Managing the quality of monitors used every day leads to the improvement of the quality of medical care itself.

Detecting changes in a monitor’s display quality and making the proper adjustments.

Efficiently managing the huge quantity of monitors throughout the hospital.

With filmless imaging spreading in the medical world, there is a growing interest in maintaining the quality of monitors displaying medical images.

With the know-how and experience as a specialist in monitor manufacturing, we offer state-of-the-art solutions for the quality control of monitors which will lead to the improvement of the quality of medical care itself.

Optimum Image, Same Image.

Controlling the Quality of Monitors

Q1: Do all monitors have same quality?
A1: Monitor quality is determined by brightness, grayscale and brightness uniformity characteristics which vary by monitor. Moreover, they change slowly over time.

Q2: What happens if the monitor quality differs or changes?
A2: In a hospital where the images are displayed on different monitors for diagnosis or for past and present image comparison, differences or changes in monitor quality may lead to deterioration in the quality of medical care itself.

Q3: What can be done to maintain monitor quality?
A3: Monitor quality control (QC) is required to detect the characteristic difference or the gradual changes and to take suitable steps for maintenance.

Q4: What’s required to start utilizing monitor QC?
A4: Software that can detect changes in monitor characteristics and perform the appropriate calibration when necessary.

Q5: What can be done to maintain monitor quality?
A5: Monitor QC assessment and judgment criteria have been standardized and put forward by organizations worldwide such as AAPM, DIN, JIRA, and IEC.

QC Standards

- AAPM On-line Report No.03
- ACR “Practice Guideline for Determinants of Image Quality in Digital Mammography”
- EUREF “European Guidelines for Quality Assurance in Breast Cancer Screening and Diagnosis Fourth Edition”
- IEC 61223-2-5
- IPEM Report 91
- DIN V 6868-57
- GS-RL “Qualitätsicherungs-Richtlinie”
- PARS 1054
- JESRA X-0093
- Quality Control Manual for Digital Mammography
- This guideline was formulated collaboratively by specialists in mammography and medical physics who represent the American College of Radiology (ACR), the American Association of Physicists in Medicine (AAPM), and the Society for Imaging Informatics in Medicine (SIIM).
- “Recommended Standards for the Routine Performance Testing of Diagnostic X-ray Imaging Systems” formulated by the Institute of Physics and Engineering in Medicine in the UK.
- “Image Quality Assurance in X-ray Diagnostics - Part 37: Acceptance testing for image display devices” formulated by the German Institute for Standardization (Deutsches Institut für Normung e.V.).
- “Guideline for implementing quality assurance of the X-ray systems for diagnostic and medical treatment purposes according to chapters+CE16 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.
- “Requirements and Testing of Digital Mammographic X-ray Equipment” formulated by the German Institute for Standardization (DIN) in cooperation with the German Radiology Society (DRG) and others. This standard defines the details of the quality assurance obliged by the X-ray Ordinance as well as the QL-RL for general X-ray systems and DIN V 6868-57 for image display devices.
- Quality control manual for digital mammography system written by NPO Central Committee for Quality Control of Mammography Screening. This NPO studies and manages quality control of mammography.
Optimum Quality Control (QC) for Hospitals

QC for Individual Monitors:
Knowledge and experience is necessary to quality control each monitor, from checking to calibration, according to established guidelines. EIZO can offer you solutions to perform high-end quality control with user-friendly software and sensors.

Monitor Quality Control Software
RadiCS + UX1 Sensor

Useful Sensors:
Choice of sensors to lighten the workload of quality control management.

Client
Built-In
Smart 3 & 4 Integrated Front Sensor
Integrated Front Sensor (IFS) housed within the front bezel does not interfere with the screen even during its use.

Smart 3 & 4 Presence Sensor
The presence sensor of the monitor or Clip-On Swing Sensor determines whether to start QC tasks automatically at scheduled times set by RadiCS. If the user is working, the QC task stays in stand-by mode, and when the user is away from the monitor the task is performed.

Smart 3 Ambient Light Sensor
Using the luminance detecting function, the ambient light sensor of the monitor or Clip-On Swing Sensor measures the illuminance in front of the monitor periodically. It will warn the user when the illuminance exceeds the preset illuminance level to maintain an ideal work environment.

Smart 3 & 4 Smart QC Solutions
Presence Sensor for Power Savings
The presence sensor feature unites convenience with savings by ensuring that the monitor conserves power when it is not in use. The presence sensor prompts the monitor to switch to power save mode when it detects the user is away from the monitor, and then resume normal operation when the user returns.

Smart 3 & 4 Smart QC Solutions
Ambient Light Sensor for Ideal Work Environment
Using the luminance detecting function, the ambient light sensor of the monitor or Clip-On Swing Sensor measures the illuminance in front of the monitor periodically. It will warn the user when the illuminance exceeds the preset illuminance level to maintain an ideal work environment.

Client
External
UX1 Sensor
Clip-On Swing Sensor G2
External sensor assures high-precision calibration.
Clip-on sensor attachable to the monitor bezel and appears on the display only during QC tasks.

QC Management for Large Amounts of Monitors:
Cost and labor is necessary to QC manage the large quantity of monitors throughout the hospital. EIZO can offer you solutions to perform efficient QC management using your intra-hospital network.

Network QC Management Software
RadiNET Pro + Server

Knowledge and experience is necessary for QC tasks such as testing and calibration and does not interfere with the screen.

Smart 3 & 4 Smart QC Solutions
Integrated Front Sensor for Intelligent QC
An IFS and RadiCS SelfQC function allows QC tasks to be performed by the monitor itself even when the connected workstation is switched off. This dramatically cuts monitor quality control workload and maintenance costs.

Smart 3 & 4 Smart QC Solutions
Presence Sensor for Smart QC Tasks
The presence sensor of the monitor or Clip-On Swing Sensor determines whether to start QC tasks automatically at scheduled times set by RadiCS. If the user is working, the QC task stays in stand-by mode, and when the user is away from the monitor the task is performed.

Smart 3 & 4 Smart QC Solutions
Ambient Light Sensor for Ideal Work Environment
Using the luminance detecting function, the ambient light sensor of the monitor or Clip-On Swing Sensor measures the illuminance in front of the monitor periodically. It will warn the user when the illuminance exceeds the preset illuminance level to maintain an ideal work environment.

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Optimum Quality Control (QC) for Hospitals
RadiCS provides total support for the quality maintenance and control of client monitors, covering everything from calibration to acceptance and constancy tests, calibration asset, and historical management. Complying with AAPM, DIN, IEC and other standards, RadiCS enables precise QC with easy-to-follow procedures.

Improved User-Interface and Enhanced Operability
Graphical design and icons are arranged next to the text making it easy to comprehend the functions visually and intuitively. A companion list also enables users to check the condition of monitors instantly. Furthermore, RadiCS simplifies operability such as gaining access to necessary information with just one click of a mouse.

Acceptance and Constancy Testing in Easy Steps
RadiCS enables you to perform brightness, grayscale and uniformity checks that comply with AAPM TG18, DIN V 6868-57, and other QC standards.

Flexible Schedule Setting
The timing of when to perform QC tasks such as daily tests or constancy tests can be set according to the needs of your institute. For example, when turning the PC on or off, or just after a specific application is opened.

Warning Icon for Swift QC
A warning icon appears on the desktop taskbar when the monitor fails a QC check such as a constancy test. This enables prompt detection and correction of the monitor quality.

DICOM Part 14 Calibration
The built-in backlight sensor enables simplified calibration compliant with the DICOM Part 14 standard to correct the grayscale tones and brightness of the monitor. Furthermore, the use of an Integrated Front Sensor or an Integrated UX1 Sensor enables higher calibration performance.

Historical Management and Report Generator
Calibration, acceptance and constancy test results are stored as history. Using this history data, you can easily create reports compliant with QC guidelines.

Continuous Asset Management
Asset management numbers for monitors, PCs, and graphics boards as well as installation location and medical institution names can be registered along with the monitor usage time. This supports continuous management of the IT properties within the facility.

Intelligent Hands-Off Check
Using a built-in backlight sensor, the hands-off check function determines whether the brightness of the monitor is within the appropriate range. This automatic brightness change detection reassures the continuous use of the monitor.

Backlight Meter for Remaining Time Estimate
The backlight meter function detects the condition of the monitor backlight and estimates the remaining time that the monitor can maintain the factory-set brightness. This helps in planning when the monitor should be replaced.

Distinct QC for All Modes
RadiForce monitors with a CAL Switch function have display modes for different types of images such as CR and endoscopy. RadiCS enables you to perform testing and calibration of each display mode.

DICOM Part 14 Calibration
The built-in backlight sensor enables simplified calibration compliant with the DICOM Part 14 standard to correct the grayscale tones and brightness of the monitor. Furthermore, the use of an Integrated Front Sensor or a bundled UX1 Sensor enables higher calibration performance.

Low-Power-Consumption with Backlight Saver
The Backlight Saver function turns off and on the monitor’s backlight in accordance with the activation of screen saver/desktop, or with the starting/closing of an application such as a DICOM viewer. This function helps to reduce power consumption and promotes the reliable and stable use of the monitor.

Compatible with Non-RadiForce Monitors
RadiCS enables you to perform acceptance and constancy test and calibration on non-RadiForce monitors such as EIZO FlexScan LCD monitors. RadiCS Client License must be purchased when using RadiCS with other commercially available monitors.
RadiNET Pro enables centralized management of all the client PC monitors with RadiCS software installed via an intra-hospital network. Up to 8,000 monochrome or color monitors connected to 1,000 client PCs covering everything from QC history reference to setting changes.

**Centralized Management of up to 8,000 Monitors**

RadiNET Pro enables centralized management of all the client PC monitors with RadiCS software installed via an intra-hospital network. Up to 8,000 monochrome or color monitors connected to 1,000 client PCs covering everything from QC history reference to setting changes.

**Easy-to-Use Web-Based Application**

This simple web-based application offers easy access to desired information. The administrator may conduct monitor QC operations from anywhere in the hospital smoothly and promptly. The user interface incorporates a tree view which makes it easy to visually capture the structure of all controlling monitors. It also supports various resolutions which increase the flexibility of the layout.

**Worry-Free Web Hosting**

Instead of installing and setting up your own network QC management server in your hospital, EIZO will host the server for you. RadiNET Pro Web Hosting will free you from concern for initial investment and running cost. EIZO provides expert maintenance services for server operation which will give you reassurance you need for monitor QC.

**Remaining Time List for Forecast Reference**

The remaining time of the monitor estimated by the RadiCS’s backlight meter function can be collected and listed in “Monitor List” window. Predicting the time of monitor replacement is helpful for the administrator to plan for capital investments.

**Security Assurance**

All the RadiNET Pro access information and client monitor setting history will be listed on a log window. This allows for the monitoring of non-authorized users as a security measure.

**One Time Remote Setting**

Settings for monitor calibration, acceptance and constancy testing, scheduling and asset management can be performed remotely. Furthermore, setting for one monitor can also be transmitted to other monitors by remote control (identical models only).

**Remote Upgrade of RadiCS Software**

The bundled RadiCS Network Upgrade Software enables hospital-wide upgrading of all client PC RadiCS versions remotely and efficiently.

**Save Time with Remote Calibration**

QC tasks such as testing and calibration using the Integrated Front Sensor or swing sensor can be performed remotely. This dramatically reduces the time and effort of the users and administrators required for calibration of the monitors.

**Collective Report Generator**

Results of acceptance and constancy tests and calibration history, along with all the monitor data can be created in reports. For extra convenience, collective reports of multiple monitors can also be generated as one report and printed out.

**Compatible with Non-RadiForce Monitors**

Unified management of non-RadiForce monitors such as EIZO FlexScan LCD monitors offers comprehensive QC management throughout the hospital.
Monitor Quality Control Combination Solutions

**For Small & Medium Sized Hospitals**
- **Client**: Quality Control Software & Sensor RadiCS + UX1 Sensor
- **Administrator**: Network QC Management Software RadiNET Pro Starter Edition

**For Large Sized Hospitals**
- **Client**: Quality Control Software & Sensor RadiCS + UX1 Sensor
- **Administrator**: Network QC Management Software RadiNET Pro

**Worry-Free Hosting**
- **Client**: Quality Control Software & Sensor RadiCS + UX1 Sensor
- **Administrator**: Network QC Management Software Server Providing RadiNET Pro Web Hosting

**Optional Sensor**
- Clip-On Swing Sensor G2

**Monitor Quality Control Combination Solutions**
- **Products & Specifications**

**RadiCS UX1**
- **Monitor Quality Control Tool**
- **Compatible Monitors**: RadiForce Monitors
- **Compatible Operating Systems**: Windows 7 SP1, Windows Vista SP2
- **Display Functions**: DICOM Part 14 GSDF, CIE, Exponential (gamma value), Log, Linear, User definition
- **Languages**: English, German, Japanese

**RadiNET Pro Starter Edition**
- Network QC Management Software (For Small & Medium Sized Hospitals)
- **Manageable Number of PCs/Monitors**: RadiNET Pro Starter Edition: 20 Monitors Maximum
- **Administrator PC**: Microsoft Windows Internet Explorer 9.0, Mozilla Firefox 5.0
- **Server PC**: Windows 7 / SP1, Windows Vista SP2, Windows XP Professional x64 Edition SP2
- **Database**: SQL Server 2008 R2 Workgroup Edition
- **Server PC Memory**: 1 GB Minimum
- **Server PC Hard Disk Drive**: 160 GB Minimum
- **Languages**: English, German, Japanese

**RadiNET Pro**
- Network QC Management Software (For Large Sized Hospitals)
- **Manageable Number of PCs/Monitors**: RadiNET Pro: 1,000 PCs / 8,000 Monitors Maximum
- **Administrator PC**: Microsoft Windows Internet Explorer 9.0, Mozilla Firefox 5.0
- **Server PC**: Windows Server 2008 R2 Standard Edition SP1
- **Database**: SQL Server 2008 R2 Standard Edition
- **Server PC Memory**: 2 GB Minimum
- **Server PC Hard Disk Drive**: 160 GB Minimum
- **Languages**: English, German, Japanese

**UX1 Sensor**
- **Compatible Monitors**: RadiForce Monitor
- **Compatible Software**: RadiCS Version 3.5 or later
- **Dimensions (ø x H)**: 68.58 x 40.64 mm
- **Weight**: 160 g

**Clip-On Swing Sensor G2**
- **Compatible Monitors**: RadiForce Monitor (Built-in Swing Sensor models not included)
- **Compatible Software**: RadiCS Version 3.5 or later
- **Dimensions (ø x H)**: 70 x 33.5 x 44 mm
- **Weight**: 140 g

**RadiCS Version UP KIT**
- A software for major version up of RadiCS

**RadiCS Client License**
- A license to use RadiCS with other commercially available monitors.

**10 Monitor Access License**
- For RadiNET Pro Starter Edition
- Monitor Access License must be purchased for every 10 additional monitors when using RadiNET Pro Starter Edition.

*Please check radiforce.com website for compatibility.*