern images.

5. To return to the previous screen, click the left mouse button on the displayed pattern image.

Note

- Selecting "Favorite" on the selected pattern allows you to register it as a favorite image.

● Pattern Output

Pattern output is a function for outputting pattern images from RadiCS in DICOM or Bitmap format.

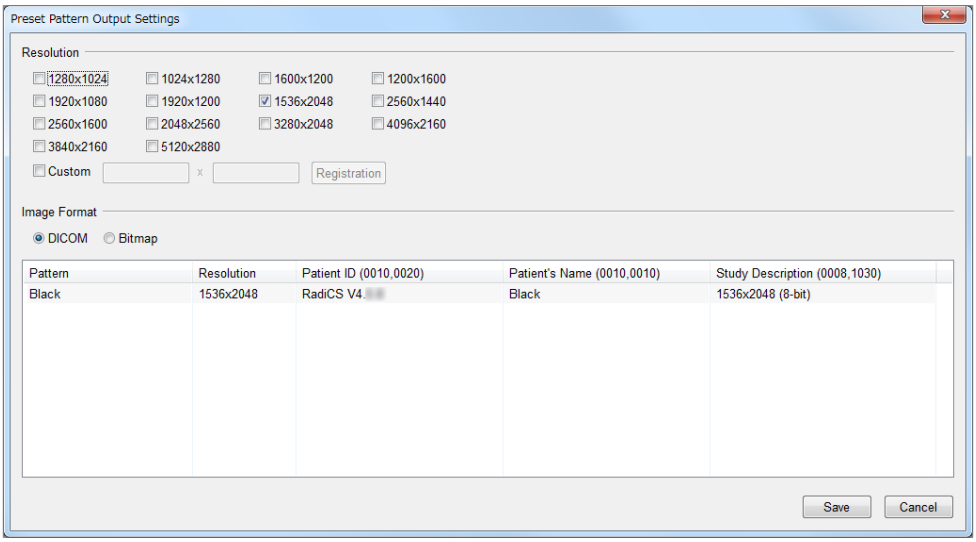
Procedure

1. Click the ☰ tab, and select "Manual Measurement / Pattern Indication" from "Execution".
2. Select "Monitor" and "CAL Mode".
3. Select "Preset Pattern" from the "Pattern Indication" pull-down menu.
4. Select a pattern image to output, and click "Export".
   The "Preset Pattern Output Settings" screen appears.

Note

- You can select multiple pattern images using the following methods.
  - Click multiple images while holding down the Ctrl key
    All images you have clicked are selected.
  - Click two images while holding down the Shift key
    The two images you have clicked and all images in between are selected.

5. Select the resolution and image format for the pattern images, and click "Save".
   You can select multiple resolutions.



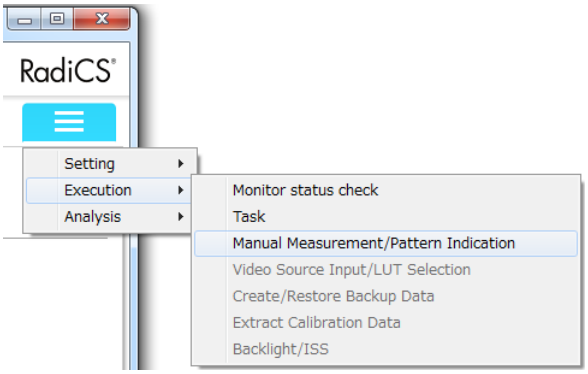
Resolution	Select the resolution of pattern images to be output. Selecting "Custom" allows you to specify any resolution from 1 to 5120.
Image Format	Select the image format. • DICOM*1 • Bitmap *1 If you select "DICOM", the following items can be edited. - Patient ID (0010,0020) - Patient Name (0010,0010) - Study Description (0008,1030)

6. Specify the save location and file name, and click "Save".
   A pattern image file will be created.

6-6. Manually Measuring Luminance

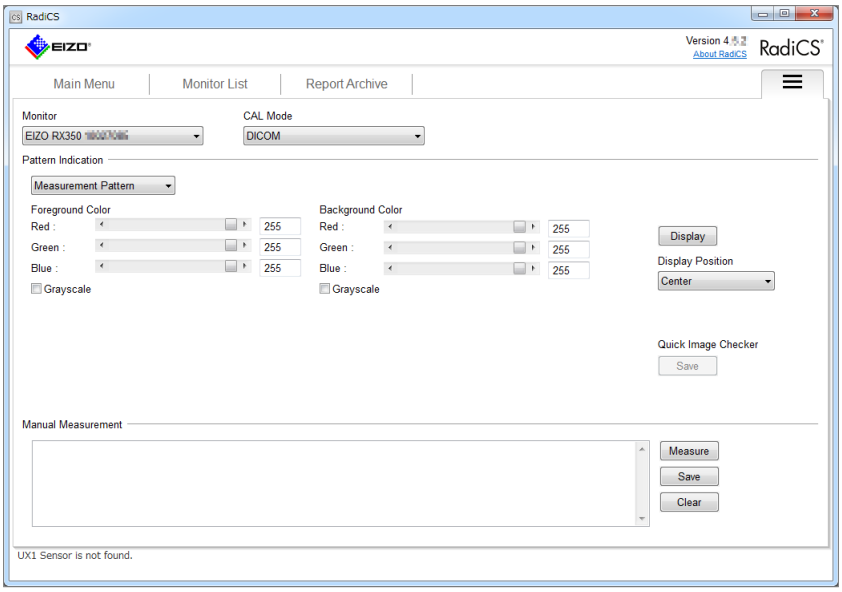
Allows you to measure luminance manually.

1. Click the ☰ tab, and select "Manual Measurement / Pattern Indication" from "Execution".



The Manual Measurement / Pattern Indication screen appears.

2. Select "Monitor" and "CAL Mode".



3. Select "Measurement Pattern" from the "Pattern Indication" pull-down menu.

A screen for setting up a measurement window for manual measurement appears

4. Select the display position of the measurement area from the Display Position pull-down menu.

5. Set "Foreground Color" and "Background Color".

Click "Display" to view the screen you set.

6. Attach the sensor to align with the measurement position and click "Measure".

When the measurement is complete, the measurement results are displayed.

Clicking "Save" allows you to save the displayed measurement result to a CSV file.

Attention

- A built-in sensor or manually input sensor cannot be used for manual measurement.

Chapter 7 Schedule Settings

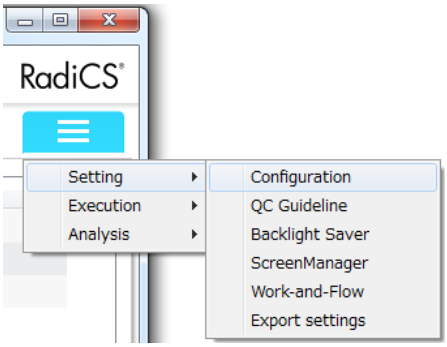
Attention

- The Integrated Front Sensor (slide type) cannot be used depending on the panel protector to be attached. If the sensor cannot be used, do not set up the schedule.

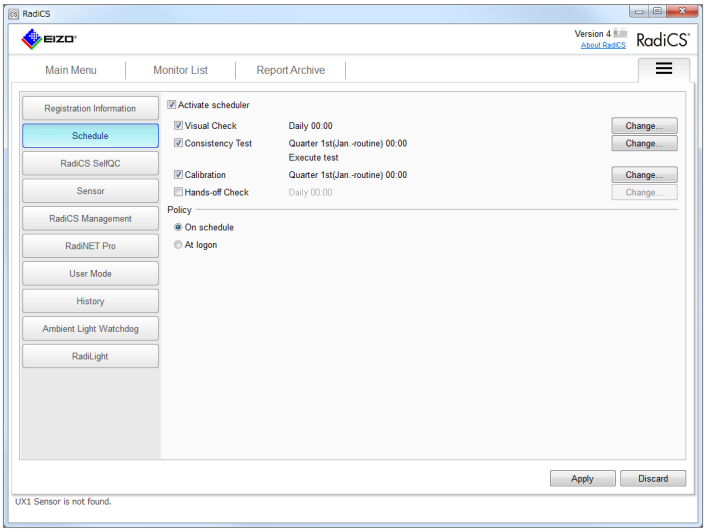
7-1. Setting the Task Execution Schedule

Scheduling allows you to set up a schedule to perform a task periodically.

1. Click the ☰ tab and click "Configuration" in the list.



2. Click "Schedule".



Example: RadiCS (Advanced mode)

The Schedule Settings screen appears to the right.

3. Select the "Activate scheduler" check box.

4. Select the check box of the task for which you want to apply the schedule.

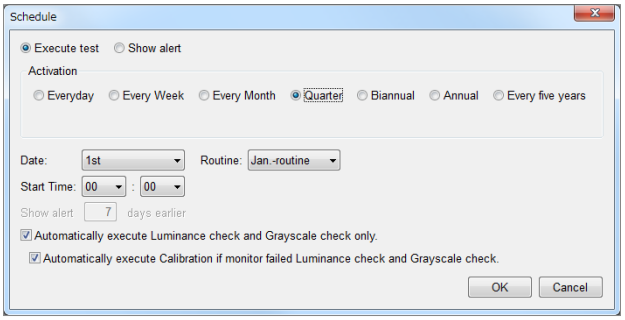
Attention

- You cannot perform visual check and the consistency test with RadiCS LE.

5. To change the execution schedule, click "Change..." and set up the schedule.

The Schedule screen appears.

Set the following items.



Execute test		Select this item to execute the test on the execution date.
Show alert*1		Select this item to announce the test execution date in advance. Set how many days prior to the test the notification is made.
Activation	Everyday	Specify the start time.
	Every Week	Specify the day of the week and the start time for execution.
	Every Month	Specify the date and start time for execution.
	Quarter	Specify the month, day, and start time. When you have selected “Every five years”, set the start year.
	Biannual	
	Annual	
	Every five years	
	Every logon	Specify this item to execute the test at the initial logon every day.
	At application startup	Specify this item to execute the test at application startup.
Automatically execute Calibration		Select this check box to automatically execute the test for monitors with built-in sensors.
Automatically execute Luminance check and Grayscale check only.		
Automatically execute Calibration if monitor failed Luminance check and Grayscale check.		Select this check box to execute calibration and repeat the consistency test automatically if the Luminance check or Grayscale check failed during the consistency test.

*1 The next test execution date is displayed on the task tray. The test is not executed.

6. Click "OK".

7. Set "Policy" (Schedule timing).

On schedule

The task is executed at the time specified in the scheduler.

Attention

- If the computer does not run at the time and date set in the scheduler, the task will be executed immediately after the computer starts.

At logon

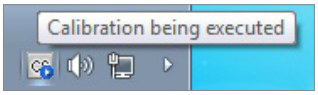
The task is executed when you log in the computer for the first time after the date and time set in the scheduler comes.

8. Click "Apply".

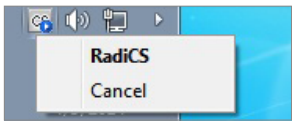
The schedule is set.

Note

- Warm-up starts 35 minutes before the time set in the scheduler (excluding visual check). If software is running at that moment, warm-up starts after the software is exited, and the task is executed when the set time comes.
- If you open and operate the software at the time set in the scheduler, the task execution time is delayed by 30 minutes. The task will not be started unless the software is exited.
- If "Cancel" is clicked during task execution, it is logged as "Canceled".
- When the mouse pointer is moved over the icon in the task tray while a warm-up process or a scheduled task is in progress, the task name will be displayed (excluding visual check).



- If you want to cancel a task in progress, right-click on the icon in the task tray and select "Cancel".



7-2. Setting RadiCS SelfQC Execution Schedule

A schedule for calibration or Grayscale check can be set up for a monitor with the RadiCS SelfQC function.

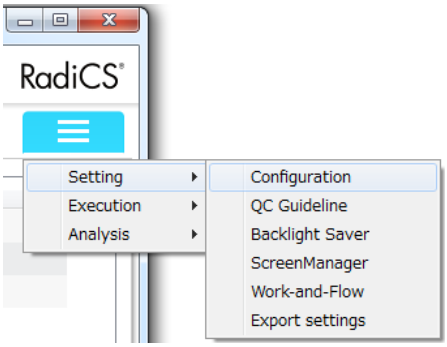
What is the RadiCS SelfQC function?

The RadiCS SelfQC function allows the monitor to perform calibration and Grayscale check independently whether the computer is running or not. For more details, the user's manual of the monitor.

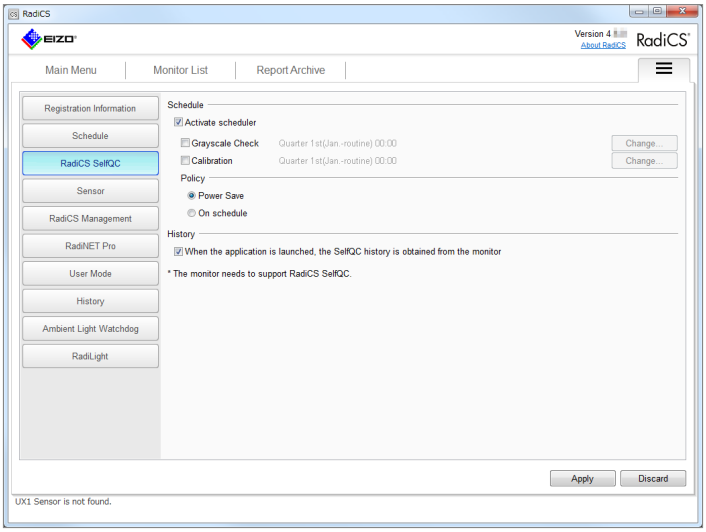
Note

- The judgment conditions and target error rate related to RadiCS SelfQC can be set from each CAL Switch property in the monitor list. For details, refer to "11-2. Editing the CAL Switch Mode Properties" (page 132).

1. Click the ☰ tab, and click "Configuration" from "Setting".



2. Click "RadiCS SelfQC".



Example: RadiCS (Advanced mode)

The RadiCS SelfQC screen appears to the right.

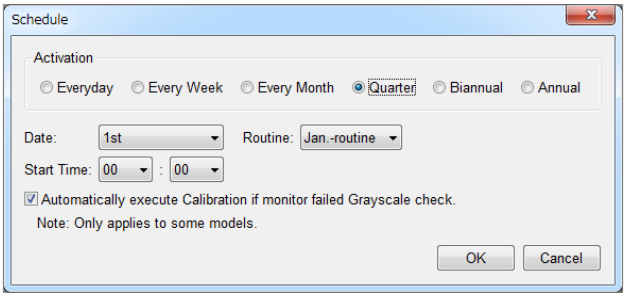
3. Select the "Activate scheduler" check box.

4. Select the check box of the task for which you want to apply the schedule.

5. To change the execution schedule, click "Change..." and set up the schedule.

The Schedule Settings screen appears.

Set the following items. (The items may differ depending on the task.)



Activation	Everyday	Specify the start time.
	Every Week	Specify the day of the week and the start time for execution.
	Every Month	Specify the date and start time for execution.
	Quarter	Specify the day, month, and start time.
	Biannual	
	Annual	
Automatically execute Calibration if monitor failed Luminance check and Grayscale check.		Select this check box to execute calibration and repeat the consistency test automatically if the Luminance check or Grayscale check failed during consistency testing. (Applies to some models only.)

6. Click "OK".

7. Select "Policy" (Schedule timing).

Power Save

The task will be executed when the monitor enters power saving mode or the power to the computer is turned off after the date and time set in the scheduler.

On schedule

The task is executed at the time specified in the scheduler.

Attention

- If the task schedule has been changed, tasks may execute immediately after exiting RadiCS. This is because no interval is set with the previous task execution.

Note

- The RadiCS SelfQC execution history will be obtained at the following times regardless of whether the "When the application is launched, the SelfQC history is obtained from the monitor" check box is selected or not.
  - On start of OS
  - After the OS is launched, every 24 hours (including when logged off)
- For information on how to cancel RadiCS SelfQC currently running, refer to the user's manual for the monitor.

8. Click "Apply".

The schedule is set.

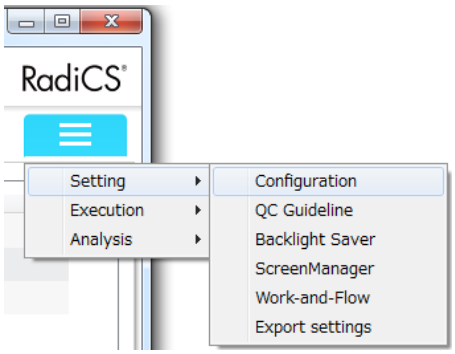
Chapter 8 Using RadiNET Pro

The RadiNET Pro network quality control software collectively manages the asset management information and quality control history of each computer where RadiCS is installed, as well as the RadiCS operation settings. Contact your dealer for information on the installation of RadiNET Pro.

8-1. Connecting to RadiNET Pro

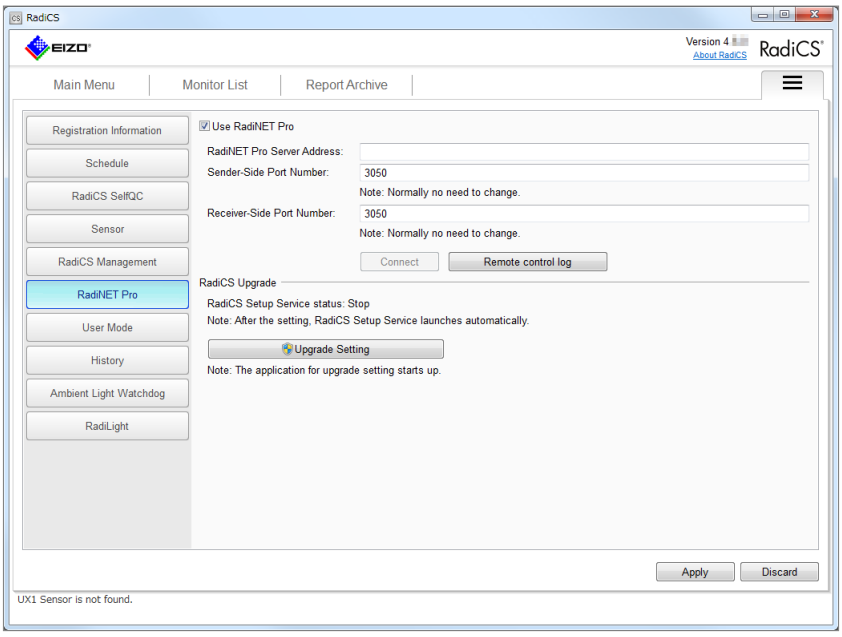
Connect the computer to RadiNET Pro.

1. Click the ☰ tab, and select "Configuration" from "Setting".



The Configuration screen appears.

2. Click "RadiNET Pro".



The RadiNET Pro screen appears to the right.

3. Select the "Use RadiNET Pro" check box.

4. Enter the following items.

RadiNET Pro Server Address	Enter the IP address or server name of the RadiNET Pro server.
Sender-Side Port Number	Enter the port number of the RadiNET Pro server.
Receiver-Side Port Number	Enter the port number of RadiCS.

5. Click "Connect".

Check the connection.

Clicking "Remote control log" displays the managed, up-to-date RadiCS information.

Note

- RadiNET Pro can upgrade RadiCS versions collectively. Clicking "Upgrade Setting" allows you to set the user for upgrading RadiCS. Refer to the RadiNET Pro system guide for details.

Monitor Settings

Chapter 9 Power Saving Setting for Monitor

9-1. Setting Up the Presence Sensor

The presence sensor prompts the monitor to switch to the power saving mode when it detects the user away from the monitor. To use this feature, the presence sensor must be enabled on a monitor with a Clip-On Swing Sensor G2 or presence sensor connected. Power saving mode helps lengthen the luminance life.

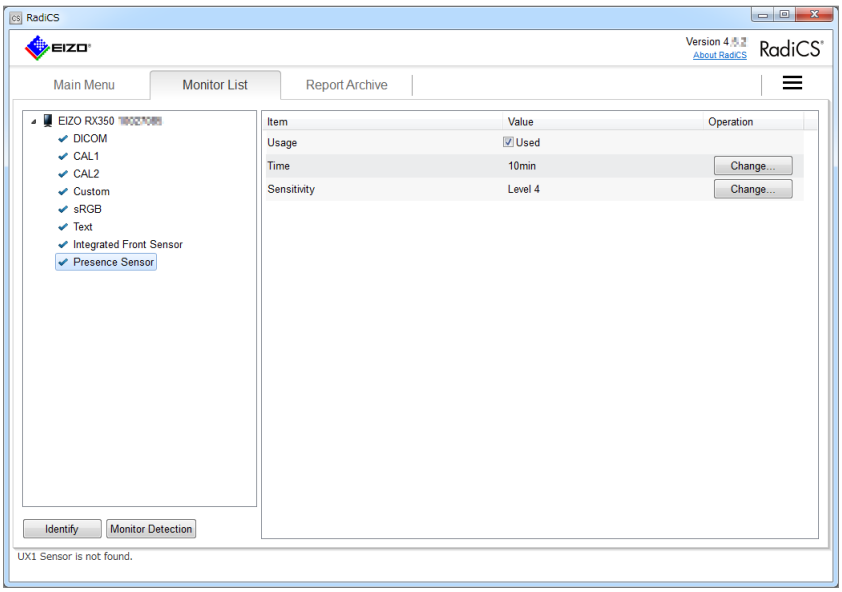
Attention

- The setting of the Presence Sensor is disabled by default.
- In the multi-monitor configuration, enable the Presence Sensor for a single monitor only.

1. Click the "Monitor List" tab.

2. Select "Presence Sensor" from the list of connected monitors.

3. Select the "Used" check box to the right of Usage.



4. Click "Change..." and specify "Time" and "Sensitivity".

Note

- The Presence Sensor settings differ depending on the monitor. For details on setting, refer to the User's Manual of the monitors.
- For Clip-On Swing Sensor G2, use the following settings.

Detection level	Detection area	Detail
Level 1	70 cm or less	If the user leaves the detection area, the schedule is executed. If there is a still object within the detection area, human presence is assumed. Either of these settings is recommended if a schedule is unintentionally executed although the monitor is attended.
Level 2	90 cm or less	
Level 3	Automatically set (to 70 cm or less)	The detection area is set automatically according to human movement. If the user leaves the set detection area, the schedule is executed. This occurs even if there is a still object in the detection area.
Level 4	Automatically set (to 90 cm or less)	

9-2. Setting Up Power Saving Function (Backlight Saver)

RadiForce series monitors or some of FlexScan EV series monitors (EV3237, EV2750, EV2780, EV2450, EV2451, EV2455 or EV2456) allow you to enable Backlight Saver to extend the monitor life. With Backlight Saver enabled, the monitor will be automatically placed in power saving mode in accordance with the specified timing and conditions.

The power saving mode differs between RadiForce series monitors and FlexScan EV series monitors.

- RadiForce series monitors: Power button switches off
- FlexScan EV series monitors: Low luminance

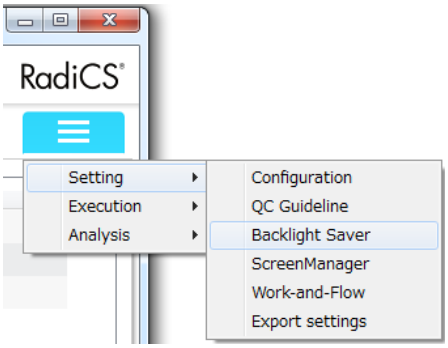
Attention

- This function is not supported by the Mac version.

Note

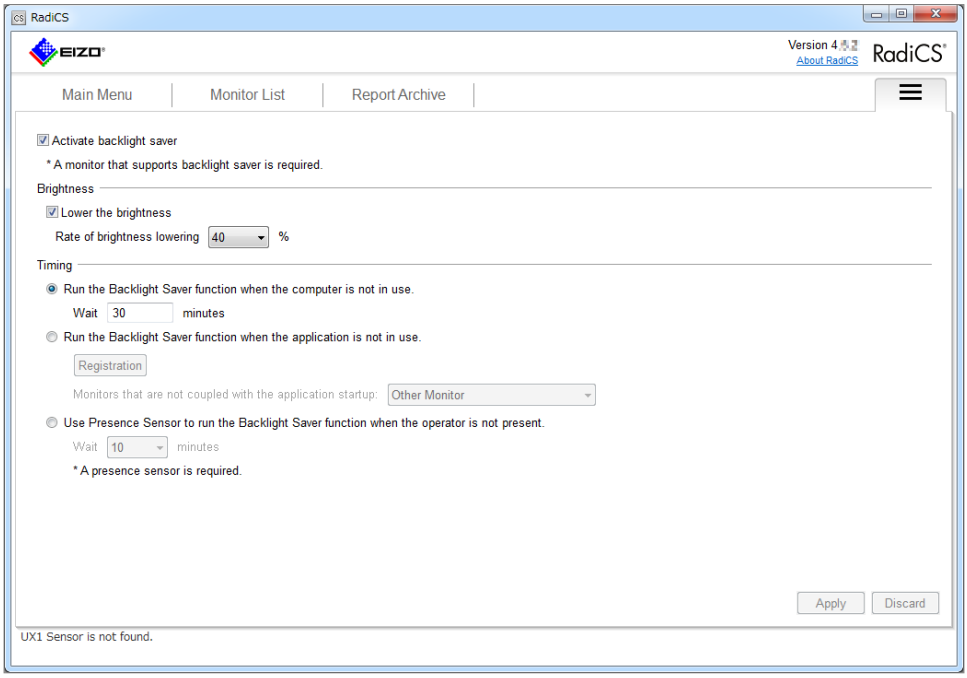
- A FlexScan EV series monitor can be entered into a low luminance state by enabling the Backlight Saver function and setting the rate of monitor brightness lowering. Disabling the Backlight Saver function will return the luminance to its original setting.

1. Click the ☰ tab, and select "Backlight Saver" from "Setting".



The setting screen appears.

2. Select the "Activate backlight saver" check box.



3. For a FlexScan EV series monitor, select "Lower the brightness" check box and set the rate of brightness lowering of the monitor.

Note

- For a RadiForce series monitor, there is no need to configure luminance-related settings because the power button is switched off in the power saving mode.

4. Select when to place the monitor in power saving mode.

Run the Backlight Saver function when the computer is not in use.

When the screen saver of a PC is activated, the Backlight Saver function places the monitor in power saving mode. The monitor resumes normal operation when you operate the mouse or keyboard.

Procedure

1. Select "Run the Backlight Saver function when the computer is not in use.".
2. Set the wait time until the computer's screen saver is activated.
   Enter the time in the Wait text box.

Note

- The wait time you set here is reflected in "Wait" for the computer's screen saver.
- If the computer's screen saver is disabled, the screen saver for EIZO Backlight Saver is automatically set. You can also set behavior options (position, speed, text).

Run the Backlight Saver function when the application is not in use.

When all applications registered are completed, the Backlight Saver function causes the monitor to be placed in power saving mode. If any of the applications registered is started, the monitor resumes normal operation.

Attention

- When the power of the target monitor is turned off, the mouse pointer moves to the monitor on which the task bar is displayed.
- Do not display the task bar on the GS521-ST monitor when using it.

Procedure

1. Select "Run the Backlight Saver function when the application is not in use.".
   For monitors where you do not want the Backlight Saver function to run in line with the application, select "Monitors that are not coupled with the application startup:".
2. Click "Registration".
   The "Application Registration" screen appears.
3. Select the appropriate application from "Application currently executing" and then click "Add".

   Note

   - If you have registered "IEXPLORER" or "MICROSOFTEDGE", you can specify any URL using the following procedure.
     1. From "Application already registered", select "IEXPLORER" or "MICROSOFTEDGE".
     2. Select "Specify the URL" check box, and then click "Registration".
     3. Enter the URL in the text box on the URL Registration" screen and click "Add".
     4. Click "OK".
        The URL will be registered.
   - Multiple applications and URLs can be registered.
4. Click "OK".

Use Presence Sensor to run the Backlight Saver function when the operator is not present.

When the presence sensor detects the user away from the monitor, the Backlight Saver function switches the monitor to power saving mode. When the user returns, the monitor resumes normal operation.

Procedure

1. Select "Use Presence Sensor to run the Backlight Saver function when the operator is not present.".
2. Specify the wait time until the monitor is placed in power saving mode by the presence sensor.
   Enter the time in the Wait text box.

Attention

- This can be selected only when the presence sensor is installed and the setting is set to ON. For details on setting the presence sensor, refer to “9-1. Setting Up the Presence Sensor” (page 100).
- To cancel RadiCS SelfQC that was started during execution of the Backlight Saver function, press the button on the front of the monitor. You cannot cancel it by operating the keyboard or the mouse.
- When more than one presence sensor is installed in a multi-monitor environment, the monitor is placed in power saving mode only when all presence sensors detect the user away from the monitor.

Note

- If the sensor does not work correctly, increase the wait time in "Wait" (recommended wait time: 10 minutes or more)
- If it still does not work correctly, check the following.
  - There is no object that reflects light such as a mirror or glass in front of the sensor.
  - The monitor is not located in a place subject to direct sunlight.
  - There is a device emitting infrared light / heat near the monitor.
  - There is no obstacle in front of the sensor.
  - The sensor is not dirty. If it is dirty, clean the sensor with a soft cloth.
  - You are sitting in front of the monitor and the monitor is tilted at the correct angle so that the sensor can detect the user.

5. Click "Apply".

The settings are applied.

Chapter 10 Monitor Operation Settings

Monitor operations can be performed in the RadiCS compatible monitors excluding the following monitors.

- G11
- G22
- GS510
- MX192
- R12
- R22
- R31
- RX210
- DSB1906
- DSB1908
- DSC1904
- DSC1905
- DSHC1914-DC
- EX190
- EX270W
- EX271W
- GX1030
- LS560W
- LS580W
- LX300W
- LX470W
- LX490W
- LX600W
- RS150
- RX150
- SCD19102
- SCD21310
- SMD21510
- SMD19102
- SMD21300

10-1. Switching the CAL Switch Mode

● Switching according to the application (Auto CAL Switch)

By registering the CAL Switch mode with an application, the CAL Switch mode can be automatically switched in association with the application.

Attention

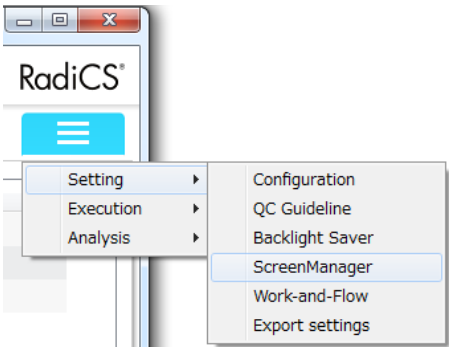
- Monitors that do not support multi-monitor mode cannot use the Auto CAL Switch function.
- When using GS521-ST, do not use the Auto CAL Switch function.
- This function is not supported by the Mac version.

Note

- By checking "Switch the application operation monitor only" in a multi-monitor environment, the Auto CAL Switch function can be activated only for monitors where the application is running. When the application is displayed across multiple monitor screens, the CAL Switch mode is switched in a monitor where the application is displayed with the largest size.

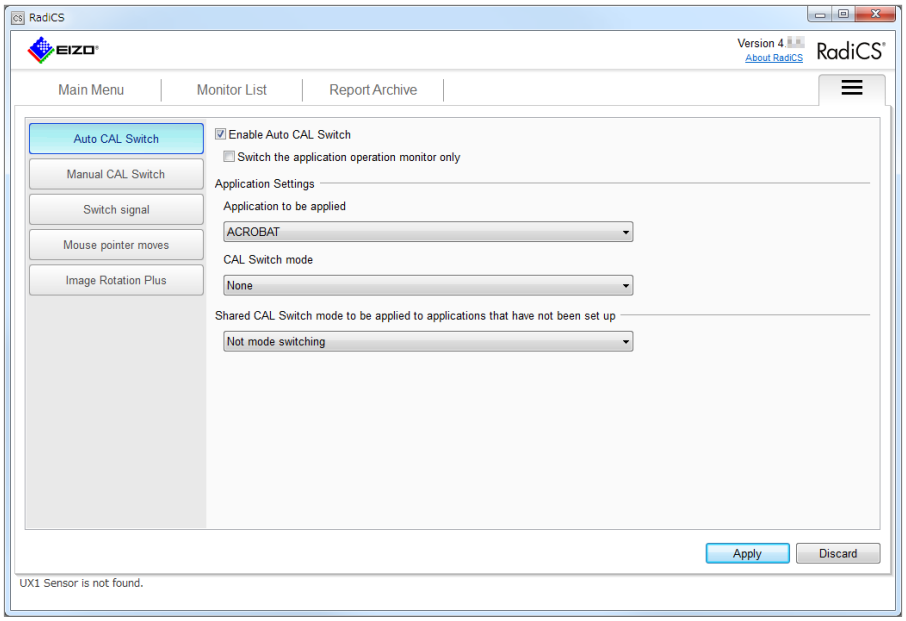
Procedure

1. Click the ☰ tab, and select "ScreenManager" from "Setting".



The ScreenManager settings screen appears.

2. Select "Auto CAL Switch".



The Auto CAL Switch screen appears to the right.

3. Select the "Enable Auto CAL Switch" check box.

Note

- Clearing this check box disables Auto CAL Switch.

4. Set the following items.

Application Settings

Change the CAL mode according to the application.

1. From the pull-down menu, select an application to be applied.
2. From the pull-down menu, select a CAL Switch mode to be associated with the application.

Shared CAL Switch mode to be applied to applications that have not been set up

Apply a CAL mode common to all applications other than the specified application.

1. From the pull-down menu, select a CAL mode to be used.

Note

- CAL modes displayed in the pull-down menu differ depending on the monitor.

5. Click "Apply".

● Switching on the monitor screen (Manual CAL Switch)

The CAL Switch mode of monitors can be switched on the screen.

Attention

- The Manual CAL Switch screen does not appear if no compatible monitors are connected.
- When RadiCS or RadiCS LE is running, the Manual CAL Switch screen does not appear.
- When using GS521-ST, do not use this function.
- This function is not supported by the Mac version.

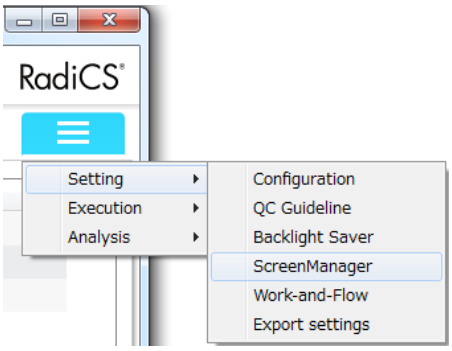
Reference: RX440

- When set to "PbyP", the Main screen and Sub screen are respectively switched to different CAL Switch modes.
- When the Hybrid-γ or ALT mode is used, you cannot set different CAL Switch modes respectively for the Main screen and Sub screen.
- When set to "PbyP", selecting "Apply to the same model" switches both the Main screen and Sub screen to the same CAL mode.
- When set to "PinP", the CAL mode of the Sub screen cannot be switched.

Configuring the Manual CAL Switch screen settings

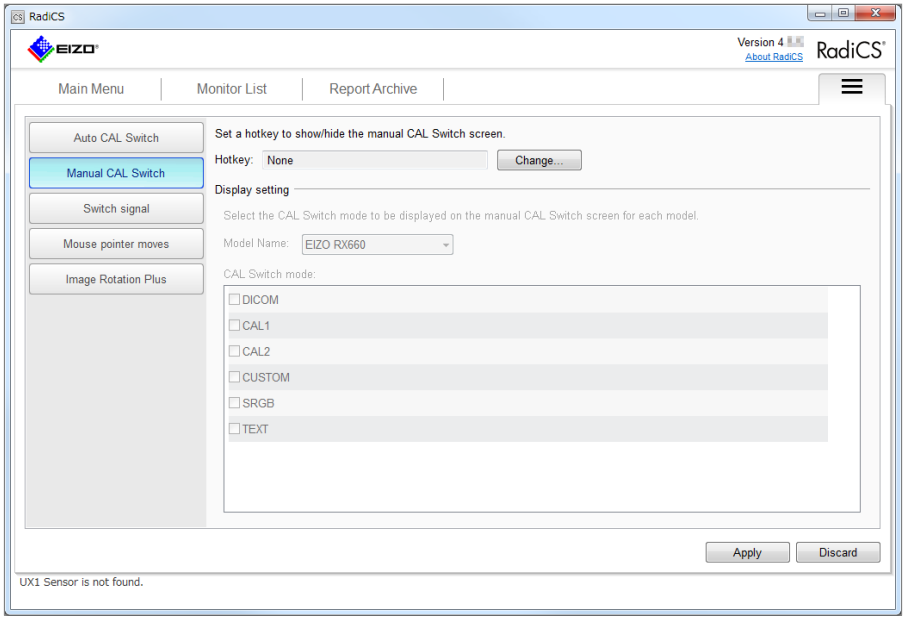
Procedure

1. Click the ☰ tab, and select "ScreenManager" from "Setting".



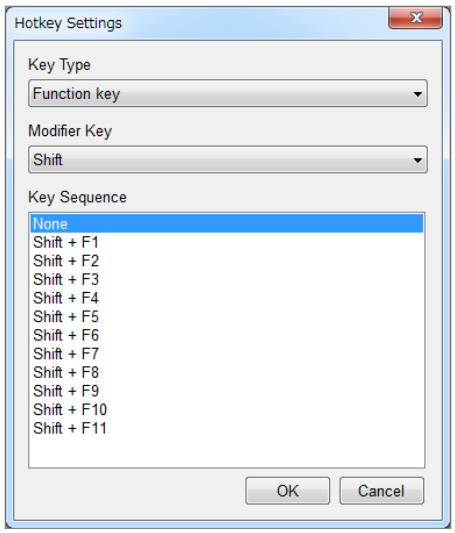
The ScreenManager settings screen appears.

2. Select "Manual CAL Switch".



The manual CAL Switch settings screen appears to the right.

3. Set the hotkey used to display or hide the Manual CAL Switch screen.
   a. Click "Change...".
      The "Hotkey Settings" screen appears.
   b. From the pull-down menu, select "Key Type" and "Modifier Key" used for the hotkey.



      The list of key combinations that match the selected key type and modifier key conditions appears in "Key Sequence".

   c. From the "Key Sequence" list, select a combination used as the hotkey, and click "OK".
      The hotkey is registered.

4. Set the CAL Switch mode displayed on the Manual CAL Switch screen.
   a. From the pull-down menu, select a model for which you want to set the CAL Switch mode.
      The CAL Switch mode of the selected model appears in the list.

> **Note**
> - The CAL Switch displayed on the Manual CAL Switch screen is set in units of models, therefore, it cannot be set for each monitor.
> - The list displays all the CAL Switch modes including those that are not the RadiCS control targets and those set to skip on the monitor side.

   b. Select the check box of a CAL Switch mode to be displayed on the Manual CAL Switch screen.

5. Click "Apply".
   Your settings are saved.

Switching the CAL Switch Mode

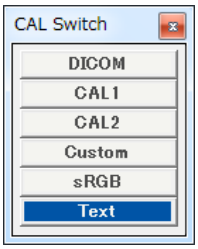
Procedure

1. Exit RadiCS.

Attention

- You need to exit RadiCS before displaying the Manual CAL Switch screen.

2. Enter the hotkey assigned to display the Manual CAL Switch screen.
   The Manual CAL Switch screen appears.



3. Move the Manual CAL Switch screen over to the screen of the monitor whose CAL Switch mode you want to change.
4. Select the CAL Switch mode to be changed to.
   The CAL Switch mode is switched.

Note

- The context menu is displayed by right-clicking the title bar in the CAL Switch mode select screen. The context menu enables you to:
  - Apply to the same model
    When you select "Apply the setting to same models" in a multi-monitor environment, the CAL Switch mode of all monitors that are the same model as the monitor that is displaying the Manual CAL Switch screen, can be switched simultaneously.
  - Display at the reduced size
    The size of the CAL Switch mode select screen can be changed by selecting "Display in reduced size". When the screen appears in the reduced size, you can move the mouse pointer over a button to view the button name.

10-2. Switching the Input Signal Using the Keyboard

By setting hotkeys, you can switch monitor input signals using the keyboard.

You can set the hotkey when any of the following monitors are connected. (Except in PinP display mode)

- Monitors in single screen display mode
  Monitors for which inputs can be switched with the "Tool" monitor adjustment menu, and FlexScan EV3237-M.
- Monitors in PbyP display mode
  RX440 / RX650 / RX660 / RX840 / RX850 / MX315W

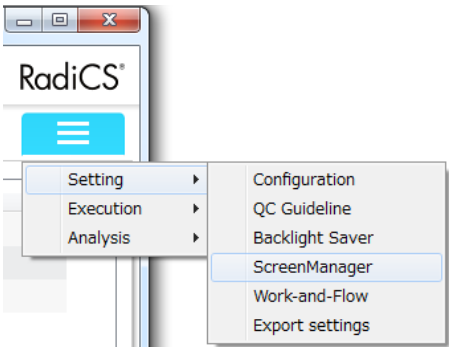
Attention

- Hotkeys do not work in the following cases:
  - Calibration is running
  - SelfCalibration is running
  - Software is running
- Do not select a key sequence that is already used in the following RadiCS functions. The key will be disabled even if it is specified.
  - Manual CAL Switch
  - Mouse pointer moves
  - Image Rotation Plus
- The set hotkeys cannot be used in other applications.
- This function is not supported by the Mac version.

Note

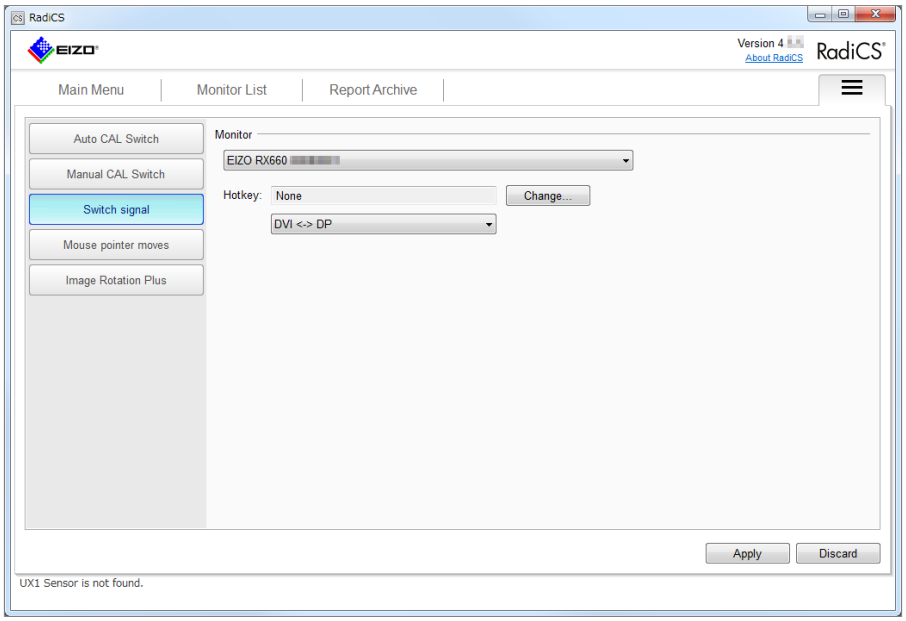
- When the same hotkey has been set in all monitors in a multi-monitor environment, pressing the hotkey activates the registered setting simultaneously in the monitors.

1. Click the ☰ tab, and select "ScreenManager" from "Setting".



The ScreenManager settings screen appears.

2. Select "Switch signal".



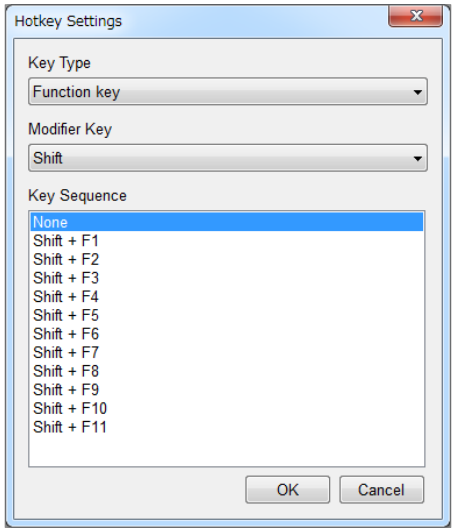
The Switch signal screen appears to the right.

3. From the pull-down menu, select a monitor for which you want to set the hotkey.

4. Set the hotkey used to select the input signal.

1. Click "Change..." in "Switch Input signals:".
   The "Hotkey Settings" screen appears.

2. From the pull-down menu, select "Key Type" and "Modifier Key" used for the hotkey.



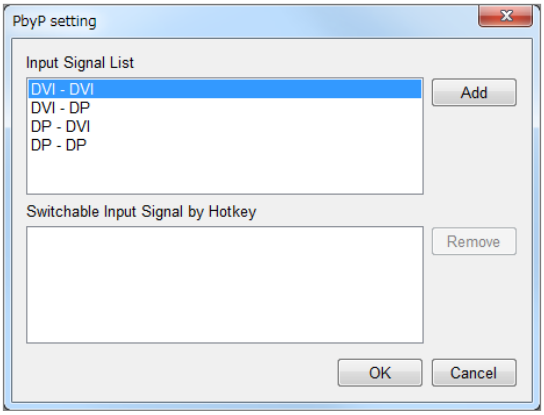
   The list of key combinations that match the selected key type condition appears in "Key Sequence".

3. From the "Key Sequence" list, select a combination used as the hotkey, and click "OK".

5. For a monitor in PbyP display mode, select a combination of signal inputs to be switched by the hotkey.

For RX440 / RX650 / RX840 / RX850:

1. Click "PbyP setting...".
   The "PbyP setting" screen appears.
2. From "Input Signal List", select one combination each for two combinations to be switched by the hotkey, and click "Add".



Attention

- To change the combination of signals to be displayed, delete unwanted signals from "Switchable Input Signal by Hotkey", and add a signal to be displayed.

3. Click "OK".

For RX660 / MX315W:

1. From the pull-down list, select a combination of signal inputs to be switched by the hotkey.
   - DP <-> DVI
     The hotkey switches between DisplayPort1 and DVI in single screen display state.
   - DP-DP <-> DVI
     The hotkey switches between the PbyP display state of DisplayPort1 and DisplayPort2, and the single screen display state of DVI.

6. Click "Apply".

The setting is enabled.

10-3. Setting the Mouse Pointer Behavior

By using the following functions, the mouse pointer can be moved automatically and the loads on mouse operations in a multi-monitor environment can be reduced.

- Warp

  When the mouse pointer reaches to the right or left edge of the desktop, it moves to the other edge.

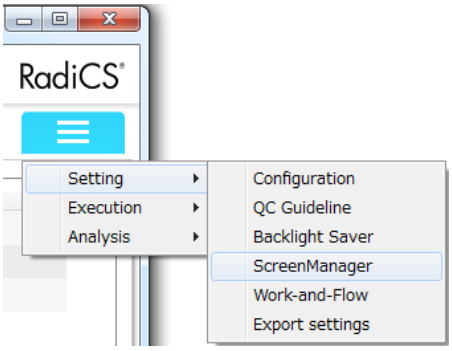
- Move to home position

  When the hotkey that has been assigned is entered, the mouse pointer moves into the vicinity of the center of the main monitor (a monitor that displays the notification area).

Attention

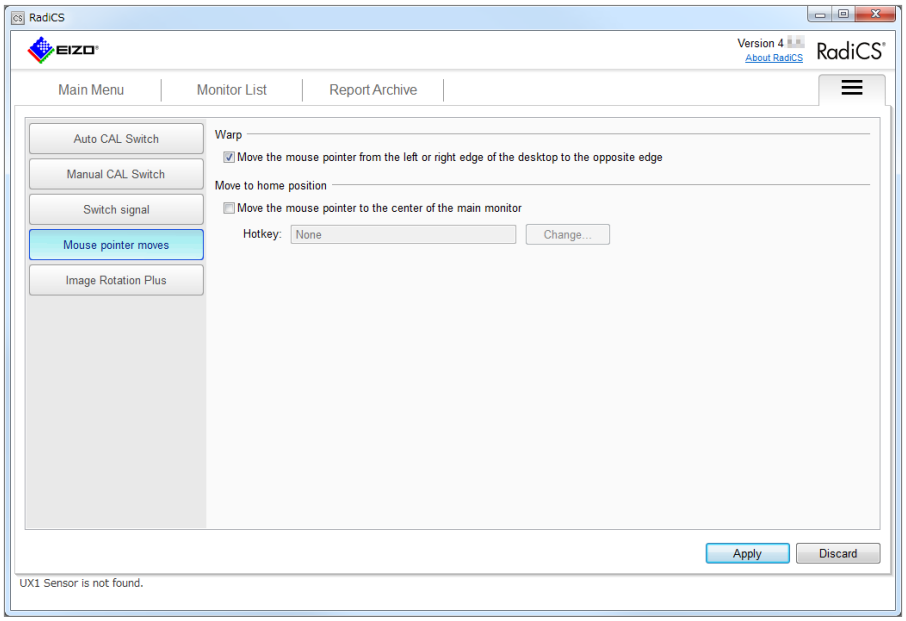
- The mouse pointer movement function is set to "Disabled" by default.
- If you connect multiple monitors that have significantly different screen resolutions in Windows 8.1 or Windows 10, the mouse pointer may not move correctly.
- This function is not available while the screen for setting the mouse point behavior appears.
- This function is not available when Hide-and-Seek function is enabled.
- This function is not supported by the Mac version.

1. Click the ☰ tab, and select "ScreenManager" from "Setting".



The ScreenManager settings screen appears.

2. Select "Mouse pointer moves".



The screen for setting the mouse pointer movement appears to the right.

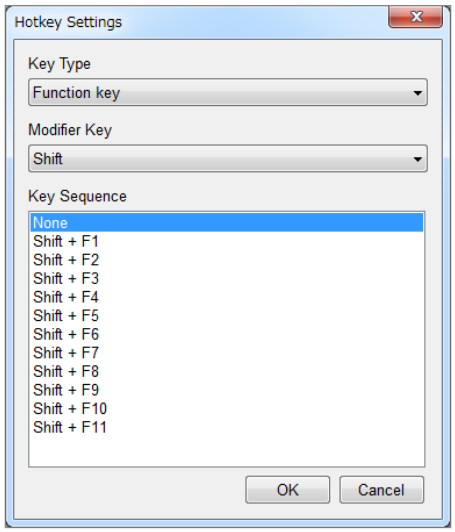
3. Configure the following settings.

Warp

Select the "Move the mouse pointer from the left or right edge of the desktop to the opposite edge" check box.

Move to home position

1. Select the "Move the mouse pointer to the center of the main monitor" check box.
2. Set the hotkey used to move the mouse pointer.
   a. Click "Change...".
      The "Hotkey Settings" screen appears.
   b. From the pull-down menu, select "Key Type" and "Modifier Key" used for the hotkey.



      The list of key combinations that match the selected key type condition appears in "Key Sequence".

   c. From the "Key Sequence" list, select a combination used as the hotkey, and click "OK".

Attention

- RadiCS uses the hotkey in several ways. The hotkey settings are not available if you have entered a registered key sequence..

4. Click "Apply".

The setting is enabled.

10-4. Rotating the Display Direction According to the Installation Direction (Image Rotation Plus)

When the following monitor is connected, any change in the installation orientation is detected to rotate the display orientation of the screen.

- RX350
- RX250
- RX340
- RX240
- RS240
- MX242W
- MX215

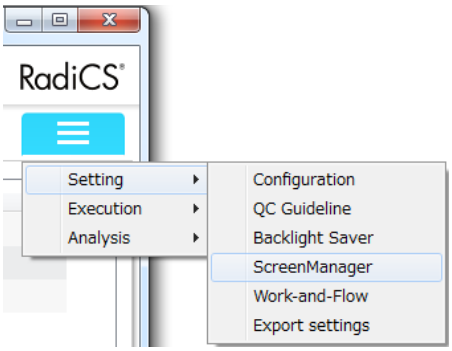
Attention

- Use the graphic board recommended by EIZO that supports the Image Rotation Plus feature. Refer to our web site (http://www.eizoglobal.com) for details.
- To use the Image Rotation Plus feature, configure the monitor settings as follows.
  - "Image rotation": Disabled
  - "Installation direction": Landscape or Portrait (SW) *1
    *1 Select Landscape if the monitor does not have Portrait (SW) as an installation direction.
- This feature is not available for PinP or PbyP display setting.
- This function is not supported by the Mac version.

1. Set the hotkeys to be assigned to the screen display directions of the graphic board.

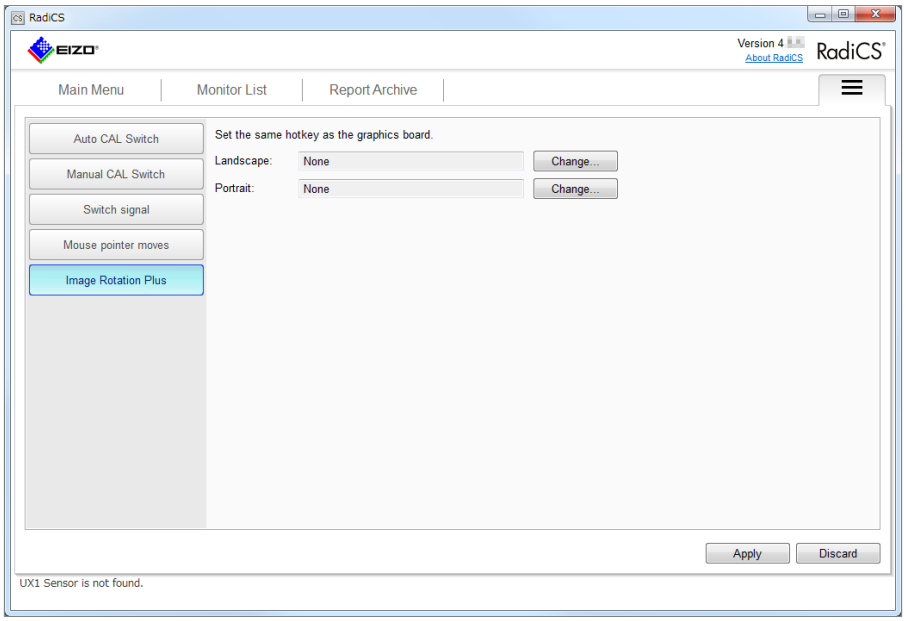
Refer to the user's manual for the graphic board for the setting procedure.

2. Click the ☰ tab, and select "ScreenManager" from "Setting".



The ScreenManager settings screen appears.

3. Select "Image Rotation Plus".



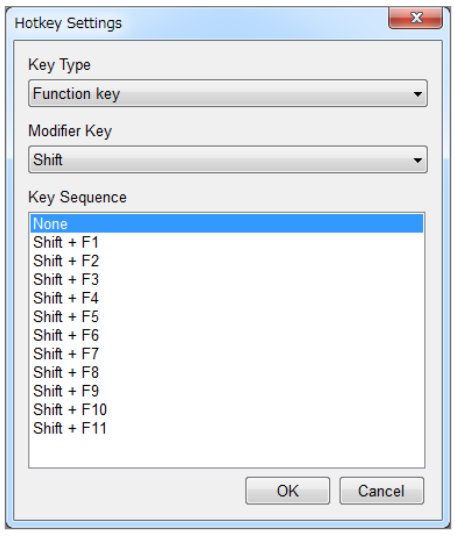
The Image Rotation Plus setting screen appears to the right.

4. Associate the hotkeys registered in the graphic board with the monitor installation directions.

1. Click "Change...".

   The "Hotkey Settings" screen appears.

2. From the pull-down menu, select "Key Type" and "Modifier Key" used for the hotkey.



   The list of key combinations that match the selected key type condition appears in "Key Sequence".

3. From the "Key Sequence" list, select a combination used as the hotkey, and click "OK".

5. Click "Apply".

The setting is enabled.

10-5. Switching Between Display / Hide the PinP Sub Window (Hide-and-Seek)

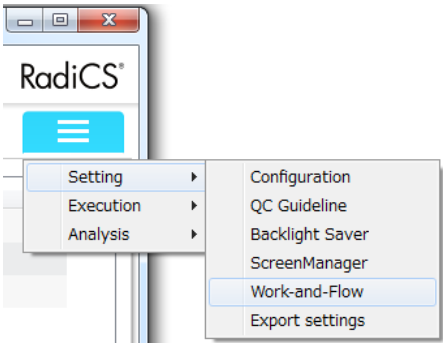
When the monitor is able to display the PinP sub window, you can display and hide the PinP sub window using the mouse or hotkey.
The following monitors support the PinP display mode:

- RX440
- RX660
- MX315W

Attention

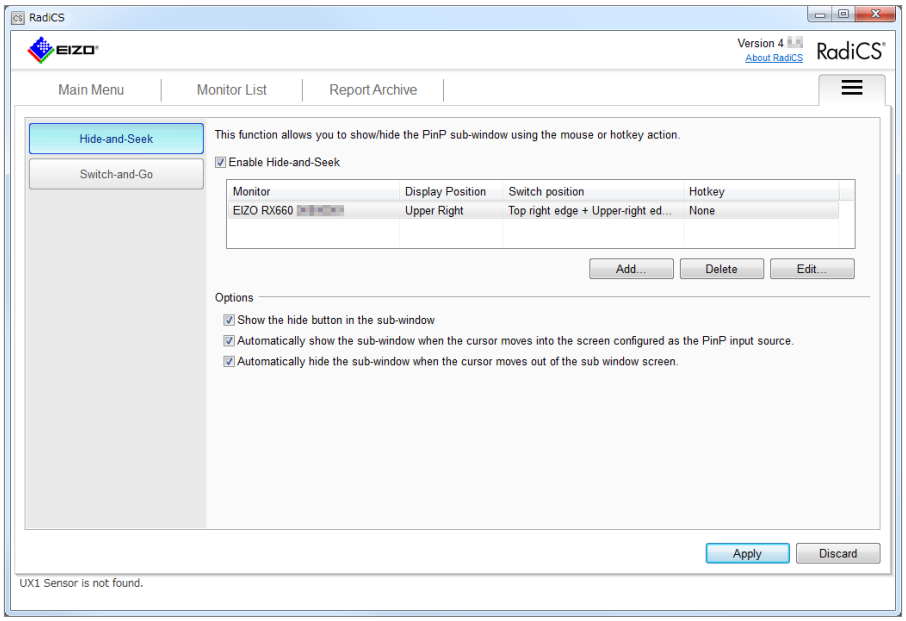
- This function is not supported by the Mac version.
- Hide-and-Seek is disabled while RadiCS is running. Exit RadiCS before carrying out this operation.
- On RX440, the PinP sub window cannot be displayed or hidden using the mouse.

1. Click the ☰ tab, and select "Work-and-Flow" from "Setting".



The Work-and-Flow setting screen appears.

2. Select "Hide-and-Seek".



The Hide-and-Seek Settings screen appears to the right.

3. Select the "Enable Hide-and-Seek" check box.

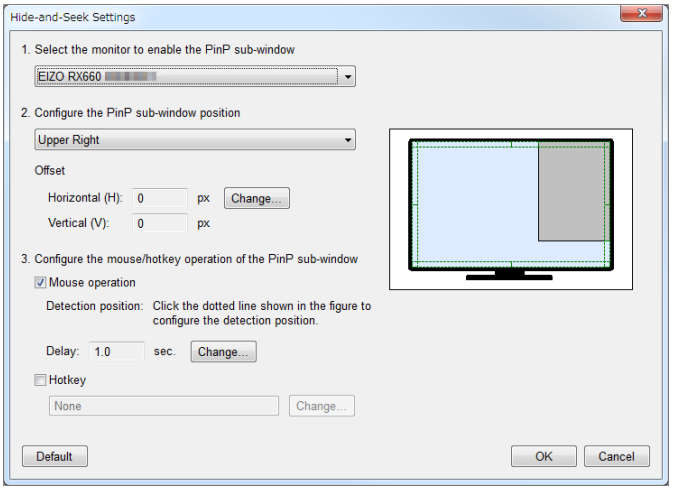
The "Hide-and-Seek Settings" screen appears.

Note

- If the "Enable Hide-and-Seek" check box is already selected, take one of the following steps to display the "Hide-and-Seek Settings" screen.
  - Click "Add".
  - Select a configured monitor from the list, and click "Edit".
- When the “Hide-and-Seek Settings” screen appears, the PinP sub windows appears on the screen.

4. Select a monitor on which to display the PinP sub window.

Select a monitor from the pull-down menu.



5. Select a display position of the PinP sub window.

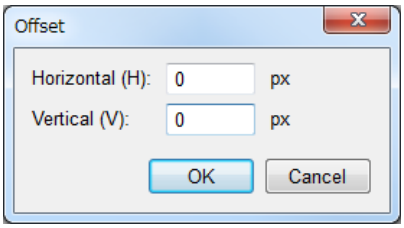
Window display position

From the pull-down menu, select a position to display the PinP sub window on the monitor.

Offset

Specify the distance from the edges of the screen to the PinP sub window. You can display the PinP sub window by circumventing the Windows task bar or other items displayed on the edges of the screen.

1. Click "Change..." for offset.
   The “Offset” screen appears.
2. Enter the required distances, and click "OK".



Note

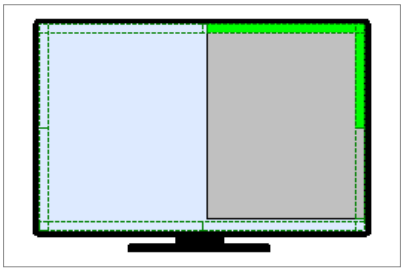
- Clicking "OK" displays the PinP sub window at the specified position.

6. Set the method used to display or hide the PinP sub window.

Mouse operation

Specify a position at which to display the PinP sub window. When the mouse pointer moves to the specified position, the PinP sub window is displayed.

1. Select the "Mouse operation" check box.
   A dotted lines appear on the monitor figure.
2. Specify the detection position.
   Click the dotted lines on the figure to specify the detection position.



3. Specify the time period between when the mouse pointer is moved to the detection position and when the PinP sub window is displayed. Click "Change..." in "Delay:".
   The "Timing Setting" screen appears. In the text box, enter the time period required to display the sub window, and click "OK".

Hotkey

Set the hotkey that switches between displaying and hiding the PinP sub window. The PinP sub window is displayed or hidden when the specified key is pressed.

1. Select the "Hotkey" check box.
2. Click "Change...".
   The "Hotkey Settings" screen appears.
3. From the pull-down menu, select "Key Type" and "Modifier Key" used for the hotkey.
   The list of key combinations that match the selected key type condition appears in "Key Sequence".
4. From the "Key Sequence" list, select a combination used as the hotkey, and click "OK".

Attention

- Do not select a key sequence that is already used in the following RadiCS functions. The key will be disabled even if it is specified.
  - Manual CAL Switch
  - Mouse pointer moves
  - Image Rotation Plus

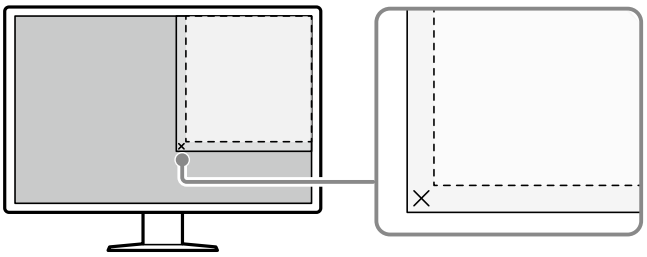
7. Click "OK".

The list setting of the Hide-and-Seek Settings screen is applied.

8. Set "Options" if necessary.

Show the hide button in the sub-window

Select this check box to display the ✕ button enabling you to hide the PinP sub window using one click.



Automatically show the sub-window when the cursor moves into the screen configured as the PinP input source.

Select this check box to display the sub window when the mouse pointer is moved to the PinP sub window position in the window.

Automatically hide the sub-window when the cursor moves out of the sub window screen.

Select this check box to hide the PinP sub window when the mouse pointer is moved from the inside of the PinP sub window to the outside.

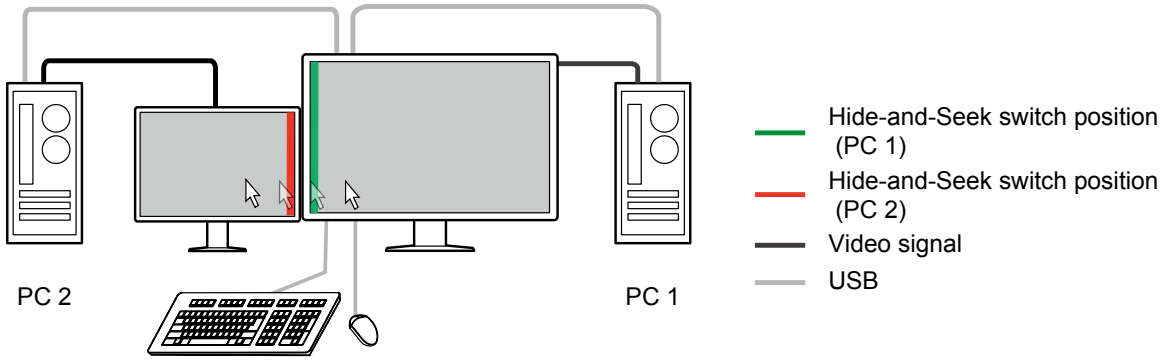
9. Click "Apply".

The setting is enabled.

10-6. Switching the PC to be Operated (Switch-and-Go)

Using a monitor with two USB upstream ports, you can switch the USB ports by using the mouse or hotkey, and operate two PCs using both a keyboard and a mouse.
The following monitor model has two USB upstream ports:

- RX660
- MX315W



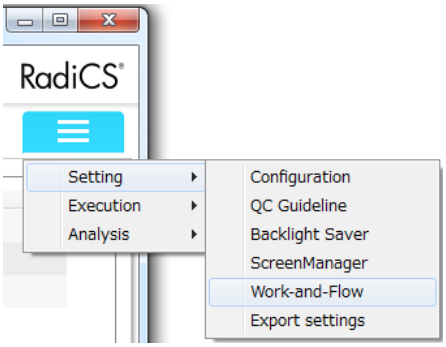
Attention

- This function is not supported by the Mac version.
- Install RadiCS on the two PCs before using this feature. Connect the main PC used for quality control to "USB-1" on the monitor. For more details, refer to the user's manual of the monitor.
- If the PC to be operated is turned Off, switch PCs by using the OSD on the monitor that has two USB upstream ports.
- If you want to change the PC from which to operate USB devices, disconnect any storage devices that are currently being used such as USB memory devices from the monitor in advance. Otherwise, data may be lost or damaged.
- Switch-and-Go is disabled while RadiCS is running. Exit RadiCS before carrying out this operation.

1. Configure settings on PC 1.

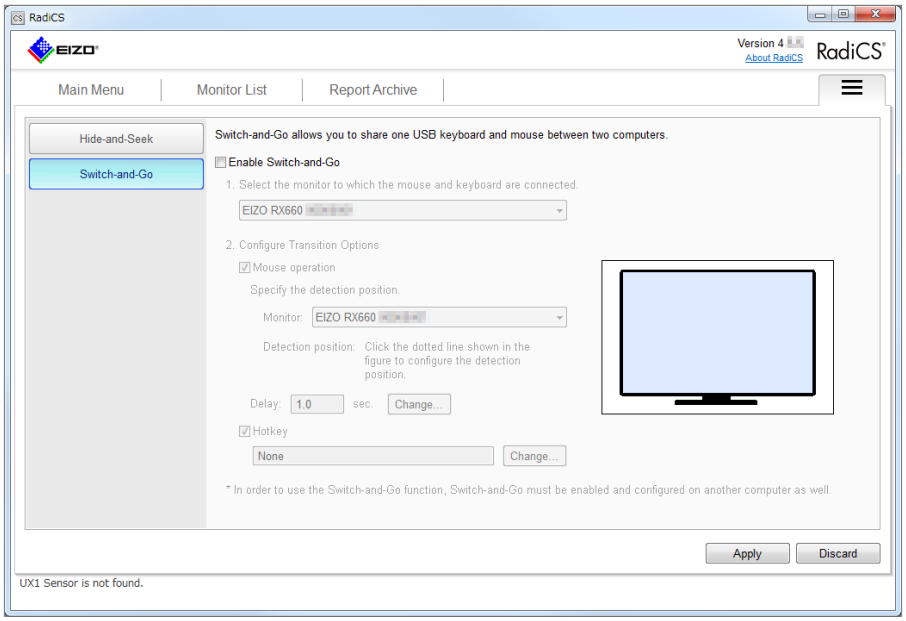
Procedure

1. Click the ☰ tab, and select "Work-and-Flow" from "Setting".



The Work-and-Flow setting screen appears.

2. Select "Switch-and-Go".



The Switch-and-Go Settings screen appears to the right.

3. Select the "Enable Switch-and-Go" check box.
4. From the pull-down menu, select the monitor to which the mouse and keyboard are connected.
5. Select the method used to switch PCs.

Mouse operation

Specify a position at which to switch PCs. You can switch PCs by moving the mouse pointer to the specified position.

a. Select the "Mouse operation" check box.

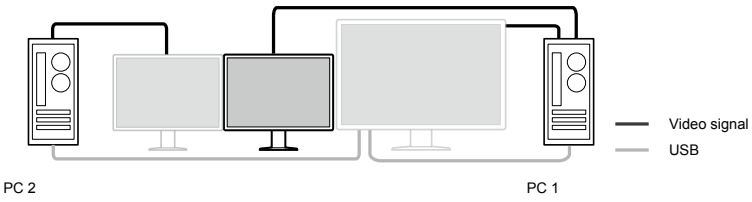
b. Specify the switch position.

Monitor:

From the pull-down menu, select a monitor for which you want to specify the switch position.

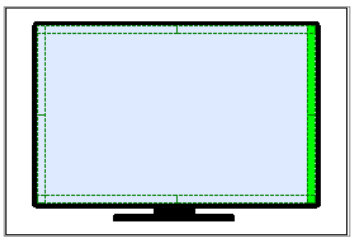
Note

- If you want to display signals from PC 1 on multiple monitors, install the monitor so that it is adjacent to the monitor of PC 2.



Detection position:

Click the dotted lines on the figure to specify the detection position.



Note

- When Hide-and-Seek is enabled, the border between the PinP sub window and main screen cab be specified as the switch position.

c. Specify the time period until the PC to which to connect the USB to is switched after the mouse pointer is moved to the detection position. Click "Change..." in "Delay:".
The "Timing Setting" screen appears. In the text box, enter the time period required for the mouse pointer to stay at the detection position until switching takes place, and click “OK”.

Hotkey

PCs can be switched by using the hotkey.

a. Select the "Hotkey" check box.
b. Click "Change...".
The "Hotkey Settings" screen appears.
c. From the pull-down menu, select "Key Type" and "Modifier Key" used for the hotkey.
The list of key combinations that match the selected key type condition appears in "Key Sequence".
d. From the "Key Sequence" list, select a combination used as the hotkey, and click "OK".

Attention

- Do not select a key sequence that is already used in the following RadiCS functions. The key will be disabled even if it is specified.
  - Manual CAL Switch
  - Mouse pointer moves
  - Image Rotation Plus
- When using a modifier key as the hotkey, only the keys on the left side of the keyboard can be used.

6. Click "Apply".
The setting is enabled.

2. Configure settings on PC 2.

Procedure

1. Display the Switch-and-Go Settings screen by referring to steps 1 and 2 of the procedure used to configure PC 1.
2. Select the "Enable Switch-and-Go" check box.
3. From the pull-down menu, select the monitor to which the mouse and keyboard are connected.
On RadiCS for PC 2, select "Switch-and-Go Compatible Monitor" from the pull-down menu.
4. Select the method used to switch PCs.

Mouse operation

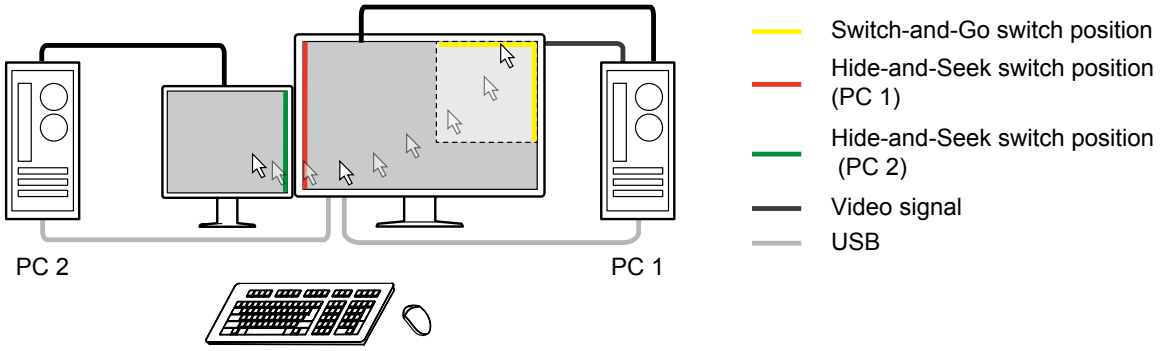
Select the "Mouse operation" check box, and configure settings using the same procedure as that for PC 1.

Hotkey

Select the "Hotkey" check box, and configure settings using the same procedure as that for PC 1.
Assign the hotkey the same key combination as that specified on PC 1.

5. Click "Apply".
The setting is enabled.

10-7. Using Hide-and-Seek in Combination with Switch-and-Go



Procedure

1. Configure the Hide-and-Seek settings on PC 1 by referring to “10-5. Switching Between Display / Hide the PinP Sub Window (Hide-and-Seek)” (page 116).
2. Configure the Switch-and-Go settings on PC 1 and PC 2 by referring to “10-6. Switching the PC to be Operated (Switch-and-Go)” (page 120).

10-8. Displaying a Desired CAL Switch Mode to a Part of the Screen (Point-and-Focus)

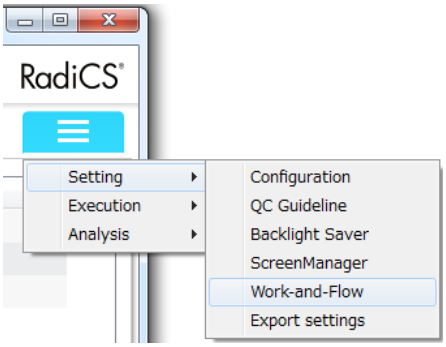
Besides a CAL Switch mode being applied to the entire screen, another CAL Switch mode can be assigned to an area neighboring the mouse pointer (highlighted area). Furthermore, to improve visualization of the highlighted area, areas other than the highlighted area (base area) can be displayed in a desired and previously defined CAL Switch mode.
You can also fix a highlighted area, or change its shape and size.
The following monitors support the highlighted area display mode:

- GX550
- RX250
- RX350
- RX560
- RX660
- MX315W

Attention

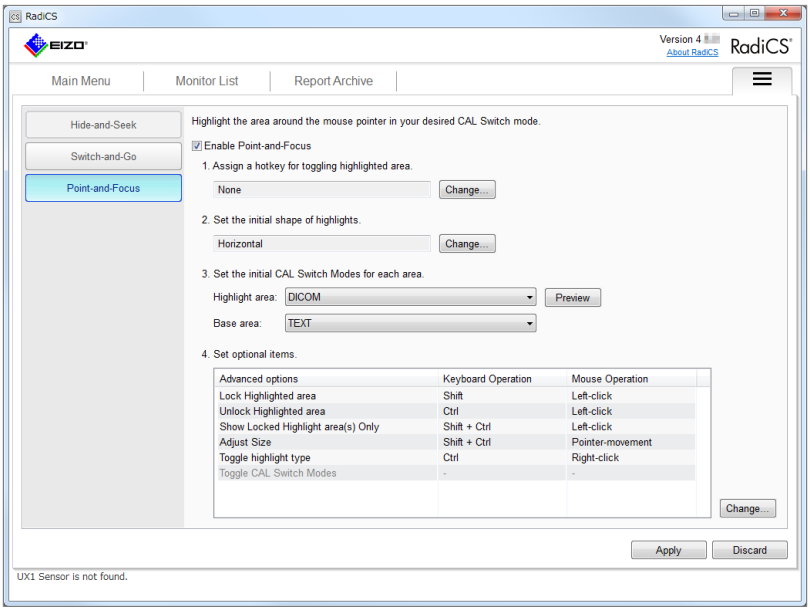
- This function is not supported by the Mac version.
- Hide-and-Seek is disabled while RadiCS is running. Exit RadiCS before carrying out this operation.

1. Click the ☰ tab, and select “Work-and-Flow” from “Setting”.



The Work-and-Flow setting screen appears.

2. Select “Point-and-Focus”.



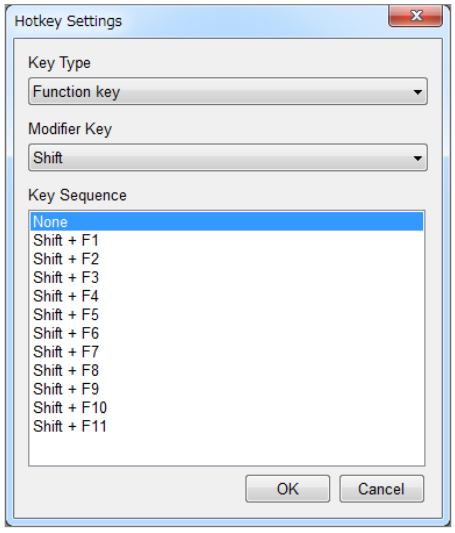
The Point-and-Focus Settings screen appears to the right.

3. Select the “Enable Point-and-Focus” check box.

4. Set the hotkey used to enable / disable Point-and-Focus.

1. Click “Change” for “1. Assign a hotkey for toggling the highlighted area”.
   The “Hotkey Settings” screen appears.

2. From the pull-down menu, select “Key Type” and “Modifier Key” used for the hotkey.



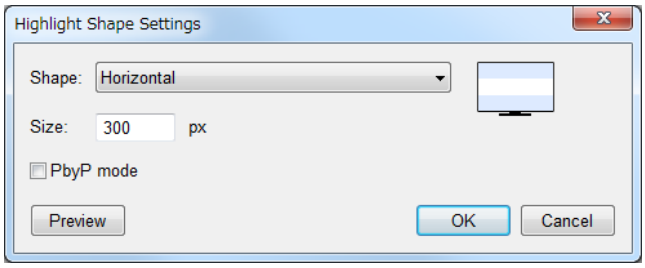
   The list of key combinations that match the selected key type condition appears in “Key Sequence”.

3. From the “Key Sequence” list, select a combination used as the hotkey, and click “OK”.

5. Set the initial shape and size of the highlighted area.

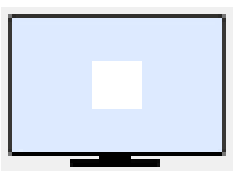
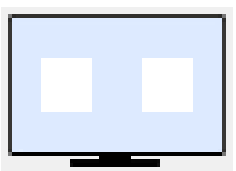
1. Click “Change” for “2. Set the initial shape of highlights.”.
   The “Highlight Shape Settings” screen appears.

2. Specify the initial shape and size, then click “OK”.



Shape

From the following three shapes, select the initial shape for when the highlighted area is displayed.

Horizontal	Rectangle	Symmetrical Rectangle
		

Size

Specify the size of the highlighted area. (Setting range: 20 - 1000 px)

PbyP mode

Specify an area to display the highlighted area for PbyP display.
Select the check box to only display the highlighted area on the screen where the mouse pointer is located. When the check box is cleared, the highlighted area is displayed across the two screens.

Note

- Clicking “Preview” allows you to view the current setting status on the screen.

6. Select the initial CAL Switch mode.

Highlight area

From the pull-down menu, select a CAL Switch mode to be assigned to the highlighted area.

Base area

From the pull-down menu, select a CAL Switch mode to be assigned to areas other than a highlighted area when a highlighted area is displayed.

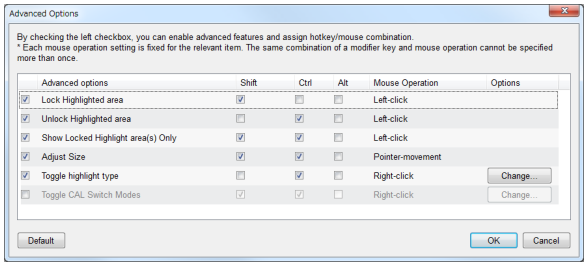
Note

- Clicking “Preview” allows you to view the current setting status on the screen.

7. Select items to be used as options.

1. Click “Change” in “Options”.
   The “Advanced Options” screen appears.

2. Select items you want to use.
   Select or clear each check box.



Lock Highlighted area

Lock the highlighted area to the current mouse pointer position.
After it is locked, a new highlighted area appears following the mouse pointer. Up to 13 highlighted areas can be displayed at the same time. (The number of highlighted areas that can be displayed at the same time differs depending on the monitor.)

Unlock Highlighted area

Deletes a locked highlighted area. Use the mouse pointer to select a highlighted area to be deleted.

Show Locked Highlight area(s) Only

Only displays locked highlighted areas The highlighting does not follow the mouse pointer even when you move the mouse.

Adjust Size

Scales the size of the highlighted area that follows the mouse pointer. The size can be changed by holding down the modifier key, which must be set in step 3, and moving the mouse.

Attention

- You cannot change the sizes of locked highlighted areas.

Toggle highlight type

Switches the shape of the highlighted area that follows the mouse pointer.

Attention

- You cannot change the shapes of locked highlighted areas.

a. Click “Change” in “Toggle highlight type”.
   The “Toggling highlight Type” screen appears.
b. Select the check boxes of shapes to be switched by a toggle operation.
   Two or more shapes can be selected.
c. Click “OK”.

Toggle CAL Switch Modes

Switches the CAL Switch mode of the highlighted area that follows the mouse pointer.

Attention

- You cannot change the CAL Switch modes of locked highlighted areas.

a. Click “Change” in “Toggle CAL Switch Modes”.
   The “Toggling CAL Switch Modes ” screen appears.
b. From the pull-down list, select CAL Switch modes to be switched by toggle operation.
   Two or more shapes can be selected.
c. Click “OK”.

Note

- Clicking “Default” resets the setting to default.

3. Set the modifier key of the keyboard.

   Select the check box of a modifier key. This determines the combination of the modifier key and mouse operation used to enable/disable each function. The mouse operations are predefined for respective functions and cannot be changed.

4. Click “OK”.

8. Click “Apply”.

The settings are applied.

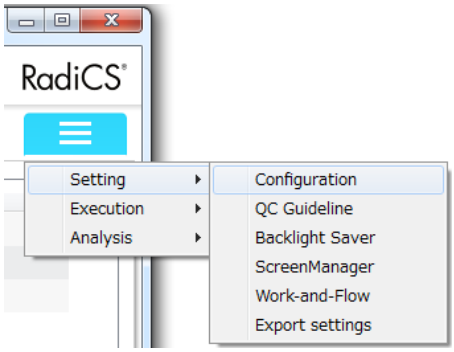
10-9. Configuring the RadiLight Area Settings

Turn RadiLight Area On/Off or configure settings such as the brightness of RadiLight Area from RadiCS.

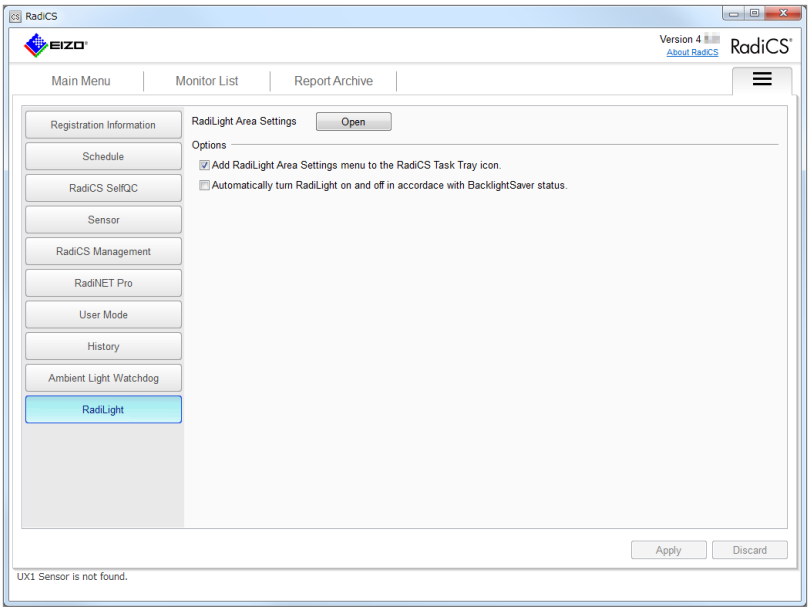
Attention

- If multiple RadiLight units are connected, only the RadiLight unit that has been recognized first can be set from RadiCS.

1. Click the ☰ tab, and select “Configuration” from “Setting”.



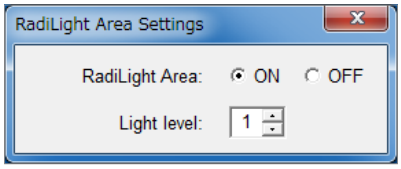
2. Select “RadiLight”.



The RadiLight screen appears to the right.

3. Configure the RadiLight Area settings.

1. Click “Open” for “RadiLight Area Settings”.
   The RadiLight Area Settings screen appears.



2. Set the following items.
   The settings are applied immediately. Click  to exit the settings.

RadiLight Area

Select On or Off RadiLight Area using the radio button.

Light level

Set the brightness of RadiLight Area. (Setting range: 1 - 10)

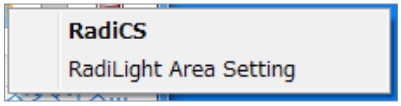
4. Configure the “Options” settings.

Add RadiLight Area Settings menu to the RadiCS Task Tray icon.

Add “RadiLight Area Settings” to the context menu that is displayed by right-clicking the icon in the task tray.
The RadiLight Area setting screen can be displayed from “RadiLight Area Settings”.

Attention

- The RadiLight Area setting screen cannot be displayed in the context menu while RadiCS is running.



Automatically turn RadiLight on and off in accordace with BacklightSaver status.

If all of the following conditions are satisfied, you can turn On/Off RadiLight Area associated with Backlight Saver.

- Backlight Saver is activated.
- At the time of transition to power saving mode, “Run the Backlight Saver function when the computer is not in use.” is selected.

5. Click “Apply”.

The settings are applied.

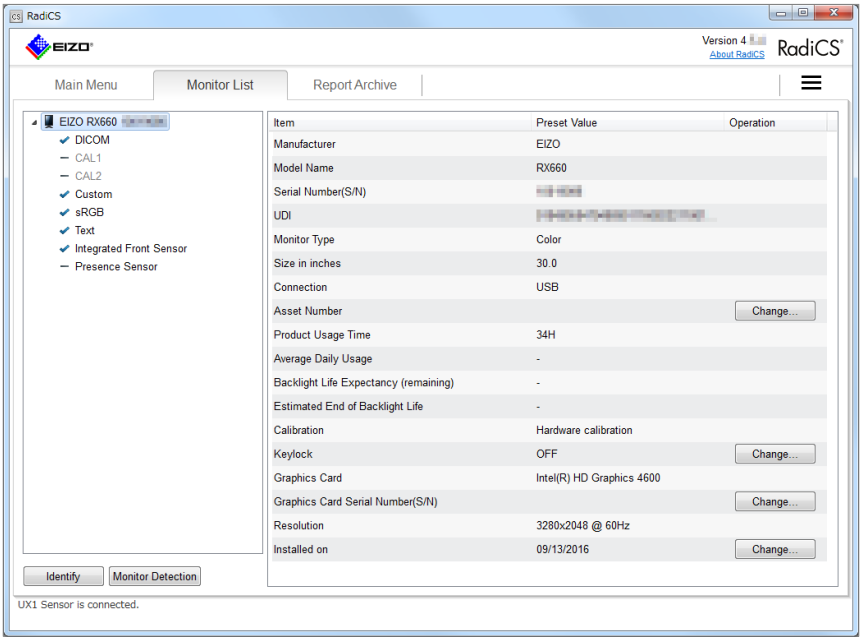
Chapter 11 Monitor Information Settings

11-1. Editing the Monitor Properties

Click the "Monitor List" tab and select a monitor name from the list of connected monitors to specify the following monitor information.

Note

- In a Windows 8.1 or Windows 10 environment, the “Resolution” value of the software may differ from the “Screen Resolution” value displayed on Control Panel in Windows. In that case, check the box for “Let me choose one scaling level for all my displays” in “Desktop” in the Control Panel.
- Clicking "Identify" allows you to view the monitor information you have configured (manufacturer, model name, serial number) on the monitor screen.



● Size in inches

Allows you to manually enter the size in inches.

● Asset Number

Clicking "Change..." allows you to enter the asset management number of the monitor.

● Estimated lifetime

The monitor’s lifetime is estimated based on the monitor’s lifetime expectancy data obtained through the RadiCS SelfQC function, and lifetime information is displayed (average daily use, remaining lifetime, date when end of lifetime will be reached).

Attention

- Information is displayed when all of the following applies.
  - The monitor you use is equipped with the RadiCS SelfQC function.
  - The monitor operating time exceeds 500 hours.
- The estimated lifetime may vary from the actual lifetime depending on your usage environment.
- Estimation accuracy may be lower when only little lifetime estimation information has been obtained, such as just after a monitor has been purchased. as .
- Please use this data for your reference.

● Calibration (Backlight Sensor) Data Creation

Clicking "Execute" generates calibration with a Backlight Sensor data and shows the last time it was executed.

These functions are available for the following monitors.

- DSB1906
- DSB1908
- DSC1904
- DSC1905
- DSHC1914-DC
- EX190
- EX270W
- EX271W
- GX1030
- LS560W
- LS580W
- LX300W
- LX470W
- LX490W
- LX600W
- RS150
- RX150
- SCD19102
- SCD21310
- SMD21510
- SMD19102
- SMD21300

● Keylock

Clicking "Change..." allows you to change the keylock setting of the monitor.

Item	Switches that can be locked
OFF	None (All switches are enabled.)
Menu Lock	Enter button
All Locks	All buttons excluding power button
All Locks (including the power button)	All buttons including power button

Attention

- If the monitor does not support "All Lock", "Menu Lock" is selected.
- If calibration is performed for the monitor with the keylock "OFF", the keylock is set to "Menu Lock". To perform adjustment on the monitor side, change the keylock to "OFF".

● Installed on

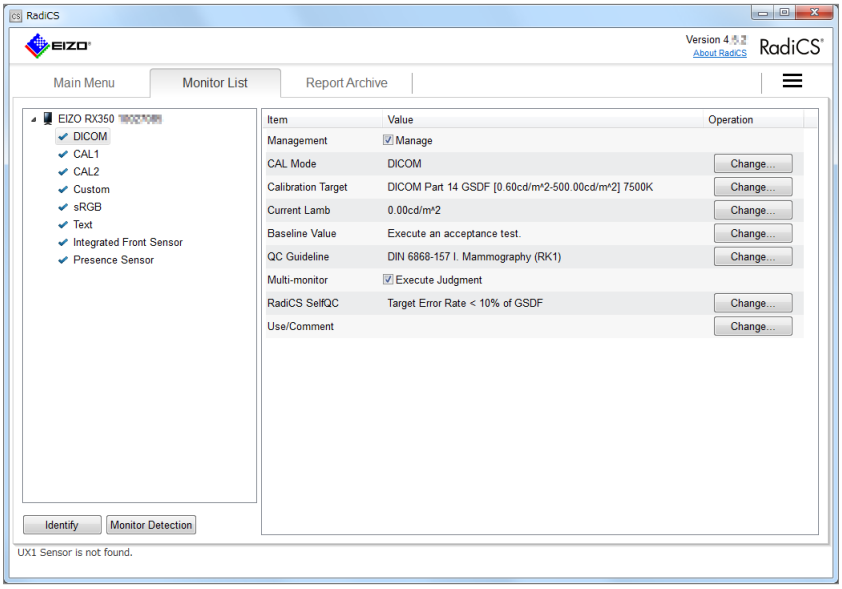
Clicking "Change..." allows you to enter the date the monitor was installed.

11-2. Editing the CAL Switch Mode Properties

Clicking the "Monitor List" tab and selecting a CAL mode name from the list of connected monitors allows you to specify the CAL mode.

Attention

- Depending on the CAL Switch mode, nothing appears or nothing can be edited.
- For GS521-ST, only “Use / Comment” can be set.



● CAL Mode

Clicking "Change..." allows you to specify the name of the CAL mode.

● Current Lamb

For the software to use an EIZO sensor or manage a non-EIZO monitor, it is necessary to specify the ambient luminance. Clicking "Change..." allows you to enter the following information:

Measurement Device	Enter the name of the sensor used to measure the ambient luminance (Lamb) (up to 16 characters).
Serial Number(S/N)	Enter the serial number of the sensor used to measure the ambient luminance (Lamb) (up to 16 characters).
Measurement Value	Enter the ambient luminance (Lamb) measurement value (valid range: 0.00 - 9.99 cd/m^2).

The specified value is incorporated into the ambient luminance setting value during calibration, grayscale check, or luminance check.

● Baseline Value

Clicking "Change..." allows you to enter a baseline value, measurement date, measurer, name of the sensor used for measurement, and serial number of the sensor.

● Multi-monitor

Allows you to select or deselect the check box to enable or disable multi-monitor judgment in the selected CAL mode.

Attention

- This is not available, depending on the selected QC guideline.

● RadiCS SelfQC

Clicking "Change..." allows you to specify a judgment condition and target error value for RadiCS SelfQC.

● Hybrid Gamma PXL

Click “On” to enable the Hybrid Gamma PXL function of the CAL mode you have selected.

Attention

- This is not available depending on the monitor and CAL mode selected.

● Use / Comment

Clicking "Change..." allows you to enter a description of the use of the monitor or a comment.

Attention

- The entered text must be up to 20 characters long.

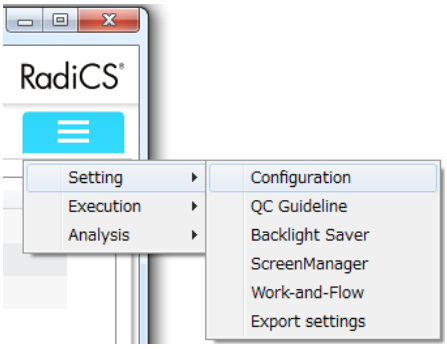
Software Settings

Chapter 12 RadiCS Setup

12-1. Registration Information

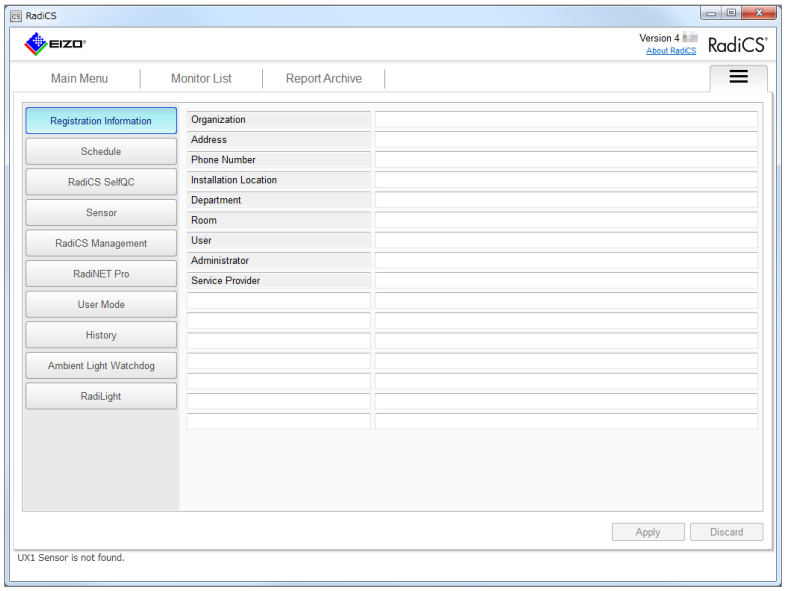
As registration information, specify information on the organization using the software. The entered information is used by the history function for report generation.

1. Click the ☰ tab, and select "Configuration" from "Setting".

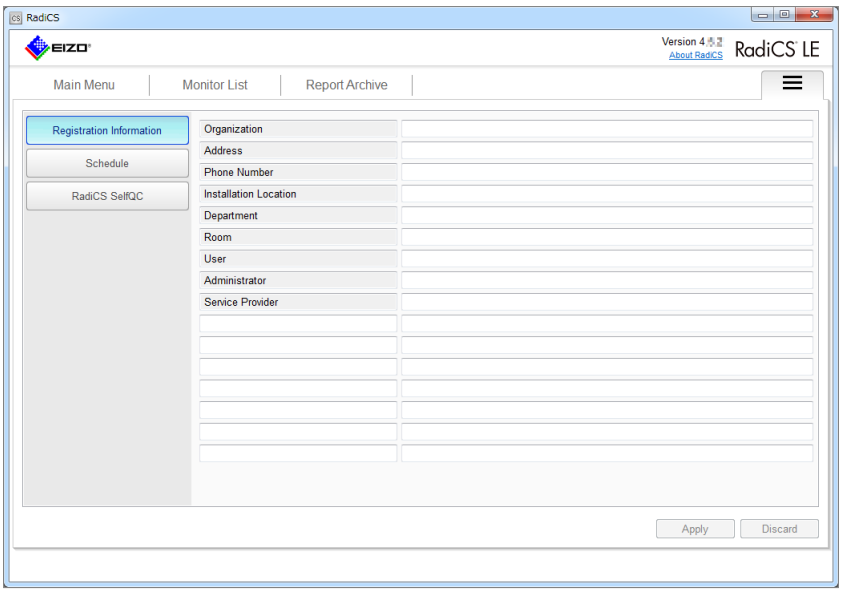


The Configuration screen appears.

2. Select "Registration Information".



RadiCS (Advanced mode)



RadiCS LE

The Registration Information screen appears to the right.

3. Set the following items.

Organization	Enter a hospital name or the like.
Address	Enter the address.
Phone Number	Enter the phone number.
Installation Location	Enter the location of the monitor.
Department	Enter the name of the department using the monitor.
Room	Enter the name of the room using the monitor.
User	Enter the name of the user of the computer to which the monitor is connected.
Administrator	Enter the name of the monitor administrator.
Service Provider	Enter information on the service provider that you contact with.

Note

- Each value must be up to 128 characters long.
- You can add a new field. The field name must be up to 50 characters long.
- When you use Active Directory, the following items are entered automatically.
  - Organization
  - Address
  - Installation Location
  - User
- The existing field names in the software cannot be changed.

4. Click "Apply".

The information is registered.

12-2. Exporting / Importing Settings

Attention

- RadiCS LE does not provide these functions.

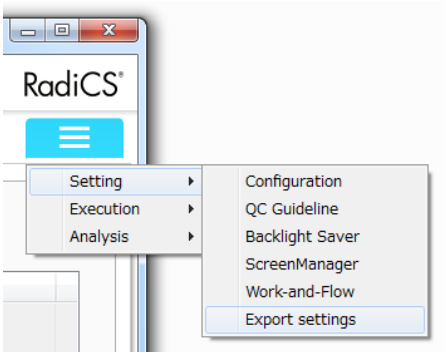
● Exporting the settings

Exporting RadiCS settings

You can export software settings (RadiCS setting file).

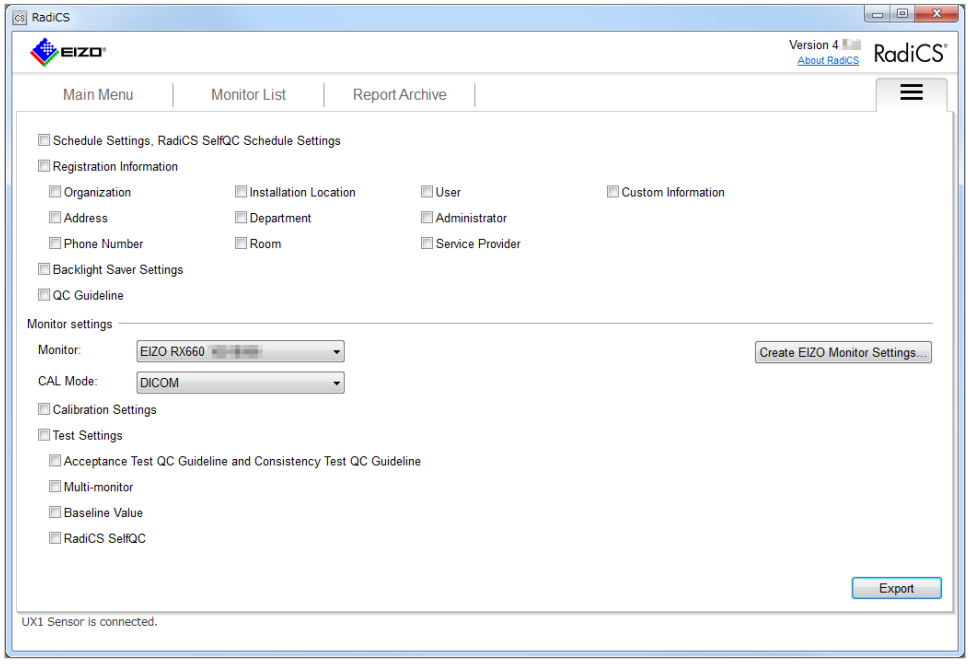
Procedure

1. Click the ☰ tab, and select "Export settings" from "Setting".



The Export settings screen appears.

2. Select the settings that you want to export.



3. Click "Export".

Specify the save location and file name of the RadiCS setting file (*.radicssetting), and click “Save”.

Note

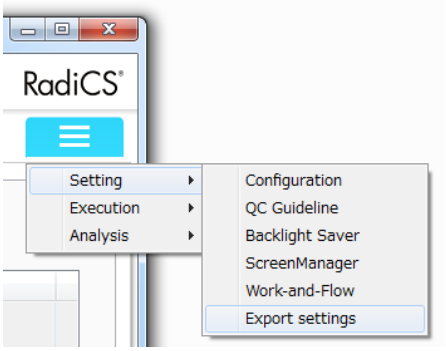
- The exported RadiCS setting file can be imported into RadiNET Pro as a policy. Refer to RadiNET Pro User’s Manual for details.

Creating / exporting monitor settings

Edit and export the settings (EIZO monitor setting file) of the desired monitor.

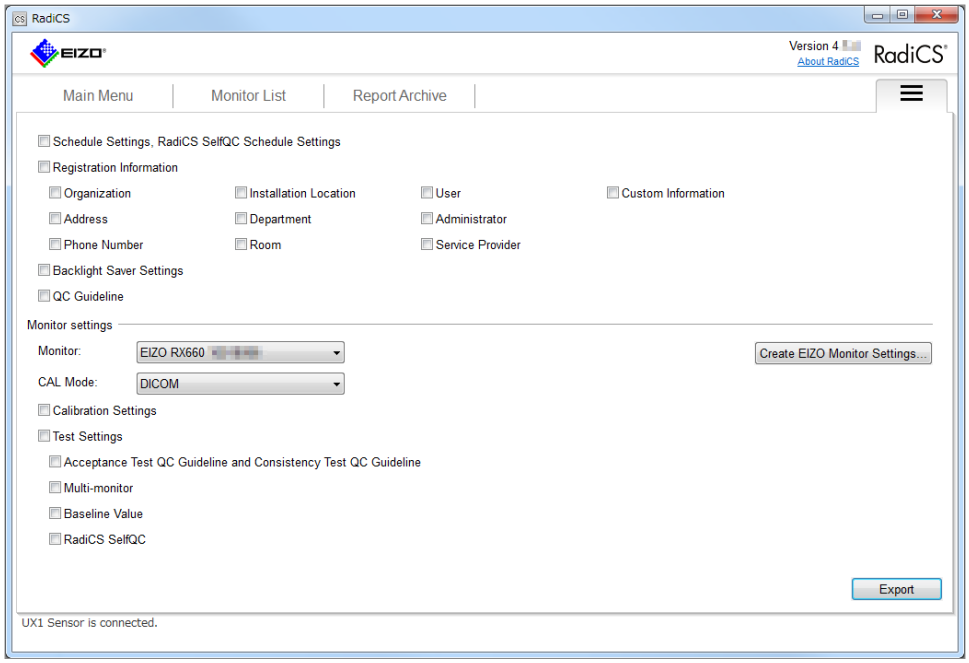
Procedure

1. Click the ☰ tab, and select “Export settings” from “Setting”.



The Export settings screen appears.

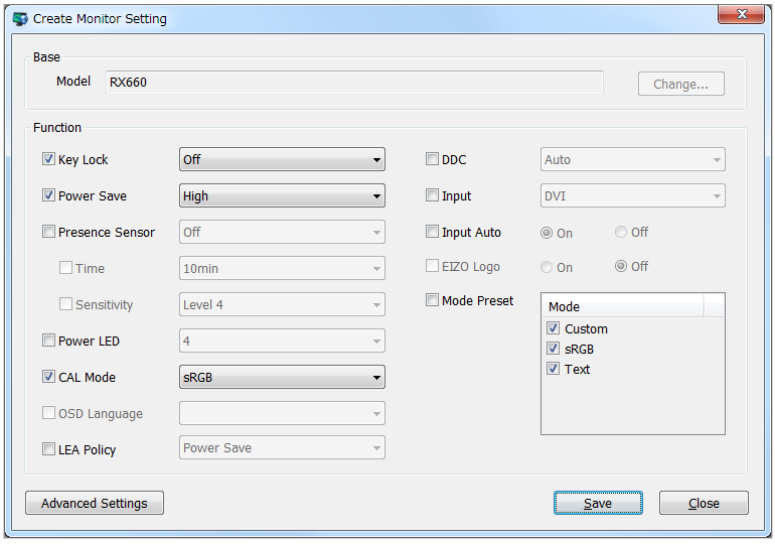
2. Select the monitor for which you want to edit settings, and click “Create EIZO Monitor Settings...”.



The “Create EIZO Monitor Setting” screen appears.

3. Edit settings.

   The “Create EIZO Monitor Setting” screen displays the default or current settings of the monitor. To change a setting, enable its check box and select a new value from the pull-down menu.



Note

- For details on how to create EIZO monitor settings, refer to the User’s Manual for “EIZO Monitor Configurator for RadiCS”. The User’s Manual for “EIZO Monitor Configurator for RadiCS” is stored in the following RadiCS DVD folder.
  - The Manual¥EIZO Monitor Configurator for RadiCS folder on the RadiCS DVD-ROM disk
- Functions that can be configured differ depending on the monitor.
- For details on each function, refer to the user’s manual of the monitor.
- Click “Advanced Settings” to configure more detailed settings of the functions.
- Settings for which the check box is selected are only exported.

4. Click “Save”.

   Specify the save location and file name of the EIZO monitor setting file (*.xml), and click “Save”.

● Importing the settings

When the RadiCS setting file is imported, the settings in the file are saved as a software policy (basic settings), therefore you do not need to configure the settings on each PC. By importing the EIZO monitor setting file, you do not need to configure keylock, brightness, or other monitor-related settings on each monitor.

Attention

- Depending on the software version, there may be settings that cannot be imported.

Note

- The following files can be imported.
  - RadiCS setting file (*.radicssetting)
  - EIZO monitor setting file (*.xml)

Procedure

1. Save the settings file in the Data/Import folder in the install folder (e.g., C:/Program Files/EIZO/RadiCS4/).
2. When the software starts, the setting file is loaded and set as a RadiCS policy.
   When imported, the files in the /Data/Import folder are deleted.

Note

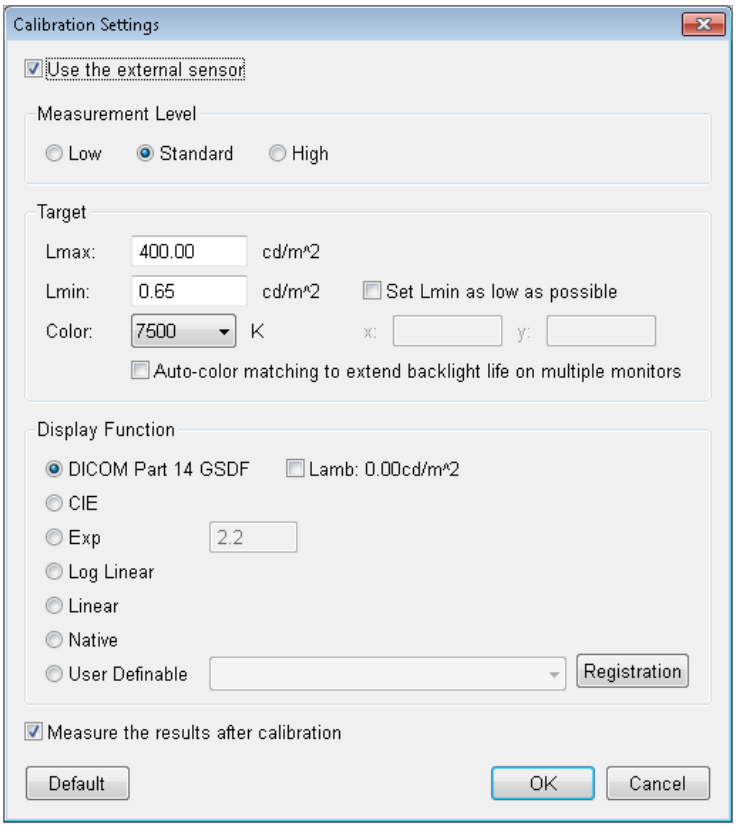
- When the settings are imported, the following message appears on the lower right of the RadiCS screen. Clicking the message displays the list of the settings applied as a policy.

Changing imported settings

In the software, you can change the settings that have been imported as a policy.

Procedure

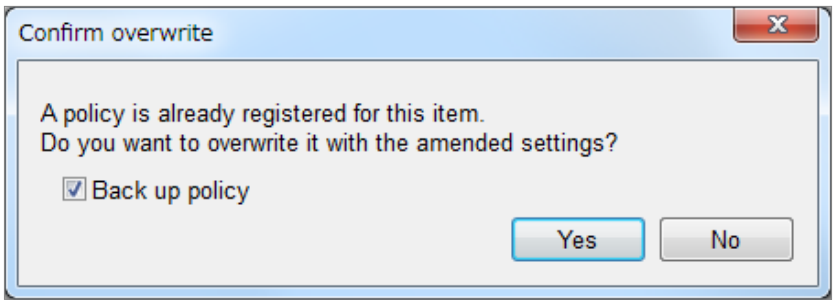
1. Edit the settings, and click “OK”.



Example: Calibration Settings

The overwrite confirmation message appears.

2. Click “Yes”.



The settings are overwritten.

Attention

- You cannot overwrite settings applied to the policy from RadiNET Pro.

Note

- By overwriting the policy while the “Back up policy” check box enabled, you can back up the settings that were set before overwriting was executed.
- If you select “No” in the overwrite confirmation message window, the display returns to the policy settings when the software starts or terminates. If the contents of the settings differ from those in the policy settings, the following message appears on the lower right of the RadiCS screen.

Deleting imported settings

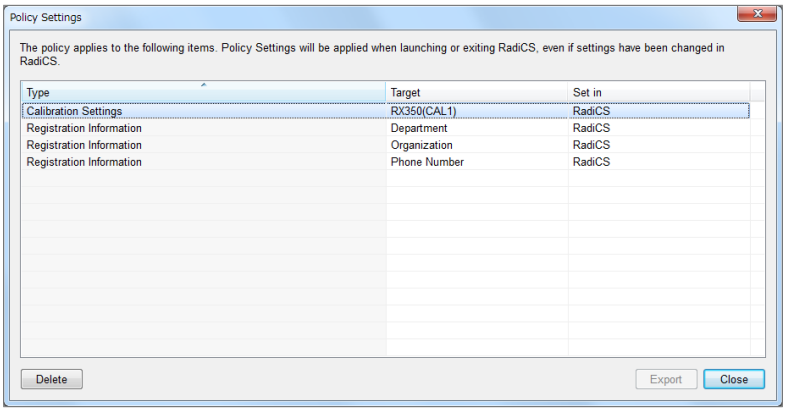
Delete imported settings from the policy.

Procedure

1. Click 

on the lower right of the software screen.
Currently applied policy settings are listed.

2. Select settings you want to delete, and click “Delete”.



The delete confirmation screen appears.

3. Click “Yes”.
The selected settings are deleted.

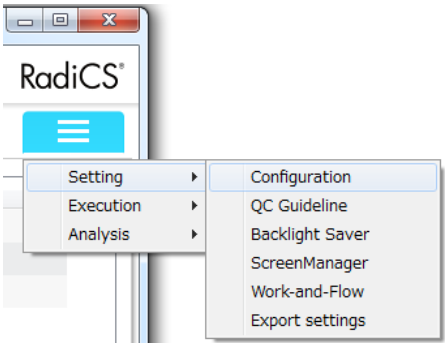
Attention

- If “RadiNET Pro” is set for “Set in”, this has been configured from RadiNET Pro, therefore it cannot be deleted.

12-3. Changing the Password

Change the password required for starting the Advanced mode of RadiCS.

1. Click the ☰ tab, and select "Configuration" from "Setting".



The Configuration screen appears.

2. Select "RadiCS Management".

The Change Password screen appears to the right.

3. Enter the following items.

Current Password	Enter the current password.
New Password	Enter a new password.
Type New Password	Reenter the new password.

4. Click "Apply".

The changed password is applied.

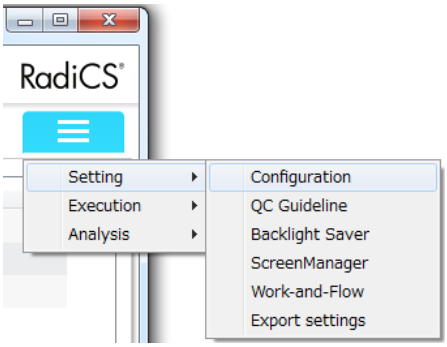
Attention

- If you forget the password, the software must be reinstalled. Uninstalling the software and then reinstalling it in the same folder resets the password.

12-4. Configuring the Startup Settings

Configure the settings for starting the software.

1. Click the ☰ tab, and select "Configuration" from "Setting".



The Configuration screen appears.

2. Select "User Mode".

The User Mode settings screen appears to the right.

3. Set the following items.

RadiCS startup

By selecting the "Starts up at logon." check box, RadiCS starts up upon logging in.

Main Menu

Configure the settings of items to be displayed in the main menu of RadiCS (User Mode).

Display test result.	Displays the test results.
Display ambient illuminance.	Displays the ambient illuminance.

4. Click "Apply".

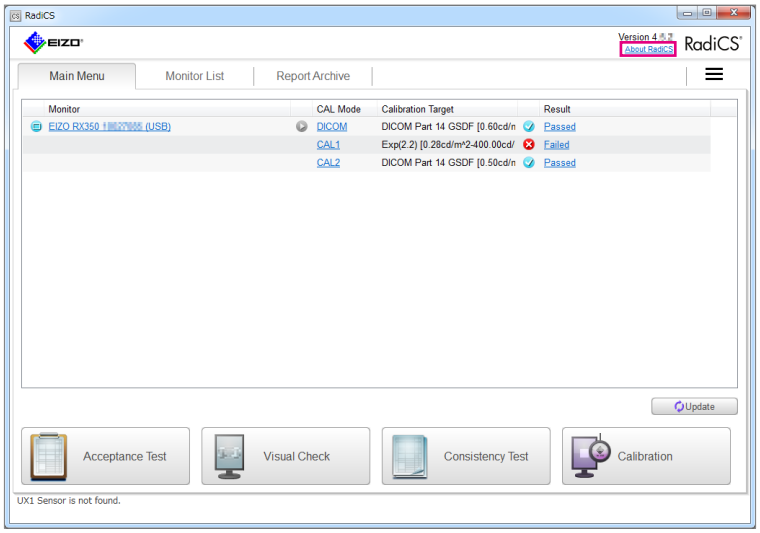
The settings are applied.

12-5. Viewing the RadiCS Information (About RadiCS)

You can view the following information on the software currently used.

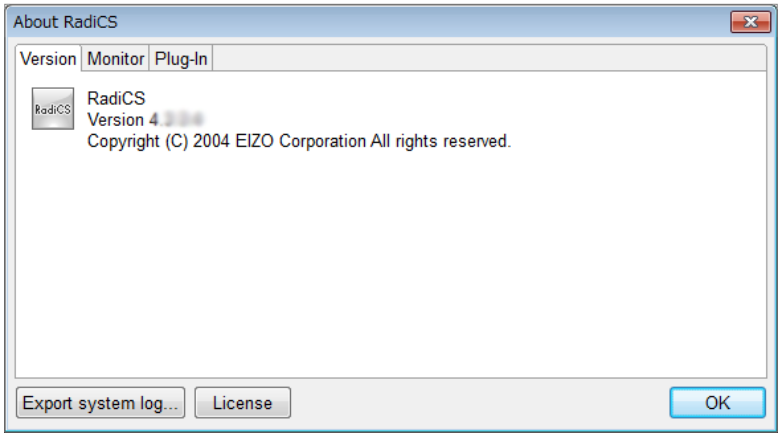
Version	Displays the software version information.
Monitor	Displays the model name or platform name of the monitor that can support hardware calibration.
Plug-In	Displays the plug-in information.

1. Click "About RadiCS".



The "About RadiCS" screen appears.

2. Select a tab whose contents you want to view.



Note

- Clicking “Version” - “License” allows you to view the license information via the browser.

● Acquiring system logs

To solve this problem, we may have to ask you to submit the system logs to us.

1. Click “About RadiCS”, and select “Version” on the “About RadiCS” screen.
2. Click “Export system log...”.

The “Save As” screen appears.

3. Specify the save location and file name (*.zip), and click “Save”.
   When presenting a log file, submit the entire file to your local EIZO representative.

12-6. Model-Depending Monitor Support Functions

RadiCS provides the following monitor support functions depending on the monitor model.
Only the following monitors are supported.

- DSB1906
- DSB1908
- DSC1904
- DSC1905
- DSHC1914-DC
- EX190
- EX270W
- EX271W
- GX1030
- LS560W
- LS580W
- LX300W
- LX470W
- LX490W
- LX600W
- RS150
- RX150
- SCD19102
- SCD21310
- SMD21510
- SMD19102
- SMD21300 *1

*1 Create / Restore Backup Data is not supported.

Attention

- This function is not supported by the Mac version.

● Video Source Input / LUT Selection

Allows you to switch the input signal to the monitor or mode.

● Create / Restore Backup Data

Obtains and saves monitor status information as a file. The saved file can be used to restore the previous monitor status.

● Extract Calibration Data

If the history data of the target monitor is not found in RadiCS, the calibration history of RadiCS is created from the factory-default calibration history data stored in the monitor. This function also can be used to generate and register baseline values for Hands-off Check.

● Backlight / ISS

Allows you to view and configure backlight control-related settings.

12-7. Uploading Old History Data

Old histories (data from versions older than Ver. 4.0) can be uploaded to RadiNET Pro.
Run the following batch file when uploading old histories to RadiNET Pro.
\installation folder\Tools\ImportOldRadiCSHistory\EnableImportOldHistory.cmd
The old histories will be uploaded to RadiNET Pro the next time RadiCS is started. Starting RadiCS may therefore take some time.

Chapter 13 Information

This chapter provides the following information:

- Notes concerning the monitor quality control standards (QC guidelines) used by RadiCS.
- Precautions for setting up a test in RadiCS according to each monitor quality control standards (QC guidelines).

13-1. Description of Standards

● Quality Control Standards for Medical Imaging Display Monitors (Monitor Quality Control Standards)

AAPM On-line Report No. 03:2005

"Assessment of Display Performance for Medical Imaging Systems" formulated by Task Group (TG) 18 of American Association of Physicists in Medicine. It defines consistency tests and acceptance tests for monitors. Monitors are classified into "Primary" and "Secondary" depending on the intended use.

Note

- "AAPM" used in RadiCS means "AAPM On-line Report No. 03".

ACR-AAPM-SIIM Practice Guideline for Determinants of Image Quality in Digital Mammography:2012

This guideline was formulated collaboratively by specialists in mammography and medical physics who represent the American College of Radiology (ACR), American Association of Physicists in Medicine (AAPM), and Society for Imaging Informatics in Medicine (SIIM). The Mammography Quality Standards Act (MQSA) obliges the quality control for mammography diagnostic equipments in the United States. This Act, which went into effect in 1992, is aimed at film based analog systems, and is being revised for digital systems that become popular recently. This guideline is positioned as one of proposals by ACR for such rework. The section on monitors covers diagnostic (Primary) use. It does not cover the concepts of acceptance tests or consistency tests. This was revised in 2012.

Note

- RadiCS with "ACR" indicates that it has been tested with additional quality control elements based on the ACR-AAPM-SIIM Practice Guideline for Determinants of Image Quality in Digital Mammography (hereinafter referred to as ACR Mammo) (the evaluation item and standard are selected from the ACR-AAPM-SIIM Practice Guideline for Determinants of Image Quality in Digital Mammography: 2012 (hereinafter referred to as the Technical Standard) and AAPM On-line Report No. 03:2005).

New York State Department of Health Bureau of Environmental Radiation Protection
Guide for Radiation Safety/Quality Assurance Program Primary Diagnostic Monitors

The guidelines describe the types and extension of information and criteria used by the New York State Department of Health Bureau of Environmental Radiation Protection to evaluate Primary Diagnostic Monitor (PDM) in facilities as a part of the radiation safety and quality assurance program.

Note

- Term “NYS PDM-***” in RadiCS refers to “New York State Department of Health Bureau of Environmental Radiation Protection Guide for Radiation Safety/Quality Assurance Program Primary Diagnostic Monitors”. In RadiCS, contents are added by referring partially to AAPM On-line Report No. 03.

Guideline references	QC guideline (Abbreviation)
Not for mammography	NYS PDM – Diagnostic
For mammography	NYS PDM – Mammography

NYC Quality Assurance Guidelines for Primary Diagnostic Monitors: 2015

Refers to the “Guidance related to quality assurance for Primary Diagnostic Monitor (PDM)” based on the health regulations of New York city provided by the New York City Health Department’s Office of Radiological Health.

Note

- The term “NYC PDM-***” in RadiCS refers to “NYC Quality Assurance Guidelines for Primary Diagnostic Monitors: 2015”. In RadiCS, contents are added by referring partially to AAPM On-line Report No. 03.

Guideline references	QC guideline (Abbreviation)
For hospitals, medical centers, imaging centers, radiologistoffices	NYC PDM – Hospitals
For all other clinical sites, including chiropractic offices, medical doctor offices, orthopedic offices	NYC PDM – Clinical sites
For mammography facilities	NYC PDM – Mammography

ONR 195240-20: 2017

“Image Quality Asvsurance in X-ray Diagnosis - Part 20: Acceptance test and consistency test for image display devices” formulated by the Austrian Standards Institute). This standard is based on German DIN6868-157 and QS-RL standards, with the Institute’s own judgment and interpretation added to the compilation. Compared with the 2008 edition, parts of test patterns, evaluation methods, judgment standards, etc. to be used have been modified in the new edition.

Note

- The term “ONR 195240-20 **” in RadiCS refers to “Image Quality Asvsurance in X-ray Diagnosis - Part 20: Acceptance test and consistency test for image display devices: 2017”.

Guideline references	QC guideline (Abbreviation)
Mammography: Application Category A	ONR 195240-20 Application Category A Mammo
Application Category A	ONR 195240-20 Application Category A
In dentistry: Application Category B	ONR 195240-20 Application Category B Dentistry
Application Category B	ONR 195240-20 Application Category B

DIN 6868-157: 2014

“Image quality assurance in diagnostic X-ray – Part 157: X-ray Ordinance Acceptance and Consistency Tests of image display systems in their environment” formulated by the German Institute for Standardization (Deutsches Institut für Normung e.V). The standard is intended to replace the preceding DIN V 6868-57 standard that defines acceptance testing and the corresponding chapters of QS-RL and PAS1054 (see below) that specifies criteria by body part and capture method, consistency test items, and frequencies. Conformance to the international standard is also one of the reasons of revision and many of the evaluation methods and test patterns specified in IEC62563-1 (or DIN EN 62563-1) have been adapted. There are also original approaches such as definition of room category and setting down of upper limit of illuminance according to the application. RadiCS reflects relevant items according to “QS-RL Rundschreiben (TOP C 04 der 74. Sitzung des LA RöV im Mai 2015, TOP C 07 der 75. Sitzung des LA RöV im November 2015)”.

Note

- “DIN 6868-157” shown in RadiCS includes the followings.

QC guideline	QC guideline (Abbreviation)
DIN 6868-157 I. Mammography	DIN 6868-157 I. Mammography
DIN 6868-157 II. Mammographic stereotaxy	DIN 6868-157 II. Mammographic stereotaxy
DIN 6868-157 III. Projection radiography (thorax, skeleton, abdomen)	DIN 6868-157 III. Projection radiography
DIN 6868-157 IV. Fluoroscopy, all applications	DIN 6868-157 IV. Fluoroscopy, all applications
DIN 6868-157 V. Computed tomography	DIN 6868-157 V. Computed tomography
DIN 6868-157 VI. Digital volume tomography (dental), intraoral X-ray diagnostics with dental tubehead, panoramic radiographs, cephalometric radiographs of the skull, Dental radiographs of a skull overview, Hand radiographs for skeletal growth determination	DIN 6868-157 VI. Digital volume tomography (dental) etc. in RK 5
DIN 6868-157 VII. Intraoral X-ray diagnostics with dental tubehead, panoramic radiographs, cephalometric radiographs of the skull, Dental radiographs of a skull overview, Hand radiographs for skeletal growth determination (The interval of the measuring tests can be extended to five years on the condition that the requirements specified in TOP C 07 der 75. Sitzung des LA RöV are satisfied.)	DIN 6868-157 VI. Dental X-ray equipment etc. in RK 5 (five-year interval)
DIN 6868-157 VII. Intraoral X-ray diagnostics with dental tubehead, panoramic radiographs, cephalometric radiographs of the skull, Dental radiographs of a skull overview, Hand radiographs for skeletal growth determination	DIN 6868-157 VII. Intraoral X-ray diagnostics (dental) etc. in RK 6
DIN 6868-157 VIII. Viewing	DIN 6868-157 VIII. Viewing

DIN V 6868-57: 2001

“Image Quality Assurance in X-ray Diagnosis - Part 57: Acceptance test for image display devices” formulated by the German Institute for Standardization (Deutsches Institut für Normung e.V). Image display devices are divided into 3 categories. “Application Category A” includes image display devices used for the diagnosis of images of high spatial and contrast resolution. “Application Category B” includes image display devices for diagnosis which are not classified in “Application Category A” and image display devices for image viewing.

Note

- “DIN” used in RadiCS means “DIN V 6868-57”.

Quality Control Manual for Digital Mammography: 2009

A quality control manual for digital mammography systems written by the Japan Central Institute on Quality Assurance of Breast Cancer Screening, a nonprofit organization, in Japan. This NPO studies and manages quality control of mammography.

Note

- "DMG QC Manual" or "DMG QCM" used in RadiCS means "Quality Control Manual for Digital Mammography". Note that "Regular Control Point" or "Daily Control Point" written in the DMG QCM is expressed as "Consistency Test" on RadiCS.

European Guidelines for Quality Assurance in Breast Cancer Screening and Diagnosis Fourth Edition - Supplements: 2013

This guideline was issued by the European Commission in cooperation with EUREF (European Reference Organization for Quality Assured Breast Screening and Diagnostic Services), EBCN (European Breast Cancer Network), and EUSOMA (European Society of Mastology). It applies to mammography systems as a whole and chapter 2 deals with monitors. Supplements were added in 2013. Different conditions are set for monitors for diagnostic and for reference use.

Note

- "EUREF" written on RadiCS means "European Guidelines for Quality Assurance in Breast Cancer Screening and Diagnosis Fourth Edition - Supplements".

JESRA X-0093*B^{-2017} : 2017

"Quality Assurance (QA) Guideline for Medical Imaging Display Systems" prepared by Japan Medical Imaging and Radiological Systems Industries Association (JIRA). It was published in 2005 and revised in 2010 and 2017. This guideline specifies the acceptance tests and consistency tests. Also, in this guideline, the organization can omit the acceptance test by substituting it with the shipment test reports provided by manufacturers. In the 2017 revision, the previous "Grade 1" was changed to "Grade 1B", and the new "Grade 1A" was added as the higher-level judgment criteria. The organization must judge which grade level is to be used for management depending on the intended use.

Note

- "JESRA" used in RadiCS means "JESRA X-0093".

IPEM Report 91: 2005

"Recommended Standards for the Routine Performance Testing of Diagnostic X-ray Imaging Systems" formulated by Institute of Physics and Engineering in Medicine in the UK. It applies to diagnostic X-ray imaging systems as a whole including image display devices but does not include MR or ultrasonic systems. The items related to monitors were added when this standard was revised from Report 77. It mainly defines consistency tests.

Note

- "IPEM" used in RadiCS means "IPEM Report 91".

Qualitätssicherungs-Richtlinie (QS-RL): 2007

"Guideline for implementing quality assurance of the X-ray systems for diagnostic and medical treatment purposes according to chapters 16 and 17 of the X-ray Ordinance". This defines the details of the quality assurance of general X-ray systems obliged by the X-ray Ordinance (for diagnostics: chapter 16, for medical treatment: chapter 17). DIN V 6868-57 is supposed to be referred on basic test methods for diagnostic image display devices. Limiting values such as the minimum value of the maximum luminance and the items/frequency of the consistency test are added to the contents of DIN V 6868-57 that defines only the acceptance test. Although the classification of image display devices conforms to DIN V 6868-57 (Category A, B), stricter criteria are established for mammography equipments by reference to PAS1054 "Requirements and testing of digital mammographic X-ray equipment", which is the standard issued by the German Institute for Standardization.

Note

- "QS-RL" used in RadiCS means "Qualitätssicherungs-Richtlinie: 2007". "Application Category A Mammo" means PAS1054 is also complied with.

● Other standards

DICOM PS 3.14: 2000

"Digital Imaging and Communications in Medicine (DICOM) Part 14: Grayscale Standard Display Function" formulated by NEMA (National Electrical Manufacturers Association) in the US. It defines the grayscale characteristics to be equipped in films and monitors for the display of grayscale images as GSDF: Grayscale Standard Display Function.
More details on the evaluation of compliance for this standard are specified in other policies and standards, such as AAPM On-line Report No. 03.

Note

- DICOM Part 14 GSDF" used in RadiCS means "The grayscale standard display function defined in DICOM PS 3.14".

CIE Pub.15.2: 1986

"Colorimetry, Second Edition" published by Commission Internationale de l' Eclairage. It recommends CIELAB(L*a*b*) and CIELUV(L*u*v*) that are uniform color spaces and uses color difference formulas to evaluate the difference of 2 colors quantitatively.

Note

- "CIE" used in RadiCS means "Display formulas with L* formula".

SMPTE RP133: 1991

"Specifications for Medical Diagnostic Imaging Test Pattern for Television Monitors and Hard-Copy Recording Cameras" proposed by Society of Motion Picture and Television Engineers in the US.

Note

- "SMPTE" used in RadiCS means "Test patterns created in reference to SMPTE PR133 specifications".

Basic QC, Basic Mammo QC, Basic QC Primary, Basic QC Secondary

The setting specific to RadiCS used for monitor management that does not comply with standards or guidelines described above.

13-2. RadiCS Software

● Prerequisite

RadiCS Software

We have long developed monitors. With those skills, knowledge and measuring data, we have developed RadiCS for users of medical image diagnosis to manage the quality of monitors efficiently according to our interpretation of the quality control standard for each medical image monitor.
Each medical image monitor evaluation standard defines the change of clinical image use and monitor luminance, as well as measuring machines. Having only RadiCS will not meet all the conditions. Read thorough the related standards and test each item according to the conditions.
A setting value for each standard can be changed and testing conditions can be set with several standards.
To maintain and manage image quality according to the standards and the situation, follow the monitor quality control standards and use RadiCS.
Monitor judgment by RadiCS is not to ensure each monitor quality control standard.

● Correlation Between RadiCS and Monitor Quality Control Standards

The RadiCS software interprets and supports each monitor quality control standard as described below. Use this information when setting up tests in RadiCS.

AAPM

● RadiCS Setup

	Acceptance Test	
	Primary	Secondary
Pattern Check (Used pattern)	Black TG18-QC TG18-AD TG18-UN80 TG18-AFC TG18-CT White (inverted black)	Black TG18-QC TG18-AD TG18-UN80 TG18-AFC TG18-CT White (inverted black)
Luminance Check	L'max/L'min > 250 L'max > 170 cd/m^2 ΔL'max < 10 % *1	L'max/L'min > 100 L'max > 100 cd/m^2 ΔL'max < 10 % *1
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 20% of GSDF
Uniformity	Grayscale: 204, 26 *2 Grayscale: 204 Δ(u′, v′) < 0.010	Grayscale: 204, 26 *2
Multi-monitor	ΔL'max < 10% between multiple monitors Grayscale 204 Mean value between multiple monitors Δ(u′, v′) < 0.010	ΔL'max < 10% between multiple monitors

	Consistency Test	
	Primary	Secondary
Pattern Check (Used pattern)	TG18-QC TG18-AD TG18-UN80 TG18-AFC Black White (inverted black)	TG18-QC TG18-AD TG18-UN80 TG18-AFC Black White (inverted black)
Luminance Check	L'max/L'min > 250 L'max > 170 cd/m^2 ΔL'max < 10 % *1	L'max/L'min > 100 L'max > 100 cd/m^2 ΔL'max < 10 % *1
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 20% of GSDF
Uniformity	Grayscale: 204, 26 *2	Grayscale: 204, 26 *2
Multi-monitor	ΔL'max < 10% between multiple monitors	ΔL'max < 10% between multiple monitors

*1 Lamb < Lmin/1.5

*2 (Lmax - Lmin) / (Lmax + Lmin) × 200 < 30%

Correlation Between AAPM and RadiCS

Pattern Check

A test pattern given in AAPN cannot be applied to a monitor whose screen aspect ratio is not 1:1 without modification, since AAPN (or the test pattern) uses an aspect ratio of 1:1. Therefore, RadiCS checks a monitor being tested, and determines and generates an appropriate test pattern for each resolution supported by the monitor.

TG18-QC TG-AD TG18-AFC TG18-CT	Equivalent to a pattern with the same name in the standard. Each of the patterns is scaled in accordance with the screen resolution.
TG18-UN80	Grayscale 204 white patterns. The same pattern of AAPM has a square frame but RadiCS does not have any because it does not need to be visible.

Luminance Check

AAPM except for Lamb < Lmin includes an equality sign in each judgment condition but RadiCS does not.
The calibration setup, Lmax value will be input in the ΔL'max basic value as an initial setup when performing a tasksetup.
The RadiCS luminance check Lmin is equivalent to AAPM L'min = (Lmin + Lamb) and Lmax is equivalent to L'max = (Lmax + Lamb). L'max/L'min means AAPM LR'(= Lmax + Lamb / Lmin + Lamb).

Grayscale Check

AAPM includes an equality sign but RadiCS doesn't because of the target error rate is < 10 % of GSDF. It is one judgment condition for DICOM Part14 GSDF.
The number of grayscale measuring points is fixed at 18 and is unchangeable.
The measurement result is 17 points because it is expressed as $(JND_{n+1} – JND_n)/2$.

Uniformity Check

AAPM includes an equality sign in each judgment condition but RadiCS does not.
AAPM uses TG18-UN80 and TG18-UN10 patterns in measurement, but these patterns cannot be applied to a monitor whose screen aspect ratio is not 1:1 without modification, since they use an aspect ratio of 1:1, Instead, RadiCS displays grayscale 204 and grayscale 26 windows equivalent to 10% of the display area in the center of the screen and in the corners, and measures the center portion of each window.

Sensors

Noncontact and contact measuring devices are available in AAPM.

Multi-monitor

AAPM includes a determination for multiple monitors, but by default RadiCS is set not to make such a determination. If necessary, make settings as indicated in the table above. AAPM includes an equality sign but RadiCS does not.

Cautions

AAPM consistency testing has 3 types, tests that monitor users perform daily, tests that medical physicists perform or QC (quality control) technologists perform under their instructions monthly / quarterly, and tests that medical physicists perform annually. RadiCS is mainly intended for consistency testing of the second type, but pattern checks can be performed for all three types of testing.
AAPM has an item to measure geometrical distortion but RadiForce series monitors do not need to be measured because it meets the requested specification. However, non-RadiForce monitors may be used. Therefore, the pattern check has patterns and checkpoints for geometrical distortion.

ACR

RadiCS Setup

	Acceptance Test	Consistency Test
Pattern Check (Used pattern)	Black TG18-QC TG18-AD TG18-UN80 TG18-AFC TG18-CT White (inverted black)	Black TG18-QC TG18-AD TG18-UN80 TG18-AFC White (inverted black)
Luminance Check	L'max/L'min > 250 L'max > 420 cd/m^2 L'min >1.2cd/m^2 Lamb < Lmin/4	L'max/L'min > 250 L'max > 420 cd/m^2 L'min >1.2cd/m^2 Lamb < Lmin/4
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 10% of GSDF
Uniformity Check	Grayscale: 204, 26 (Lmax-Lmin)/(Lmax+Lmin) × 200 < 30% Grayscale: 204 Δ(u', v') < 0.010	Grayscale: 204, 26 (Lmax-Lmin)/(Lmax+Lmin) × 200 < 30% Grayscale: 204 Δ(u', v') < 0.010
Multi-monitor	Grayscale: 204 Δ(u', v') < 0.010	Grayscale: 204 Δ(u', v') < 0.010

Correlation Between ACR and RadiCS

Pattern Check

The test patterns are not introduced specifically in ACR Mammo. The same check method as AAPM is applied to RadiCS. See the AAPM item for details of the correlation with RadiCS.

Luminance Check

For ACR Mammo, only "L'max ≥ 400 cd/m^2 (recommendation: 450 cd/$m^{2)}$" is displayed. For the Technical Standard, "L'max ≥ 420cd/m^2" is specified for mammography, so 420 cd/m^2 is used. In addition, other judgment standards specified by the Technical Standard are also used. The judgment conditions include an equality sign but RadiCS does not.

Grayscale Check

GSDF is recommended for ACR Mammo, but there is no judgment standard. For reference values, the values for AAPM and the Technical Standard are used. These include an equality sign but RadiCS does not because the target error rate is < 10% of GSDF. This is a judgment condition for DICOM Part 14 GSDF. The number of grayscale measuring points is fixed at 18 and is unchangeable. The measurement result is 17 points because it is expressed as $(JND_{n+1} – JND_n)/2$.

Uniformity Check

For ACR Mammo, the uniformity of the luminance and color is not specified. The uniformity needs to be confirmed, so conditions for RadiCS include uniformity judgment for luminance and color. These are identical to AAPM in content. The content is the same as that for AAPM. For details on the correlation with RadiCS, refer to the AAPM section.

Sensors

ACR Mammo contains nothing in particular about sensors or measuring devices. Since this standard was compiled using AAPM as a reference, sensors are handled in the same manner as AAPM.

Multi-monitor

For ACR Mammo, there is no multi-monitor judgment. By default, RadiCS does not perform judgment. If necessary, make settings as indicated in the table above.

Cautions

ACR Mammo is an educational tool to supply physicians, technicians, and physicists with extensive knowledge related to digital mammography image quality. It is not an implementation standard, a list of essential requirements, or a quality control standard. For this reason it does not cover the concepts of acceptance tests or consistency tests. However, we, who have agreed to the ACR policy, suggest support for the deficiencies in quality control with reference to the AAPM and the Technical Standard stated in ACR Mammo to achieve more practical operation.

NYS-PDM

RadiCS Setup

	Acceptance Test / Consistency Test [Annually]	
	NYS PDM – Diagnostic	NYS PDM – Mammography
Pattern Check (Used pattern)		
Luminance Check	L'max/L'min > 170 L'max > 171cd/m^2 Lamb < Lmin/1.5	L'max/L'min>250 L'max>250cd/m^2 Lamb < Lmin/1.5
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 10% of GSDF
Uniformity Check	Grayscale: 204, 26 (Lmax-Lmin)/(Lmax+Lmin) × 200 < 30%	Grayscale: 204, 26 (Lmax-Lmin)/(Lmax+Lmin) × 200 < 30%
Multi-monitor		

	Consistency Test [Bi-Weekly]	
	NYS PDM – Diagnostic	NYS PDM – Mammography
Pattern Check (Used pattern)	Black SMPTE Shades of RGB White	Black SMPTE Shades of RGB White
Luminance Check		
Grayscale Check		
Uniformity Check		
Multi-monitor		

	Consistency Test [Quarterly]	
	NYS PDM – Diagnostic	NYS PDM – Mammography
Pattern Check (Used pattern)		
Luminance Check	L'max/L'min > 170 L'max > 171cd/m^2 Lamb < Lmin/1.5	L'max/L'min > 250 L'max > 250cd/m^2 Lamb < Lmin/1.5
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 10% of GSDF
Uniformity Check		
Multi-monitor		

Pattern Check

The Shades of RGB pattern displays 18 gradation levels for each of Red, Green, and Blue for checking. Monochrome monitors cannot run (display) this pattern even if it has been specified as a display pattern. The Bi-Weekly setting is not available in RadiCS. Specify Weekly instead. The Visual Check settings are the same as those for Bi-Weekly.

Luminance Check

Lamb < Lmin/1.5 is added in accordance with AAPM On-line Report No. 03.

Grayscale Check

Added in accordance with AAPM On-line Report No. 03.

Uniformity Check

Added in accordance with AAPM On-line Report No. 03.

Sensors

All the measurement devices can be used in accordance with AAPM On-line Report No. 03.

Cautions

As the guideline does not contain any description of the acceptance test, the same settings as those for the consistency test (annually) are configured.

NYC-PDM

RadiCS Setup

	Acceptance Test / Consistency Test [Annually]		
	NYC PDM – Hospitals	NYC PDM – Clinical sites	NYC PDM – Mammography
Pattern Check (Used pattern)			
Luminance Check	L'max/L'min > 250 L'max > 350cd/m^2 Lamb < Lmin/1.5	L'max/L'min > 250 L'max > 250cd/m^2 Lamb < Lmin/1.5	L'max/L'min > 250 L'max > 420cd/m^2 Lamb < Lmin/1.5
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 10% of GSDF	Target error rate < 10% of GSDF
Uniformity Check	Grayscale: 204, 26 (Lmax-Lmin)/(Lmax+Lmin) × 200 < 30%	Grayscale: 204, 26 (Lmax-Lmin)/(Lmax+Lmin) × 200 < 30%	Grayscale: 204, 26 (Lmax-Lmin)/(Lmax+Lmin) × 200 < 30%
Multi-monitor			

	Consistency Test [Bi-Weekly]		
	NYC PDM – Hospitals	NYC PDM – Clinical sites	NYC PDM – Mammography
Pattern Check (Used pattern)	Black SMPTE Shades of RGB White	Black SMPTE Shades of RGB White	Black SMPTE Shades of RGB White
Luminance Check			
Grayscale Check			
Uniformity Check			
Multi-monitor			

	Consistency Test [Quarterly]		
	NYC PDM – Hospitals	NYC PDM – Clinical sites	NYS PDM – Mammography
Pattern Check (Used pattern)			
Luminance Check	L'max/L'min > 250 L'max > 350cd/m^2 Lamb < Lmin/1.5	L'max/L'min > 250 L'max > 250cd/m^2 Lamb < Lmin/1.5	L'max/L'min > 250 L'max > 420cd/m^2 Lamb < Lmin/1.5
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 10% of GSDF	Target error rate < 10% of GSDF
Uniformity Check			
Multi-monitor			

Pattern Check

The Shades of RGB pattern displays 18 gradation levels for each of Red, Green, and Blue for checking. Monochrome monitors cannot run (display) this pattern even if it has been specified as a display pattern. The Bi-Weekly setting is not available in RadiCS. Specify Weekly instead. The Visual Check settings are the same as those for Bi-Weekly.

Luminance Check

Lamb < Lmin/1.5 is added in accordance with AAPM On-line Report No. 03.

Grayscale Check

Lamb < Lmin/1.5 is added in accordance with AAPM On-line Report No. 03.

Uniformity Check

Each judgment condition includes an equality sign, but RadiCS does not.

Sensors

All the measurement devices can be used in accordance with AAPM On-line Report No. 03.

Cautions

The judgment of the luminance check has been added to each test. In addition, the judgment of the luminance ratio has been added to consistency tests (quarterly).

ONR 195240-20

RadiCS Setup

	Acceptance Test			
	Category A	Category A Mammo	Category B	Category B Dentistry
Pattern Check (Used pattern)	TG18-OIQ TG18-UN80 TG18-UN10	TG18-OIQ TG18-UN80 TG18-UN10 TG18-MM1 TG18-MM2	TG18-OIQ TG18-UN80 TG18-UN10	TG18-OIQ TG18-UN80 TG18-UN10
Illuminance judgment	≤ 50 lx	≤ 50 lx	≤ 100 lx	≤ 100 lx
Luminance Check	L'max/L'min>100 L'max>200cd/m^2 Lamb<L'max/100	L'max/L'min>250 L'max>250cd/m^2 Lamb<L'max/100	L'max/L'min>40 L'max>120cd/m^2 Lamb<L'max/40	L'max/L'min>40 L'max>120cd/m^2 Lamb<L'max/40
Grayscale Check				
Uniformity Check	Grayscale:204,26 (Lcorner-Lcenter)/ LcenterX100<25%	Grayscale:204,26 (Lcorner-Lcenter)/ LcenterX100<25%	Grayscale:204,26 (Lcorner-Lcenter)/ LcenterX100<30%	Grayscale: 204,26 (Lcorner-Lcenter)/ LcenterX100<30%
Multi-monitor	Δ L'max < 20%	Δ L'max < 10%	Δ L'max < 20%	Δ L'max < 20%

	Consistency Test			
	Category A	Category A Mammo	Category B	Category B Dentistry
Pattern Check (Used pattern)	TG18-OIQ TG18-UN80 TG18-UN10	TG18-OIQ TG18-UN80 TG18-UN10 TG18-MM1 TG18-MM2	TG18-OIQ TG18-UN80 TG18-UN10	TG18-OIQ TG18-UN80 TG18-UN10
Illuminance judgment	≤ 50 lx	≤ 50 lx	≤ 100 lx	≤ 100 lx
Luminance Check	L'max/L'min>100 L'max>200cd/m^2 Lamb<L'max/100 Δ Lamb<30%	L'max/L'min>250 L'max>250cd/m^2 Lamb<L'max/100 Δ Lamb<30%	L'max/L'min>40 L'max>120cd/m^2 Lamb<L'max/40 Δ Lamb<30%	
Grayscale Check				
Uniformity Check	Grayscale:204,26 (Lcorner-Lcenter)/ LcenterX100<25%	Grayscale:204,26 (Lcorner-Lcenter)/ LcenterX100<25%	Grayscale:204,26 (Lcorner-Lcenter)/ LcenterX100<30%	
Multi-monitor	Δ L'max < 20%	Δ L'max < 10%	Δ L'max < 20%	

Correlation Between ONR 195240-20: 2008 and RadiCS

Pattern Check

RadiCS prepares the patterns based on check results for respective compatible resolutions.

Luminance Check

Lmax and Lmin in ONR 195240-20, which include ambient luminance, are equivalent to L'max and L'min in RadiCS. Lamb indicates ambient luminance, the same value as "Ls" in ONR 195240-20. The equation is transformed by changing Lmax/Ls>100 (or 40) in ONR195240-20 into Ls<Lmax/100 (or 40). When a contact type sensor is used for a monitor containing an ambient light sensor capable of measuring ambient illuminance (see "Chapter 6 Checking Monitor Status" (page 81)), the illuminance is automatically converted into luminance. Based on the standard, if the measurement value of the consistency test is 0.15cd/m^2 at maximum and less than the baseline value, RadiCS does not determine Δ Lamb.

Uniformity Check

Uniformity Check Luminance uniformity is determined from the ratio of difference in luminance between the center and corner with the center as the standard. ONR195240-20 provides a method that uses the SMPTE pattern and another method that uses the TG18-UNL80 (or UNL10). RadiCS adopts the method that uses the TG18-UNL80 (or UNL10) pattern. It displays grayscale 204 and grayscale 26 windows (a square occupying 10% of the total display area) in the center and corners, and measures the center portion of the window.
All monitors compatible with RadiCS are LCD, therefore, LCD values (25% and 30%) are used as the judgment value. For this reason, CRT monitors are not supported.
RadiCS specifies (Lcorner-Lcenter)/Lcenter×100<25% (or 30%), but this denotes ±25% (or ±30%), and does not include an equals sign.

Sensors

For acceptance tests, ONR 195240-20 defines the use of measurement devices conforming to class B or higher (DIN5032-7) and those do not block ambient light. To perform acceptance tests using RadiCS, only non-contact type measurement devices can be used. EIZO sensors can also be used for consistency tests.

Multi-monitor

ONR 195240-20 has multi-monitor judgment. If necessary, make settings as indicated in the table above.
ONR 195240-20 includes an equality sign but RadiCS does not.

Cautions

Category A Mammo requires a minimum resolution of 2000 x 2500 for monitors used for mammography, however, RadiCS does not perform this judgment.

DIN 6868-157

RadiCS Setup

	Acceptance Test				
	I. Mammography	II. Mammographic stereotaxy	III. Projection radiography	IV. Fluoroscopy, all applications	V. Computed tomography
Pattern Check (Used pattern)	TG18-OIQ TG18-UN80 TG18-UN10 TG18-MP TG18-LPH (89,50,10) TG18-LPV (89,50,10)	TG18-OIQ TG18-UN80 TG18-UN10 TG18-MP			
Luminance Check	L'max > 250cd/ m^2 L'max /L'min > 250	L'max > 200cd/ m^2 L'max /L'min > 100	L'max > 250cd/m^2 L'max / L'min >250	L'max > 150cd/m^2 L'max /L'min > 100	
	Lamb < Lmin/0.1 *1				
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 15% of GSDF	Target error rate < 10% of GSDF	Target error rate < 15% of GSDF	
Uniformity Check	Grayscale:204,26 (Lmax-Lmin)/(Lmax+Lmin) X 200				
	<25%				
Multi-monitor *2	Grayscale:26 <10%	Grayscale:26 <20%			
Resolution	≥2048×≥2048	≥1024×≥1024	≥1600×≥1200 *3	≥1024×≥1024	≥1024×≥768

	Acceptance Test		
	VI. Digital volume tomography (dental) etc. in RK 5 VI. Dental X-ray equipment etc. in RK 5 (five-year interval)*4	VII. Intraoral X-ray diagnostics (dental) etc. in RK 6	VIII. Viewing
Pattern Check (Used pattern)	TG18-OIQ TG18-UN80 TG18-UN10		
Luminance Check	L'max > 200cd/m^2 L'max /L'min > 100	L'max > 300cd/m^2 L'max /L'min > 100	
	Lamb < Lmin/0.1 *1		
Grayscale Check			
Uniformity Check	Grayscale:204,26 (Lmax-Lmin)/(Lmax+Lmin) X 200		
	<30%		
Multi-monitor *2	Grayscale:26 <30%		
Resolution	≥1024×≥768		

*1 L'min > 1.1Lamb - > Lmin+Lamb > 1.1Lamb - > Lmin > 0.1Lamb - > Lamb < Lmin/0.1

*2 (Lhigh-Llow)/(Lhigh+Llow) X 200

*3 ≥1024 x ≥1024 can be used until June 30, 2018 as per transition measures.

*4 The interval of the annual measuring tests can be extended to five years on the condition that the specified requirements are satisfied.

	Consistency Test				
	I. Mammography	II. Mammographic stereotaxy	III. Projection radiography	IV. Fluoroscopy, all applications	V. Computed tomography
Pattern Check (Used pattern)	TG18-OIQ TG18-UN80				
Luminance Check	L'max > 250cd/ m^2 L'max / L'min > 250	L'max > 200cd/ m^2 L'max / L'min > 100	L'max > 250cd/m^2 L'max / L'min >250	L'max > 150cd/m^2 L'max /L'min > 100	
	Lamb < Lmin/0.1 *1 Δ L'max < 30% Δ L'min < 30%				
	Δ Lamb ≤ 30% *3				
Grayscale Check *3	Target error rate < 10% of GSDF	Target error rate < 15% of GSDF	Target error rate < 10% of GSDF	Target error rate < 15% of GSDF	
Uniformity Check					
Multi-monitor *2,3	Grayscale:26 <10%	Grayscale:26 <20%			
Resolution	≥2048×≥2048	≥1024×≥1024	≥1600×≥1200 *4	≥1024×≥1024	≥1024×≥1024

	Consistency Test		
	VI. Digital volume tomography (dental) etc. in RK 5	VII. Intraoral X-ray diagnostics (dental) etc. in RK 6	VIII. Viewing
	VI. Dental X-ray equipment etc. in RK 5 (five-year interval)*5		
Pattern Check (Used pattern)	TG18-OIQ TG18-UN80		TG18-OIQ
Luminance Check	L'max > 200cd/m^2 L'max /L'min > 100	L'max > 300cd/m^2 L'max /L'min > 100	
	Lamb < Lmin/0.1 *1 Δ L'max < 30% Δ L'min < 30%		
Grayscale Check			
Uniformity Check			
Multi-monitor *2			
Resolution	≥1024×≥768		

*1 L'min ≥ 1.1Lamb -> Lmin+Lamb ≥ 1.1Lamb - > Lmin ≥ 0.1Lamb - > Lamb ≤ Lmin/0.1

*2 (Lhigh-Llow)/(Lhigh+Llow) X 200

*3 If Room Category "RK3" is selected, it will be excepted from judgment. If the luminance satisfies Δ L'min < 30 %, Δ Lamb < 30 % does not display or provide judgment.

*4 ≥1024 x ≥1024 can be used until December 31, 2024 as per transition measures.

*5 The interval of the annual measuring tests can be extended to five years on the condition that the specified requirements are satisfied.

Correlation Between DIN 6868-157 and RadiCS

Test requirements

To create a test result report in RadiCS, it is necessary to check and enter information of the requirements before executing the test.

- Check that the image display system has adequate ability and has been installed and configured correctly.
  (E.g., the system is for medical use, the grayscale characteristics of the image display device are GSDF, and the system has been configured and installed correctly according to the specifications.)
- Check that the specifications of the measuring equipment and software to be used in the test are appropriate.
  (E.g., using the measuring equipment of DIN5032-7 class B or higher, acceptance test, selecting and securing the reference clinical image*1, appropriate resolution of the test image*2, ensuring reliability of the testing software*2)
- Check that the environment where the test is executed has been set up.
  (E.g., turn on the power of the monitor in advance, clean the display, stabilize the ambient light, and prevent reflection.)

*1 An appropriate clinical image should be selected as reference clinical image and viewed with optimum parameters. Before running RadiCS, check the quality of the image secured by the responsible operator on the application software (viewer, etc.) to be actually used for displaying the image. On the reference clinical image confirmation dialog, enter the image identification, parameters to be displayed, name of the responsible operator, and other necessary information. Enter the judgment result when performing pattern check.

*2 RadiCS displays the test image in the same resolution as that of the monitor, so each pixel of the test image corresponds to that of the monitor. As displayed image is not corrected by the software, it is possible to evaluate the monitor characteristics correctly even in measurement of grayscale characteristics such as GSDF.

As DIN 6868-157 specifies not only selection of the body parts and capture methods but also illuminance that should be selected depending on the actual work and locations, so it is necessary to select the ambient illuminance*3. RK that can be selected differs depending on the selected body part and capture method.

Room category	Location (Work)	Illuminance (lx)
RK1	Diagnostics room	≤50
RK2	Examination rooms with immediate diagnostics	≤100
RK3	Rooms to carry out examinations	≤500
RK4	Viewing and treatment rooms	≤1000
RK5	Dental diagnostic workstation	≤100
RK6	Dental treatment room	≤1000

*3 It may be necessary for the ambient illuminance to be set appropriately in order to pass the test.

Pattern Check

RadiCS determines the properties to be verified and independently prepares patterns for each resolution applied.
As for checking the reference clinical image, the items to be checked are displayed but the image is not displayed. As the check here is only for recording the history of check results, you need to judge with the results you checked before execution.
Although the TG18-MP pattern has been created as a pattern of 10 bits or more enabling identification of both 8 bits and 10 bits resolutions, RadiCS creates and displays it as an 8-bit pattern. An 8-bit pattern is enough to check the judgment criteria of the test items.

Luminance Check

In case of DIN6868-157, luminance of ambient light should be included in the test. If a contact type sensor is used for a monitor with an illuminance sensor that can measure ambient illuminance (see “Chapter 6 Checking Monitor Status” (page 81)), illuminance will be automatically converted to luminance.
Deviation from the reference value includes an equality sign in the standard but not in RadiCS. Therefore L’min≥1.1Lamb does not include an equality sign in RadiCS.
In RadiCS, as in accordance with the standard, no judgment will be made for Delta Lamb if the measurement value of the consistency test is 0.15 cd/m^2 or less and below the baseline value.

Grayscale Check

GSDF checking includes an equality sign in the standard but not in RadiCS.

Uniformity Check

In DIN 6868-157, luminance uniformity is measured at 5 points for less than 23 inch and 9 points for 23 inch or larger, which will be selected automatically.
If a contact type sensor is used, luminance of ambient light is not included.
“(Lmax - Lmin) / (Lmax + Lmin) x 200” shown in RadiCS is the same as “200 ×(Lhighest - Llowest) / (Lhighest + Llowest)” in the standard.

Sensors

DIN6868-157 requires a luminance meter class B or higher (DIN 5032-7) for acceptance tests and measuring devices that does not block environmental light. If measuring grayscale by bringing a measuring device in contact with the monitor, use a measurement device that, in accordance with the measurement devices’ User’s Manual, can be brought in contact with the monitor.
EIZO Sensors are available for consistency tests. DIN6868-157 requires creation of a reference value for consistency test to include reflected luminance caused by ambient light and accepts the use of contact type sensor.
If any measuring equipment or measurement method different from that is used in the acceptance test is used, it is recommended to make a correlation with the measuring equipment used in the acceptance test before deciding the reference value.

Multi-monitor

DIN 6868-157 includes a determination for multiple monitors, but by default RadiCS is set not to make such a determination. Enter the settings as necessary (see “RadiCS Setup” (page 162)).
“(Lhigh - Llow)/(Lhigh + Llow) x 200” shown in RadiCS is the same as “200 x (Lhighest - Llowest)/ (Lhighest + Llowest)” in the standard.

Resolution

The available monitor resolution is determined in the standard depending on body part / capture method. RadiCS has set restrictions in the control criteria to be selected for body parts / capture methods in accordance with the standard.

	I. Mammography	II. Mammographic stereotaxy	III. Projection radiography	IV. Fluoroscopy, all applications / V. Computed tomography	VI. Digital volume tomography (dental) etc. in RK 5/ VI. Dental X-ray equipment etc. in RK 5 (five-year interval)/ VII. Intraoral X-ray diagnostics (dental) etc. in RK 6
Resolution	≥2048×≥2048	≥1024×≥1024	≥1600×≥1200	≥1024×≥1024	≥1024×≥768

DIN V 6868-57

RadiCS Setup

	Acceptance Test	
	Category A	Category B
Pattern Check (Used pattern)	Test pattern 1 Test pattern 2 Test pattern 3	Test pattern 1 Test pattern 2 Test pattern 3
Luminance Check	L'max/L'min > 100 Lamb < L'max/100	L'max/L'min > 40 Lamb < L'max/40
Grayscale Check		
Uniformity Check	Grayscale: 128 *1	Grayscale: 128 *2

	Consistency Test	
	Category A	Category B
Pattern Check (Used pattern)	Test pattern 1 Test pattern 2 Test pattern 3	Test pattern 1 Test pattern 2 Test pattern 3
Luminance Check	L'max/L'min > 100 Lamb < L'max/100	L'max/L'min > 40 Lamb < L'max/40
Grayscale Check		
Uniformity Check	Grayscale: 128 *1	Grayscale: 128 *2

*1 (Lcorner-Lcenter)/Lcenter × 100 < 15%

*2 (Lcorner-Lcenter)/Lcenter × 100 < 20%

Correlation Between DIN V 6868-57 and RadiCS

Pattern Check

A test pattern given in DIN V 6868-57 cannot be applied to a monitor whose screen aspect ratio is not 1:1 without modification, since DIN V 6868-57 (or the test pattern) uses an aspect ratio of 1:1. Therefore, RadiCS checks a monitor being tested, and determines and generates an appropriate test pattern for each resolution supported by the monitor.

Test pattern 1	Equivalent to Bild 3 pattern. The pattern is scaled in accordance with the screen resolution.
Test pattern 2	Equivalent to Bild 2 pattern. The pattern is scaled in accordance with the screen resolution.
Test pattern 3	Equivalent to Bild 5 pattern. The pattern is scaled in accordance with the screen resolution.

Luminance Check

Lmax and Lmin used in DIN V 6868-57 include ambient luminance and are the same as L'max and L'min in RadiCS. Lamb stands for ambient luminance and refers to the same value as "Ls" of DIN V 6868-57. Lmax/Ls > 100 (or 40) have been Ls < Lmax/100 (or 40).

L'max/L'min stands for a contrast ratio. DIN V 6868-57 includes an equality sign like Lmax/Lmin ≥ 100 (or 40) but RadiCS does not.

DIN V 6868-57 defines L'max and L'min by measuring the test pattern 2 square with white (grayscale: 255) and black (grayscale: 0). RadiCS displays 10 % of a display area in the middle and measures luminance by changing the grayscale 0 to 255. By doing so, the exact contrast ratio can be acquired.

Uniformity Check

The Uniformity Check judges the uniformity of the ratio between the screen corner and the center of the screen as a standard. DIN V 6868-57 has no particular standard regarding measuring points. It also displays 10 % display area of the window at grayscale 128 in the middle of the screen and in the corner of the screen and measures the center of the window.
The basic judgment value (15 % or 20 %) is the same as LCD monitors since RadiForce series monitors are recommended for RadiCS.
The specification described as (Lcorner-Lcenter) /Lcenter × 100 < 15 % (or 20 %) means (Lcorner-Lcenter) /Lcenter × 100 < ±15 % (or ±20 %). Note that this inequality does not include the equality sign.

Sensors

DIN V 6868-57 requires a luminance meter class B or higher (DIN 5032-7) for acceptance tests and measuring devices that does not block environmental light.
DIN V 6868-57 allows noncontact sensors only to measure Category B reference value for consistency tests. EIZO Sensors are available for consistency tests.

DMG QC Manual

RadiCS Setup

	Acceptance Test	Consistency Test
Pattern Check (Used pattern)	TG18-QC TG18-UN80	Black TG18-QC TG18-UN80
Luminance Check	L'max/L'min > 250	L'max/L'min > 250 ΔL'max < 10%
Grayscale Check	Target Error rate < 15 % of GSDF	Target Error rate < 15 % of GSDF
Uniformity Check	Grayscale: 204 (Lmax-Lmin)/(Lmax-Lmin) × 200 < 30%	
Multi-monitor	ΔL'max < 10% between multiple monitors	ΔL'max < 10% between multiple monitors

Correlation Between DMG QC Manual and RadiCS

Pattern Check

RadiCS determines necessary test patterns based on the inspection results and generates its own patterns corresponding to the monitor's resolution.

TG18-QC	Equivalent to the pattern with the same name in the standard. However, RadiCS-specific scaling is performed in accordance with the monitor resolution.
TG18-UN80	A pattern solidly filled with white of grayscale 204. The pattern with the same name in the JESRA has a square frame, but RadiCS does not have it because it is not necessary for the visual inspection.

Luminance Check

In DMG QCM, the luminance measurement does not include the ambient luminance. In RadiCS, an apostrophe (') in the L'max, for example, indicates that it includes the ambient luminance. However, entering the ambient luminance value as 0 cd/m^2 can effectively exclude the ambient luminance from the luminance measurement.
Note that none of inequalities used in RadiCS includes an equality sign although every judgment condition in DMG QCM includes it.
The Lmax value in the calibration setup is provided as the default for the baseline value of ΔL'max.

Grayscale Check

In DMG QCM, the luminance measurement does not include the ambient luminance. In RadiCS, an apostrophe (') in the L'max, for example, indicates that it includes the ambient luminance. However, entering the ambient luminance value as 0 cd/m^2 can effectively exclude the ambient luminance from the luminance measurement.
The calculation method for this item is the same as the one for κδ. RadiCS describes the specification of the grayscale as Target Error Rate < 15 % (or 30 %) of GSDF. Note that none of inequalities used in RadiCS includes an equality sign.
This specification is provided as the judgment condition for DICOM Part 14 GSDF, so there is no meaning to use this specification for other display functions.
The number of measuring points is fixed to 18 points and this value cannot be changed. (The number of data points will be 17 because the result is presented as $(JND_{n+1} – JND_n)/2$.)

Uniformity Check

Although DMG QCM includes an equality sign, each judgment condition in RadiCS does not.
The DMG QCM specifies that the luminance is measured using the TG18-UN80 patterns. On the other hand, RadiCS displays two windows (grayscale: 204) with the size of 10 % of the whole display area at the center and a corner of the screen. It then measures the luminance at the center of both windows.

Sensors

DMG QCM permits the use of both noncontact and contact type measuring devices. For a noncontact type measuring device, since RadiCS measures the luminance without blocking the ambient light, you should use a dark room or a cylinder to block the ambient light. Any sensors can be used to perform both the acceptance tests and the consistency tests.

Multi-monitor

DMG QCM has multi-monitor judgment. If necessary, make settings as indicated in the table above.
DMG QCM includes an equality sign but RadiCS does not.

EUREF

RadiCS Setup

	Acceptance Test	
	Primary	Secondary
Pattern Check (Used pattern)	TG18-QC TG18-LPH (89, 50, 10) TG18-LPV (89, 50, 10)	TG18-QC TG18-LPH (89, 50, 10) TG18-LPV (89, 50, 10)
Luminance Check	L'max/L'min > 250	L'max/L'min > 100
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 20% of GSDF
Uniformity Check	Grayscale: 26 (Lmax-Lmin)/Lcenter × 100 < 30%	Grayscale: 26 (Lmax-Lmin)/Lcenter × 100 < 30%
	Grayscale: 204 (Lmax-Lmin)/Lcenter × 100 < 15%	Grayscale: 204 (Lmax-Lmin)/Lcenter × 100 < 15%
Multi-monitor	ΔL'max < 5% between multiple monitors	ΔL'max < 5% between multiple monitors

	Consistency Test	
	Primary	Secondary
Pattern Check (Used pattern)	TG18-QC TG18-LPH (89, 50, 10) TG18-LPV (89, 50, 10)	TG18-QC TG18-LPH (89, 50, 10) TG18-LPV (89, 50, 10)
Luminance Check	L'max/L'min > 250	L'max/L'min > 100
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 20% of GSDF
Uniformity Check	Grayscale: 26 (Lmax-Lmin)/Lcenter × 100 < 30%	Grayscale: 26 (Lmax-Lmin)/Lcenter × 100 < 30%
	Grayscale: 204 (Lmax-Lmin)/Lcenter × 100 < 15%	Grayscale: 204 (Lmax-Lmin)/Lcenter × 100 < 15%
Multi-monitor	ΔL'max < 5% between multiple monitors	ΔL'max < 5% between multiple monitors

Correlation Between EUREF and RadiCS

Pattern Check

The patterns used for EUREF are the same as those used for AAPM. RadiCS determines the properties to be verified and independently prepares appropriate patterns for each resolution.

TG18-QC	This is scaled to match the resolution.
TG18-LPH (89, 50, 10)	This is scaled to match the resolution.
TG18-LPV (89, 50, 10)	This is scaled to match the resolution.

Luminance Check

Maximum luminance and luminance ratio specified in the standard correspond to L'max and L'max/L'min used in RadiCS. The patterns TG18-LN12-01 and TG18-LN12-18 are recommended for luminance measurements, but RadiCS measures the luminance by displaying a window equivalent to 10% of the display area in the center of the screen and changing its grayscale level to 0 and 255. This provides a more accurate measurement. EUREF includes an equality sign but RadiCS does not.

Grayscale Check

The GSDF determination conditions correspond to those specified in EUREF. EUREF recommends using patterns TG18-LN12-01 to TG18-LN12-18 for measurements, but RadiCS measures the luminance by displaying a window equivalent to 10% of the display area in the center of the screen and changing the grayscale level corresponding to the specified pattern from 0 to 255. This provides a more accurate measurement. EUREF includes an equality sign but RadiCS does not.

Uniformity Check

EUREF recommends using the TG18-UNL10 and TG18-UNL80 patterns, but since they have an aspect ratio of 1 : 1 they cannot be used directly. Instead, RadiCS displays grayscale 204 and grayscale 26 windows equivalent to 10% of the display area in the center of the screen and in the corners, and measures the center portion of each window. In Supplements:2013, the judgment standard for LCDs to satisfy in relation to grayscale 204 has been tightened from 30 % to 15 % (30 % for CRTs). RadiCS monitors satisfy the standard applicable to LCDs.

Sensors

EUREF recommends the use of a telescopic luminance meter. EIZO sensors may also be used to perform measurements.

Multi-monitor

EUREF includes a determination for multiple monitors, but by default RadiCS is set not to make such a determination. If necessary, make settings as indicated in the table above. EUREF includes an equality sign but RadiCS does not.

Cautions

For primary use, an illuminance meter must be used to ensure that the ambient light level is less than 10 lux. RadiCS does not make illuminance-based judgment.
RadiForce series monitors are considered to sufficiently satisfy requirements regarding geometrical distortion, so this item is omitted.

IPEM

RadiCS Setup

	Acceptance Test	Consistency Test
Pattern Check (Used pattern)	TG18-QC	TG18-QC
Luminance Check	L'max/L'min > 250 ΔL'max < 20%	L'max/L'min > 250 ΔL'max < 20%
Grayscale Check	Target Error rate < 15 % of GSDF	Target Error rate < 15 % of GSDF
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 10% of GSDF
Uniformity Check	Grayscale: 128 (Lmax-Lmin)/(Lmax+Lmin) × 200 < 30%	Grayscale: 128 (Lmax-Lmin)/(Lmax+Lmin) × 200 < 30%
Multi-monitor	ΔL'max < 30% between multiple monitors ΔL'min < 30% between multiple monitors	ΔL'max < 30% between multiple monitors ΔL'min < 30% between multiple monitors

Correlation Between IPEM and RadiCS

Pattern Check

The patterns used for IPEM are the same as those used for AAPM. RadiCS determines the properties to be verified and independently prepares appropriate patterns for each resolution.

TG18-QC	This is scaled to match the resolution.

Luminance Check

Maximum luminance and luminance ratio specified in IPEM correspond to L'max and L'max/L'min used in RadiCS. The patterns TG18-QC and SMPTE are recommended for luminance measurements, but RadiCS measures the luminance by displaying a window equivalent to 10% of the display area in the center of the screen and changing its grayscale level to 0 and 255. This provides a more accurate measurement. IPEM makes ΔLmin ≤ 25% judgment, but RadiCS does not. Make the settings as necessary although the standard name will be "Custom". This provides a more accurate measurement. IPEM includes an equality sign but RadiCS does not.

Uniformity Check

IPEM recommends using TG18-QC or SMPTE patterns, but these patterns are not suitable for measuring 50% grayscale uniformity. Instead, RadiCS displays grayscale 128 windows equivalent to 10% of the display area in the center of the screen and in the corners, and measures the center portion of each window. IPEM includes an equality sign but RadiCS does not.

Sensors

Use of a measuring device that complies with the CIE standard photopic spectral response and has a calibration traceable to an appropriate primary standard is recommended. RadiCS supports use of all compliant sensors.

Multi-monitor

IPEM includes a determination for multiple monitors, but by default RadiCS is set not to make such a determination. If necessary, make settings as indicated in the table above. IPEM includes an equality sign but RadiCS does not.

Cautions

An illuminance meter must be used to ensure that the ambient light level is less than 15 lux. RadiCS does not make illuminance-based judgment.

JESRA

RadiCS Setup

An apostrophe (‘) in L’max and L’min indicates that it includes the ambient luminance. However, using a measurement method that does not include the ambient luminance or by entering the ambient luminance value as “0 cd/m^2”, judgment can exclude the ambient luminance from the luminance measurement.

In RadiCS, each condition does not include this symbol; however, this fact has no real influence because judgment is performed using a lower value than the fourth decimal place.

	Acceptance Test		
	Grade 1A	Grade 1B	Grade 2
Pattern Check (Used pattern)	TG18-QC TG18-UN80 JESRA Clinical Image	TG18-QC TG18-UN80 JESRA Clinical Image	TG18-QC TG18-UN80 JESRA Clinical Image
Luminance Check	L’max/ L’min > 250 L’max > 350cd/m^2	L’max/ L’min > 250 L’max > 170cd/m^2	L’max/ L’min > 100 L’max > 100cd/m^2
Grayscale Check	Target Error rate < 10% of GSDF	Target Error rate < 15% of GSDF	Target Error rate < 30% of GSDF
Uniformity Check	Grayscale: 204 (Lmax-Lmin)/(Lmax+Lmin) × 200 < 30% Grayscale: 204 Δ(u′, v′) < 0.010	Grayscale: 204 (Lmax-Lmin)/(Lmax+Lmin) × 200 < 30% Grayscale: 204 Δ(u′, v′) < 0.010	Grayscale: 204 (Lmax-Lmin)/(Lmax+Lmin) × 200 < 30% Grayscale: 204 Δ(u′, v′) < 0.010
Multi-monitor	ΔL’max < 10% between multiple monitors Grayscale 204 Mean value between multiple monitors Δ(u′, v′) < 0.010	ΔL’max < 10% between multiple monitors Grayscale 204 Mean value between multiple monitors Δ(u′, v′) < 0.010	ΔL’max < 10% between multiple monitors

	Consistency Test		
	Grade 1A	Grade 1B	Grade 2
Pattern Check (Used pattern)	TG18-QC TG18-UN80 JESRA Clinical Image	TG18-QC TG18-UN80 JESRA Clinical Image	TG18-QC TG18-UN80 JESRA Clinical Image
Luminance Check	L’max/L’min > 250 L’max > 350 cd/m^2 ΔL’max < 10%	L’max/L’min > 250 L’max > 170 cd/m^2 ΔL’max < 10%	L’max/L’min > 100 L’max > 100 cd/m^2 ΔL’max < 10%
Grayscale Check	Target Error rate < 10% of GSDF	Target Error rate < 15% of GSDF	Target Error rate < 30% of GSDF
Uniformity Check			
Multi-monitor	ΔL’max < 10% between multiple monitors	ΔL’max < 10% between multiple monitors	ΔL’max < 10% between multiple monitors

Correlation Between JESRA and RadiCS

Pattern Check

The guideline introduces test patterns for conducting a test, but it does not cover all medical monitors’ resolutions. RadiCS provides the appropriate test patterns, taking into account the check contents shown in the guideline.

Luminance Check

The ambient change ratio between the baseline value and the measured value is indicated by “ΔL’max”. The default baseline value is set to the Lmax value in the Calibration Settings.

Grayscale Check

The maximum error rate of contrast response, “κδ”, is indicated by “target error rate < 10 % (15 %,30 %) of GSDF”.

Uniformity Check

In JESRA, measurements are performed while displaying the TG18-UN80 pattern on the full screen. In RadiCS, window patterns (same as the TG18-UN80 specifications), each of which is 10 % of the display area in 204 gradations, are sequentially displayed in the center or corner of the screen, which enables an easy-to-perform measurement. In RadiCS, the brightness uniformity is indicated by “(Lmax-Lmin)/(Lmax+Lmin) x 200”.

Sensors

JESRA provides use of both the non-contact type (telescopic) and contact type measurement devices; therefore, all the compatible sensors can be used.
The non-contact type measurement device performs measurements including the ambient luminance. When you do not want to include the ambient luminance, perform measurements in a dark room or shut down the environmental light using a circular cylinder, etc.

Multi-monitor

The differential ratio of the maximum luminance between medical monitors is indicated by “ΔL’max”.

QS-RL

RadiCS Setup

	Acceptance Test		
	Category A	Category B	Category A Mammo
Pattern Check (Used pattern)	Test pattern 1 Test pattern 2 Test pattern 3	Test pattern 1 Test pattern 2 Test pattern 3	Test pattern 1 Test pattern 2 Test pattern 3
Luminance Check	L'max/L'min > 100 L'max > 200 cd/m^2 Lamb < L'max/100	L'max/L'min > 40 L'max > 120 cd/m^2 Lamb < L'max/40	L'max/L'min > 250 L'max > 250 cd/m^2 L'min > 1.0 cd/m^2 Lamb < L'max/100
Grayscale Check			
Uniformity Check	Grayscale: 128 (Lcorner-Lcenter)/ Lcenter × 100 < 15%	Grayscale: 128 (Lcorner-Lcenter)/ Lcenter × 100 < 20 %	Grayscale: 128 (Lcorner-Lcenter)/ Lcenter × 100 < 15%
Multi-monitor			ΔL'max < 10% between multiple monitors Δ(L' max/ L'min) < 10% between multiple monitors

	Consistency Test		
	Category A	Category B	Category A Mammo
Pattern Check (Used pattern)	Test pattern 1 Test pattern 2 Test pattern 3	Test pattern 1 Test pattern 2 Test pattern 3	Test pattern 1 Test pattern 2 Test pattern 3
Luminance Check	L'max/L'min > 100 L'max > 200 cd/m^2 Δ(L'max/L'min) < 30% ΔLamb < 30 %	L'max/L'min > 40 L'max > 120 cd/m^2 Δ(L'max/L'min) < 30% ΔLamb < 30 %	L'max/L'min > 250 L'max > 250 cd/m^2 L'min > 1.0 cd/m^2 Δ(L'max/L'min) < 30% ΔLamb < 30 %
Grayscale Check			
Uniformity Check			
Multi-monitor			ΔL'max < 10% between multiple monitors Δ(L' max/ L'min) < 10% between multiple monitors

Correlation Between QS-RL and RadiCS

Pattern Check

The test patterns used are the same as the one specified in DIN V 6868-57.

Luminance Check

Lmax and Lmin used in RS-RL include the ambient luminance and are the same as L'max and L'min used in RadiCS. QS-RL specifies Lmin ≥ 1.0 cd/m^2, but RadiCS includes no equality sign. Lamb stands for the ambient luminance and refers to the same value as "Ls" of DIN. The inequality Lmax/Ls > 100 (or 40) in the standard has been transformed into Ls > Lmax/100 (or 40). In QS-RL, the luminance is specified as |Delta Ls| ≤ 0.3 Ls. Delta Lamb in RadiCS corresponds to the calculation of |Delta Ls|/Ls in QS-RL, and is expressed as its percentage. Note that none of inequalities used in RadiCS includes an equality sign.
L'max/L'min stands for a contrast ratio. The inequality of L'max/L'min in QS-RL has an equality sign in it (L'max/L'min ≥ 100, 40 or 250) but the inequality in RadiCS does not. (L'max/L'min > 100, 40 or 250). In QS-RL, the luminance is specified as |Delta Km| ≤ 0.3 Km. Km corresponds to L'max/L'min in RadiCS, and Delta (L'max/L'min) in RadiCS corresponds to the calculation of |Delta Km|/Km in QS-RL, and is expressed as its percentage. Also note that none of inequalities used in RadiCS includes an equality sign.
In QS-RL, L'max and L'min are determined by measuring the luminance at square regions filled with white (grayscale: 255) and black (grayscale: 0) in the test pattern 2, respectively. In RadiCS, a window with the size of 10 % of the whole display area is displayed at the center of the screen. The luminance is then measured twice in that window by setting the grayscales to 0 and 255. By doing so, the exact contrast ratio can be acquired.

Uniformity Check

The luminance uniformity is determined by firstly measuring the luminance of the center and a corner of the screen. Then, calculate the difference of these two luminance values and evaluate a percentage by dividing the difference by the luminance of the center. However, QS-RL does not specify particular measuring points for the uniformity measurement. In QS-RL, the measuring points are indicated with the test pattern 1 or the SMPTE pattern of the aspect ratio of 1:1, but the measuring points in these patterns have a significant difference, and other patterns around the measuring points may affect the measurement results. RadiCS displays two windows (grayscale: 128) with the size of 10 % of the whole display area at the center and a corner of the screen. It then measures the luminance at the center of both windows.
It then measures the luminance at the center of both windows. Since any monitors that support the RadiCS luminance check are LCD monitors, the criteria of 15 % or 20 % should apply to the LCD monitors, not to CRT monitors.
The specification described as (Lcorner-Lcenter) /Lcenter × 100 < 15 % (or 20 %) means (Lcorner-Lcenter) /Lcenter × 100 < ±15 % (or ±20 %). Note that this inequality does not include the equality sign.

Sensors

DIN requires the use of a measuring device for the acceptance tests that provides a luminance meter compliant with Class B or higher standard (DIN 5032-7) and does not block the ambient light. This requirement is also effective for QS-RL. RadiCS only allows noncontact type measuring devices to perform both the acceptance tests and the consistency tests. Since the EIZO sensors (UX2 / UX1 / ASLM) are contact type measuring devices, they are not applicable.

Multi-monitor

Category A Mammo includes a determination for multiple monitors. QS-RL includes an equality sign but RadiCS does not.

Cautions

Category A Mammo conforms to the PAS1054 mammography standard. This standard includes monitor resolution of 2000 × 2500 or above as a condition, but RadiCS makes no such determination.

Basic QC

RadiCS Setup

	Acceptance Test	Consistency Test
Pattern Check (Used pattern)	TG18-QC	TG18-QC
Luminance Check		
Grayscale Check		
Uniformity Check		
Multi-monitor		

Correlation Between Basic QC and RadiCS

Pattern Check

The patterns used for Basic QC are the same as those used for AAPM. RadiCS determines the properties to be verified and independently prepares appropriate patterns for each resolution.

TG18-QC	This is scaled to match the resolution.

Basic Mammo QC

RadiCS Setup

	Acceptance Test	Consistency Test
Pattern Check (Used pattern)	TG18-QC TG18-UN80	TG18-QC TG18-UN80
Luminance Check	L'max/L'min > 250 L'max > 450 cd/m^2 Lamb < Lmin/1.5	L'max/L'min > 250 L'max > 450 cd/m^2 Lamb < Lmin/1.5
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 10% of GSDF

Correlation Between Basic Mammo QC and RadiCS

Pattern Check

The patterns used for Basic Mammo QC are the same as those used for ACR. RadiCS determines the properties to be verified and independently prepares appropriate patterns for each resolution.

TG18-QC	This is scaled to match the resolution.
TG18-UN80	A pattern solidly filled with white of grayscale 204.

Luminance Check

Except for Lamb < Lmin / 1.5, Basic Mammo QC includes an equality sign in each judgment condition but RadiCS does not.

Grayscale Check

Basic Mammo QC includes an equality sign but RadiCS doesn't because of the target error rate is < 10 % of GSDF. This is a judgment condition for DICOM Part 14 GSDF. The number of grayscale measuring points is fixed at 18 and is unchangeable. The measurement result is 17 points because it is expressed as $(JND_{n+1} – JND_n)/2$.

Sensors

Any sensors can be used to perform both the acceptance tests and the consistency tests with Basic Mammo QC.

Basic QC Primary, Basic QC Secondary

RadiCS Setup

	Acceptance Test	
	Basic QC Primary	Basic QC Secondary
Pattern Check (Used pattern)		
Luminance Check	L'max/L'min > 250 L'max > 170 cd/m^2 Lamb < Lmin/1.5 ΔL'max < 10 %	L'max/L'min > 100 L'max > 100 cd/m^2 Lamb < Lmin/1.5 ΔL'max < 10 %
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 20% of GSDF

	Visual Check	
	Basic QC Primary	Basic QC Secondary
Pattern Check (Used pattern)	TG18-QC	TG18-QC

	Consistency Test	
	Basic QC Primary	Basic QC Secondary
Pattern Check (Used pattern)	TG18-QC	TG18-QC
Luminance Check	L'max/L'min > 250 L'max > 170 cd/m^2 Lamb < Lmin/1.5 ΔL'max < 10 %	L'max/L'min > 100 L'max > 100 cd/m^2 Lamb < Lmin/1.5 ΔL'max < 10 %
Grayscale Check	Target error rate < 10% of GSDF	Target error rate < 20% of GSDF

Correlation Between Basic QC Primary and Basic QC Secondary, and RadiCS

Pattern Check

The patterns used for Basic QC Primary and Basic QC Secondary are the same as those used for AAPM. RadiCS determines the properties to be verified and independently prepares appropriate patterns for each resolution.

TG18-QC	This is scaled to match the resolution.

Luminance Check

Except for Lamb < Lmin / 1.5, Basic QC Primary and Basic QC Secondary include an equality sign in each judgment condition but RadiCS does not.

Grayscale Check

Basic QC Primary and Basic QC Secondary include an equality sign but RadiCS doesn't because of the target rate is < 10 % of GSDF. This is a judgment condition for DICOM Part 14 GSDF. The number of grayscale measuring points is fixed at 18 and is unchangeable. The measurement result is 17 points because it is expressed as (JNDn+1 – JNDn)/2.

Sensors

Any sensors can be used to perform both the acceptance tests and the consistency tests with Basic QC Primary and Basic QC Secondary.

Appendix

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