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User Guide - QAWeb Enterprise Agent

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CONTENTS

QUICK START GUIDE

1.1 Preparing the installation

- Determine the operating mode in which you will deploy QAWeb Enterprise agent (See *Agent operating mode* (page 5)).

- For **online mode**:

  – The workstation outbound network requirements must be met (See *Workstation networking requirements* (page 5)).

  – You need a valid login account for the QAWeb Enterprise Portal. If you do not have an account:

    * If your organization is already registered in QAWeb Enterprise, ask an existing member of your QAWeb Enterprise organization to create a user account for you.

    * If your organization is not yet registered in QAWeb Enterprise, submit a sign-up request at https://signup-qaweb.healthcare.barco.com.

  – Documentation on how to use the Portal is available here: QAWeb Enterprise Portal user guide (https://documentation-qaweb.healthcare.barco.com)

  – Locate your organization ID and registration key, which you will need in the installation process (in the Portal, navigate to *My organization* in the *Administration* header menu)

- It is recommended to connect all Barco displays to the workstation with a USB cable.

- It is recommended to update the driver for Barco MXRT graphics controllers to the latest available version.

- For more details, see *Agent System requirements* (page 5)

1.2 Agent installation

- Run the qaweb agent installer executable. The graphical installation wizard will guide you through the installation process. For more details, see *Installing the QAWeb agent* (page 9)

1.3 Verifying the installation

After succesful installation of the agent, the expected behavior is the following:

- The QAWeb status icon is present in the Windows taskbar notification area. Initially, the icon will indicate that a number of tasks (calibration and QA tests) are running. You may see gray or color patches appear under the I-Guard optical sensor of the display(s). Eventually all tasks should complete and the icon changes to indicate a compliant QA status (See *User interface overview* (page 15)).

- The following important default setting are applied:

– Supported Barco displays are assigned a default *use* depending on the display model (general radiology, mammography, digital breast tomography, reviewing, dental or pathology). The *use* determines which calibration and QA tests will be applied to the display, and at which frequency the will be scheduled. Other (non-Barco) displays are assigned a non-clinical use by default.

– This means that for these supported Barco displays with an I-Guard sensor, automatically the calibration will be started, followed by one or more QA tests.

– For DICOM GSDF calibration, a default ambient light of 35 lux (CT/MR/NM reading room) is used to calculate the amount of reflected ambient light.

– Barco displays are calibrated to the default white luminance target (brightness) of the display model.

– For Barco mammography displays,the default *Barco mammography compliance test* will request to complete a visual test as part of the acceptance test.

– The on-screen display menu is automatically locked to prevent end-users from modifying settings applied by the agent. (see *Unlocking the display menu* (page 19))

• It is recommended to configure the Windows taskbar area to always show the QAWeb icon in order to make the current QA status always visible to the user of the workstation.

1.4 How to verify or manually start display calibration

1. Click the QAWeb status icon in the windows taskbar ( ).

2. Click the icon to open the **Workstation detail window**.

3. In the **Task Overview** window, click on the *Calibration* task.

4. For each display, the timestamp of the last calibration is indicated.

5. Click on the timestamp to view the details of the calibration.

6. To manually start the calibration, click the *Run task* button.

1.5 How to modify calibration and display settings

In *online mode*, the agent receives the calibration- and QA policies as they are defined in the QAWeb Enterprise Portal. The settings cannot be modified locally. Refer to the Portal user guide for more information on this topic.

In *stand-alone mode*, the calibration and QA policies can be modified using the agent user interface. See *Using the policy editor* (page 25)

1.6 How to verify or manually start a QA test

1. Click the QAWeb status icon in the windows taskbar ( ).

2. Click the icon to open the **Workstation detail window**.

3. In the **Task Overview** window, click on the QA test.

4. For each display, the timestamp and result of the last execution of the QA test is indicated.

5. Click on the timestamp to view the detailed results of the QA test.

6. To manually start the QA test, click the *Run task* button.

LINKS TO DOCUMENTATION

User guides:

- QAWeb Enterprise Portal user guide (https://documentation-qaweb.healthcare.barco.com)

- QAWeb Enterprise Agent user guide (this document) (https://documentation-qaweb-agent.healthcare.barco.com)

- Supported Barco displays (https://www.barco.com/en/support/docs/TDE10174)

Support:

- QAWeb Enterprise Support page (https://www.barco.com/en/support/qaweb-enterprise)

- Support page: documents and user guides (PDF) (https://www.barco.com/en/support/qaweb-enterprise/docs)

- Support page: Knowledge base (https://www.barco.com/en/support/qaweb%20enterprise/knowledge-base)

General Product information:

- QAWeb Enterprise landing page (https://www.barco.com/qaweb)

- Release notes (https://www.barco.com/en/support/docs/TDE10170)

- QAWeb Enterprise Security and Connectivity FAQ (https://www.barco.com/services/website/en/TdeFiles/Download?FileNumbe

- Product privacy statement (https://www.barco.com/en/about-barco/legal/privacy-policy/product-privacy-statement#qawebe)

AGENT SYSTEM REQUIREMENTS

3.1 Operating System requirements

QAWeb Enterprise Agent is supported on the following operating systems:

- Microsoft Windows 7 64-bit

- Microsoft Windows 10 64-bit

To ensure correct calibration conditions for diagnostic images viewed on your displays, please make sure that the Night Light feature in Windows 10 is disabled.

It is recommended to frequently apply security updates to the workstation and to use an up-to-date antivirus solution.

3.2 Agent operating mode

When deploying QAWeb Enterprise, consider the operating mode that matches your needs.

- **Online mode**: The agent uses a network connection to communicate to the QAWeb Enterprise online service, enabling a centralized overview and configuration. Calibration and QA tests are controlled by policies, and the results are stored in the online service, accessible by opening the QAWeb Enterprise portal with a supported web browser. For more information, see the QAWeb Enterprise Portal user guide (https://documentation-qaweb.healthcare.barco.com).

- **Stand-alone mode**: In the stand-alone operating mode, the agent does not use any network connection. Configuration, calibration and QA tests are limited at the level of workstation. Use this mode only when no network connection is available.

Note: The QAWeb Enterprise online mode includes the most functionalities and advantages to manage Barco diagnostic displays. The stand-alone mode should be used in scenarios where only calibration and basic QA testing, without centralized overview and management, are required.

3.3 Workstation networking requirements

When using the agent in **online mode**, the workstation requires access to the following URLS hosted by the Barco QAWeb Enterprise online service:

```
https://qaweb.healthcare.barco.com
https://qawebapi.healthcare.barco.com
https://documentation-qaweb.healthcare.barco.com
https://auth.healthcare.barco.com
https://qawebdata.healthcare.barco.com
https://a3n9amleodurj6-ats.iot.eu-west-1.amazonaws.com
```

For networks where HTTP traffic is only allowed through an HTTP proxy server, you will need to gather the proxy server information prior to installation of the agent. If the proxy server supports authentication, we recommended creating one username/password that will be used for all QAWeb Enterprise agent installations. Note that the QAWeb agent must execute as a Windows Local System account - the agent cannot execute as a domain user and also perform proxy authentication.
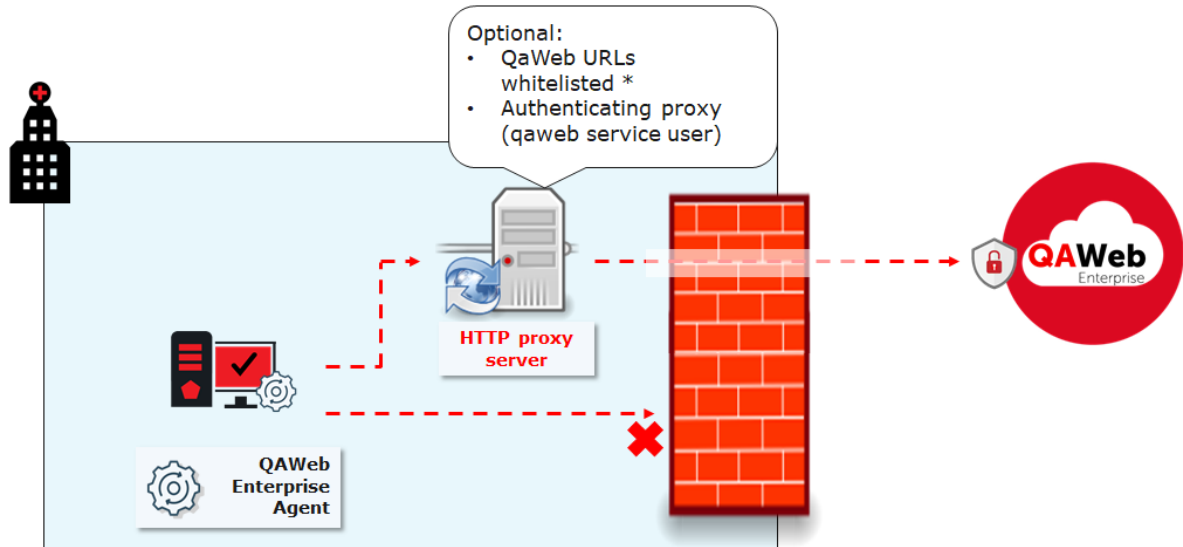
If no proxy server is used, but firewall rules are limiting outbound internet communication, the whitelisting should be performed based on the workstation hostnames (and not using domain credentials, because the QAWeb Enterprise service should run as a Windows Local System account as described above)
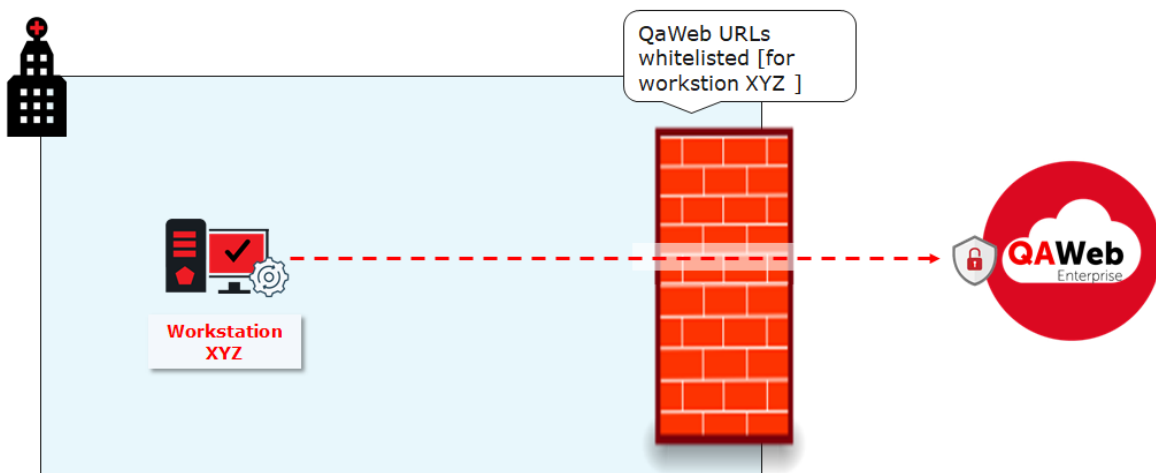
3.4 Supported displays

Note: It is strongly recommended to connect all displays to the workstation with a USB cable. This improves the stability of the communication between agent and display, and increases the execution speed of certain operations.

Note: The following displays always require a USB connection. MDNG-2120, MDNG-3220, MDNC-2221, MDRC-1219, MDRC-2122, MDRC-2221, MDRC-2222, MDRC-2224, MDRC-2321, MDRC-2324.

To view the list of supported Barco displays:

- Navigate to the Qaweb Enterprise support page (https://www.barco.com/en/support/qaweb%20enterprise) and download the technical note "QAWeb Enterprise supported Barco displays"

- Alternatively, download this document using a direct link: https://www.barco.com/en/support/docs/TDE10174

If a legacy Barco display is not supported, it will be treated as a third-party display and communication with the internal sensors isn't possible. An external sensor will be required for all QA tests.

3.5 Supported external optical sensors

The following optical sensors for display measurement and calibration are supported by QAWeb Enterprise:

- Barco LCD sensor MKII (P/N B4100035)

- LXCan sensor (USB)

- Raysafe X2

To use the Raysafe X2, make sure to install .NET framework 4.5 or higher and restart the computer. Also, a zero adjustment should be performed before measuring.

INSTALLING THE QAWEB AGENT

4.1 Installation overview

Before installing the software on a workstation, refer to the system requirements (See *Agent System requirements* (page 5)). Additionally, note that installing the QAWeb agent requires administrative privileges on the workstation.

The installation can be performed in two ways:

- Using the graphical installation wizard.

- Using the command-line interface. This allows installing the QAWeb agent on a large number of workstations using automated software deployment tools.

If an older QAWeb Enterprise agent version is already installed, it will be automatically upgraded by the installation process. It is not required to first uninstall the older version.

The installation of QAWeb Enterprise agent consists of two phases: installation and configuration.

- Software Installation: The agent is installed in the operating system.

- Agent Configuration: The settings of the agent can be configured.

Note: It is possible to apply a different configuration at any moment after installation, without the need to re-install the software. For example, an agent configured in stand-alone mode can later be configured to operate in online mode.

When the QAWeb agent will be installed for use in *online mode*, have the following information at hand:

- Using the QAWeb Enterprise Portal, retrieve the **organization ID** and **registration key** of your QAWeb Enterprise organization. This will be used to register the workstation with your organization during the installation process.

- If an HTTP proxy server needs be used for accessing the online service, have the configuration details available (server hostname or address, port, user and password).

4.2 Downloading the agent installation software

The latest version of the QAWeb agent software can be downloaded from the QAWeb Enterprise Portal.

1. Login into to the portal (https://qaweb.healthcare.barco.com).

2. Click **Administration** in the header menu.

3. Click **My organization** in the side menu.

4. Click the **Download** button to download the QAWeb Enterprise Agent installer.

The QAWeb agent software can also be downloaded from the Barco support page (https://www.barco.com/support/ qaweb-enterprise). This is useful when using the agent only in *stand-alone mode*, because it does not require you to sign up for the QAWeb Enterprise Portal.
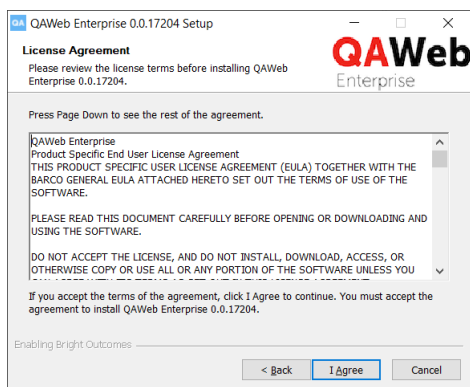
4.3 Installing the agent using the graphical installation wizard

Launch the graphical installation wizard by executing **qaweb-agent-installer.exe**.

1. On the first page, click the *Next* button.
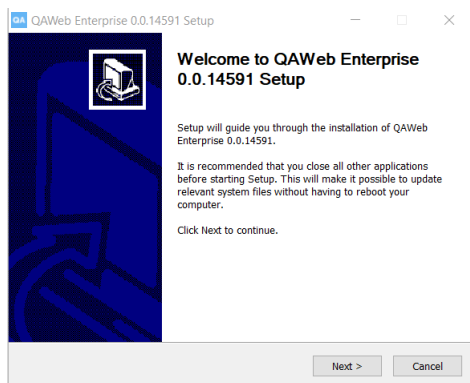
2. Confirm the end user license agreement (EULA).

3. Wait until the software installation is completed.
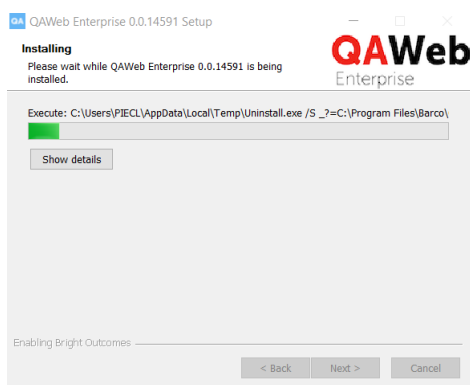
4. Keep the option 'configure QAWeb agent' selected and click the *Next* button. Deselecting this option is only needed when creating a ghost image of the workstation (explained later in this chapter).

In the second phase, complete the configuration wizard.

1. Select the operating mode.
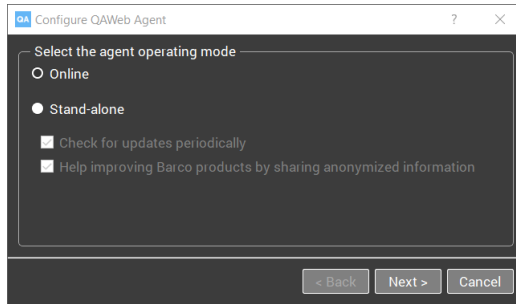
2. Configure the HTTP proxy server settings. This step is skipped when stand-alone mode was selected and when both the 'check for updates' and 'anonymized information sharing' were unselected.
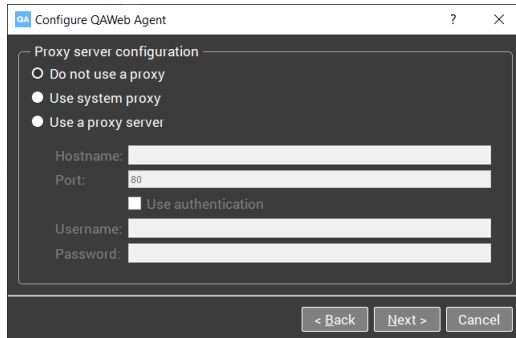
3. Enter the **organization ID** and **registration key**. This step is skipped when stand-alone mode was selected.

4. Confirm your settings.

5. In the final step, the settings are applied.

4.4 Installing the agent via the command-line

Command-line installation requires the following arguments:

```
qaweb-agent-installer.exe /S /ORG <organization ID> /REGKEY <registrationkey>
```

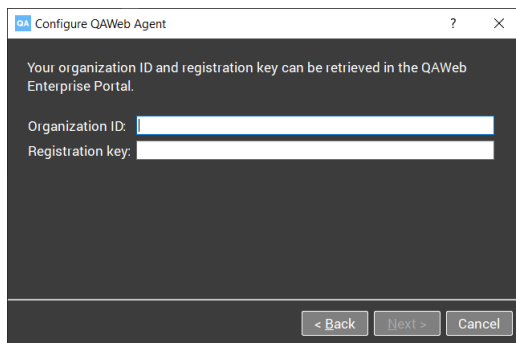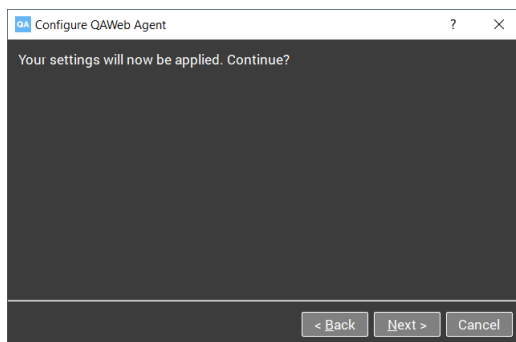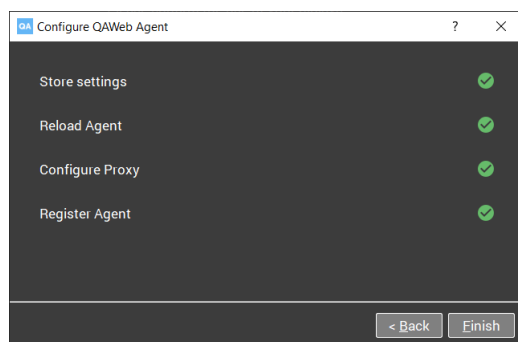**Note:** Please note that all options are case sensitive.

Additionally, the following command line parameters can be used:

- /PROXY=no|system|custom (default: no)
- /PROXY_NAME to specify the hostname of the proxy server. (implies /PROXY=custom)
- /PROXY_PORT to specify the port number of the proxy server (implies /PROXY=custom)
- /PROXY_USR to specify the username needed for proxy authentication (if required) (implies /PROXY=custom)
- /PROXY_PWD to specify the password needed for proxy authentication (if required) (implies /PROXY=custom)
- /WORKSTATION_DETAIL_SHORTCUT to add a shortcut to the desktop to open the workstation detail window of the agent (default: no)
- /SKIP_CONFIGURATION to postpone the configuration until a later moment.
- /MODE=online|standalone|localserver (default: online)
- /SERVER to specify the hostname of the local server. (implies /MODE=localserver)
- /UPDATES=yes|no to periodic check for updates (default: yes). This is only applicable to standalone configurations.
- /SHARE_DIAGNOSTICS=yes|no to enable periodic sharing of relevant info to improve our product (default: no) This is only applicable to standalone configurations.

To uninstall the agent via command-line, use the following command, in the installation directory (default 'C:\Program Files\Barco\QAWeb'):

```
uninstall.exe /S
```

4.5 Post installation steps

When the installation and registration procedure has been successful, the QAWeb Enterprise agent icon will appear in the Windows notification area. **It is recommended to configure Windows to always show this icon in the notification area.**
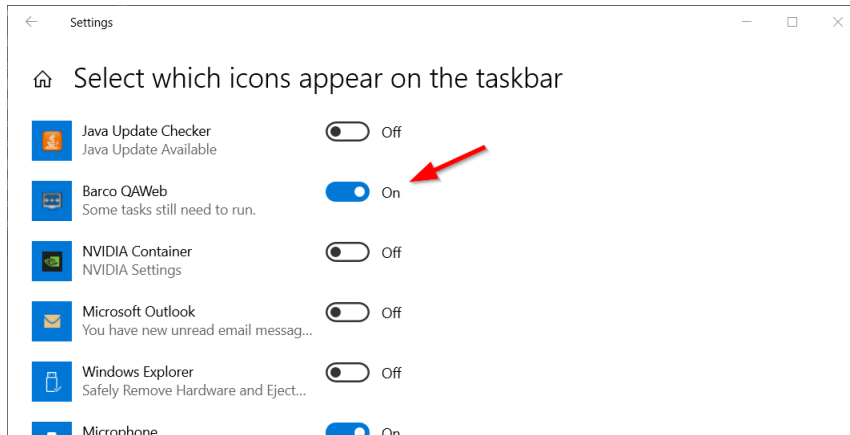

Immediately after successful installation and registration, the agent may start several QA tests and apply display settings. The agent will evaluate which tasks to perform based on the following default values:

- The displays connected to the workstation are given a default use (based on the Barco display model).

- A default ambient light value of 35 lux will be used to calculate the reflected ambient light during calibration and QA tests.

4.6 Instructions for 'ghosting'

The term 'ghosting' refers to the practice of making an image of the entire operating system and installed software, which subsequently is applied / restored to different workstations in order to provide the end-users a reliable and controlled environment.

When making a ghost image of a workstation with QAWeb Enterprise agent, it is important to **make sure the agent is in an unconfigured state** and to **perform the configuration process after restoring the image**. During the installation wizard, make sure to **deselect** the option *Configure QAWeb agent*.
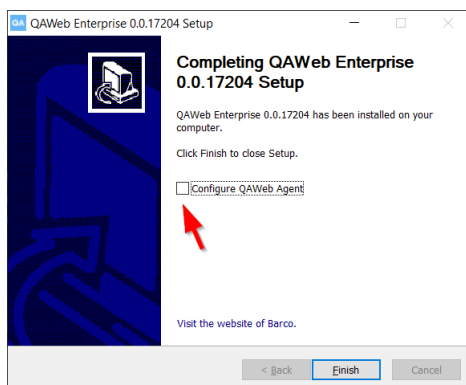

After re-applying an image to a workstation, the configuration wizard must be started on that workstation by running **configurator.exe** (located in the QAWeb Enterprise installation directory).

4.7 Modifying the agent configuration after installation

A number settings can be modified after registration using the executable **configurator.exe**, located in the installation directory (default C:\Program Files\Barco\QAWeb). When running this application, the configuration phase of the installer will be repeated. This allows the re-apply the following settings:

- switch between operating modes (for example: switch from stand-alone mode to online mode).

- modifying the HTTP proxy server settings.
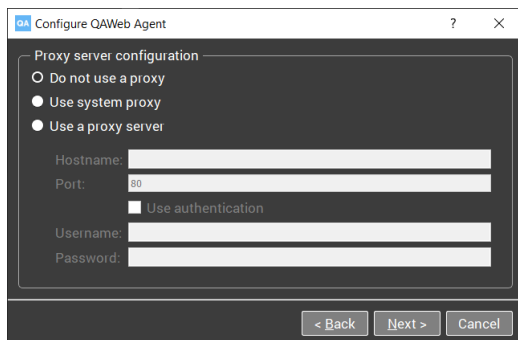
- Modifying the log level is available to investigate technical issues.
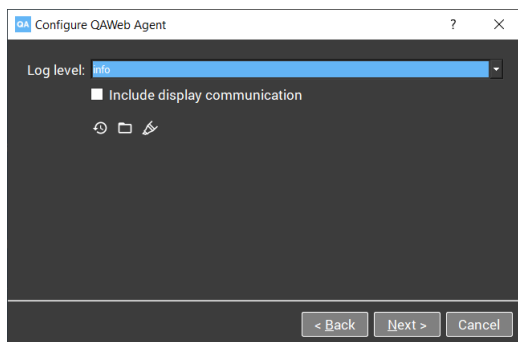
- By default, the agent uses the language of the operating system. Alternatively, a specific language can be set.

USER INTERFACE OVERVIEW

5.1 Icon in the Windows notification area

The icon in the notification area of the operating system reflects the current QA status of the workstation.

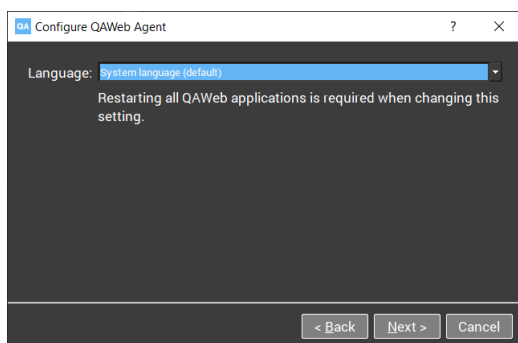- **Compliant**: All applicable QA tests have a *compliant* QA status. There currently are no tasks due for execution.

- **Awaiting Results**: At least one task is due for execution.

- **Not compliant**: At least one QA test has a *Not compliant* QA status because it failed to pass the test criteria.

5.2 Status panel and workstation details

The QAWeb interface user interface consists of the following elements:

- The QAWeb agent **status panel** displays summarized information to the user of the workstation. Open the status panel by left-clicking the QAweb agent icon in the Windows notification area. See *Using the Status panel* (page 17).

- The **Workstation detail window** is primarily intended for users that need more detailed information on calibration, QA tests or system configuration. It can be opened from the status panel by clicking on the icon. See *Using the Workstation Details* (page 21).

USING THE STATUS PANEL

The QAWeb status panel is accessible by left-clicking the QAweb agent icon in the Windows taskbar notification area.
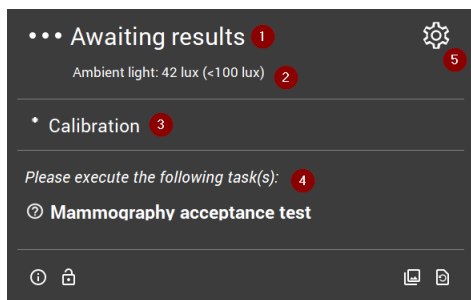
- ① Indicates the current QA Status. See *Current QA status* (page 18)

- ② Indicates the current measured ambient light (illuminance). See *Current ambient light indication* (page 18)

- ③ If a task is current currently being executed, it is shown in this area.

- ④ This area shows due tasks that require intervention by a user. See *Due tasks requiring user intervention* (page 18)

- ⑤ Click [icon] to open the workstation details.

The bottom area of the status panel contains a number of buttons:

- [icon] See *Unlocking the display menu* (page 19)

- [icon] See *Refreshing the server policy* (page 19)

- [icon] See *Displaying test patterns* (page 19)

- [icon] See *How to retrieve version and product label information* (page 32)

6.1 Current QA status

The combined status of calibration and QA tests is summarized into a single QA status indicator. It can have the following values:

- **Compliant**: All QA tests have a *compliant* QA status. There currently are no QA tests due for execution.

- **Awaiting Results**: At least one task is due for execution.

- **Not compliant**: At least one QA test has a *Not compliant* QA status because it failed to pass the test criteria.

- **Warning**: There is a technical issue that needs to be resolved.

6.2 Due tasks requiring user intervention

The QAWeb agent will automatically execute automated tasks in the background. Some tasks, however, require user intervention. Typical examples of tasks requiring user intervention are tasks involving a visual test pattern, or tasks using measurements with an external optical sensor.

Due tasks requiring user intervention are listed in the status panel.
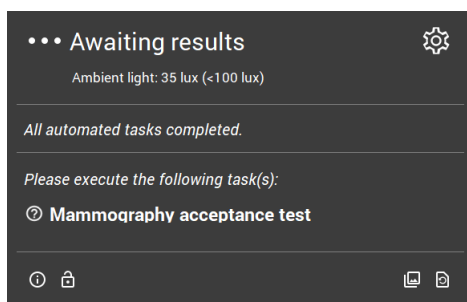
Left-click a due task in the status panel to start its execution. When the task has been completed, it will removed from the status panel until the next time it becomes due.

For more information on viewing the details of calibration and QA tasks, see *Task overview* (page 21).

6.3 Current ambient light indication

Note: Ambient light indication requires a Barco display with integrated ambient light sensor.

The QAWeb agent will periodically measure ambient light (a measurement is made every minute and the last 3 measurements are combined to eliminate temporary fluctuations). This value is displayed on the status panel. If multiple displays with a supported sensor are present, the average of the measurements between multiple displays is calculated.

Optionally, an ambient light policy can be configured to notify the end-user when the ambient light exceeds a configurable limit. When this ambient light policy is active for the agent, a pop-up window will appear on the workstation when the limit is exceeded, reminding the user to reduce ambient light. The user has the option to disable these pop-up warnings for the rest of the day (for example, if no more diagnostic readings will be done for this day).

For more information on the configuration of ambient light policies, refer to the QAWeb Enterprise Portal user guide.

6.4 Unlocking the display menu

The QAWeb agent automatically locks the display menu (OSD menu, On-Screen-Display menu) to prevent that users accidently modify the calibration settings. The display menu can be temporarily unlocked, for example for service reasons or performing a factory reset.

To unlock the display menu:

1. Open the panel by clicking on the QAweb agent icon in the Windows notification area.

2. Click the icon.

3. Click the 'Unlock' button to confirm.

The display menu is now unlocked for the duration of one hour, or until the QAWeb agent is restarted, after which the display menu is automatically locked again.

6.5 Refreshing the server policy

When the agent is used in the online mode, the calibration and QA policy are configured using the QAWeb Enterprise Web Portal. When changes are made to a policy using the portal, it may take up to one hour for the agent to adopt these changes. As this delay may be inconvenient during testing or troubleshooting, the reloading of the policies can be forced by clicking the icon.

6.6 Displaying test patterns

Test patterns can be used to evaluate the display characteristics through visual inspection or using an external luminance sensor.

After clicking the icon, a window containing the available test patterns will appear. Select the pattern to be displayed.

USING THE WORKSTATION DETAILS

7.1 Opening the Portal

This feature is not available in stand-alone mode.

Click on the [icon] icon (Open in Portal) to open the workstation details page in the QAWeb Enterprise Portal using the default internet browser application (requires Portal user authentication).

7.2 Task overview

The **Task overview** window indicates which calibration tasks and QA tests are applicable to the workstation. This is determined by the applicable calibration policy, the applicable QA policy, and the configured use of the displays connected to the workstation.
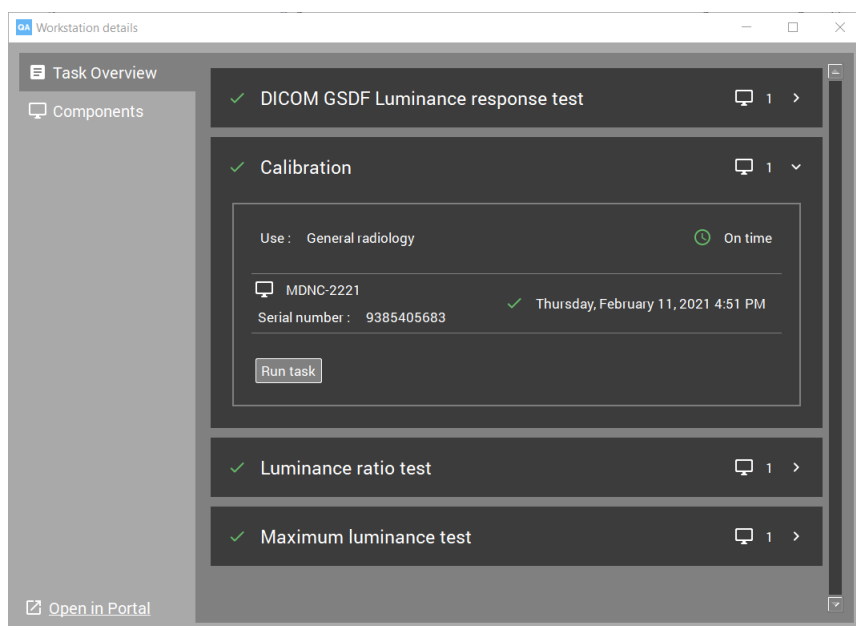
Click on the [icon] icon to display more information of each task.

7.2.1 Manually starting a calibration or QA test

1. Expand the details of the task.

2. Click the the **Run task** button.

7.2.2 To view the results of the latest calibration or QA test

1. Expand the details of the task.

2. Click on the timestamp to view the details of the calibration or QA test.

To view the *history* of previous results, use the QAWeb Enterprise Web Portal. This feature is not available in stand-alone mode.

7.3 Components

The **components** window shows which displays are currently connected to the workstation. For each display, the configured use is indicated.
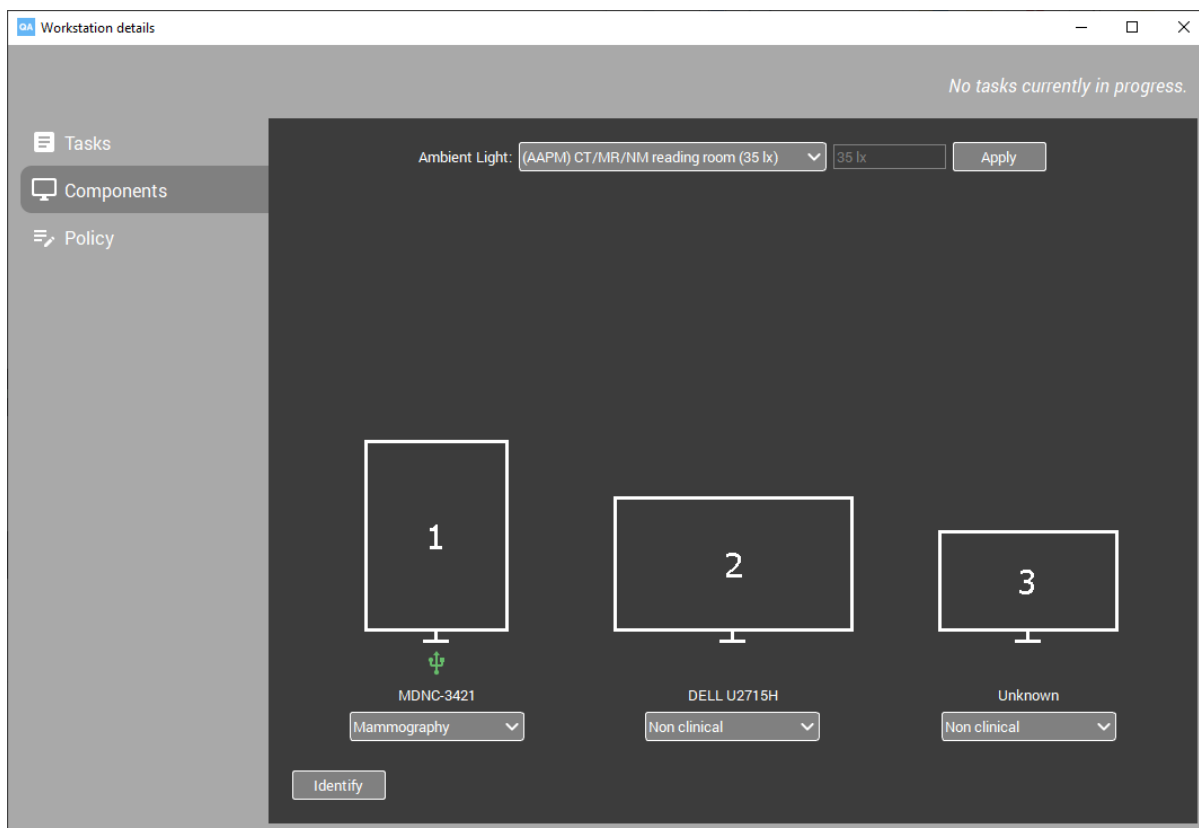
To verify the physical location positioning of the displays, click the **Identify** button. A display number indication will be temporarily shown on each display.

7.3.1 Modifying the use of a display

Modifying the use of a display is only possible in stand-alone mode (in online mode, the use is controlled in the Portal).

To modify the use of a display (stand-alone mode only), use the drop-down menu associated with each display.

7.3.2 Modifying the ambient light conditions

The agent can be configured to assume a certain level of ambient light (ambient illuminance, symbol E, unit lx) in a reading room. During calibration and QA tests, the *reflected* ambient light (L_{amb}) is calculated by multiplying the *configured* ambient illuminance (E) with the diffuse reflection coëfficient of the display (R_d) ($L_{amb} = E * R_d$).

The default ambient light setting is 35 lux.

After modifying the ambient light setting, a new calibration should be performed.

7.4 Policy

See *Using the policy editor* (page 25)

USING THE POLICY EDITOR

This agent policy editor is only available in stand-alone mode.

8.1 Settings per 'use'

In order to correctly understand how policies are applied to specific displays, it is necessary to understand the concept of the **use** of a display.

The use of a display provides a practical way to control which calibration settings and QA tests should be applied to one or more displays, irrespective of the model of these displays. The use of a display can be set to one of the following values:

- Reviewing

- General radiology

- Mammography

- Breast Tomosynthesis

- Non-clinical (No QA tests can be associated with this use)

- Pathology

When a new display is added to the workstation, a default use is automatically assigned based on the model of the display. Non-Barco displays always have 'non-clinical' assigned as default. To modify the use of a display, open to the *Components* window (see *Components* (page 22)).

The calibration settings and QA test settings are configured per use (these settings are **not** configured *per individual* connected display). As a consequence, when multiple displays are present with the same configured use, then the agent will attempt to calibrate them towards the same luminance target, and apply the same configured QA tests.

In the agent policy editor, one horizontal tab is shown for each available use. On each tab, the calibration settings and QA test settings can be configured. The settings tab for a specific use is only available when at least one display is connected for which that specific use is configured.
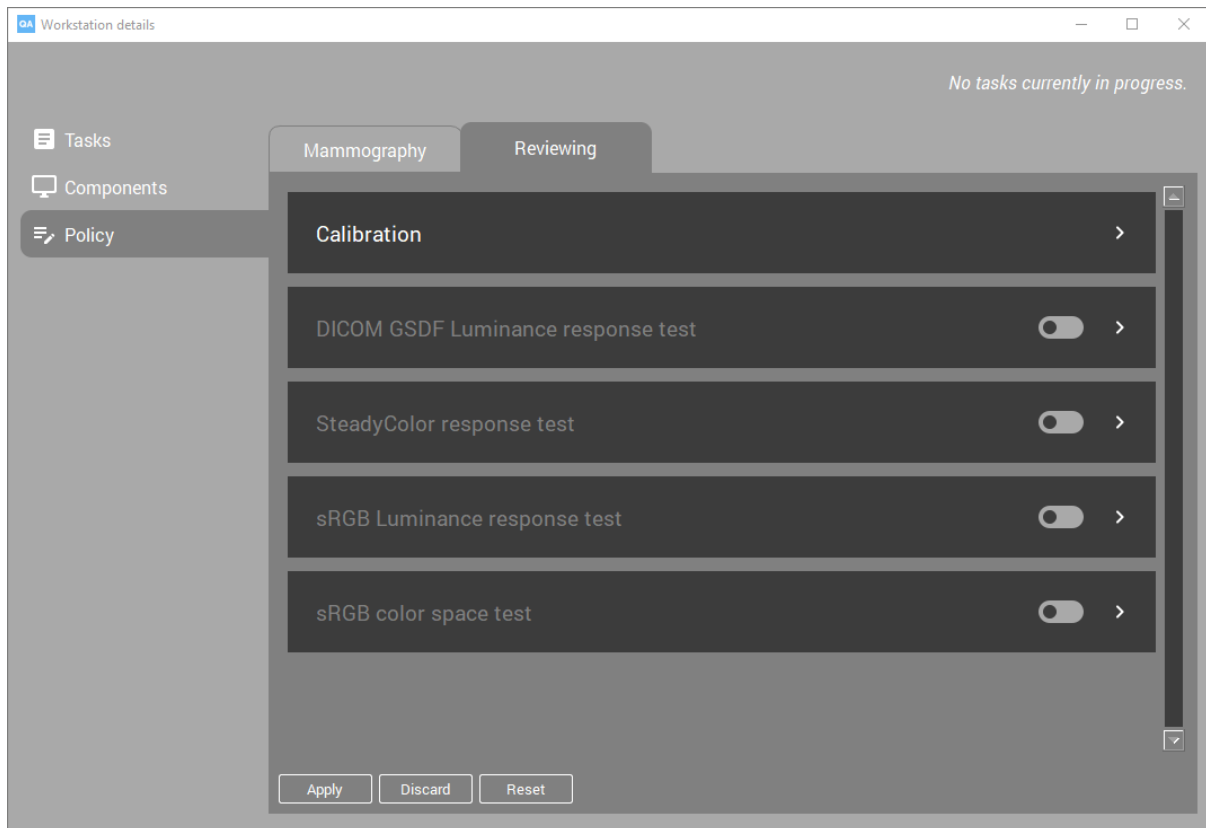
In stand-alone mode, the following tasks can be configured:

- Calibration
- DICOM Luminance response test
- SteadyColor response test
- sRGB Luminance response test
- sRGB color space test

For each use, a Barco default configuration is applied

Note: It is mandatory to define calibration settings (except for the *non-clinical* use). QA tests are optional.

8.2 Schedule settings

Each task has a schedule setting, that determines the execution frequency for the task.
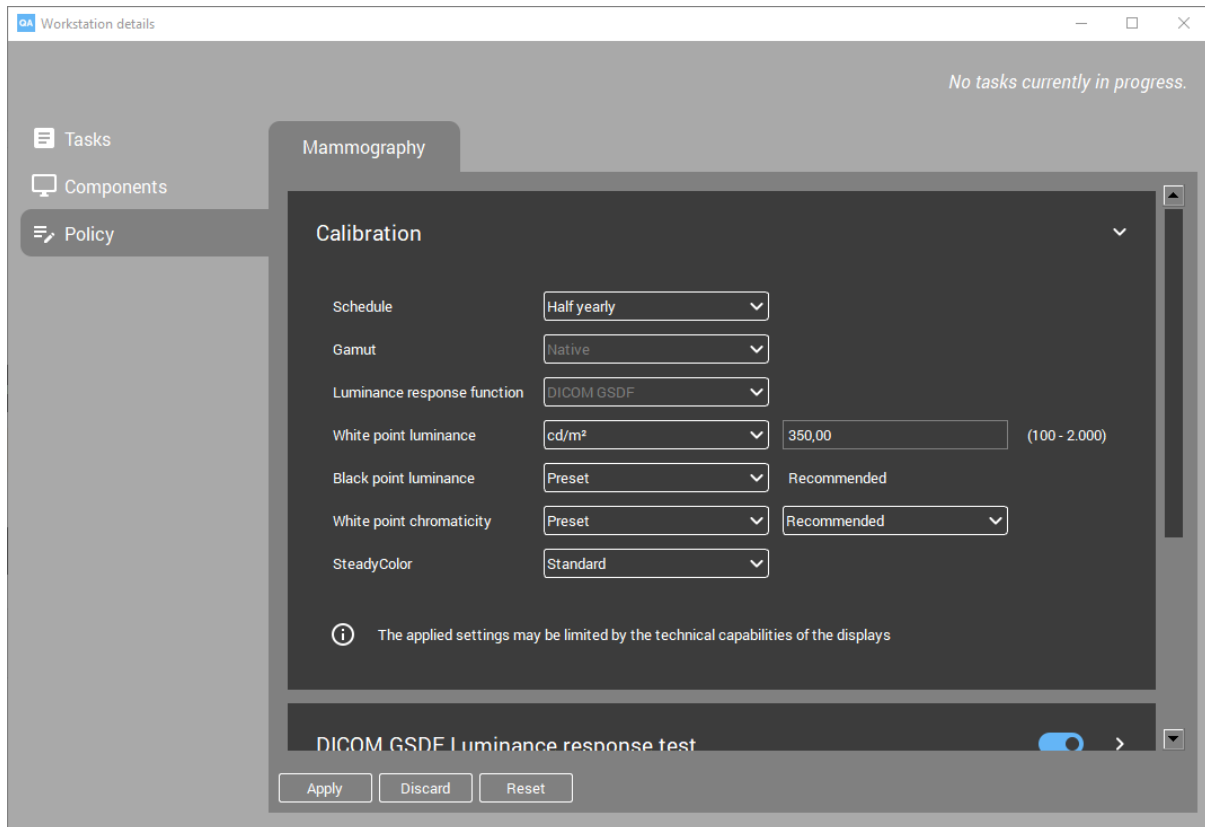
- Daily: Every day
- Weekly: Every Monday
- Biweekly: Every 1st and 15th of the month
- Monthly: Every first day of the month
- Quarterly: Every first day of each quarter
- Half yearly: Every first day of each semester
- Yearly: Every 1st of January

8.3 Calibration settings

Gamut:

- **Native**: Use the color gamut as natively available for the display.

- **sRGB**: Apply the pre-defined sRGB color gamut (can only be selected for 'pathology' use).

Luminance response function:

- **DICOM GSDF**: Apply the Greyscale Standard Display Function, as defined in DICOM part 14, in order to achieve perceptual linearity.

- **sRGB**: Apply an sRGB luminance response function (can only be selected for 'pathology' use)

White point luminance:

- **Preset/Recommended**: The Barco-defined default for the specific display model will be applied.

- **cd/m²**: Allows you to choose a custom white luminance value between 100 and 2000 cd/m². If the display cannot reach this target, it will apply the closest supported value.

Black point luminance:

- **Preset/Recommended**: A Barco-defined default for the specific type of display which uses the native black point of the display panel.

- **cd/m²**: Allows you to choose a custom black luminance value between 0.01 and 10 cd/m²

White point chromaticity:

- **Preset**:

  - **Recommended**: A Barco-defined default for the specific display model.

  - **Bluebase**: Simulates the bluebase film color temperature.

  - **Clearbase**: Simulates the clearbase film color temperature.

- **D65 / D75**: Corresponds approximately to a color temperature of 6500 or 7500 Kelvin.

- **Native white**: The native, unmodified color temperature of the LCD panel.

- **Kelvin**: Allows you to choose a custom white point chromaticity value between 4000 and 10000 K.

- **xy**: Allows you to choose a custom white point chromaticity value defined in xy coordinates.

SteadyColor: Barco's SteadyColor™ technology was created to achieve consistency and perceptual linearity in the display of color images. With multiple internal sensors, display parameters are constantly monitored and adjusted to ensure that the perceptual difference between colors is proportional with their Digital Driving Level (DDL) difference. This setting controls how SteadyColor is applied to the display:

- **Standard**: Calibrates the display system to meet the DICOM GSDF and guarantees consistent, perceptually linear distribution of color hues.

- **Full**: Extends the standard perceptual linearization to equally distribute desaturated and saturated colors.

- **Off**: Disables SteadyColor.

Note that the SteadyColor setting is only effective on selected Barco display systems that support SteadyColor technology. For all other display systems, this setting will be ignored.

Calibration of a display will include the generation of an ICC profile if it supports Barco SteadyColor technology. The ICC profile is registered in the operating system.

8.4 DICOM GSDF Luminance response test (LRT)

The DICOM GSDF luminance response test (LRT) verifies that the measured grayscale luminance response function conforms to the DICOM GSDF luminance response function. This is done by measuring the luminance (in cd/m^2) at 18 digital driving levels (DDL) and calculating the deviation from the standard curve. The reflected ambient light is taken into account.

Parameters:

- **Sensor**: Choose between *Internal (if available)* and *External*.

- **Error Tolerance**: Defines the maximum deviation, expressed as a percentage (%) of the measured luminance versus the standard DICOM curve. If at least one of the measurements exceeds the error tolerance, then the test will fail.

8.5 SteadyColor response test

The SteadyColor test measures the color response of your display and checks that the perceptual difference between colors is proportional to their Digital Driving Level (DDL) difference.

The color response test can only be executed on Barco color displays with an I-Guard™ sensor and SteadyColor™ technology.

Parameters:

- **Error Tolerance**: The test will return a negative result if the measurements exceed the configured threshold percentage.

8.6 sRGB Luminance response test

The sRGB luminance response test verifies that the measured grayscale luminance response function conforms to the sRGB response function.

Parameters:

- **Error Tolerance**: Defines the maximum deviation, expressed as a percentage (%) of the measured luminance versus the standard sRGB curve.

- **Sensor**: Choose between *Internal (if available)* and *External*.

Note that this test will only succeed if the display is calibrated for an sRGB luminance response.

8.7 sRGB color space test

The sRGB color space test verifies that the display conforms to the sRGB color space. It measures the color of 216 different RGB values, and calculates the difference with the sRGB color space specification.

Note that this test will only succeed if the display is calibrated for an sRGB gamut and an sRGB luminance response.

IMPORTANT INFORMATION

9.1 Release notes

Navigate to the Qaweb Enterprise support page (https://www.barco.com/en/support/qaweb%20enterprise) and download the release notes document: "QAWeb Enterprise Release Notes"

Alternatively, download the release notes using a direct link: https://www.barco.com/en/support/docs/TDE10170

9.2 Indications for use

QAWeb Enterprise software is intended to be used as a quality assurance tool for medical imaging display systems individually and across an enterprise. It helps achieve consistent conformity to medical display settings, standards and guidelines for digital images being reviewed by trained medical practitioners.

9.3 Intended usage environment

There are no intended conditions for use applicable.

9.4 Contra-indications

There are no contra-indications.

9.5 Intended users

QAWeb Enterprise is intended to be used by following user profiles:

- PACS / IT technicians and administrators
- Medical physicists
- Medically trained practitioners
- Trained service providers

9.6 Report a Security Vulnerability / Incident

If you discover a vulnerability, we would like to know about it so we can take steps to address it as quickly as possible: https://www.barco.com/en/about-barco/legal/responsible-disclosure

9.7 How to retrieve version and product label information

To access the current version, product label, legal manufacturer and manufacturing date:

1. Open the status panel by left-clicking the QAWeb Enterprise icon in the Windows notification area.

2. Click the 'About' icon ⓘ.

9.8 Disclaimer notice

Although every attempt has been made to achieve technical accuracy in this document, we assume no responsibility for errors that may be found. Our goal is to provide you with the most accurate and usable documentation possible; if you discover errors, please let us know.

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9.11 Explanation of symbols

In QAWeb Enterprise (Agent and Web Client), you may find the following symbols (non-exhaustive list):

- ▰▰ Legal manufacturer

- ⌂ Manufacturing date

- ℞ ONLY Caution: Federal law (United Stated of America) restricts this device to sale by or on the order of a licensed healthcare practitioner

- 📖 Consult the electronic operating instructions

- $C \epsilon$
1639 Indicates the device meets the requirements of the applicable EC directives / regulations

9.12 Open source components used

- LibUSB (GNU LGPL 2.1)

- Qt5 (http://doc.qt.io/qt-5/licenses-used-in-qt.html (only chapters Qt Core, Qt D-Bus, Qt Gui are applicable)

- LittleCMS (MIT)