syngo MR XA60

Operator Manual – MR System Administration

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Legend

	Indicates a hint Provides information on how to avoid operating errors or information emphasizing important details
	Indicates the solution to a problem Provides troubleshooting information or answers to frequently asked questions
■	Indicates a list item
✓	Indicates a prerequisite A condition that has to be fulfilled before starting a particular operation
◆	Indicates a single-step operation
1 2 3	Indicates steps within operating sequences
Italic	Used for references and for table or figure titles
➔	Used to identify a link to related information as well as previous or next steps
Bold	Used to identify window titles, menu items, function names, buttons, and keys, for example, the Save button Used for on-screen output of the system including code-related elements or commands
Orange	Used to emphasize **particularly** important sections of the text
`Courier`	Identifies inputs you need to provide
Menu > Menu Item	Used for the navigation to a certain submenu entry
<variable>	Identifies variables or parameters, for example, within a string

⚠ CAUTION	CAUTION Used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury or material damage. CAUTION consists of the following elements: • Information about the nature of a hazardous situation • Consequences of not avoiding a hazardous situation • Methods of avoiding a hazardous situation
⚠ WARNING	WARNING Indicates a hazardous situation which, if not avoided, could result in death or serious injury. WARNING consists of the following elements: • Information about the nature of a hazardous situation • Consequences of not avoiding a hazardous situation • Methods of avoiding a hazardous situation

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1 Introduction

In order to operate the MR system accurately and safely, the operating personnel must have the necessary expertise as well as knowledge of the complete operator manual. The operator manual must be read carefully prior to using the MR system.

1.1 Documentation overview

To improve readability, the Instructions for Use are split up into a number of individual operator manuals. Each of these individual operator manuals covers a specific topic or addresses a specific user group:

- Hardware components (system, coils, etc.)
- Software (measurement, evaluation, etc.)
- System owner manual

The scope of the respective operator manual depends on the system configuration and may vary.



All components of the complete operator manual may include safety information that must be adhered to. The intended use of the system is stated in the operator manual MR System and Coils.

1.1.1 Availability

All operator manuals for your medical device are part of your software application and are available electronically. They are provided as PDF files in the **Library** section of the **Help** portal.

Additionally, the main software-related information is also available context-based via the Online Help. As the Online Help is part of the user interface, the language of the Online Help is the same as the language of the user interface.

Hardware-related information for your system is also provided in printed form.

1.1.2 Contents

The operator manuals include information on frequently used functions for safe and proper use. They may include descriptions covering standard as well as optional hardware and software. The description of an option does not infer a legal requirement to provide it. To find out what hardware and software is available for your system, contact your Siemens Sales Organization.

The graphics, figures, and medical images used in this documentation are examples only. Their actual display and design may be different on your system. In particular, the screenshots may show the color design of an older user interface.

The operator manuals for hardware and software address the authorized user. Basic knowledge in operating PCs and software is a prerequisite.

For the sake of simplicity, male and female patients are referred to as "the patient".

1.2 Accessing the operator manuals

The operator manuals for your system are available electronically in the **Help** portal of your application.

✓ Software application is open.

◆ To quickly access the **Online Help**:

Follow the link in an extended tooltip, or press the **F1** key, or click the icon in the upper right access bar (⋮ icon or ? icon depending on the available space).

– or –



To view **online PDF** files, if available:

Open the **Help** portal as described above. Then click the **Library** button to go to the available documents.

In the **Library** section of the **Help** portal, you can choose the required document. If necessary, you can apply filters to optimize the display of the documents.

For detailed information about using the **Help** portal, see: Operator Manual MR Examination and Review.

1.3 Intended users/Authorized operating personnel

The MR system must be operated according to the intended use and only by qualified persons with the necessary knowledge in accordance with country-specific regulations, for example, physicians, trained radiological technicians or technologists, having received the necessary user training.

This user training must include basics in MR technology as well as safe handling of MR systems. The user must be familiar with potential hazard and safety guidelines and emergency and rescue scenarios. In addition, the user has to have read and understood the contents of the operator manual.

The user must be fluent in the language used in the software user interface and in the Instructions for Use. The software user interface is available in less languages than the Instructions for Use.

Please contact Siemens Service for more information on available training options and suggested duration and frequency of such training.

1.3.1 Definitions of different persons

Term used	Explanation
User/Operator/ Operating personnel	Person who operates the system or software, takes care of the patient or reads images Typically physicians, trained radiological technicians, or technologists
System owner	Person who is responsible for the MR environment. This includes legal requirements, emergency plans, employee information and qualifications, as well as maintenance/repair.

Term used	Explanation
MR worker	Person who works within the controlled access area or MR environment User/Operator as well as further personnel (for example, cleaning staff, facility manager, service personnel)
Siemens Healthineers Service/service personnel	Group of specially trained persons who are authorized by Siemens Healthineers to perform certain maintenance activities References to “Siemens Service”, “Siemens Healthineers Service”, or “Siemens Healthineers Customer Service” include service personnel authorized by Siemens Healthineers.

1.4 myExam Companion

myExam Companion is a new philosophy to operate MRI, providing built-in expertise and automation for any user and clinical question. With its capabilities to help users generate consistent, comprehensive results, myExam Companion is an advancement of the Dot workflow technology of Siemens Healthineers.

The following terms will be introduced with *syngo* MR XA40:

≤ *syngo* MR XA31	≥ *syngo* MR XA40
–	myExam Companion
–	myExam 3D Camera
–	myExam Autopilot

The following terms will be replaced with the introduction of *syngo* MR XA40:

≤ *syngo* MR XA31	≥ *syngo* MR XA40
Dot Engine	myExam Assist (For details see below)
Dot Engines	myExam Assist programs

≤ *syngo* MR XA31	≥ *syngo* MR XA40
Dot Cockpit	myExam Cockpit
Dot Cockpit Explorer	myExam Cockpit Explorer
Dot Cockpit Program Editor	myExam Cockpit Program Editor
Dot add-in/Dot AddIn	myExam add-in
DotAddIn Configuration	myExam Add-In Configuration
Dot Add-In Configurator	myExam Add-In Configurator
Dot View	Assist View

The Dot Engine names will be replaced with the introduction of *syngo* MR XA40. The following is a non-exhaustive list of examples:

≤ *syngo* MR XA31	≥ *syngo* MR XA40
Abdomen Dot Engine	myExam Abdomen Assist
Angio Dot Engine	—
Biopsy Dot Engine	—
Brain Dot Engine	myExam Brain Assist
Breast Dot Engine	—
Cardiac Dot Engine	—
C-Spine Dot Engine	myExam C-Spine Assist
Hip Dot Engine	myExam Hip Assist
Knee Dot Engine	myExam Knee Assist
LiverLab Dot Engine	—
L-Spine Dot Engine	myExam L-Spine Assist
Prostate Dot Engine	—
RT Dot Engine	—
Shoulder Dot Engine	myExam Shoulder Assist

≤ *syngo* MR XA31	≥ *syngo* MR XA40
Spine Dot Engine	myExam Spine Assist
T-Spine Dot Engine	myExam T-Spine Assist
Whole-Body Dot Engine	—

In the user interface, for example, in the protocol trees, the myExam Assist names are listed without the prefix myExam.

2 System and Data Management

2.1 System and data management overview

Management and operation of the system comprises of tasks like checking, starting, and logging on to the system. Software updates must also be monitored.

(→ Page 18 *Managing the system*)

(→ Page 39 *Configuring automatic slice positioning*)

(→ Page 84 *Managing patient data and studies*)

(→ Page 142 *Creating new series numbers*)

(→ Page 143 *Managing voice commands*)

(→ Page 165 *Creating screen videos and screenshots*)

Further tools are available for controlling and connecting to the MR system:

- (→ Page 147 *Managing background tasks (jobs)*)
- (→ Page 169 *Using syngo Virtual Cockpit*)
- (→ Page 171 *Expert-i: Collaborating with colleagues*)
- (→ Page 189 *Remote Assistance*)
- (→ Page 191 *Remote Access*)
- (→ Page 192 *Access-i remote control*)

2.2 Managing the system

Management and operation of the system comprises of the following tasks:

(→ Page 19 *Viewing the system information*)

(→ Page 19 *Checking the system*)

(→ Page 21 *Safety tests*)

(→ Page 21 *Controlling the system*)

(→ Page 25 *Logging on to the system*)

(→ Page 28 *Adjusting the workplace*)

(→ Page 36 *Gathering diagnostic information*)

(→ Page 37 *Software Updates*)

2.2.1 Viewing the system information

Use the information platform **About** to display the general system and configuration information of the MR system.



1 On the access bar, click the **Help** icon and choose **About** from the menu.

The **About** dialog box opens.

The main **About** dialog box displays service information, general legal information, and a copyright notice.

2 Click the **System Info** button to display information about:

- **Software**: Shows information about software packages and software options.
- **Hardware**: List of installed hardware components, including gradient licenses and the number of Rx and Tx channels.

3 Click the **More Info** button to display information about:

- **Installed Version**: Shows version details about all installed components.
- **Regulatory Info**: Shows information about CE markings of the installed product.
- **Copyright Info**: Shows detailed information about the copyright of the installed product,

2.2.2 Checking the system

On the **Home** screen you have a quick access to the **System Status Overview** tab of the Administration Portal. Clicking the **System Check** icon provides a simple and fast overview over the status of the whole MR system.

The **System Check** icon indicates the status of the MR system:



The MR system is ready.



Actions are required for maintenance of the MR system.

✓ The **Home** screen is open.

◆ Click the **System Check** icon.

The Administration Portal opens with the **System Status Overview** tab.

The following information is displayed:

- **Startup Reports**
- **Customer Environment** (including helium fill level)
- **Maintenance** (optional)
- **Periphery Groups**
- **Host Infrastructure**

The status of each component is represented by one of the following icons.

Icon	Status	Comment
	**Operational**	The component is running without errors.
	**Warning**	The component indicates a warning.
	**Error**	An error occurred. However, the component is still able to run.

Clicking an entry, displays a specific help text.

2.2.3 Safety tests

To ensure safe operation of the system, routine tests need to be carried out at regular intervals. Safety tests typically take several minutes.

Users are alerted to the fact that safety tests are due (test status "pending") when they shut down or restart the system. Performance of these tests can be postponed for a short while. However, if tests have not been performed for an extended period of time, they become "overdue". This would result in the system no longer being ready for measurements and would cause delays in the examination workflow. Users would have to restart the system and perform the required safety tests before they can register the next patient. Or safety tests need to be performed when the system is being started up the next time, which would result in the startup process taking longer.

(➔ Page 22 *Restarting the system*)

(➔ Page 22 *Shutting down the system*)

2.2.4 Controlling the system

You can control and operate your MR system from the **Home** screen.

(➔ Page 22 *Restarting the system*)

(➔ Page 22 *Shutting down the system*)

(→ Page 23 *Restarting the workplace*)

(→ Page 24 *Restarting MARS*)

(→ Page 24 *Standby of the MR scanner*)

2.2.4.1 Restarting the system

In case of an error in the operating system, MARS, or in the scanner hardware, you may have to restart the whole system.

1 Inform your colleagues at all connected workplaces that the system is about to shut down. Any unsaved data at the connected workplaces will be saved automatically.



2 On the access bar, click the **Home** icon.

The **Home** screen opens.



3 Click the shutdown icon and select **Restart System**.

The **Restart System** dialog box opens.

4 Click **Restart**.

If safety tests are due to be performed, the **System Test Required** dialog box is shown.

5 Click **OK** to perform safety tests during restart.

Preferably, do not postpone tests.

(→ Page 21 *Safety tests*)

Scanner hardware, Numaris/X, MARS, and the operating system are shut down and then started again.

2.2.4.2 Shutting down the system

At the end of the workday, you switch off the entire system, that is, the MR scanner, the acquisition workplace and the image reconstruction system at Numaris/X.

Shutting down the system will close all open workflows and save the results to the Short Term Storage (STS). The system waits until all jobs are completed.

1 Exit all ongoing examinations and close all applications.

2 Inform your colleagues at all connected workplaces that the system is about to shut down. Any unsaved data at the connected workplaces will be saved automatically.



3 On the access bar, click the **Home** icon.

The **Home** screen opens.



4 Click the shutdown icon and select **Shut down System**.

The **Shut down System** dialog box opens.

5 Click **Shut down**.

If safety tests are due to be performed, the **System Test Required** dialog box is shown.

6 Click **OK** to perform safety tests during restart.

Preferably, do not postpone tests.

(➔ Page 21 *Safety tests*)

Open workflows are closed and results are saved. Scanner hardware, Numaris/X, MARS, and the operating system are shut down.



After the shutdown, the MR system turns off automatically. Alternatively, you can switch off the system via the **System ON/OFF** button at the intercom.

2.2.4.3 Restarting the workplace

If Numaris/X is not responding, or MARS is not working correctly, you can start it separately.



1 On the access bar, click the **Home** icon.

The **Home** screen opens.



2 Click the shutdown icon and select **Restart Workplace**.

The **Restart Workplace** dialog box opens.

3 Click **Restart**.

Numaris/X and MARS shut down and restart. The operating systems are *not* shut down.

2.2.4.4 Restarting MARS

As an administrator, you can start the measurement and reconstruction system (MARS) separately if it is not working correctly.

✓ You have administrator rights.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

The **Configuration Panel** opens.

2 Select the **Scan Application** tab.

3 In the **MARS - Measurement and Reconstruction** section, select one of the following restart options:

- **Partial Restart**

  Only the **MARS** software will be restarted.

- **Full Restart**

  The **MARS** system and software will be restarted.

4 Click **Restart MARS**.

2.2.4.5 Standby of the MR scanner

If you do not intend to perform measurements for a lengthy period of time or only want to edit or evaluate images, you can save energy by switching off the power supply to the MR scanner and the image reconstruction system.



As soon as the system is in the standby mode, you are no longer able to perform measurements.

1 On the access bar, click the **Home** icon.



The **Home** screen opens.



2 Click the shutdown icon and select **Standby System**.

The **Standby System** dialog box opens.

3 Click **Standby**.

The MR scanner switches to a low power mode.

4 To end standby, press the **System ON/OFF** button at the intercom.

See: Operator Manual MR System and Coils.

– or –

Click the shutdown icon and select **Wake up System**.

2.2.5 Logging on to the system

Depending on the security policy at your site, you might have to log on to Numaris/X and change the password at regular intervals.

In some cases, you need to switch the user, for example to log on as administrator.

Additionally, you can lock the workplace so that no unauthorized user is able to use the system.

(→ Page 25 *Logging on to your system*)

(→ Page 26 *Changing your password*)

(→ Page 27 *Switching the current user*)

(→ Page 27 *Locking the workplace*)

2.2.5.1 Logging on to your system

Depending on the security policy at your site, you might have to log on to your system after system startup.

If no logon is put in place after the system starts, you are logged on as meduser.

1 On the access bar, click the user icon and select a user name.

The **Logon** dialog box opens.

2 Enter your user name and password in the corresponding field.

The password is case-sensitive.

3 Select a domain, if required. After initial logon, the system will remember the domain.

4 Click **OK**.

If your account is locked out, disabled, or otherwise prevented from logging in, you will see a message explaining the reason. Please contact your IT administrator.

2.2.5.2 Changing your password

Depending on the security policy at your site, the password has to be changed at regular intervals.

You cannot change the password for the user **meduser**.

As a new user, ask your administrator for a user name and password. By default your password is temporary.

1 On the access bar, click the user icon and select **Other User**.

The **Logon** dialog box opens.

2 Fill in valid credentials including the old password.

3 Click **Change Password**.

4 Type your new password into the corresponding fields.

- The password is case-sensitive.
- Make sure, that your new password contains at least eight characters (for higher security, 14 are recommended). Use capital letters, lower case letters, numbers, and special characters.

5 Click **OK**.

The new password will apply the next time you log on.

2.2.5.3 Switching the current user

You can switch the current user in order to hand over the system to another user.

You can display the current user by moving the mouse pointer over the user icon on the access bar.

1 On the access bar, click the user icon.

A list of recently logged on users opens.

2 Select a user name or select **Other User**.

The **Logon** dialog box opens.

3 Enter **User name** and **Password** for the selected user.

Note that the password is case-sensitive.

4 Select a domain, if required. After initial logon, the system will remember the domain.

5 Click **OK**.

2.2.5.4 Locking the workplace

You can manually lock the workplace so that no unauthorized user is able to use the system.

For how to lock the screen automatically after a configurable time interval, see (→ Page 36 *Configuring automatic screen lock*).



1 On the access bar, click the **Home** icon.

The **Home** screen opens.



2 Click the **Lock** icon to lock your workplace.

The workplace is locked. To unlock the workplace, click the **Unlock** icon.

If your administrator has configured that a password must be entered to unlock the screen, enter your credentials.

- User has not changed: Enter your password.
- User has changed: Enter your user name and password.

2.2.6 Adjusting the workplace

On the **Configuration Panel**, you can adjust your workplace.

(→ Page 28 *Setting the monitor layout*)

(→ Page 29 *Setting the user interface language*)

(→ Page 30 *Adjusting the font size of annotations*)

(→ Page 31 *Adjusting the findings behavior*)

(→ Page 31 *Configuring the Series panel*)

(→ Page 32 *Configuring storage of the image presentation*)

(→ Page 33 *Configuring the patient name format*)

(→ Page 33 *Configuring image text*)

(→ Page 34 *Configuring image comment*)

(→ Page 34 *Configuring call-up of the corner menus*)

(→ Page 35 *Configuring the keyboard*)

(→ Page 35 *Configuring Access Control*)

(→ Page 36 *Configuring automatic screen lock*)

2.2.6.1 Setting the monitor layout

On the **Client Settings** tab of the **Configuration Panel**, you can switch between single and dual monitor layout. You must restart the system to apply the changes.

✓ You have to be logged on as a user with administrator rights.

1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

   The **Configuration Panel** opens.

2 Select the **Client Settings** tab.

3 In the **Multi Monitor Setup** section, select **One monitor** or **Two monitors**.

4 Click **OK**.

5 Restart the system.

   (➔ Page 22 *Restarting the system*)

Your changes will only take effect when you restart the system. With **Restart Workplace**, changes to the monitor configuration will not be applied.

2.2.6.2 Setting the user interface language

On the **Client Settings** tab of the **Configuration Panel**, you can select the language in which the user interface (UI) is displayed. Tooltips and the Online Help are also displayed in the selected language.

1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

   The **Configuration Panel** opens.

2 Select the **Client Settings** tab.

3 From the **Select the UI Language** list, select your preferred language.

   The following languages are supported:

   - English (United States)
   - German (Germany)
   - French (France)
   - Spanish (Spain, International Sort)
   - Japanese (Japan)
   - Chinese (Simplified)

4 From the **Select Language for Date, Time and Number Format** list, select your preferred date format.

5 Click **Apply** and **OK**.

Your changes will apply when the client is next started.

Changing the language adds a new entry to the list of available keyboard layouts, but the default is still English (US). To switch the keyboard language, press the **Alt**+**Shift** keys until the correct layout is selected.

2.2.6.3 Adjusting the font size of annotations

On the **Display And Behavior** tab on the **Configuration Panel**, you can predefine the font size of annotation texts.

1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

The **Configuration Panel** opens.

2 Select the **Display And Behavior** tab.

3 Select the **Measurements and Snapshots Configuration** section.

4 In the **Measurements** subsection, choose a font size from the **Font size for annotations and measurements** list.

The **Font size preview** shows the currently selected font size.

5 From the **Optimize in Snapshots for** list, choose the quality for displaying the snapshots on different monitor types.

You can choose **Standard Monitor** or **High-Resolution Monitor**.

6 In the **Snapshot Images** subsection, choose one of the following options from the **Optimize Snapshot Image for** to adjust the quality for saving snapshot:

- **PACS Reading**:

  Optimized for PACS storage

- **Printing**:

  Optimized for printing

7 Click **OK**.

2.2.6.4 Adjusting the findings behavior

On the **Display And Behavior** tab of the **Configuration Panel**, you can predefine the findings behavior of advanced applications.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

   The **Configuration Panel** opens.

2 Select the **Display And Behavior** tab.

3 Select the **Measurements and Snapshots Configuration** section.

4 In the **Findings** subsection, select the **Automatically create findings for measurements** check box.

   When you perform measurements, such as ROIs or distance lines, the values are automatically listed in the **Findings Navigator**.

5 In the **Findings** subsection, select the **Automatically create snapshot images for findings** check box.

   When you create findings, snapshots of the images (in the resolution of the displayed segment) are automatically added to the findings in the **Findings Navigator**.

6 Click **OK**.

2.2.6.5 Configuring the Series panel

On the **Display And Behavior** tab of the **Configuration Panel**, you can change the view of the **Series** panel.

✓ You have administrator rights.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

   The **Configuration Panel** opens.

2 Select the **Display And Behavior** tab.

3 In the **Series Navigator** section, select one of the following options for displaying the series within the **Series** panel:

- **Flat**

  Provides a linear (flat) presentation of the series of the loaded study.

- **Group**

  Gives an overview of the data sorted into hierarchically structured data groups.

4 Click **OK**.

2.2.6.6 Configuring storage of the image presentation

On the **Display And Behavior** tab of the **Configuration Panel**, you can configure how image presentations in 2D images and 4D data sets are saved and which modifications they include.

✓ You have administrator rights.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

  The **Configuration Panel** opens.

2 Select the **Display And Behavior** tab.

3 In the **MR View&GO** section, select one of the following options for saving the image presentation:

- **Store automatically on closing a case**

  Changes to window values will be automatically saved if the workflow is paused or completed or if any series of the patient study is sent for archiving via the **Send and Archive** window.

- **Store manually**

  Changes to the image presentation will be saved only if explicitly triggered by user interaction.

  In addition to changed window values, the current settings for zoom, pan, rotate, flip, and color LUT, as well as graphics drawn for evaluation will be included in the image presentation.

4 Click **OK**.

Your changes will only take effect after you restart the system.

2.2.6.7 Configuring the patient name format

On the **Display And Behavior** tab of the **Configuration Panel**, you can set the display format of the patient name used, for example, in the **Patient Browser** and for the image text.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

   The **Configuration Panel** opens.

2 Select the **Display And Behavior** tab.

3 In the **Name Format** section, select the required option from the list.

   If you select special options, such as Japanese or Chinese, you have to restart the client.

4 Click **OK**.

2.2.6.8 Configuring image text

On the **Display And Behavior** tab of the **Configuration Panel**, you can set the attributes for customized image text (for example, reduced image text). Customized image text is applied if you click the **Custom Text** icon in the **Favorite Tools** panel of **MR View&GO**.

If you have administrator rights, you can set the image text attributes either for the current user only (user-specific) or make them available for all users (site-specific).



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

   The **Configuration Panel** opens.

2 Select the **Display And Behavior** tab.

3 In the **Image Text Configuration** section, select your preferred options for displaying the image text.

4 For administrators only: From the **Configuration** list, select whether the image text configuration should apply to the current user only (**My Image Text Config**) or to all users (**General Image Text Config**).

5 Click **OK**.

2.2.6.9 Configuring image comment

On the **Scan Application** tab of the **Configuration Panel**, you can decide whether registration information about body part and laterality will be automatically included in the image comment.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

The **Configuration Panel** opens.

2 Select the **Scan Application** tab.

3 In the **Image Comment** area, select your preferred options for adding **Body Part** and/or **Laterality** information to the image comment.

4 Click **OK**.

2.2.6.10 Configuring call-up of the corner menus

On the **Display And Behavior** tab of the **Configuration Panel**, you can configure how to open the corner menus and mini toolbars in the image segments of the reading workflows.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

The **Configuration Panel** opens.

2 Select the **Display And Behavior** tab.

3 In the **Corner Menu and Mini Toolbar Configuration** section, select the **On mouse over watermark** option to be able to open the segment corner menus and mini toolbars by moving the mouse over the segment corners.

This is the default system behavior.

– or –

Select the **On click on watermark** option to be able to open the segment corner menus and mini toolbars only after clicking them.

4 Click **OK**.

You must restart the system before your changes will take effect.

2.2.6.11 Configuring the keyboard

On the **Scan Application** tab of the **Configuration Panel**, you can determine where the input focus will be set after a value within a parameter card has been confirmed with the **Enter**/**Return** key.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

The **Configuration Panel** opens.

2 Select the **Scan Application** tab.

3 In the **Keyboard Configuration** section, select one of the following options:

- **Allow further typing within same input field**

  When you press the **Enter**/**Return** key, the input focus remains in the currently selected input field.

- **Allow image navigation**

  When you press the **Enter**/**Return** key, the input focus switches to the image area.

4 Click **OK**.

2.2.6.12 Configuring Access Control

On the **Client Settings** tab of the **Configuration Panel**, you can configure Access Control. If Access Control is enabled, you have to log on to your system after system startup.

(➔ Page 25 *Logging on to your system*)

✓ You have administrator rights.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

   The **Configuration Panel** opens.

2 Select the **Client Settings** tab.

3 Select **Require authentication on startup** to enable Access Control.

4 Click **OK**.

2.2.6.13 Configuring automatic screen lock

On the **Client Settings** tab of the **Configuration Panel**, you can enable automatic locking of the workplace after a certain time without user interaction has elapsed.



Please note that for safety reasons, screen lock is not possible during measurement. The screen lock could hide safety-relevant pop-up windows, for example, indicating that the patient needs attention.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

   The **Configuration Panel** opens.

2 Select the **Client Settings** tab.

3 In the **Lock screen** section, enter the time interval in minutes to be considered for automatic activation of the screen lock.

   – or –

   Enter “0” to disable automatic screen lock.

4 Click **OK**.

2.2.7 Gathering diagnostic information

In case of an error, it is useful to generate a SaveLog data set for error analysis.

Saving log files can interfere with a running measurement and subsequent workflows or even crash them.

Make sure no measurement is in progress before starting the SaveLog creation.

1 On the access bar, click the **Configuration** icon and choose **SaveLog** from the menu.

   The **Create SaveLog** dialog box opens.

2 In the **Name** field, enter a name for the log file.

3 Provide additional information.

4 Select the **Attach screenshots** check box to include screenshots with the log file.

5 Click **OK**.

   The MR system is collecting data for the SaveLog data set. The SaveLog file is stored automatically in your offline file system.

2.2.8 Software Updates

Siemens Healthineers regularly provides application updates, which you should always install.

These updates can contain feature improvements and security-related patches.

At your MR scanner, you are prompted to install updates during system start.

You can update the system and the *syngo* Acquisition Workplace:

(→ Page 37 *Updating the system software*)

(→ Page 38 *Upgrading the syngo Acquisition Workplace*)

2.2.8.1 Updating the system software

When you start or shut down your system while software updates are waiting to be installed, the software packages are presented one by one and you can either install them or defer the installation.

1 Start your system.

Software packages to be installed are automatically detected and the name of the first package is displayed.

Additionally, you can see if a restart is required and the estimated installation time.

2 If a disclaimer is displayed, select the **accepted** check box.

3 To install the software package, select **Install**.

– or –

To postpone the installation, for example, in case of an emergency, select **Defer**.

Deferred packages will be listed again on the next startup or shutdown.

4 After the installation of the last package, click **Finish**.

A list of the software packages, including the status **INSTALLED** or **DEFERRED** is displayed.

5 Click **OK**.

If you installed software packages that require a restart, your system is restarted.

If you defer a package over a long period of time, the Siemens Customer Care Center will contact you.

2.2.8.2 Upgrading the *syngo* Acquisition Workplace

The update will take approximately four hours. All data on the host will be erased.

✓ All unsaved or unsent patient data and user-generated content are backed up.

✓ All background jobs are completed, for example, MR reconstruction jobs.

1 Shut down the *syngo* Acquisition Workplace.

Wait until the *syngo* Acquisition Workplace and the measurement system are both switched off.

2 Restart the *syngo* Acquisition Workplace and the measurement system.

Wait until the system is ready for measurement.

3 Insert the SD card with the *syngo* Acquisition Workplace package.

Wait until the **User Installable Software Update Available** dialog box opens.

4 Click **Install**.

During installation, you can ignore the subsequent popup windows:

- network discovery
- graphic adapter update
- Windows logon screen (Logon will be performed automatically.)

You will be informed by a pop-up window as soon as the update has been completed.

5 For necessary remote TuneUp and Quality Assurance steps, please contact Siemens Healthineers Customer Services.

2.3 Configuring automatic slice positioning

AutoAlign (AA) is a function that aids the workflow for preparing MR scans and that assists the user in positioning slices.

Depending on the patient under examination, for example, infants or patients after surgery, it might be necessary to check and correct the positioning of clinical protocols that use the AutoAlign function.

All MR applications, such as spine, neuro, muscular-skeletal, and cardiac imaging, benefit from automatic slice positioning. However, the specific requirements differ between the anatomical regions.

An AutoAlign region corresponds to an anatomical region, such as the head, knee, hip, shoulder, or spine, for which several AutoAlign programs are available.

(→ Page 42 *AutoAlign Head*)

(→ Page 51 *AutoAlign Knee*)

(→ Page 61 *AutoAlign Hip*)

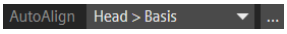
(→ Page 69 *AutoAlign Shoulder*)

(→ Page 73 *AutoAlign Spine*)

Some AutoAlign regions are only available in conjunction with the corresponding myExam Assist.

In an AutoAlign region, the position and orientation of a number of so-called AutoAlign references are detected. For example, **Head > Basis** (which provides the midsagittal plane), **Head > Optic nerves**, **Head > Inner ear**, **Head > Temporal lobe** and others.

All AutoAlign references are landmark based. Based on a landmark detection, several AutoAlign references are computed from the 3D volume. Also, several MPR localizer images are reconstructed from this 3D volume and automatically loaded into the planning segments of the scanning user interface.



On the **Routine** parameter card of a protocol, all AutoAlign references are listed in the **AutoAlign** field.

(→ Page 41 *Sequence of an AutoAlign examination*)

(→ Page 79 *Creating and modifying an AutoAlign program*)

2.3.1 Definitions

AutoAlign scouts

AutoAlign scouts are localizer images and are used to detect anatomical landmarks. AutoAlign references and corresponding organ boxes are computed based on these landmarks.

AutoAlign references

AutoAlign references provide the positioning and orientation of slices in a standardized way according to anatomical planes. The AutoAlign reference can be selected in the **AutoAlign** field on the **Routine** parameter card of a protocol.

Organ box

For many AutoAlign references, the dimension of the region of interest is also calculated from the AutoAlign scout. This so-called organ box is a cuboid, which defines the boundaries of the anatomy under examination. The organ box is used for the Auto Coverage functionality.

(→ Page 321 *Auto Coverage*)

2.3.2 Sequence of an AutoAlign examination

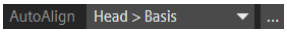
An AutoAlign examination is performed in the following steps:

Patient registration

A patient examination can be performed with or without AutoAlign. Without AutoAlign, the slice positions refer to the patient coordinate system that lies parallel to the magnet axes. With AutoAlign, the slice positions refer to the detected AutoAlign reference, which prescribes the position and orientation of an organ, for example.

AutoAlign scout scanning

An AutoAlign program starts with an AutoAlign scout protocol, which is used to detect the AutoAlign references and to generate the localizer images. The AutoAlign scout is followed by multiple clinical AutoAlign protocols using the computed AutoAlign results.



With the AutoAlign parameter of the **Routine** parameter card, you select the AutoAlign reference to be used for the clinical protocol.

AutoAlign scout feedback

When an AutoAlign scout is acquired, the status of the computed AutoAlign references is visualized in clinical protocols that use AutoAlign references.



AutoAlign symbol:

- The symbol is displayed to the left of the program step name.
- The symbol is displayed if the AutoAlign scout is still running (no AutoAlign result available yet).

- The symbol is displayed if the AutoAlign reference configured for this step was not found or has insufficient quality.
- The symbol is displayed if the steps were configured without construction worker and when a step is open. When a step with a user-configured construction worker symbol is closed, the symbol is not shown.

A tooltip describing the error can be displayed. The error is also shown in the status bar when the step is opened.

To continue the examination, you have to:

- Open the protocol.
- Adapt the slice positions manually, if needed.
- Click **Apply** to start the scanning, using the adapted slice positions.

If necessary, you can create and edit AutoAlign programs.

Autoload of images

The resulting images are autoloaded to the **Examination** screen.

Follow up and Phoenix

You can apply patient-specific, individual adaptations to the aligned slice positions. For improved alignment of follow-up examinations, we recommend that you avoid individual modifications if they are not absolutely necessary.

If individual adaptations were performed during a prior examination, these changes must be recalled via Phoenix Zip™ to obtain the same parameters in the follow-up exam.

Phoenix Zip contains the entire study information.

When single protocols are reconstructed with Phoenix™, the AddIn is not applied to the protocol. The behavior of the protocol may therefore change.

2.3.3 AutoAlign Head

The AutoAlign Head scout scans a sagittal, T1-weighted 3D volume at the isocenter and computes the AutoAlign Head references. The resulting MPR localizer images are automatically loaded into the graphical segments.

AAhead_scout protocol

A collection of AutoAlign Head scout protocols – one for each head coil – can be found in the following protocol tree:

\SIEMENS\head\library\localizer

We recommend that you copy the most relevant one into your scan program.

AutoAlign Head references

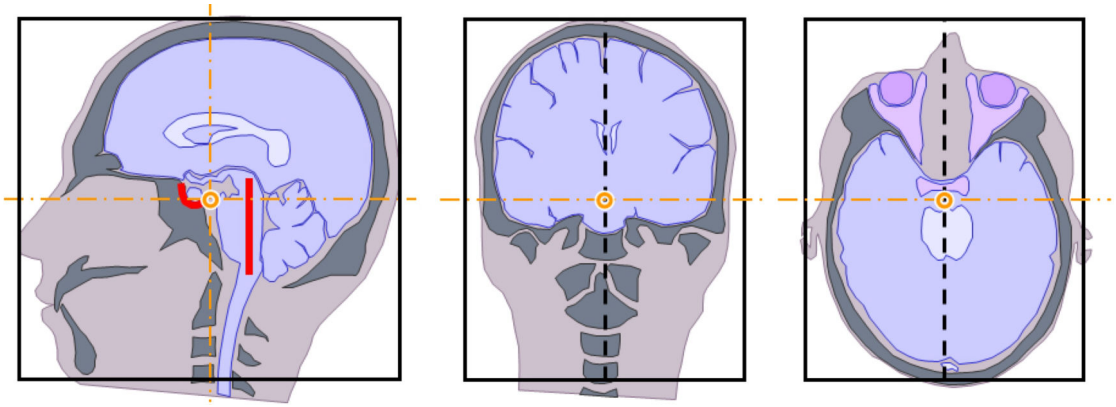
AutoAlign Head computes the following AutoAlign references:

- (→ Page 44 *Head > Basis*)
- (→ Page 45 *Head > Brain*)
- (→ Page 46 *Head > Inner ear*)
- (→ Page 47 *Head > Orbits*)
- (→ Page 48 *Head > Optic nerves*)
- (→ Page 49 *Head > Optic nerve L/Head > Optic nerve R*)
- (→ Page 50 *Head > Temporal lobe*)

All references are designed to provide high reliability (good alignment in the clinical routine) across patient ages, for a variety of diseases, and in problem cases.

Some of the AutoAlign references provide high reproducibility (for example for re-scanning or follow-up examinations of the same patient).

2.3.3.1 Head > Basis



The midsagittal plane (MSP) is the most important plane in the head. As the MSP is used as orthogonal basis for many other planes in the head, this plane is subject to extra high accuracy criteria in respect of robustness and reproducibility.

The MSP is provided by the **Head > Basis** reference for use in all standard sagittal and standard coronal protocols in the head. This reference also can be used as a reference for other regions in the head, such as hypophysis or brainstem.

The **Head > Basis** reference is mainly derived from head symmetry structures in addition to further soft symmetric structures like the eyes, the sinus vessel, or the brainstem.

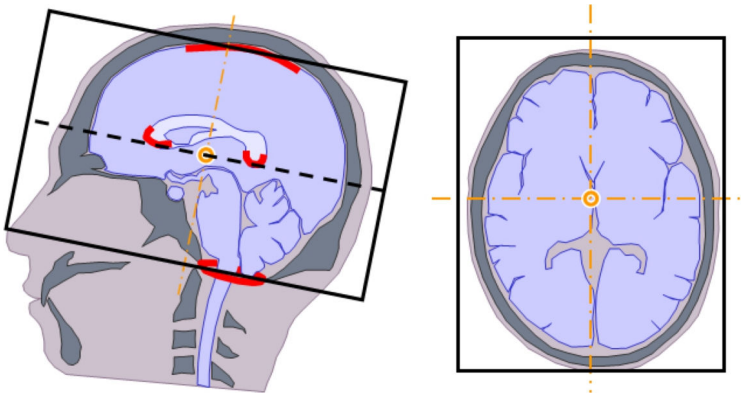
Application:

- Standard sagittal head protocols
- Brainstem imaging (with offset)
- Pituitary transverse/coronal (with offset)

Alignment:

- Inplane orientation: parallel to the brainstem
- Center: 10 mm offset posterior from the lower border of the sella and perpendicular to the Meynert axis

2.3.3.2 Head > Brain



The **Head > Brain** reference provides the standard transverse orientation in the head for the most applications in the brain region: morphology, diffusion, perfusion, fMRI, etc.

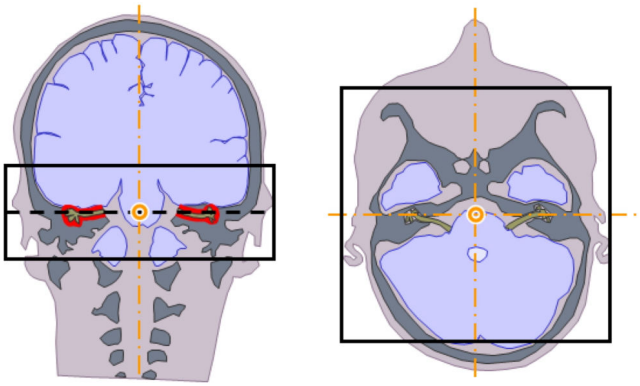
Application:

- Standard transverse view of the brain

Alignment:

- Perpendicular to the midsagittal plane, which is provided by the **Head > Basis** reference
- Tilted Tra > Cor along the lower borders of the anterior and posterior part of the corpus callosum
- If the following two landmarks are not covered by the clinical standard protocol, a user interaction is forced to adapt the positioning of the transverse brain protocols manually:
  - Superior frontal gyrus
  - Center of the foramen magnum

2.3.3.3 Head > Inner ear



The **Head > Inner ear** reference is used in the clinical routine, for example, to examine for acusticus neurinoma.

The **Head > Inner ear** reference is initialized with the values of the **Head > Basis** reference. The final inplane rotation of the sagittal plane is the same as in the **Head > Basis** reference. Only the tilted Tra>Sag and Tra >Cor is adapted in such a way that the final x-axis is along the inner ear axis.

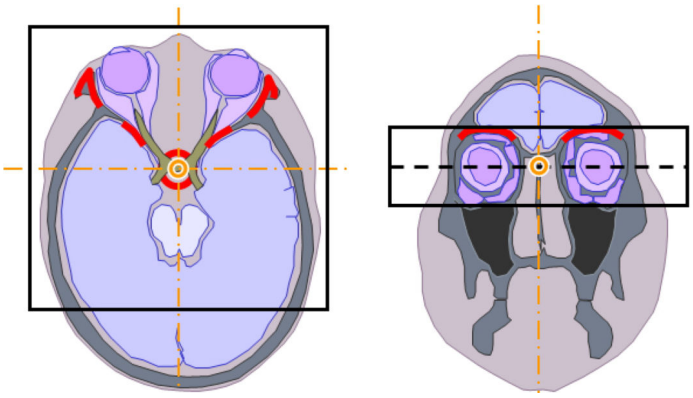
Application:

- Provides robust views of the inner ears

Alignment:

- Orientation: along the internal acoustic meatus
- The intersection point of the inner ear axis with the midsagittal plane defines the center point.

2.3.3.4 Head > Orbits



The **Head > Orbits** reference can be used to setup protocols in all three standard orientations parallel or perpendicular to the approximate optic plane. This reference is determined mainly based on bony landmarks.

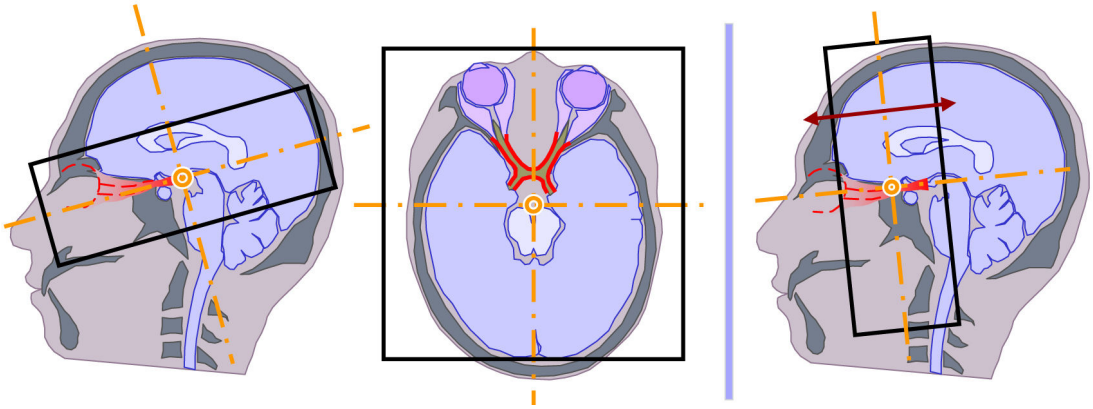
Application:

- Provides reproducible sag/cor/tra views for follow-up examinations of the optic nerve system
- Based on bony landmarks and therefore unaffected by
  - Eye position/movement
  - Orbital or optic nerve lesions and diseases

Alignment:

- Tilted Tra>Sag: parallel to the roof of the two orbits.
- Tilted Tra > Cor: derived from bony landmarks where the two outer optical bone landmarks and the optic chiasm are included.
- Inplane rotation: derived from the perpendicular line that passes through the midpoint between the optical bones.
- Center: projection of the optical chiasma into the double-oblique transverse plane that includes the two optical bones.

2.3.3.5 Head > Optic nerves



The **Head > Optic nerves** reference provides a symmetric and robust view of the two optic nerves. Unlike to the **Head > Orbits** reference, soft landmarks are used on the two nerves and the optic chiasm.

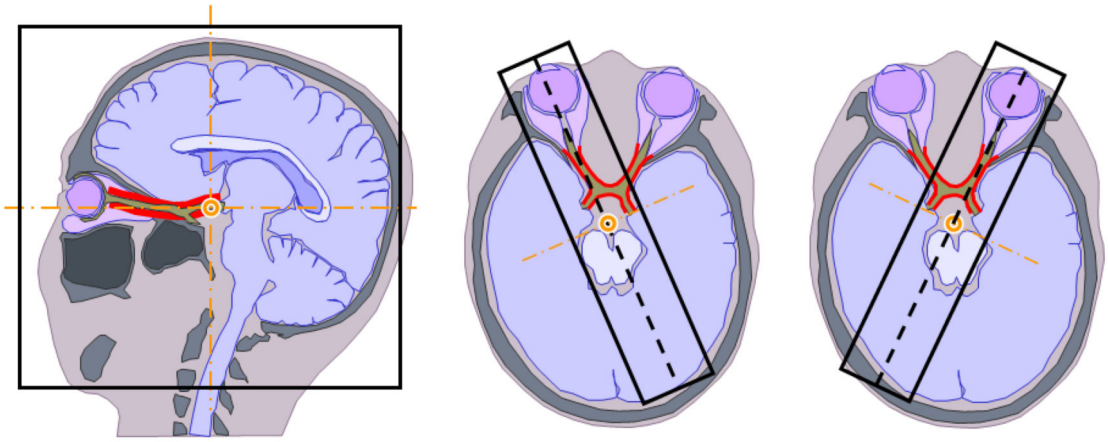
Application:

- Alignment to the contours of the optic nerves
- Mainly based on the intracranial part of the optic nerves and on the optic chiasm
- Special features: If the clinical protocol defines exactly two sagittal slice groups, the following is applied automatically: The first slice group is aligned by **Head > Optic nerve L**; the second, by **Head > Optic nerve R**.

Alignment:

- Tilted Tra > Sag: the intercranial part of both optical nerves is included
- Tilted Tra > Cor: both optical nerves and the optic chiasm are included
- Inplane rotation: the column vector of the resulting transverse plane is within the midsagittal plane
- Center: midsagittal plane and optic chiasm

2.3.3.6 Head > Optic nerve L/Head > Optic nerve R



The **Head > Optic nerve L/Head > Optic nerve R** reference is initialized with the values of the **Head > Optic nerves** reference. It provides robust and symmetric sagittal views of the left (or right) optic nerve.

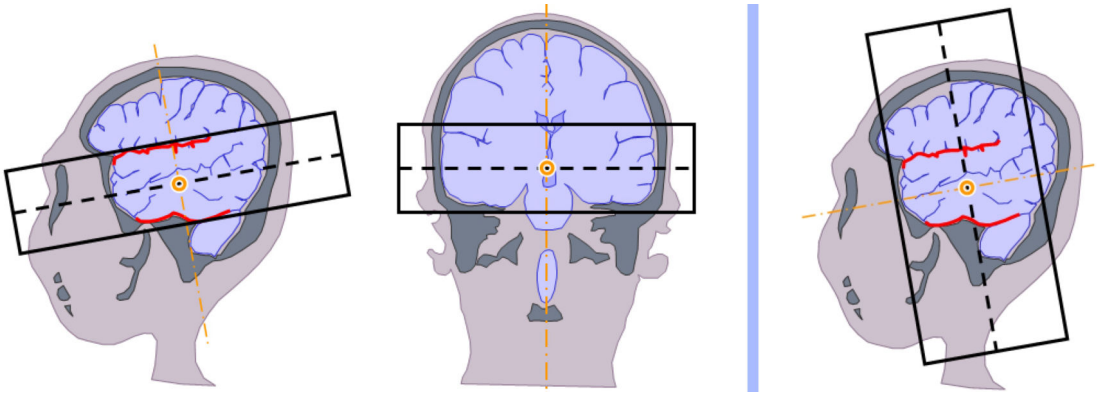
Application:

- Based on the optic nerves and the optic chiasm

Alignment:

- Tilted Sag>Cor: for each optic nerve, the connection point lies in a plane with the eyeball
- Center: the center point lies 4 mm behind of the optic chiasm center

2.3.3.7 Head > Temporal lobe



The **Head > Temporal lobe** reference is provided for transverse and coronal protocols.

The transverse orientation is derived from the lateral fissure line above the temporal lobe. The center lies at the center of a bounding box around the temporal lobe being examined.

The **Head > Temporal lobe** reference is initialized with the values of the **Head > Basis** reference.

Application:

- Provides robust transverse and coronal views of the temporal lobe
- Tilted Tra>Cor: to be parallel to the left and right lateral fissure line
- Right-left axis: perpendicular to the midsagittal plane
- Right-left center: on the on the midsagittal plane
- Feet-head center: in the mid-plane between the lateral fissure plane and a parallel plane that passes through the IAC
- Anterior-posterior center: the midpoint between the front plane and the back plane of the temporal lobe

2.3.4 AutoAlign Knee

The AutoAlign Knee scout scans a transverse, T1-weighted 3D volume at the isocenter and computes the AutoAlign Knee references. The resulting MPR images are automatically loaded into the graphical segments of the **Examination** screen.

When using AutoAlign Knee scouts, ensure that the knee is not rotated more than 15°.

AAKnee_Scout protocol

A collection of AutoAlign Knee scout protocols – one for each knee coil – can be found in the following protocol tree:

\SIEMENS\knee\library\localizer

We recommend that you copy the relevant protocols into your scan program.

Saturation regions

If saturation regions are configured for knee imaging, the first saturation region is automatically set to paracoronal.

You have to configure the AutoAlign positioning of saturation regions in the myExam Cockpit. If you insert a saturation region into a protocol in the queue during measurement, you must position the saturation region manually.

AutoAlign Knee references

AutoAlign Knee computes the following AutoAlign references in the knee joint:

- (→ Page 52 *Knee > Standard*)
- (→ Page 55 *Knee > Meniscus*)
- (→ Page 55 *Knee > Meniscus*)
- (→ Page 56 *Knee > Patella routine*)
- (→ Page 57 *Knee > Patella cartilage*)
- (→ Page 58 *Knee > Femur cartilage*)
- (→ Page 58 *Knee > ACL (Sag > Cor)*)

- (➔ Page 59 *Knee > ACL (Sag > Tra)*)
- (➔ Page 61 *Knee > PCL*)

The AutoAlign references **Knee > Meniscus**, **Knee > Patella cartilage** and **Knee > Femur cartilage** are designed for high reproducibility in follow-up examinations.

2.3.4.1 Knee > Standard

Depending on the main orientation of a clinical protocol, the **Knee > Standard** reference adapts the positions by means of one of the following AutoAlign matrices:

- Knee > Transverse

  (➔ Page 52 *Knee > Standard (Transverse)*)

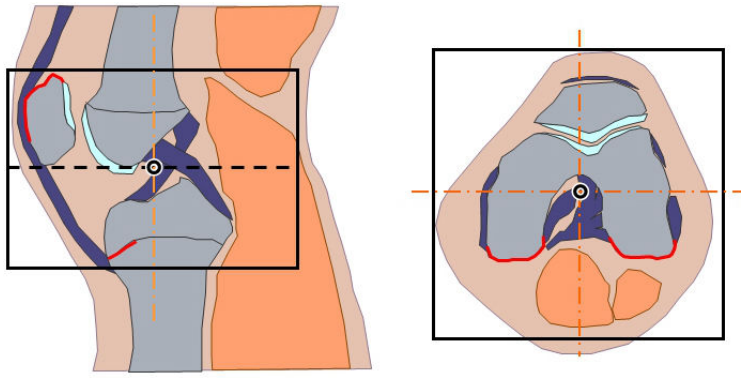
- Knee > Sagittal

  (➔ Page 53 *Knee > Standard (Sagittal)*)

- Knee > Coronal

  (➔ Page 54 *Knee > Standard (Coronal)*)

2.3.4.2 Knee > Standard (Transverse)



The **Knee > Transverse** reference provides robust coverage of the knee joint within a transverse knee protocol by means of an auto-adapted center point.

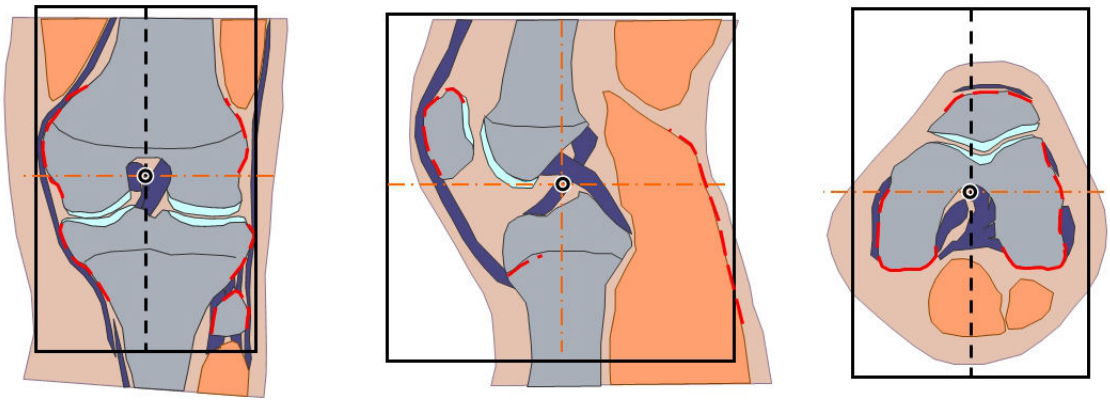
Application:

- Standard transverse scans of the whole knee joint

Alignment:

- Feet-head center: mid-point between the top tip of the patella and the tibial growth plate. If the patella cannot be fully included, the center is moved towards the head, until the patella is included with a margin of at least 3 mm.
- Right-left center: If parts of the whole knee joint are not covered in the standard slice box, and if the total size of the knee in the right-left direction (within a margin of 3 mm) is smaller than the defined slice box, the center is moved right or left to cover the knee.
- Anterior-posterior center: If parts of the whole knee joint are not covered in the standard slice box, the center is first moved into the geometric center of the whole knee. Starting from here, the center is moved toward the anterior, until the anterior skin in the center patella plane is included with no remaining margin.

2.3.4.3 Knee > Standard (Sagittal)



The **Knee > Sagittal** reference provides robust positioning for sagittal knee protocols by an autoadapted center point.

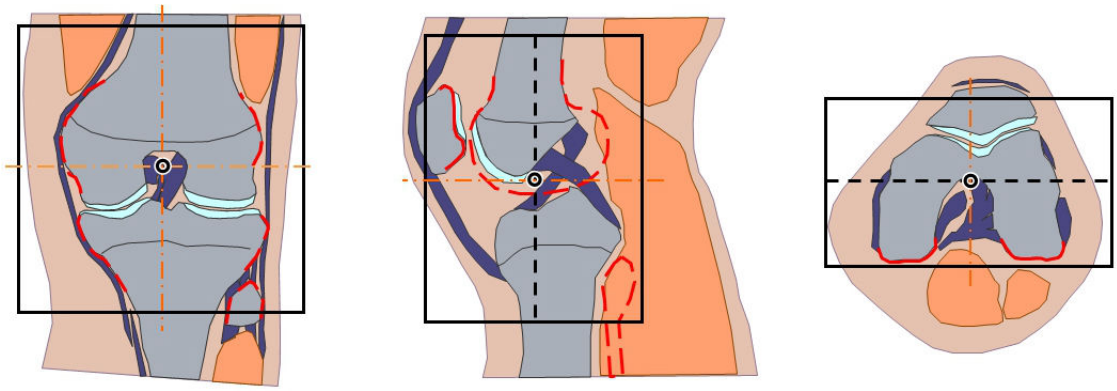
Application:

- Standard sagittal scans of the knee joint

Alignment:

- Feet-head center: Same center point as **Knee > Standard (Transverse)** reference.
- Right-left center: Is automatically adapted within the range of the slice box, so that the whole femur and whole tibia is centered. If there is enough space on the medial side between femur (with a margin of 3 mm) and the slice box, the center is shifted toward the side to attempt to include the fibula.
- Anterior-posterior center: Same as for **Knee > Standard (Transverse)** reference.

2.3.4.4 Knee > Standard (Coronal)



The **Knee > Coronal** reference provides robust positioning within coronal knee protocols by means of an autoadapted center.

Application:

- Standard coronal scans of the knee joint

Alignment:

- Feet-head center: Same center point as for **Knee > Standard (Transverse)** reference
- Right-left center: the center remains in the midsagittal plane, defined by the **Knee > Meniscus** reference.

- Anterior-posterior center: The bones are included by the following bone priority:

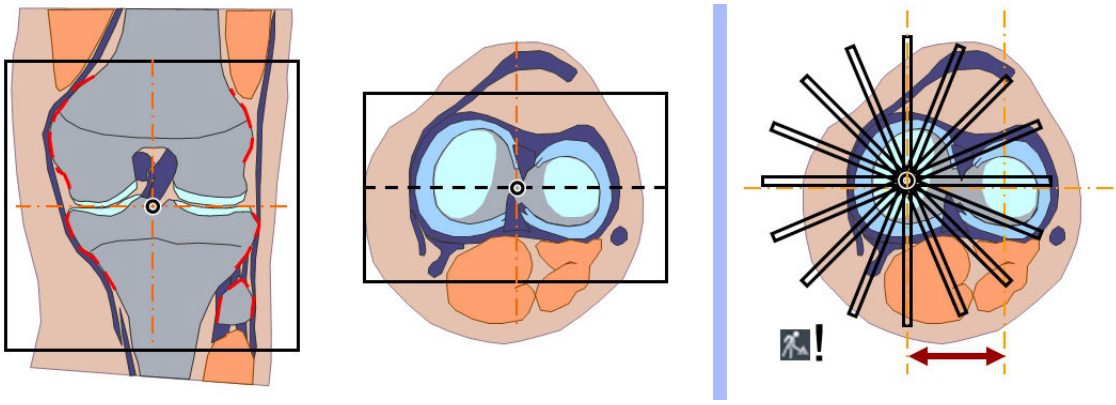
  1. The tibia (max. the upper 40 mm) must be included (margin: 3 mm)

  2. The femur (max. the lower 60 mm) must be included (margin: 3 mm)

  3. If possible the tibia (margin: 3 mm) should be included by moving the slice box toward the posterior.

  4. As long as the tibia is included and there is enough space, the patella should be included as much as possible.

2.3.4.5 Knee > Meniscus



The **Knee > Meniscus** reference is the most important knee reference, as it provides the basic orientations in the knee, also for other AutoAlign references.

The center of the **Knee > Meniscus** reference is “bone-based” and therefore does not take into account the size of the whole knee joint (muscle, fat, potential swellings).

Application:

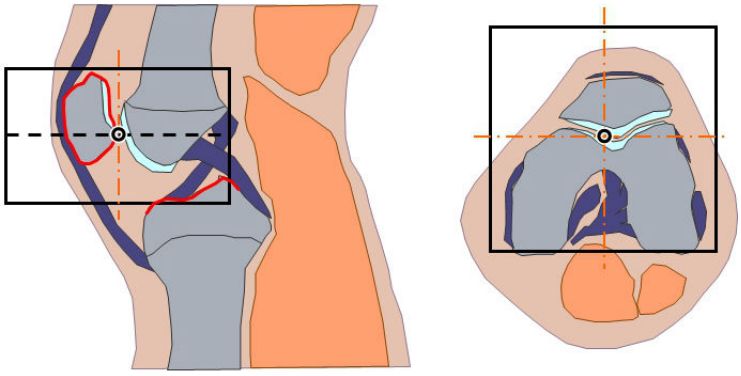
- sagittal/coronal meniscus imaging with a group of parallel slices.

Alignment:

- Cor>Sag: Pre-aligned axial plane at the center of the condyles.
- Tra>Cor: Sagittal intersection of the medial femur condyle.

- Tra>Sag: Two approximate parallel lines in a coronal plane of the knee: the first line is along the bottom edges of the medial and lateral condyle, the second line is the so-called “joint space Right-Left line” that passes through the medial and lateral center of the joint space.
- Feet-head center: On the “joint space Right-Left line”.
- Right-left center: The projection point of the Center of Tibia Intercondylar Eminence (CTIE) into the transverse plane of the **Knee > Meniscus** reference.
- Anterior-posterior center: The projection point of the Center of Tibia Intercondylar Eminence (CTIE) into the transverse plane of the **Knee > Meniscus** reference.

2.3.4.6 Knee > Patella routine



The **Knee > Patella routine** reference provides robust positioning for straight axial patella scans. It has the same orientation as the **Knee > Meniscus** reference, but the center point is in the joint space between the patella and femur.

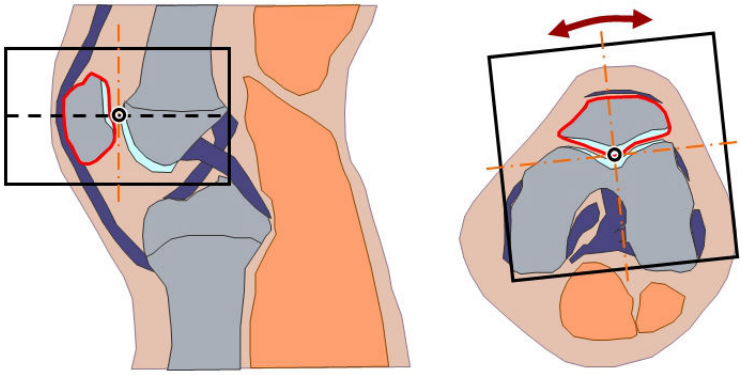
Application:

- Standard patella imaging (not focusing on high reproducibility of the patellar cartilage).
- Supports a small field of view (without offset) and a large field of view (with offset towards posterior) because the A-P center point is fixed in the joint space between patella and femur.

Alignment:

- Right-left center: Lies on the midsagittal plane.
- Feet-head center: Includes the top tip of the patella with 10 mm margin.
- Anterior-posterior center: In the joint space between the patella and the femur.

2.3.4.7 Knee > Patella cartilage



The **Knee > Patella cartilage** reference provides reproducible views of the patella cartilage for special cartilage examinations and follow-up exams.

Unlike from the **Knee > Patella routine** reference, the **Knee > Patella cartilage** reference does not depend on any other anatomy than the patella itself.

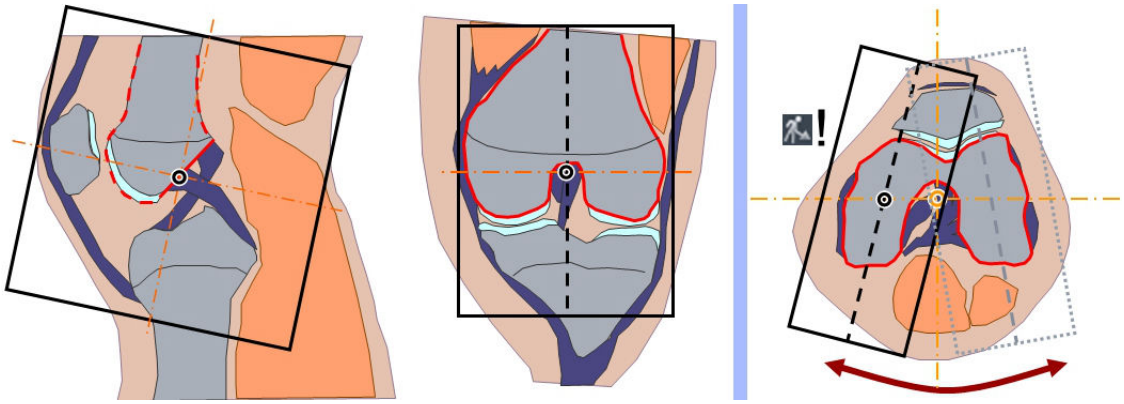
Application:

- Special patella cartilage imaging
- Supports a small field of view (without offset) and a large field of view (with offset towards posterior) because the A-P center point is fixed in the joint space between the patella and the femur

Alignment:

- Perpendicular to the patella cartilage
- The center point is on the posterior edge of the patella.

2.3.4.8 Knee > Femur cartilage



The **Knee > Femur cartilage** reference provides highly reproducible positioning for cartilage examinations of the femur in follow up exams. As the knee joint may be bent in a different way between the examinations, the **Knee > Femur cartilage** reference does not depend on any other anatomy than the femur itself.

Application:

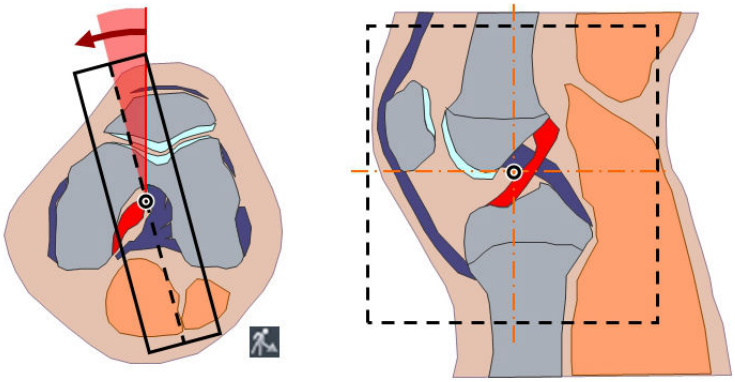
- Special femur cartilage imaging
- Used, for example, for monitoring an arthritic process or the progress of a knee therapy

Alignment:

- The center point is in the intercondylar fossa.
- The orientation is derived from Blumensaat's line.

2.3.4.9 Knee > ACL (Sag > Cor)

The **Knee > ACL (Sag > Cor)** reference provides a robust, sagittal standard view of the anterior cruciate ligament (ACL) with a fixed tilt starting from the Knee midsagittal plane (**Knee > Meniscus** reference).



Application:

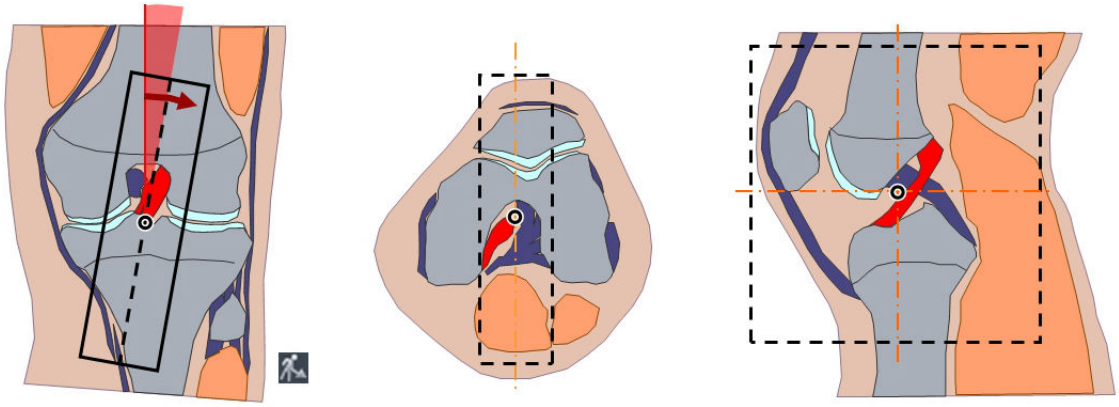
- Sagittal imaging of the anterior cruciate ligament. Sagittal slices are tilted toward Cor.
- Based on bony landmarks, and therefore independent of the status or existence of the anterior ligament itself.
- Used, for example, in a suspected case of a cruciate ligament rupture or post-surgery scans after a cruciate ligament replacement.
- Detects laterality and applies the tilt (+/–) accordingly.

Alignment:

- Tilted Sag > Cor by 15 degrees (+/–), starting from the midsagittal plane that is provided by the **Knee > Standard (Sagittal)** reference.
- In the right knee, a positive Sag > Cor tilt is applied.
- In the left knee, a negative Sag > Cor tilt is applied.

2.3.4.10 Knee > ACL (Sag > Tra)

The **Knee > ACL (Sag > Tra)** reference provides a robust, sagittal standard view of the anterior cruciate ligament (ACL) with a fixed tilt starting from the Knee midsagittal plane (**Knee > Meniscus** reference).



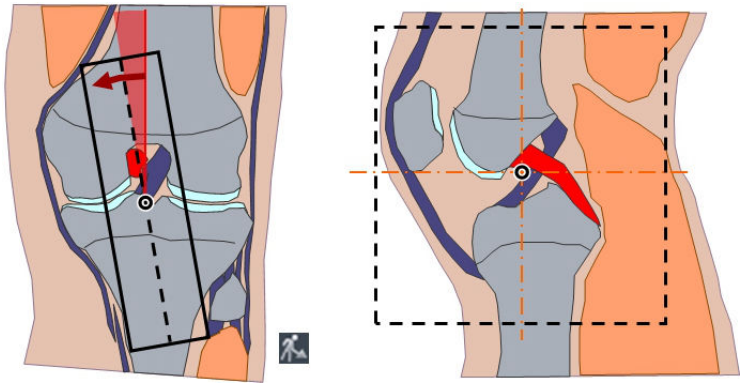
Application:

- Sagittal imaging of the anterior cruciate ligament. Sagittal slices are tilted toward Tra.
- Based on bony landmarks, and therefore independent of the status or existence of the anterior ligament itself.
- Used, for example, in a suspected case of a cruciate ligament rupture or post-surgery scans after a cruciate ligament replacement.
- Detects laterality and applies the tilt (+/–) accordingly.

Alignment:

- Tilted Sag > Tra by 8 degrees (+/–), starting from the midsagittal plane that is provided by the **Knee > Standard (Sagittal)** reference.
- In the right knee, a negative Sag > Tra tilt is applied.
- In the left knee, a positive Sag > Tra tilt is applied.

2.3.4.11 Knee > PCL



The **Knee > PCL** reference provides a robust, sagittal standard view of the posterior cruciate ligament (PCL) with a fixed tilt starting from the knee midsagittal plane (**Knee > Standard** reference).

Application:

- Sagittal imaging of the posterior cruciate ligament.
- Based on bony landmarks, therefore independent of the status or existence of the posterior ligament itself.
- Used, for example, in the suspected case of a cruciate ligament rupture or post-surgery scans after a cruciate ligament replacement.
- Detects laterality and applies the tilt (+/–) accordingly.

Alignment:

- Tilted Sag > Tra by 10 degrees (+/–), starting from the midsagittal plane that is provided by the **Knee > Standard (Sagittal)** reference.
- In the right knee, a positive tilted Sag > Tra is applied.
- In the left knee, a negative tilted Sag > Tra is applied.

2.3.5 AutoAlign Hip

The AutoAlign Hip scout scans a coronal, T1-weighted 3D volume at the isocenter and computes the AutoAlign Hip references.

The resulting localizer images are automatically loaded into the graphical segments of the **Examination** screen. For bilateral hip scans, MPRs with coronal and transverse orientation are calculated. For unilateral hip scans, MPRs in sagittal, coronal, and transverse orientation are presented.

AAHip_Scout protocol

The AutoAlign Hip scout protocols can be found in the following protocol tree:

\SIEMENS\Hip\library\localizer

We recommend that you copy the relevant protocols into your scan program.

Saturation regions

If saturation regions are configured for bilateral hip imaging, the first saturation region is automatically set to paracoronal for transverse view imaging and transverse for coronal view imaging.

You have to configure the AutoAlign positioning of saturation regions in the myExam Cockpit. If you insert a saturation region into a protocol in the queue during measurement, you must position the saturation region manually.

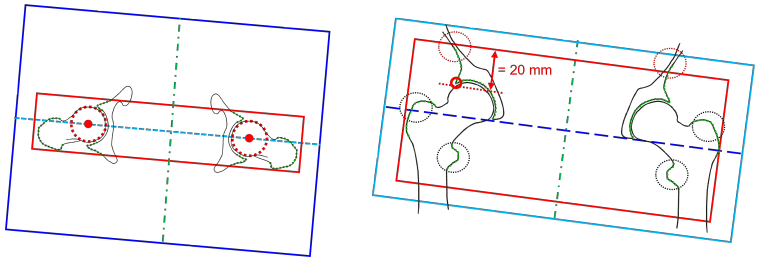
AutoAlign Hip References

AutoAlign Hip computes the following AutoAlign references of the hip:

- (→ Page 63 *Hip > (Both) Transverse*)
- (→ Page 64 *Hip > (Both) Paracoronal*)
- (→ Page 65 *Hip > (Single) Paratransverse*)
- (→ Page 66 *Hip > (Single) Transverse*)
- (→ Page 67 *Hip > (Single) Femur Axis*)
- (→ Page 68 *Hip > (Single) Paracoronal*)
- (→ Page 69 *Hip > (Single) Parasagittal*)

In addition, all single side views have a dedicated right and left side view when you are using the Body 18 coil. The side of the AutoAlign reference is automatically changed to the side registered during patient registration of a unilateral hip exam.

2.3.5.1 Hip > (Both) Transverse



Legend: blue box = slice group, red box = region of interest

The **Hip > Tra L+R** reference is used for standard transverse imaging of both hips.

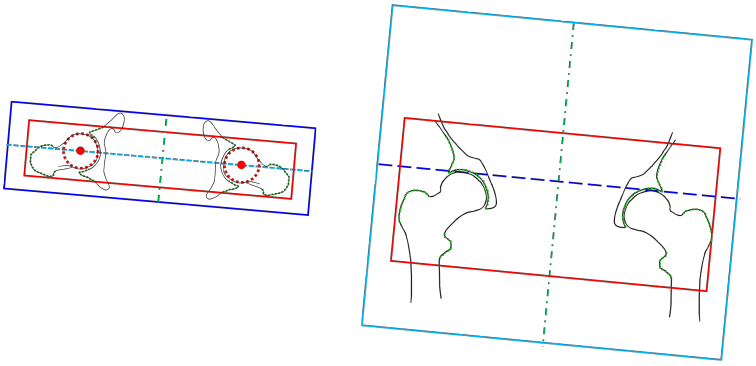
Application: Visualizes the following:

- Femur head
- Acetabulum
- Trochanter minor and major

Alignment:

- Orientation: Inplane rotation to be aligned with axis connecting the centers of two femur heads
- Positioning:
  - Right-left center: symmetry line between femur heads in transverse view
  - Anterior-posterior center: axis connecting center of femur heads in transverse view
  - Feet-head center: axis connecting bottom side of femur heads in coronal view

2.3.5.2 Hip > (Both) Paracoronal



The **Hip > Cor L+R** reference is used for standard coronal imaging of both hips.

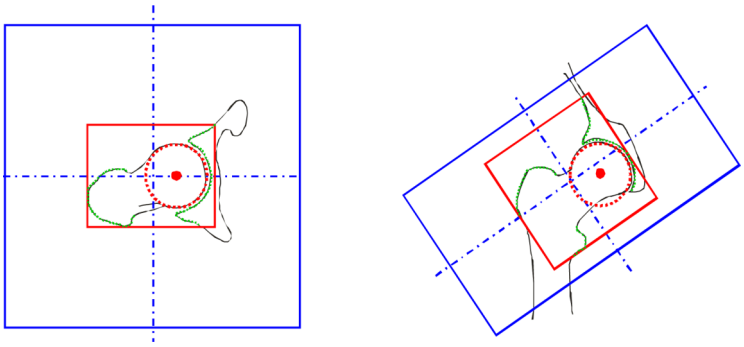
Application: Visualizes the following:

- Femur head
- Acetabulum
- Trochanter major

Alignment:

- Orientation:
  - Cor>Sag to be aligned with axis connecting center of femur heads in transverse view
  - Inplane rotation to be aligned with axis connecting top of femur heads in coronal view
- Positioning:
  - Right-left center: symmetry line between femur heads in transverse view
  - Anterior-posterior center: axis connecting center of femur heads in transverse view
  - Feet-head center: axis connecting top side of femur heads in coronal view

2.3.5.3 Hip > (Single) Paratransverse



The **Hip > Para Tra**, the **Hip > Para Tra L** and the **Hip > Para Tra R** reference are used for standard paratransverse imaging of a single hip.

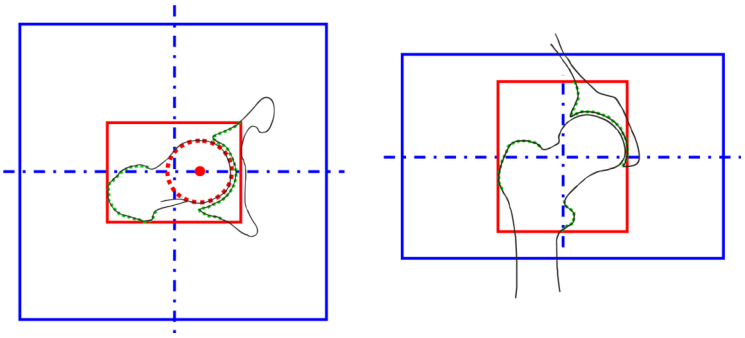
Application: Visualizes the following:

- Acetabulum - femur head
- Trochanter major and minor

Alignment:

- Orientation:
  - Aligned with the femoral neck
  - No inplane rotation
- Positioning: center of organ box

2.3.5.4 Hip > (Single) Transverse



The **Hip > Tra**, the **Hip > Tra L** and the **Hip > Tra R** reference are used for standard transverse imaging of a single hip.

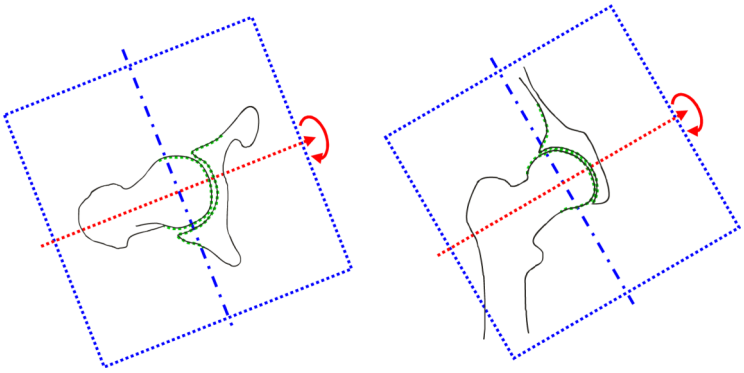
Application: Visualizes the following:

- Acetabulum - femur head
- Trochanter major and minor

Alignment

- Orientation:
  - No inplane rotation
  - Pure transverse
- Positioning: center of organ box

2.3.5.5 Hip > (Single) Femur Axis



The **Hip > Femur Neck**, the **Hip > Femur Neck L**, and the **Hip > Femur Neck R** reference are used for visualizing anatomies in a single hip with respect to the femoral neck axis.

Application: For example:

- Femoral head
- Femoral neck
- Acetabulum

Alignment:

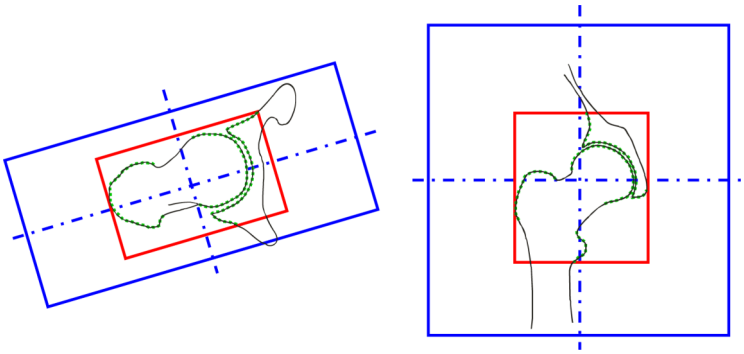
- Orientation:

  Rotation axis aligned with neck axis

- Positioning:

  Center of the femoral head

2.3.5.6 Hip > (Single) Paracoronal



The **Hip > Para Cor**, the **Hip > Para Cor L**, and the **Hip > Para Cor R** reference are used for standard paracoronal imaging of a single hip.

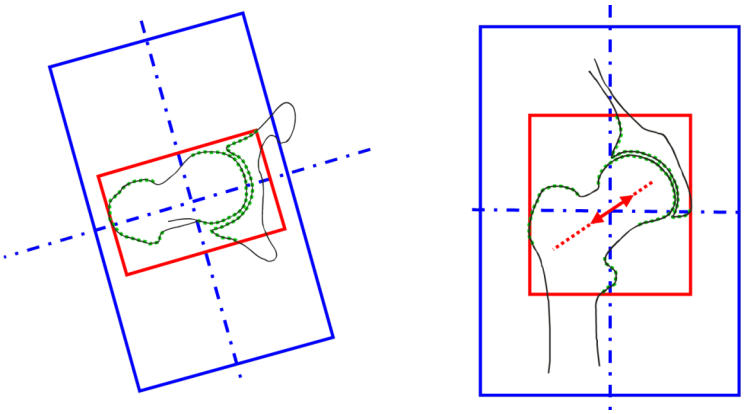
Application: Visualizes the following:

- Femoral head
- Acetabulum
- Trochanter major and minor

Alignment:

- Orientation:
  - No inplane rotation
  - Cor>Sag to be aligned with the femoral neck in transverse view
- Positioning: center of organ box, which covers relevant anatomy exactly (red box in diagram)

2.3.5.7 Hip > (Single) Parasagittal



The **Hip > Para Sag**, the **Hip > Para Sag L**, and the **Hip > Para Sag R** reference are used for standard parasagittal imaging of a single hip.

Application: Visualizes the following:

- Femoral head
- Acetabulum
- Trochanter major and minor

Alignment:

- Orientation:
  - Sag > Cor to be aligned with femoral neck
  - No inplane rotation
- Positioning: between trochanter major and acetabulum

2.3.6 AutoAlign Shoulder

The AutoAlign Shoulder scout scans a coronal, T1-weighted 3D volume at the isocenter and computes the AutoAlign Shoulder references.

The resulting localizer images in coronal, sagittal, and transverse orientation are automatically loaded into the graphical segments of the **Examination** screen.

AAShoulder_Scout protocol

The AutoAlign Shoulder scout protocol can be found in the following protocol tree:

\SIEMENS\shoulder\library\localizer

We recommend that you copy the relevant protocols into your scan program.

Saturation regions

If saturation regions are configured for shoulder imaging, the first saturation region is automatically set to parasagittal.

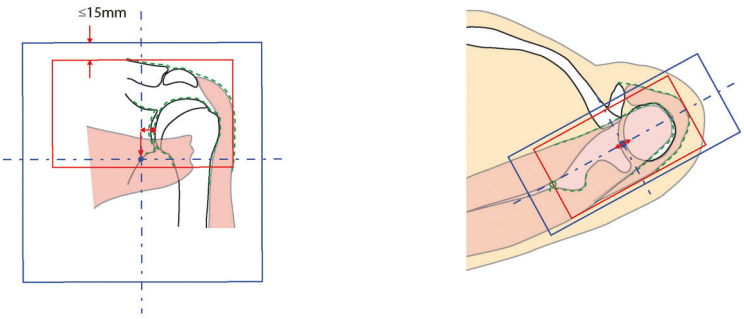
You have to configure the AutoAlign positioning of saturation regions in the myExam Cockpit. If you insert a saturation region into a protocol in the queue during measurement, you must position the saturation region manually.

AutoAlign Shoulder References

AutoAlign Shoulder computes the following AutoAlign references of the shoulder:

- (→ Page 72 *Shoulder > Parasagittal*)
- (→ Page 70 *Shoulder > Paracoronal*)
- (→ Page 72 *Shoulder > Parasagittal*)

2.3.6.1 Shoulder > Paracoronal



The **Shoulder > Para Cor** reference is used for standard coronal imaging of a shoulder.

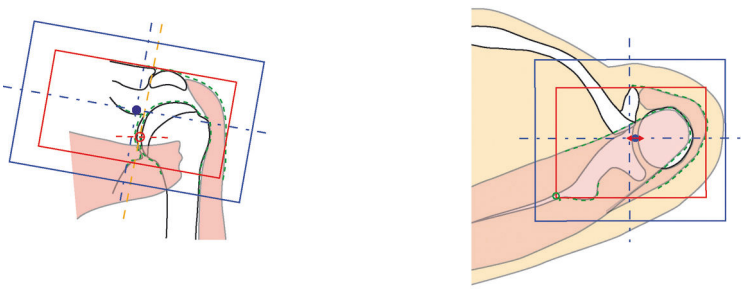
Application: Visualizing the following:

- Labrum
- Glenoid cavity/humeral head interface, along with the rotator cuff muscles

Alignment:

- Orientation:
  - Cor > Sag: to be aligned with scapula
  - No inplane rotation
- Positioning:
  - Center of the glenoid
  - Shift in medial/lateral direction to include a maximum gap of 1 cm laterally
  - Upper edge maximally 15 mm above organ box

2.3.6.2 Shoulder > Paratransverse



Legend: blue box = slice group, red box = region of interest

The **Shoulder > Para Tra** reference is used for standard paratransverse imaging of a shoulder.

Application: Basic alignment for visualizing the following:

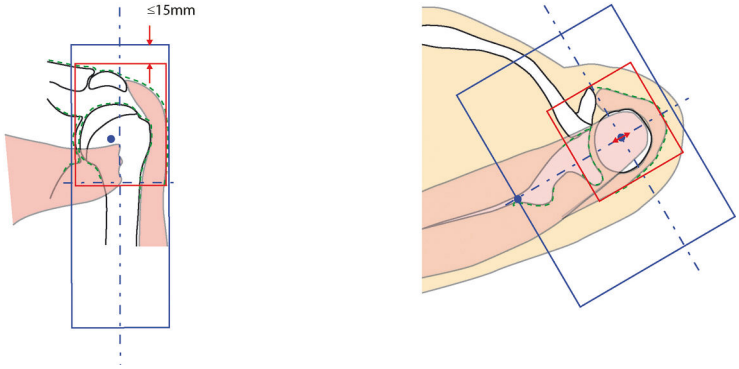
- Overall shoulder anatomy
- Acromioclavicular (ac) joint
- Rotator cuff (all tendons and ligaments around humeral head)

- Glenoid
- Humeral head
- Tip of scapula

Alignment:

- Orientation:
  - Tra > Sag: to be aligned with supraspinatus muscle fibers in coronal view
  - To be aligned with an axis defined by glenoid center and AC joint center (yellow dashed line)
  - No inplane rotation
- Positioning:
  - Initially centered by the glenoid center with shift in head/feet direction to include the AC joint
  - Shift in medial/lateral direction to center the organ box laterally

2.3.6.3 Shoulder > Parasagittal



The **Shoulder > Para Sag** reference is used for standard parasagittal imaging of a shoulder.

Application: Basic alignment for visualizing the following:

- Labrum
- Glenoid cavity/humeral head interface, along with the rotator cuff muscles

Alignment:

- Orientation
  - Sag > Cor:to be aligned with the scapula
  - To be aligned with scapula (as for Paracoronal, but rotated through 90 degrees)
  - No inplane rotation
- Positioning
  - Center of humeral head
  - Shift in medial/lateral direction to center the organ box
  - Shifted in HF direction to be maximally 15 mm above upper edge of organ box

2.3.7 AutoAlign Spine

AutoAlign Spine is part of the myExam Spine Assist.

For further information on using the myExam Spine Assist, see: Operator Manual Diagnostic MR Imaging.

CAUTION

AutoAlign Spine may result in wrong mapping of anatomical data (for example, mismatch of vertebras) due to different distortions!

Incorrect diagnosis or wrong therapy planning

◆ If you use **AutoAlign Spine**, always check the anatomy and be aware of possible wrong mapping.

2.3.7.1 AutoAlign Spine scout

The AutoAlign Spine scout scans a volume at the isocenter and computes the AutoAlign Spine landmarks.

The field of view (FOV) of the scout is large enough to cover the L-spine, the T-spine, or the C-spine. To scan the entire spine of an average sized adult, three scouts are necessary.

AutoAlign Spine supports:

- Detection and identification of the vertebral bodies and disks
- Prescription of sagittal, coronal, and double-oblique axial slices in the spine
- Prescription of an anterior regular saturation region
- Labeling of axial slices with the vertebrae and vertebral disk labels

The resulting MPR and CPR localizer images are loaded into the graphical segments of the **Examination** screen.

AAspine_scout:

- **Stationary Spine scout** (C-Spine, L-Spine):

  The scout scans the local spine at the current table position, starting at the light marker position.

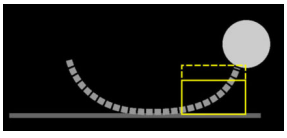
- **Whole-Spine Scout** (e.g. C-T-Spine, T-L-Spine, Whole-Spine):

  The scout scans the whole spine at 2 to 3 table positions, starting at the light marker position.

AAspine_scout protocols can be found in the c-/t-/l-spine protocol libraries of the SIEMENS protocol tree.

The average scan duration of an AutoAlign Spine scout is about 20 seconds measurement time plus 10 seconds AutoAlign computing and reconstruction time per table position.

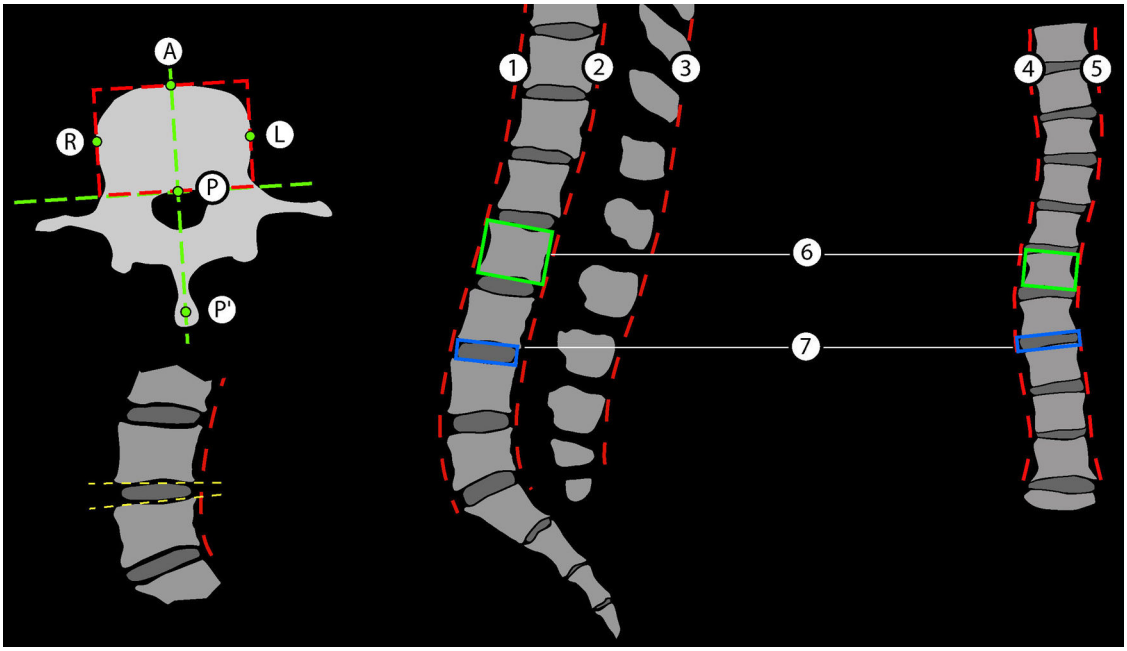
Thickness of the AA scout volume:



The number of slices of the scout can be increased. This may be required for patients with strong kyphosis.

For this purpose, the **Slices per slab** and **TR** parameters can be adapted.

2.3.7.2 AutoAlign landmarks



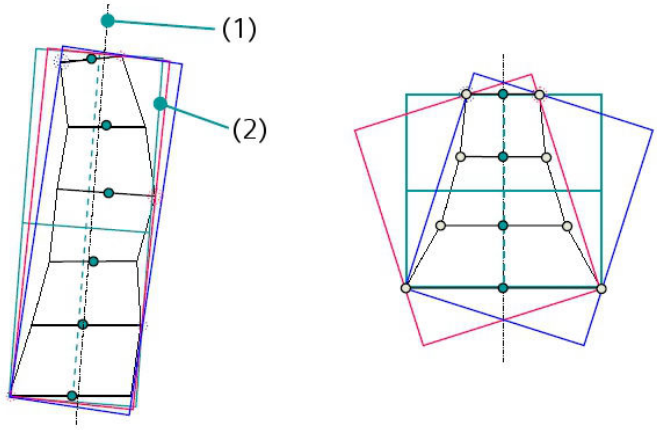
The **AutoAlign Spine** reference derives the spine geometry from multiple landmarks:

(1)	Anterior spine geometry line (spline through all A-points.)
(2)	Posterior spine geometry line (spline through all P-points.)
(3)	Spinous process geometry line (spline through all P'-points.)
(4), (5)	Left and right spine geometry line (spline through all R- or L-points.)

(6)	Vertebral body
(7)	Disk cartridge A disk cartridge is computed as the mid-plane between the lower plate of the upper vertebral body and the upper plate of the lower vertebral body.

So called Minimal Bounding Boxes (MMBs) are used to help to determine the final positioning of the protocol geometry, such as the slices. The minimal bounding box encompasses all vertebras and vertebral disks within the spine part of interest.

The left and right borders of the MBB (linear fitting slice box in the following image) are parallel to a linear fitting line that connects the given landmarks.



(1)	Linear fitting line
(2)	Linear fitting slice box

2.3.7.3 Clinical protocols

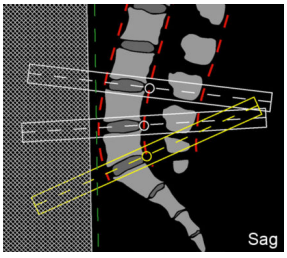
A clinical protocol can reference one of the following AutoAlign references:

- Spine > Cervical
- Spine > Thoracic
- Spine > Lumbar

AutoAlign suggests positioning for the slices/slabs and saturation regions of the protocol in the center of the corresponding part of the spine.

You can define the offset of the saturation region within the extended configuration of the linked Spine Positioning AddIn.

2.3.7.4 AutoAlign Spine Scenarios



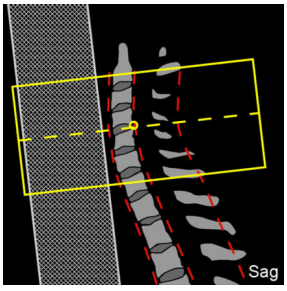
Axial slices are positioned in the disk cartridge plane.

The tilt is double-oblique. It is derived from the averaged lower and upper plate of the adjacent vertebrae.

The slice group center is located on the posterior spine geometry line. The axial slices are not inplane-rotated.

A saturation region is positioned tangential to the anterior spine geometry line with a user-configurable gap. You can adapt the positioning of the saturation region to avoid artifacts.

Axial slabs:



Axial slabs (slice groups of 9 or more slices) are positioned perpendicular to the posterior spine geometry line.

The slice group center is located on the posterior spine geometry line. The tilt is double-oblique. The axial slices are not inplane-rotated.

A saturation region is positioned tangential to the anterior spine geometry line with a user-configurable gap. You can adapt the positioning of the saturation region to avoid artefacts.

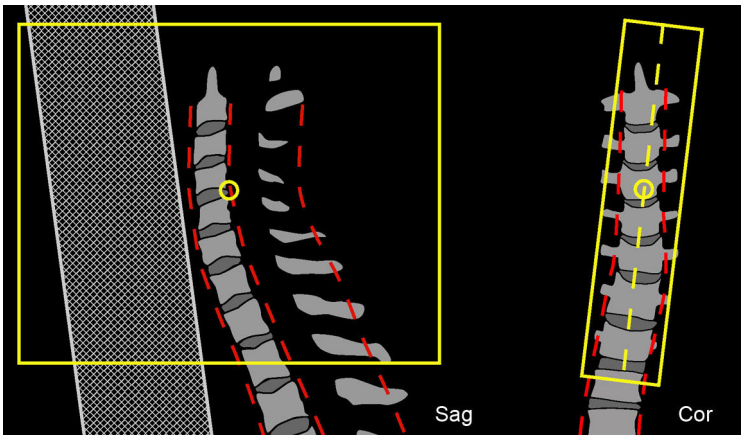
Sagittal protocols:

The position and orientation of sagittal protocols is derived from the left and right spine geometry line in the focused spine part (in this case C2/C7 .. T1). The tilt is single-oblique.

If Auto Coverage is activated and configured accordingly, the necessary number of slices is suggested.

The slice group center is located on the posterior spine geometry line. The sagittal slices are not inplane-rotated.

A saturation region is positioned tangential to the anterior spine geometry line with a user-configurable gap. You can adapt the positioning of the saturation region to avoid artifacts.



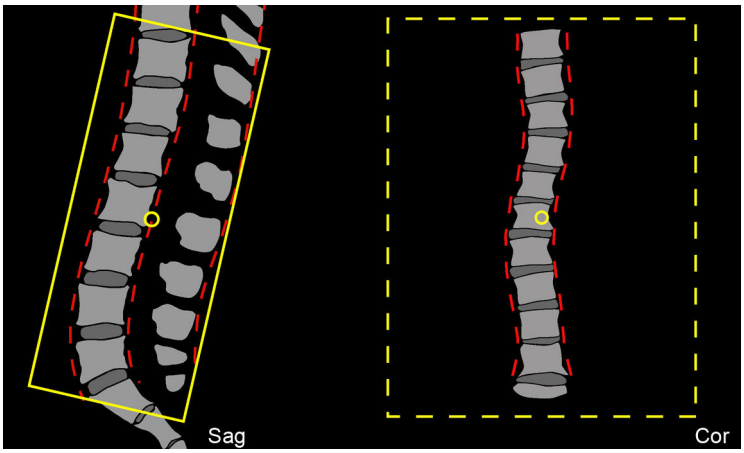
Coronal Slabs:

The position and orientation of coronal protocols is derived from the anterior and posterior spine geometry line in the focused spine part.

If Auto Coverage is activated and configured accordingly, the necessary number of slices will be suggested.

The center is located on the posterior spine geometry line and in the common center of the left and right spine geometry line.

The tilt is single-oblique. The slices have inplane rotation.



2.3.8 Creating and modifying an AutoAlign program

Creating an AutoAlign program consists of the following steps:

- (→ Page 79 *Running an AutoAlign scout*)
- (→ Page 80 *Adapting a protocol*)
- (→ Page 81 *Saving the queue as a new program*)
- (→ Page 81 *Optimizing the workflow parameters*)
- (→ Page 81 *Testing the program*)

2.3.8.1 Running an AutoAlign scout

1 Register a volunteer.

2 Select a program containing an AutoAlign scout.

Only use predefined AutoAlign scouts from the Siemens localizer libraries, e.g.

- **\\SIEMENS\head\library\localizer\AAhead_scout**
- **\\SIEMENS\knee\library\localizer\AAknee_scout**

3 Start the AutoAlign scout in the program control.

4 Wait until the AutoAlign scout has finished.

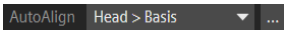
2.3.8.2 Adapting a protocol

1 In the measurement queue, double-click a protocol.

The parameter cards are displayed.

2 Select **Geometry/AutoAlign**.

The **AutoAlign** tab is displayed.



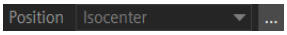
3 In the field **AutoAlign** field, set the required AutoAlign reference.

For **AutoAlign Spine**, go to the **Routine** parameter card and select the AutoAlign reference.

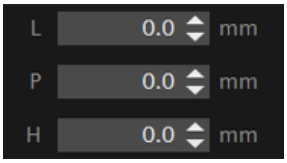
You can edit the AutoAlign region and reference by clicking the **[...]** button.



4 In the **Orientation** field, predefine the main orientation (Sagittal, Coronal, Transverse).



5 In the **Position** field, set the position to **Isocenter**.



6 If required, define initial positioning offsets in the **L**, **P**, and **H** fields or drag the slices in the graphical slice positioning after applying the AutoAlign reference.

We recommend that you round the offset values.

When planning the slices, make sure that the effective thickness of your slice group/slab is large enough to cover the typical anatomical variances within your patients.

2.3.8.3 Saving the queue as a new program

1 In the wait queue, right-click the protocol and choose **Save as ...** from the context menu to save the protocol as a new program.

The **Save as** dialog box opens.

2 Enter a path (region, exam) and a program name.

(➔ Page 229 *Saving the measurement program*)

2.3.8.4 Optimizing the workflow parameters

1 Set **Copy references** between the protocols where necessary.

(➔ Page 227 *Creating copy references*)

2 Set the execution settings of the protocol as required.

(➔ Page 299 *Execution*)

Even with the use of the correct **AutoAlign** reference and with well-defined **Position** and **Orientation** offsets, some clinical protocols might need user interaction before scanning, for example the user needs to decide on additional slices for a good coverage or to adapt a sat band in addition to the well-aligned slice group.

- Protocols that may require user interaction should be set up with a construction worker symbol.
- Protocols that are well aligned and do not require user interaction can be set up without a construction worker symbol. These protocols should run first. In the meantime, the user will prepare or adapt the semi-automated protocols.

2.3.8.5 Testing the program

◆ Test the new AutoAlign program with different volunteers to optimize the program or the initial values for position and orientation.

2.3.9 Simultaneously changing AutoAlign parameters of multiple protocols

In the **myExam Cockpit**, it is possible to change the AutoAlign parameter of multiple selected protocols in one run.

(→ Page 267 *Modifying properties in several protocols or program steps*)

Prior to editing the step properties, you have to select the requested protocols with a search dialog.

1 Open the **myExam Cockpit**.

2 Select **Find** in the context menu of a structure element (region, exam, or program).

3 In the **Find and Set Parameters** dialog box, enter the **Name** searched for and set "Measurement Step" in the **Type** selection list.

4 Multi-select the protocols in the search result list and click the **Edit selected** button.

5 Change the AutoAlign parameters as required on the **Protocol Parameters** card.

2.3.10 Importing an AutoAlign program from another system or software version

An AutoAlign program that is based on an older software version must usually be adjusted before it is used for the first time.

2.3.10.1 From Atlas-based to Landmark-based AutoAlign Head

If the imported scan program previously used the atlas-based AutoAlign (AAScout) Head principle, adapt the scan program as follows:

1 Insert the landmark-based AutoAlign scout **AAhead_scout** where previously an atlas-based **AAScout** was used.

2 Remove any additional standard localizers.



These localizers are no longer needed as several MPR localizer images are generated from the landmark-based AutoAlign scout.

3 To obtain a positioning that is as similar to the old AutoAlign principle as possible, set the **AutoAlign** reference parameter to **Head > Brain** in all clinical **AutoAlign** protocols.

– or –

Use the new, more specialized **AutoAlign** references like **Head > Basis**, **Head > IAC**, **Head > Orbits** or **Head > Temporal lobe** where possible.

4 Since these **AutoAlign** references may require other **Position** and **Orientation** offsets, start with a zero offset.

2.3.10.2 From *syngo* MR Bxx to *syngo* MR D11 or higher

A scan program that is based on the software version *syngo* MR Bxx (e.g. B17, B19, B20) may already be set up with a landmark-based AutoAlign scout. In this case, the user can execute the scan program without adaptions.

However, the imported scan program can still be optimized.

1 Use the extended AutoAlign functionality.

2 Adapt and test the protocols.

AutoAlign Head: In *syngo* MR B17, only the **AutoAlign** references **Head > Basis** and **Head > Brain** were available. Scan protocols, e.g. for the inner ear, were set up with an offset based on the given **AutoAlign** reference. We recommend that you adapt such protocols to take full advantage of the new **AutoAlign** references like **Head > Inner ear**, **Head > Orbits**, **Head > Optic nerves** and **Head > Temporal lobe**.

AutoAlign Knee: In *syngo* MR B17, only the **AutoAlign** reference **Knee > Basis** was available. In all imported protocols that used this reference, the new **AutoAlign** reference **Knee > Standard** is applied. We recommend that you remove any previous **Position** and **Orientation** offsets and that you use the new **AutoAlign** references like **Knee > Meniscus**, **Knee > Patella routine**, **Knee > Patella cartilage**, and **Knee > PCL**.

2.4 Managing patient data and studies

The **Patient Browser** is the entry point for searching and managing patient data and studies.

(→ Page 87 *Adding or removing columns in the Patient Browser*)

(→ Page 89 *Quick search of studies*)

(→ Page 91 *Searching studies with filters*)

(→ Page 92 *Searching studies with DICOM Query/Retrieve*)

(→ Page 98 *Loading studies for reading*)

(→ Page 99 *Loading multiple studies for reading*)

(→ Page 100 *Loading additional data from the Patient Browser*)

(→ Page 101 *Batch loading of patient data*)

(→ Page 103 *Canceling workflows*)

(→ Page 93 *Creating or modifying work lists*)

(→ Page 121 *Correcting and rearranging data*)

(→ Page 120 *Marking studies*)

(→ Page 132 *Splitting series*)

(→ Page 126 *Merging patient data*)

(→ Page 127 *Merging studies*)

(→ Page 139 *Displaying the DICOM header of an instance*)

(→ Page 140 *Starting an examination from the Patient Browser*)

(→ Page 141 *Continuing an examination from the Patient Browser*)

(→ Page 102 *Importing image data*)

(→ Page 103 *Exporting data*)

(→ Page 115 *Printing images*)

(→ Page 117 *Selecting data for archiving*)

(→ Page 136 *Deleting data from Short Term Storage (STS)*)

2.4.1 Opening the Patient Browser

You use the **Patient Browser** for searching and managing patient data, series, and instances.



1 In the top left access bar, click the **Patient Browser** icon.

– or –

At the bottom of the **Patient Registration** tab, click the **Local Data** button to see the studies that belong to the selected patient.

The **Patient Browser** window is displayed in the foreground.

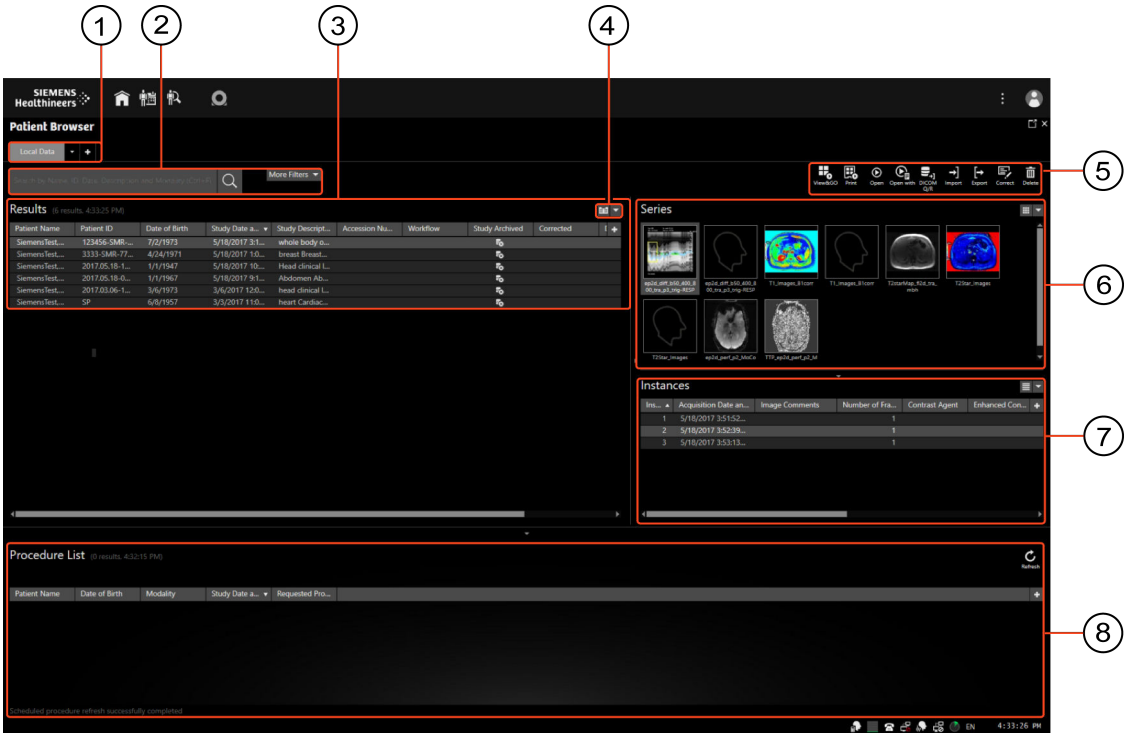


If you get an error message when trying to open the **Patient Browser**, ask your clinical administrator to check the assigend user role.

2 Drag the triangles to increase or decrease the area of the **Results** list, the **Series** list, **Instances** list, or the **Procedure List**.

2.4.1.1 Patient Browser screen layout

The **Patient Browser** window consists of the following areas:



(1) Work list bar
Shows up to five work lists.
(➔ Page 93 *Creating or modifying work lists*)

(2) Search area
Enables the search with the Quick search and the search with advanced filters.
(➔ Page 89 *Quick search of studies*)
(➔ Page 91 *Searching studies with filters*)

(3) **Results** list
Shows the data that matches the current search criteria.

(4) Switch for the **Patient View** and the **Study View** in the **Results** list.

(5) Toolbar

(6) **Series** list
Shows the series of the selected study.
Thumbnails: Shows a thumbnail for each series of the selected study.
List: Lists the series of the selected study.

(7) **Instances** list

Shows the images and results of the selected series.
Preview: Shows a preview of the selected series. You can scroll through the preview.
Thumbnails: Shows a thumbnail for each frame of the selected series.
List: Lists the instances of the selected series.

(8) **Procedure List**
Shows the requested procedures.

Depending on your screen orientation (landscape or portrait), the layout of the **Patient Browser** may vary.

2.4.1.2 Docking / undocking windows

You can undock certain windows, for example, the **Patient Browser** window, and make them a floating window.



1 Click this icon to undock the window.

You can move the window to a convenient position. This position is preserved when you log on to the system next time.



2 Click this icon to dock the window.

If you undock the **Patient Browser** window on a secondary monitor, it will fill the entire monitor display area and remain on top even if images are loaded for reading.

2.4.2 Adding or removing columns in the Patient Browser

You can add and remove columns in the displayed lists of the **Patient Browser**.

✓ The **Patient Browser** is open.



1 In the **Results** list, the **Series** list, or the **Instances** list, click the **Plus** icon to add or remove columns.

– or –

Right-click the header of the **Results** list, the **Series** list, or the **Instances** list.

The **Show Columns** dialog box opens.

2 To add a column, select the check box next to the column name.

The column will be added to the rightmost position of the list.

– or –

To remove a column, clear the check box next to the column name.



In the text field at the top, you can type a string to filter the list for column names containing this string.

You can restore the default column setting with the **Reset** button.

3 Click **OK** to close the list.



You can reorder the columns by using a drag-and-drop operation.

2.4.3 Searching studies

In the **Patient Browser**, you have the following options to search for studies:

(➔ Page 89 *Quick search of studies*)

(➔ Page 91 *Searching studies with filters*)

(➔ Page 93 *Creating or modifying work lists*)

(➔ Page 92 *Searching studies with DICOM Query/Retrieve*)

2.4.3.1 Quick search of studies

In the **Patient Browser**, you can use a Quick search in studies. The Quick search supports a common basic search syntax. You can sort the search result and save the query in a work list.

(→ Page 90 *Search syntax*)

(→ Page 91 *Sorting search results*)

(→ Page 93 *Creating or modifying work lists*)

1 In the **Quick search** field, enter your search criteria:

- Patient Name
- Date of Birth
- Patient ID
- Study Description
- Study Date
- Accession Number
- Modality

Adhere to the DICOM format (YYYYMMDD) or to the Windows regional settings for date and time formats.



2 Click the **Search** icon.

While the search process is running, the **Search** icon changes its shape. To cancel the search, click this icon.



The search result is displayed in the **Results** list.

The **Results** list is updated periodically.

2.4.3.2 Search syntax

In the **Patient Browser**, the Quick search and the filter search supports a common basic search syntax.

Syntax and rules for names and values:

- Text strings are not case-sensitive, for example, **`Meyer`** and **`meyer`** produce the same results.
- You can enter a fragment of a name or a value, for example, **`Me`** to search for all patients whose name begins with "Me".
- You can use **`*`** as a wildcard character.

  Examples:

  - **`*eyer`** will find "Meyer", "Breyer", "Dreyermann", etc.
  - **`Me*er`** will find "Meyer", "Meier", "Meuller", etc.
- You can search for patients with composite surnames.

  In such cases, you have to enter the surname in the appropriate order in the **Quick search** field. If you just enter parts of the surname, the patient will not be found.

  Example: The last name "van Houten" must be entered starting with **`van Hou`**.
- In the **More Filters** area, you can use quotation marks "" to search for an exact term.

  Example: **`"Me"`** will only find "Me" but not "Meyer", "Meier", "Merz", etc.

  If you do not want to search for an exact term, you can also use quotation marks "" combined with **`*`** as a wildcard character.

  Example: **`"van Hou*"`** will find "van Houten".

Syntax and rules for date and time ranges

- In the **Quick search** field, you can enter a date manually.
- You can combine a date or a time range with a name or a value.

  Example: **`2013/10/25 Meyer`** will find all patients whose name is "Meyer", and whose birth date is "2013/10/25".

Ensure you adhere to the DICOM format (YYYYMMDD) or to the Windows regional settings for date and time formats.

2.4.3.3 Sorting search results

In the **Patient Browser**, you can sort the results by columns ascending or descending. Within this sorting, the results are sorted by date and time.

1 In the **Results** list, the **Series** list, or the **Instances** list, click a column header.

Not every column is suitable for sorting!

The results are sorted by the attributes of this column and the column is marked by an arrow icon.

– or –

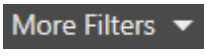
In the patient view of the **Results** list, the patient attributes, such as patient name, patient ID, patient sex, and date of birth, are hidden.

2 Click the **Patients** header to open a menu for sorting.

You can sort for the patient name, the patient ID, or the date of birth.

2.4.3.4 Searching studies with filters

In the **Patient Browser**, you can use filters and additional search criteria to refine your search.



1 Click **More Filters**.

The **More Filters** dialog box opens.

By default, the following filters are used:

- Patient Name
- Patient ID
- Accession Number

- Study Date and Time
- Study Description
- Modality



2 If you want to modify the filter, click the **Add Condition** icon.

The **Add Condition** dialog box opens. Here you can select filters to refine or modify your search. Select your filters and click **OK**.

3 Enter your search criteria in the corresponding fields.



4 Click the **Search** icon.

The search result is displayed in the **Results** list.



5 To save the query in a work list, click the **Save Work List** icon.

The **Save Work List** dialog box opens.

6 Enter a work list name and click **OK**.



7 To remove all conditions, click the **Remove All** icon.

2.4.3.5 Searching studies with DICOM Query/Retrieve

In the **Patient Browser**, you can search for prior or related studies on external media or DICOM nodes and import them into your local system.

✓ DICOM nodes are configured.

✓ The available data are DICOM-compliant.



1 On the toolbar, click the **DICOM Q/R** icon.

The **DICOM Query/Retrieve** dialog box opens.

2 Click **Source Selection** to select the source where you want to search for studies.



The preset sources are the prefetch nodes and the default archive.

3 Click **Search Filters** to specify the search criteria.



4 Click the **Search** icon.

The results are listed in the **DICOM Query/Retrieve** dialog box.



5 Select a study and click the **Retrieve** icon to retrieve the study.

The retrieval progress of the selected study or series is displayed in the **Data Source** column of the **DICOM Query/Retrieve** dialog box.

If the column is not displayed, you have to scroll to the right to see it.

The column **Data Source** may display one of the following values:

- Name of a remote DICOM node, for example, **HOSPITAL_PACS**

  This data is located on another network node. Loading it requires retrieving and may take some time.

- Name of a removable medium, for example, DVD or USB stick

When the retrieving process is finished, the study is listed in the **Results** list.

If there are no studies listed in the **Results** list, you may have to change your search criteria.

If DICOM UID change is enabled on your system and the import of the selected data fails, further steps may be required.

(➔ Page 124 *Re-importing data from the PACS after local data correction*)

2.4.4 Creating or modifying work lists



In the **Patient Browser**, work lists are predefined queries to find studies. Additionally, you can create a demo list (for example, for clinical rounds, discussions) by adding selected studies to it. The figure next to the work list name indicates the number of matching items.

(➔ Page 95 *Creating a work list*)

(→ Page 96 *Modifying a work list*)

(→ Page 97 *Creating a demo list for selected studies*)

(→ Page 97 *Renaming a work list*)

(→ Page 98 *Deleting a work list*)



Up to five work lists are shown in the work list bar. Additional work lists are available when clicking the **More work list** icon.

By using drag and drop, you can arrange the order of work lists and move them to or from the **More Work Lists** menu (hide/show).

Work lists basing on filters

The work lists for your daily work are dynamic work lists, for example a work list containing all series that are ready to read. These work lists are based on filters. Studies are added or removed from the work list automatically due to the filter settings of the work list.

Work lists basing on collected studies (demo list)

Demo lists are work lists that are created by adding studies manually to the work list. These work lists are designed for presentation, conference, discussion, or training purposes.

As long as a study is part of a demo list it will not be deleted from the short term storage (STS) by the automatic data deletion procedure, although it can be deleted manually.

In the **More Filters** area, administrators can search for studies that are part of a demo list. Information whether the study is part of a demo list can be shown in the **Demo List** column of the **Results** list.

(→ Page 91 *Searching studies with filters*)

Public work lists

Public work lists are customized work lists that are available for all users. To create and modify public work lists, you need clinical administrator rights.

Customized work lists

You can create, modify, and delete user-specific work lists according to your needs.

Purpose	Settings in the Search area
Reading everything	**Workitem Type**: Read **Workflow Status**: Ready or Saved
Reading everything from a certain modality type	**Workitem Type**: Read **Workflow Status**: Ready or Saved **Modality**: for example, **MR**
Reading everything where study description matches a pattern	**Workitem Type**: Read **Workflow Status**: Ready or Saved **Study Description**: for example, **MR*Head***
Checking for all available tasks (for administrative purposes)	**Workflow Status**: Ready or Saved (Use this work list to check for open tasks throughout all work lists at the end of a day.)

Example work lists for various purposes

2.4.4.1 Creating a work list

In the **Patient Browser**, you can customize and save work lists. As a clinical administrator, you can save work lists for all users (public work lists).



1 To clear the entry in the **Quick search** field, click the **X** in the **Quick search** field.



Note that any entry in the **Quick search** field will be part of your work list.

It is recommended to clear the **Quick search** field before creating a new work list.

2 Click **More Filters** and enter your search criteria in the search condition fields of the **More Filters** area.



To avoid outdated filter criteria, use relative date and time formats such as *Today*, *Yesterday*, *Last 2 Days*.

3 If required, you can add or remove search condition fields.



4 In the **More Filters** area, click the **Save Work List** icon.

The **Save Work List** dialog box opens.

– or –



On the work list bar, click the **Create new Work List** icon.

The **Save Work List** dialog box opens.

5 In the **Save Work List** dialog box, select **Create a Work List using the current filters**, to create a work list that uses the current filter settings.

6 To save the work list for all users, select the **Available for all users** check box.

This option is only available to clinical administrators.

7 Enter the name of the work list and click **OK**.

The work list is saved and displayed on the work list bar.

2.4.4.2 Modifying a work list

In the **Patient Browser**, you can modify the search and filter criteria of existing work lists. To modify public work lists, you need clinical administrator rights.

1 On the work list bar, click the work list you want to edit.

The **More Filters** area shows the applied search and filter criteria.

The **Results** list shows the search results according to the work list.

2 Modify the search criteria and the filters.

3 Right-click the work list and choose **Overwrite** from the context menu.

The **Overwrite Work List** dialog box opens.

4 Click **Yes** to overwrite the work list.

The work list is modified.

2.4.4.3 Creating a demo list for selected studies

In the **Patient Browser**, you can create a demo list (for example for clinical rounds) by adding selected studies. As a clinical administrator, you can save the demo list for all users (public demo lists).



1 On the work list bar, click the **Create new Work List** icon.

   The **Save Work List** dialog box opens.

2 Select **Create a Demo List to add studies from other tabs by dragging or using the context menu**.

3 To save the demo list for all users, select the **Available for all users** check box.

   This option is only available to clinical administrators.

4 Enter the name of the demo list and click **OK**.

   An empty demo list is created.

5 Drag and drop the desired studies into the empty demo list.

   – or –

   From the context menu, select **Add to Demo List** and choose the demo list in which you want to add the study.

6 To delete a study, right-click the desired study from your demo list and choose **Remove from Demo List** from the context menu.

As long as a study is part of a demo list it will not be deleted from the short the term storage (STS) by the automatic data deletion procedure, although it can be deleted manually.

In the **More Filters** area, administrators can search for studies that are part of a demo list. Information whether the study is part of a demo list can be shown in the **Demo List** Column of the **Results** list.

(➔ Page 91 *Searching studies with filters*)

2.4.4.4 Renaming a work list

In the **Patient Browser**, you can change the name of a work list. To modify public work lists, you need clinical administrator rights.

1 On the work list bar, right-click a work list and choose **Properties** from the context menu.

The **Work List Properties** dialog box opens.

2 Enter a name and click **Save**.

The work list is renamed.

2.4.4.5 Deleting a work list

In the **Patient Browser**, you can delete work lists.

To delete public work lists, you need clinical administrator rights.

1 On the work list bar, right-click the work list and choose **Delete** from the context menu.

The **Delete Work List** dialog box opens.

2 Click **Yes** to delete the work list.

The work list is deleted.

2.4.5 Loading studies for reading

In the **Patient Browser**, you can load studies for reading.

Check the patient name in each application.

Check that loading has been completed before you finalize the diagnosis.

Do not select partial series for calculations requiring full data sets (for instance SUV in PET images).

1 On the **Results** list, select the corresponding study.



2 On the toolbar, click the **MR View&GO** icon.

The images are loaded into **MR View&GO**.

– or –



On the toolbar, click the **Open** icon.

The study opens with the workflow assigned to it. If no workflow is assigned to the study, **MR View&GO** is started.

– or –



In the toolbar, click the **Open with** icon.

You can assign another workflow to the study before opening.



Image segments may occasionally remain empty when you click the **Open with** icon. Incomplete processing can occur with series that are not completed in time. To view all images, open the series in read-only mode.

(→ Page 101 *Loading studies with limited write access*)

The workflow is started, and the images are loaded for reading. For more information on **MR View&GO**, see: Operator Manual MR Examination and Review.



If you re-open a workflow, the workflow will be displayed in the previous view. Ensure that the segments are displaying the data you expect.

2.4.5.1 Loading multiple studies for reading

In the **Patient Browser**, you can load multiple studies for reading, for example, studies that cover a period of time within an oncology follow-up.

- The most recent data is loaded into the current time point.
- Older data is loaded into prior time points.
- The applied layout defines the amount and presentation of data loaded into the image area.

1 In the **Results** lists, select multiple studies.



2 On the toolbar, click the **Open** icon.

The selected studies open with the workflow assigned to them. If no workflow is assigned to a study, **MR View&GO** is started.

– or –



On the toolbar, click the **Open with** icon.

You can assign another workflow to the study before opening.

The workflow is started, and the images are loaded for reading. For more information on **MR View&GO**, see: Operator Manual MR Examination and Review.

2.4.5.2 Loading additional data from the Patient Browser

In the **Patient Browser**, you can load additional studies, series, or images for a loaded patient.

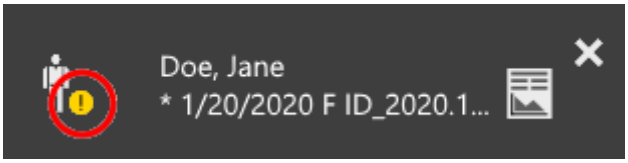
1 In the **Patient Browser**, select the relevant data from the **Results** list, **Series** list, or **Instances** list.

2 Make sure that the selected data really belongs to the same patient.

3 Drag the data onto the corresponding Patient tab.

If additionally loaded data is not identified as belonging to the same patient, confirm the load operation.

In this case, the Patient tab displays an indicator for inconsistencies.



Depending on the layout, data is displayed in the image area.

2.4.5.3 Loading studies with limited write access

In the **Patient Browser**, you can load studies with full access or with limited write access.

In limited write access, you can save images, for example, snapshots or ranges. You can use all tools for image optimization, image evaluation, and 3D postprocessing.

Studies are opened with limited write access if one of the following conditions is met:

- The study is already open.
- You decided to open the study with limited write access (**View as Read-Only with**).

1 In the **Results** list, select a study.

– or –

In the **Series** or **Instances** list, select a series or instance.

2 Right-click and choose **View as Read-Only with** from the context menu.

The workflow is started with limited write access, and the images are loaded for reading.

A padlock icon in the Patient tab indicates, that the study has been opened with limited write access.

2.4.5.4 Batch loading of patient data

In the **Patient Browser**, you can use batch mode to process all selected patient data in a result list one after the other. Batch mode automatically loads the next patient of your selection.

If some of the studies have no workflow assigned to them, they are opened in a default workflow.

You can assign workflows to studies from the context menu without opening them with **Assign Workflow**.

1 In the **Results** list, select the corresponding studies.

2 Right-click and choose **Batch Open > Start** from the context menu.

The batch mode is started for the selected studies.

When you close the current patient, the next selected patient of your selection will be loaded.

If there are no more studies in your selection, the batch mode is stopped.

To stop the batch mode manually, proceed as follows:

In the **Results** list right-click and choose **Batch Open > Stop** from the context menu.

2.4.6 Importing image data

In the **Patient Browser**, you can import external image data.

There are two ways to import data:

- **DICOM Retrieve**

  You can search for patients and studies on external media or on DICOM network nodes and import them to your local system.

  Only DICOM-compliant data are supported.

  (→ Page 92 *Searching studies with DICOM Query/Retrieve*)

- **Import of images**

  You can import data from external media or from the Windows file system.

  Only DICOM-compliant data are supported.



1 On the toolbar, click the **Import** icon.

The **Import** dialog box opens.

2 In the file browser, select the data you want to import.

3 Click the **Import** button.

A job is started. You can view its progress in the **Job View** or you can observe the status icon on the status bar.

(➔ Page 151 *Viewing job information*)

2.4.7 Canceling workflows

In the **Patient Browser**, you can cancel assigned workflows manually without automatic reassignment of a workflow.



To check whether a workflow has been assigned, display the columns **Workflow** and **Workflow Status** on the **Results** list. (➔ Page 87 *Adding or removing columns in the Patient Browser*)

1 On the **Results** list, select the corresponding study.

2 Right-click and choose **Cancel Workflow** from the context menu.

2.4.8 Exporting data

In the **Patient Browser**, you can export the following data:

- the complete data of a patient
- selected studies and series
- single images

You can export the selected data in DICOM format:

- to the file system
- to other DICOM nodes

- to optical disc (CD/DVD/Blu-ray)

  If no optical disc drive is available on your system, an image file (*.iso) will be created and can be saved to a local drive.

In the **Configuration Panel** you can configure the export settings.

(➔ Page 112 *Defining media writing profiles*)

(➔ Page 114 *Setting the displayed number of recently used nodes*)

1 In the **Results** list, the **Series** list or the **Instances** list, select the series, studies or images you want to export.

  In the patient view of the **Results** list, you can only select studies. You cannot select patient entries.

The size of the series, study, or images to be exported is indicated in the **Size** column of the **Patient Browser**.

You can check that against the available storage space on the export target.

Consider that the size of the data to be exported and the available storage space is also checked in the **Export** dialog box as soon as you have made the necessary settings.

---

2 On the toolbar, click the **Export** icon.

  The **Export Data** dialog box opens. The data you have selected are displayed in a list.

  For following options are available for the export:

  - (➔ Page 105 *Exporting data to the file system*)
  - (➔ Page 107 *Exporting data to other DICOM nodes*)
  - (➔ Page 108 *Writing data to optical disc storage media (CD, DVD, or Blu-ray)*)

3 Adjust the relevant settings in the **Export Data** dialog box.

4 Click **Export**.

  Information on the export state is shown in the **Exported** column in the **Results** list of the **Patient Browser**. A tooltip shows you the target media to which the data has been exported.

2.4.8.1 Exporting data to the file system

You can export DICOM data to your local file system, to shared network drives, or to removable drives (for example, a USB flash drive) by using the **Export Data** dialog box.

(→ Page 103 *Exporting data*)

✓ The **Export Data** dialog box is open and data to be exported are available.

Do not use lossy compression if images will be used for further diagnosis.

This can be checked in the export profile and the system configuration.

Do not use lossy compressed images for primary diagnosis. A compression factor is shown on compressed images.

---

1 In the **Export Data** dialog box, select the data to be exported.

2 Select **File System**.

3 From the **Destination** list, you can select a default path.

The list shows predefined paths and paths of previous exports.

– or –

Click the **Browse** button and select the required folder (local drive, network drive, or USB flash drive).

The visibility of the export target folders depends on the system configuration with regard to access restriction.

If required, you can add a new folder to the displayed default folders.

On any folder level, you can right-click and choose **New Folder...** from the context menu.

You can also delete folders that you have created since you logged on to the system. Right-click and choose **Delete** from the context menu.

---

4 Click **Export**.

An export job is started. You can display information about the progress in the **Job View** or you can observe the status icon on the status bar.

If you selected a USB device as the target, ensure that the export is completed before you disconnect your USB device.

The following elements are available in the **File System** area:

Target capacity	Shows whether the storage capacity of the target medium is sufficient for the current export job or not
Destination	Path in the file system (including shared network drives and USB devices). For easy navigation, use the icons.
Properties	Export options: • **Compressed** Data is compressed before export • **Create DICOM File System** A file directory according to DICOM standards is created • **Include Image Viewer on Disc** A DICOM viewer software is added for viewing the exported data • **Image Conversion** The options are: – **Interoperability**: assures that the data is compatible with any DICOM node, but enhanced features cannot be guaranteed. If **Include Image Viewer on Disc** is selected, **Image Conversion** cannot be modified. – **Enhanced**: preserves the enhanced features of the source images.

	Data Minimization: To reduce the ability to identify the original patient from the exported data. • **Profile**: – **High privacy**: Most of the original patient information is removed. The patient name is changed to a pseudonym that you can specify. – **Reduced privacy**: Most of the original patient information is removed, except the following: – Retains temporal information, such as examination date – Retains certain patient characteristics (for example, age, size, weight, pregnancy status, etc.) – **Low privacy**: This profile is designed for service use cases only. Please note that with this profile, the probability of identifying the patient based on the patient information provided is high. • **Pseudonym**: You can enter the name you want as a pseudonym. This name is then displayed instead of the patient name. Please keep in mind that this information will be exported with the patient data (for example, Patient Name, PatientID) and therefore must not contain any PHI/PII.

2.4.8.2 Exporting data to other DICOM nodes

You can export DICOM data to other DICOM nodes by using the **Export Data** dialog box.

(➔ Page 103 *Exporting data*)

✓ The **Export Data** dialog box is open and data to be exported are available.

1 In the **Export Data** dialog box, select the data to be exported.

2 Select **Network**.

3 Select a **Destination**. Only preconfigured DICOM nodes are available.

4 Click **Export**.

A job is started. You can view its progress in the **Job View** or you can observe the status icon on the status bar.

2.4.8.3 Writing data to optical disc storage media (CD, DVD, or Blu-ray)

You can write DICOM data to optical disc storage media (CD, DVD, or Blu-ray) using the **Export Data** dialog box.

If no optical disc drive is available on your system, the option to select the respective burning drive is dimmed. Instead, an image file (*.iso) can be created on the local drive. You can use this *.iso image file to burn an optical disc using third-party burning software.

Note that Numaris/X will only create single-session optical discs. Multi-session burning is not supported.

When preparing data for a media export (for example, exporting DICOM images to a DVD), the export user interface may display **Storage space sufficient** when in fact the ISO file prepared for burning to DVD exceeds the available size.

Split the data and export it to several DVDs.

✓ The **Export Data** dialog box opens and data to be exported are available.

Do not use lossy compression if images will be used for further diagnosis.

This can be checked in the export profile and the system configuration.

Do not use lossy compressed images for primary diagnosis. A compression factor is shown on compressed images.

Do not open the optical disc drive until a message is displayed informing you that writing has been completed.

Use only quality media approved for medical applications to store patient data.

Observe proper handling guidelines for optical discs.

1 In the **Export Data** dialog box, select the data to be exported.

2 Select **Optical Disc**.

3 Select the **Drive** and the **Action** to be performed.

4 In the **Media Label** field, enter the label for the optical disc.

Only letters, numbers, and underscore are allowed, maximum six characters.

This label is extended with the current date and time (YYMMDDhhmm).

5 Check the **Profile** settings.

The setting of the **Profile** can be edited on the **Export** tab in the **Configuration Panel**. Ask your clinical administrator.

6 Click **Export**.

A job is started. You can view its progress in the **Job View** or you can observe the status icon on the status bar.

Optical disc labels and ***.iso** file names do not contain any patient information. After writing to optical discs, check the media for patient identification data. Make sure that the correct optical disc is handed to the patient.

The following elements are available in the **Optical Disc** area:

Target capacity	Shows whether the storage capacity of the target medium is sufficient for the current export job or not
Drive	Determines the drive of the media device.

Action	When you export data to CD, DVD, or Blu-ray, an ***.iso** image file with the data to be exported is generated and stored on your local hard disk. In the **Export Data** dialog box, you can select your preferred option for proceeding: • **Burn** Automatically burns the data onto CD, DVD, or Blu-ray on the basis of the ***.iso** image file. This option is selected by default. • **Open with Explorer** Opens the ***.iso** image file in the Windows Explorer, for example, to view the file before burning the data onto CD, DVD, or Blu-ray. **Note:** The last two ***.iso** image files are stored on your computer.

Media label	User-defined supplement of the CD, DVD, or Blu-ray label **Note:** Only characters, numbers, and underscore are allowed. **Note:** The length of the user-defined media label is restricted to a maximum of 6 characters. The user-defined media label is extended with the current date and time (YYMMDDhhmm).
Profile	Determines the profile of the target medium, for example, Demo Medium, Patient Medium, or Standard (and private profiles) An export profile defines settings such as image compression, DICOM file system, addition of a viewer, and image conversion. You can add, modify, and delete these profiles. (➔ Page 112 *Defining media writing profiles*). **Image Conversion** • **Interoperability**: assures that the data is compatible with any DICOM node, but enhanced features cannot be guaranteed. • **Enhanced**: preserves the enhanced features of the source images. Consider that older systems might not support enhanced DICOM image format.

	Data Minimization: To reduce the ability to identify the original patient from the exported data. • **Profile**: – **High privacy**: Most of the original patient information is removed. The patient name is changed to a pseudonym that you can specify. – **Reduced privacy**: Most of the original patient information is removed, except the following: – Retains temporal information, such as examination date – Retains certain patient characteristics (for example, age, size, weight, pregnancy status, etc.) – **Low privacy**: This profile is designed for service use cases only. Please note that with this profile, the probability of identifying the patient based on the patient information provided is high. • **Pseudonym**: You can enter the name you want as a pseudonym. This name is then displayed instead of the patient name. Please keep in mind that this information will be exported with the patient data (for example, Patient Name, PatientID) and therefore must not contain any PHI/PII.

2.4.8.4 Defining media writing profiles

In the **Configuration Panel**, you can manage media writing profiles for data exports from your system.

The system provides several default writing profiles for different purposes. The media writing profiles are available in the **Profiles** list of the **Export Data** dialog box when you are writing DICOM data on CD or DVD.

The changes you make on the **Export** tab will immediately become effective in the **Export Data** dialog box.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

   The **Configuration Panel** opens.

2 Select the **Export** tab.

3 In the **Media Burning Profiles** section, click **New** to create a Media Burning Profile.

   – or –

   Select a **Profile name** from the list on the left and click **Edit** to change an existing Media Burning Profile.

4 Enter a **Profile name**.

5 Select the **Compressed** check box if the data is to be written with lossy compression.

6 Select the **Create DICOM File System** check box if the data is to be written as a DICOM file set.

7 Select the **Include Image Viewer on Disc** check box if a DICOM viewer is to be added to the medium (only available for the **Create DICOM File System**).

8 Choose an **Image Conversion** type:

   - **Interoperability**: Exported data will be converted for best interoperability between modalities. This conversion type is preselected and cannot be modified if **Include Image Viewer on Disc** is selected.
   - **Enhanced**: Data is not converted for export. Presentation states and enhanced MR formats, for example, are kept.

9 Select the **Data Minimization** check box and select the level of data privacy.

   Data minimization is used to reduce the ability to identify the original patient from the exported data.

10 Select the type of data minimization from the **Profile** list:

- **High privacy**: Most of the original patient information is removed. The patient name is changed to a pseudonym that you can specify.
- **Reduced privacy**: Most of the original patient information is removed, except the following:
  - Retains temporal information, such as examination date
  - Retains certain patient characteristics (for example, age, size, weight, pregnancy status, etc.)
- **Low privacy**: This profile is designed for service use cases only.

  Please note that with this profile, the probability of identifying the patient based on the patient information provided is high.

11 In the **Pseudonym** field, enter the name that you want to have displayed as the patient name.

Please keep in mind that this information will be exported with the patient data (for example, Patient Name, PatientID) and therefore must not contain any PHI/PII.

---

12 To delete a Media Burning Profile, select a **Profile name** from the list and click **Delete**.

13 Click **Save**.

2.4.8.5 Setting the displayed number of recently used nodes

In the **Export** tab of the **Configuration Panel**, you can define the number of the configured remote nodes to be displayed in the **Target** list of the **Export** dialog box.

The system keeps the paths that you have defined to export data to a network node in the **Export** dialog box. These paths or nodes are listed in the **Target** list of the **Export** dialog box when you export DICOM data to a network node.

1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

The **Configuration Panel** opens.

2 Select the **Export** tab.

3 In the **Recently Used Nodes** section, enter in the **Length of recently used node** list field the new number of items you want to display. The default value is 10 items.

Your changes become effective immediately.

2.4.9 Printing images

In the **Patient Browser**, you can expose images on film, that is, print them out on a DICOM printer. Printouts can be used for reporting, archiving, documentation, and treatment decisions.

After you have sent images for printing, the film sheets display a print preview of all series or images.

(→ Page 115 *Sending images to the film sheet*)

2.4.9.1 Sending images to the film sheet

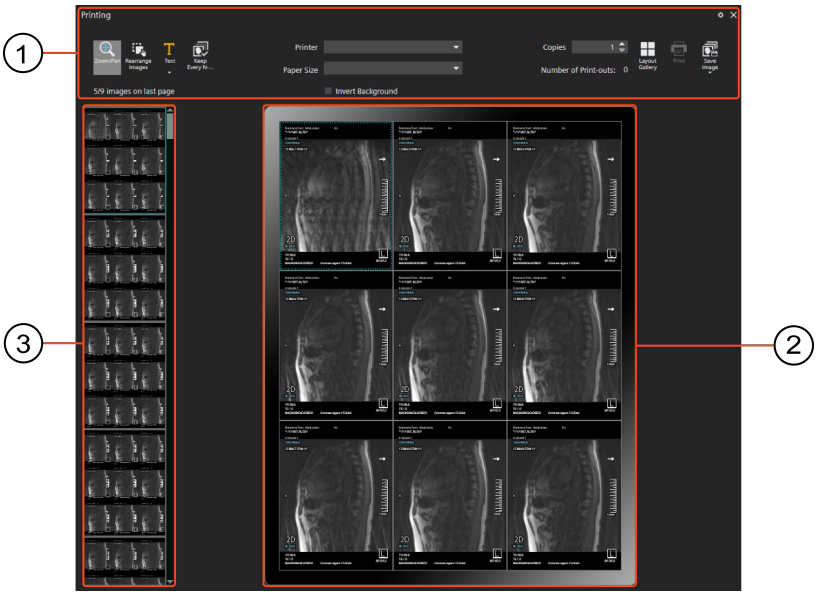
You can send images, series, or studies for printing directly from the **Patient Browser**, without first loading them into **MR View&GO**.

1 Select one or more images or series.



2 On the toolbar of the **Patient Browser** click the **Print** icon.

The images are displayed in the **Printing** window. The film sheets display a print preview of all series or images.



(1) **Tools** area

(2) **Film sheet**
The film sheet for the currently selected thumbnail is displayed.

(3) **Thumbnail gallery**
The thumbnail gallery shows all available film sheets.
You can scroll through the available film sheets.

Just like in the **Printing** window of **MR View&GO**, you can now optimize the images on the film sheet and then expose them on film or send them to a printer. For more information, see: Operator Manual MR Examination and Review.

2.4.10 Archiving data (images)

If your system is connected to a PACS or a corresponding DICOM node, relevant data can be sent to an archive automatically or manually.

At least one DICOM node must be configured as a PACS.

The archive status of objects may change to "Archive failed" after archiving.

If the following factors are combined, the archive status of objects may change to **Archive failed** after archiving:

- low bandwidth
- lossy compression
- disabled storage commitment

Depending on the configuration, data is archived with the following settings:

- **Interoperability**: the graphics in the source images are converted to an interchangeable output format. The source images are stored in separate DICOM instances.
- **Enhanced**: the graphics format in the output images is the same as in the source images. When choosing the enhanced export option, multiple images are stored in one DICOM instance. (➔ Page 112 *Defining media writing profiles*)

For the archiving of data, you have the following general options:

- (➔ Page 117 *Selecting data for archiving*)
- (➔ Page 118 *Archiving data manually*)
- (➔ Page 118 *Checking for successful archiving*)
- (➔ Page 119 *Preventing data from being archived*)

2.4.10.1 Selecting data for archiving

In the **Patient Browser**, you can mark data for archiving.

Data will be archived by the next archiving session as defined in the Administration Portal. If required, you can trigger archiving of selected data manually.

If large data sets or multiple exams are archived via the **Patient Browser**, the system resources (RAM) may run short and no postprocessing will be possible while these jobs are running.

In the **Results** list, information on the archive status of data is shown in the **Study Archived**, **Series Archived**, and **Archive Status** columns.

(→ Page 118 *Checking for successful archiving*)

(→ Page 120 *Information on the archive status of data*)

✓ You have the necessary user rights.

1 In the **Results** list, select the studies, series, or instances to be archived.

2 Right-click and choose **Set Archive state > Mark for Archiving** from the context menu.

Archiving will start as defined in the Administration Portal.

2.4.10.2 Archiving data manually

In the **Patient Browser**, you can archive data manually.

In the **Results** list, information on the archive status of data is shown in the **Study Archived**, **Series Archived**, and **Archive Status** columns.

✓ A default archive is configured.

✓ You have the necessary user rights.

1 In the **Results** list of the **Patient Browser**, select the studies, series or instances to be archived.



2 Click the **Send to Archive** icon.

Archiving will start without delay.

2.4.10.3 Checking for successful archiving

In the **Patient Browser**, you can search in the **More Filters** area for data that has been neither archived nor deleted. This helps you to identify archiving errors and to identify data that takes up unnecessary space in the STS.

(→ Page 91 *Searching studies with filters*)



1 Click **More Filters**.

The **More Filters** dialog box opens.

2 In the **Study Archived** field, select **Queued for archiving**.

In the **Workflow Status** field, select **Completed**.

If required, you must add these fields.

3 In the **Results** list, search for archivable data that is older than 48 hours.

4 Check why this data has been neither archived nor set to "not to be archived".

Data with the status "Queued for archiving" is waiting for a storage commitment response from the archive. Depending on the archive, this process can take a couple of days.

Also check whether any workflows are in status "Saved" and complete them. Otherwise the results may be automatically deleted as they are in status "Not to be archived".

2.4.10.4 Preventing data from being archived

In the **Results** list, information on the archiving state is shown in the **Study Archived**, **Series Archived**, and **Archive Status** columns. If necessary, you can add these columns to the **Results** list.

1 In the **Results** list, select the corresponding studies.

2 Right-click and choose **Set Archive state > Prevent from Archiving** from the context menu.

2.4.10.5 Information on the archive status of data

In the **Results** list, information on the archiving state is shown in the **Study Archived**, **Series Archived**, and **Archive Status** columns. If necessary, you can add these columns to the **Results** list.

The following archive statuses are possible:

- **Not to be archived**

  Data will not be archived.

- **To be archived**

  Data will be archived during the next archiving interval, as defined in the Administration Portal.

- **Queued for archiving**

  Archiving is running and the data is in the queue to be archived.

- **Archived**

  Data was successfully archived.

- **Archive failed**

  Data could not be archived.

In the extended tooltip of the **Archived** and **Archive failed** icons, you can find detailed status information including the target systems.

To check if data has been archived successfully, you can search for data that has been neither archived nor deleted in the **Patient Browser**.

(→ Page 118 *Checking for successful archiving*)

2.4.11 Marking studies

In the **Patient Browser**, you can mark studies, so that they can easily be located later on.

With the **Marked** field of the **More Filters** area, you can search for marked studies.

(→ Page 91 *Searching studies with filters*)

In the **Results** list, information on the state of a study is shown in the **Mark** column. A tooltip displays, who marked the data and when the date mark was set.

1 In the **Results** list, select the corresponding study.

2 Right-click and choose **Set Mark state > Set as Marked** from the context menu to mark the study.

– or –

Right-click and choose **Set Mark state > Remove Mark state** from the context menu to unmark the study.

2.4.12 Correcting and rearranging data

In the **Patient Browser**, you correct, add, or rearrange patient data, studies, series, and instances.

- (→ Page 122 *Correcting patient data*)
- (→ Page 124 *Correcting patient data after sending to the PACS*)
- (→ Page 124 *Re-importing data from the PACS after local data correction*)
- (→ Page 125 *Correcting studies, series, or instances data*)
- (→ Page 126 *Merging patient data*)
- (→ Page 127 *Merging studies*)
- (→ Page 128 *Merging series*)
- (→ Page 128 *Moving studies*)
- (→ Page 129 *Moving series*)
- (→ Page 134 *Assigning studies or series to scheduled procedures*)
- (→ Page 130 *Copying series*)
- (→ Page 131 *Deleting frames from instances*)
- (→ Page 132 *Splitting series*)
- (→ Page 133 *Removing the Corrected flag*)

Correcting and rearranging of data has the following effects on the data:

- Any assigned workflow is canceled.
- The **Corrected** flag is set in the **Corrected** column of the **Results** list. A tooltip shows you a list of the corrected attributes.

  If necessary, you can add this column to the displayed columns.
  (➔ Page 87 *Adding or removing columns in the Patient Browser*)
- A history entry is written into the Audit Log file.
- The last access time is set to the time of correction.
- If critical attributes are changed, for example, the patient position or the DICOM UID, previous results and findings are removed automatically.

When you correct or rearrange data that has already been archived or exported, some PACS refuse to re-archive this data. In this case, re-archiving must be done manually. (➔ Page 118 *Archiving data manually*)

Please note the communication between the RIS and the **Patient Browser**:

- Corrections in the **Patient Browser**:

  If you correct patient data and information in the **Patient Browser**, these corrections will **not** be sent back to the RIS.
- Corrections in the RIS:

  If patient data is corrected in the RIS, your system inherits these changes.

No direct undo option for correct or rearrange operations are available on the UI. Therefore, perform correct and rearrange operations carefully.

Correction and rearrangement are not possible if the source selection contains raw data or scan protocol data.

2.4.12.1 Correcting patient data

In the **Patient Browser**, you can correct patient data.

Previously saved results and findings may become inconsistent.

✓ You have the necessary user rights.



1 In the patient view of the **Results** list, select a patient.

– or –



In the study view of the **Results** list, select a study.



2 On the toolbar, click the **Correct** icon.

The **Correction of Patient/Study** dialog box opens.

3 Select the **Patient** tab.

If you have selected a patient from the patient view of the **Results** list, you cannot select any other tab.

4 Correct or add data.

5 Click **OK** to confirm.

The **Correction** message prompts you to confirm your changes.

If you correct patient data in such a way that it becomes indistinguishable from other patient data, you are informed that the patients will be merged.

Patient data are corrected.

- The **Corrected** flag is set.

  (➔ Page 133 *Removing the Corrected flag*)

- Any assigned workflow is canceled.

2.4.12.2 Correcting patient data after sending to the PACS

If you correct patient data in the **Patient Browser** that has already been sent to the PACS, it is possible that the corrected data will be ignored when it is sent to the PACS again. Whether this happens or not depends on the PACS implementation.

Unlike the Numaris/4 software, Numaris/X does not currently create a new unique identifier for corrected data.

If this problem occurs, please perform the following steps.

- Try to correct patient data before sending it to the PACS.

  – or –

  Delete the patient data in the PACS before resending data.

2.4.12.3 Re-importing data from the PACS after local data correction

Even if you have enabled DICOM UID change in the Administration Portal, the system will refuse to re-import the original data of a patient that has already been archived to the PACS due to the internal data base logic.

To re-import an already archived patient after data correction, perform the following steps at the scanner workplace.

1 From the **Patient Browser**, export the corrected data to the local file system.

  (➔ Page 105 *Exporting data to the file system*)

2 From the **Patient Browser**, delete the corrected data.

  (➔ Page 136 *Deleting data from Short Term Storage (STS)*)

3 From the local file system, import the corrected data.

  (➔ Page 102 *Importing image data*)

4 From the PACS, import the original data.

  (➔ Page 92 *Searching studies with DICOM Query/Retrieve*)

Both the original data and the corrected data are now available in the **Patient Browser**.

2.4.12.4 Correcting studies, series, or instances data

In the **Patient Browser**, you can correct the attributes of a selected element (study, series, or instance). Additionally, you can correct the attributes of the subelements and the higher-level element.

For example, when selecting a series, you can correct the required attributes on the **Series** tab. In addition, you can correct the attributes of the parent study on the **Studies** tab and the attributes of all instances on the **Instances** tab.

The attributes that can be corrected in the **Patient Browser** depend on the selected image type.

Previously saved results and findings may become inconsistent.

✓ You have the necessary user rights.

1 In the **Results** list, select a study.

– or –

In the **Series** list, select a series.

– or –

In the **Instances** list, select an instance.

You can also select multiple studies, series, or instances.

2 On the toolbar, click the **Correct** icon to open the **Correction of Study**, **Correction of Series**, or **Correction of Instance** dialog box.

3 Select the **Study**, **Series** or **Instance** tab.

4 Correct or add data in the available fields.

– or –

To correct attributes that have different values for the selected elements, click the **Edit** icon and enter a common value for all elements.

Your corrections may affect more than one study, series, or instance, depending on the attribute level. The number of affected studies, series, or instances is displayed.

The number of affected series and instances depends on the state of the system at the time when the correction was initiated.

5 Click **OK** to confirm.

The **Correction** message prompts you to confirm your changes.

If critical attributes have been changed, for example, the patient position or the DICOM UID, previous results and findings are removed automatically.

Data is corrected.

- The **Corrected** flag is set.

  (→ Page 133 *Removing the Corrected flag*)

- Any assigned workflow is canceled.

2.4.12.5 Merging patient data

In the **Patient Browser**, you can merge patient data by cutting the patient data of one patient and pasting it to another patient.

Previously saved results and findings may become inconsistent.

✓ You have the necessary user rights.



1 In the **Results** list, activate the patient view.

2 In the **Results** list, select the patient you want to merge with another patient.

This patient will be removed at the end of the operation.

3 Right-click and choose **Cut** from the context menu to mark the source patient you want to merge.

4 In the **Results** list, select the target patient.

5 Right-click and choose **Paste** from the context menu to merge the source patient with the target patient.

The **Merge Patients** message prompts you to confirm your changes.

All studies of the source patient will be moved to the target patient. The source patient is deleted.

- The **Corrected** flag is set.

  (→ Page 133 *Removing the Corrected flag*)

- Any assigned workflow is canceled.

2.4.12.6 Merging studies

In the **Patient Browser**, you can merge studies by cutting a study and pasting it to another study.

Previously saved results and findings may become inconsistent.

✓ You have the necessary user rights.



1 In the **Results** list, activate the study view.

2 In the **Results** list, select the study you want to merge with another study.

This study will be removed at the end of the operation.

3 Right-click and choose **Cut** from the context menu to mark the source study you want to merge.

4 In the **Results** list, select the target study.

5 Right-click and choose **Paste** from the context menu to merge the source study with the target study.

The **Merge Studies** message prompts you to confirm your changes.

The studies are merged.

- The **Corrected** flag is set.

  (→ Page 133 *Removing the Corrected flag*)

- Any assigned workflow is canceled.

2.4.12.7 Merging series

In the **Patient Browser**, you can merge series by cutting a series and pasting it to another series.

Previously saved results and findings may become inconsistent.

✓ You have appropriate user rights.

1 In the **Series** list, select the series you want to merge with another series.

  This series will be removed at the end of the operation.

2 Right-click and choose **Cut** from the context menu to mark the source series you want to merge.

3 In the **Series** list, select the target series.

4 Right-click and choose **Paste** from the context menu to merge the source series with the target series.

  The **Merge Series** message prompts you to confirm your changes.

The series are merged.

- The **Corrected** flag is set.

  (→ Page 133 *Removing the Corrected flag*)

- Any assigned workflow is canceled.

2.4.12.8 Moving studies

In the **Patient Browser**, you can move a study from one patient to another patient.

Previously saved results and findings may become inconsistent.

✓ You have the necessary user rights.



1 In the **Results** list, activate the patient view.

2 In the **Results** list, select the study that you want to assign to another patient.

You can only cut a single study. If more than one study is selected, the **Cut** menu item is deactivated.

3 Right-click and choose **Cut** from the context menu to mark the study that you want to move to another patient.

4 In the **Results** list, select the patient who will own the study.

5 Right-click and choose **Paste** from the context menu to move the study.

The **Move Studies** message prompts you to confirm your changes.

Patient data is corrected.

- The **Corrected** flag is set.

  (→ Page 133 *Removing the Corrected flag*)

- Any assigned workflow is canceled.

2.4.12.9 Moving series

In the **Patient Browser**, you can move a series from one study to another study.

Previously saved results and findings may become inconsistent.

When you move an image series, the system will automatically move the corresponding presentation states (PS) series. You cannot move a presentation states series independently of the image series to which it belongs.

✓ You have the necessary user rights.

1 In the **Series** list, select the series you want to assign to another study.

To select several series, keep the **Ctrl** key pressed.

2 Right-click and choose **Cut** from the context menu to mark the series that you want to move to another study.

3 In the **Results** list, select the study that will own the series.

4 Right-click and choose **Paste** from the context menu to move the series.

The **Move Series** message prompts you to confirm your changes.

The series are rearranged.

- The **Corrected** flag is set.

  (➔ Page 133 *Removing the Corrected flag*)

- Any workflow assigned to the source study is canceled.

2.4.12.10 Copying series

In the **Patient Browser**, you can copy series together with their results and findings.

You can either create a duplicate within the same study, or you can copy the series to another study or to another scheduled procedure.

When you copy an image series, the system will automatically copy the corresponding presentation states (PS) series. You cannot copy a presentation states series independently of the image series to which it belongs.

✓ You have the necessary user rights.

1 In the **Series** list, select one or more series that you want to copy.

To select several series, keep the **Ctrl** key pressed.

You can only select series that belong to the same study.

2 Right-click and choose **Copy** from the context menu.

3 In the **Results** list, select the study to which you want to copy the series.

– or –

In the **Procedure** list, select the scheduled procedure to which you want to copy the series.

The **Procedure** list is not available to all user roles.

4 Right-click and choose **Paste** from the context menu to copy the series to the selected study or procedure.

The **Copy Series** message prompts you to confirm your changes.

The series are copied to the target study or procedure. The copied series can be identified by the prefix **`"Copied from"`** in the series description.

- The patient and study attributes are taken over from the target study or procedure.
- The **Series Instance UID** and **SOP Instance UID** are automatically changed.
- The original series remain unchanged in the source study.

2.4.12.11 Deleting frames from instances

In the **Patient Browser**, you can delete any frame from multiframe instances, for example, to avoid sending and archiving images of poor quality.

✓ You have the necessary user rights.

1 In the **Instances** list, select an instance from which you want to delete frames.

2 Right-click and choose **Delete Frames from Instance** from the context menu.

The **Delete Frames from Instance** dialog box opens.



3 In the upper right corner of the dialog box, click the arrow icon to select an appropriate view, if required.

You can switch between three different views:

- **Thumbnail**: shows a thumbnail for each frame of the selected instance.
- **Preview**: shows a preview of the selected instance. You can scroll through the preview.
- **List**: lists the frames of the selected instance.

4 Select the frame that you want to delete.

– or –

Press and hold the **Ctrl** key or the **Shift** key and select two or more frames if you want to delete more than one frame.

5 Use the icons in the lower left corner of the dialog box to define the range of frames to be deleted.

- **Delete from Start**: deletes all frames from the beginning up to and including the selected frame.
- **Delete Frame(s)**: deletes the selected frames.
- **Delete till End**: deletes all frames from and including the selected frame up to the end.

When you click an icon, the functionality alternates between “Delete” and “Include”. For example, the icon **Delete from Start** changes to **Include from Start** and you can deselect the range of frames again.

To cancel your selection, you can also click **Reset**.

6 To delete the selected frames, click **Confirm**.

2.4.12.12 Splitting series

In the **Patient Browser**, you can split series by selecting instances of the series and creating a new series containing the selected instances.

Previously saved results and findings may become inconsistent.

✓ You have the necessary user rights.

1 In the **Instances** list, select the instances you want to create a new series with.

2 Right-click the instances and choose **Split to New Series** from the context menu.

The **Split Series** message prompts you to confirm your changes.

The series is split.

- The **Corrected** flag is set.

  (→ Page 133 *Removing the Corrected flag*)

- Any assigned workflow is canceled.

2.4.12.13 Removing the Corrected flag

Every time you correct or rearrange data, the **Corrected** flag is set for that data.

When you correct or rearrange data that has already been archived, re-archiving must be done manually.

The **Corrected** flag indicates which data has been corrected and needs to be manually re-archived.

(→ Page 118 *Archiving data manually*)

Once you have successfully re-archived a study, you can remove the **Corrected** flag from this study. This helps you to keep track of the manual archiving process.

✓ The **Corrected** flag is set for a study.

1 In the **Results** list, select the study you want to remove the **Corrected** flag from.

2 Right-click and choose **Remove Correction state** from the context menu.

The **Corrected** flag is removed.

2.4.12.14 Assigning studies or series to scheduled procedures

If the assignment between an acquired study or series and a scheduled procedure fails, you can manually assign studies or series to scheduled procedures in the **Patient Browser**.

The information on scheduled procedures is acquired from the RIS by a DICOM Modality Work List (DMWL) broad query.

Previously saved results and findings may become inconsistent.

When you assign an image series, the system will automatically handle the corresponding presentation states (PS) series, too. You cannot assign a presentation states series independently of the image series to which it belongs.

✓ You have the necessary user rights.

1 Click the arrow at the bottom of the **Patient Browser** to open the **Procedure List**.

Note that this tab is not available for all user roles.

2 To refresh the list, click the **Refresh** icon.

While the refresh process is running, the **Refresh** icon changes shape. To abort the refresh process, click this icon.



3 In the **Results** list, select the study that you want to assign to the planned procedure.

– or –

In the **Series** list, select the series that you want to assign to the planned procedure.

You can only cut a single study or series. If more than one study or series is selected, the **Cut** icon is deactivated.

4 Right-click and choose **Cut** from the context menu to mark the study or series that you want to assign to a scheduled procedure.

5 In the **Procedure List**, select the scheduled procedure to which you want to move the study or series.

6 Right-click and choose **Paste** from the context menu to assign the study or series to the selected scheduled procedure.

The **Move Studies** or **Move Series** message prompts you to confirm your changes.

The study or series is now assigned to the scheduled procedure.

- The study or series can be found in the **Results** list.
- The **Corrected** flag is set.
- Affected reading applications are canceled.

2.4.13 Deleting data

In the **Patient Browser**, you can manually delete data from the Short Term Storage (STS). For manual data deletion, you must have the necessary user rights.

- (→ Page 136 *Deleting data from Short Term Storage (STS)*)
- (→ Page 137 *Measures after accidental deletion during scanning*)
- (→ Page 138 *Protecting data from deletion*)
- (→ Page 138 *Protecting data from deletion*)

In the Administration Portal, you can configure the rules for automatic data deletion.

Enabling the **Automatic Deletion** function can cause shutdown and deletion issues. To avoid unwanted deletion of data and shutdown issues, **Automatic Deletion** must not be used.

In the Administration Portal (**DICOM Data handling** > **Archiving and Deletion**), activate **Disable automatic deletion**.

In the **Patient Browser**, presentation state series (PR series) may be unexpectedly set to the state **To be archived**, which prevents automatic deletion of patient data, if configured. Please delete the series in question manually.

(➔ Page 136 *Deleting data from Short Term Storage (STS)*)

2.4.13.1 Deleting data from Short Term Storage (STS)

In the **Patient Browser**, you can delete data manually from the Short Term Storage (STS). In this way, images with insufficient image quality or corrupt images can be removed.

The Short Term Storage (STS) is not an archive. It stores recently acquired data and data needed for current studies until the workflow is closed and data are archived.

Please do not delete data of a patient who has been closed recently. There may still be jobs running in the background that are not visible. Wait about an hour before you start deleting.

If you have accidentally deleted data, you will find further information here: (➔ Page 137 *Measures after accidental deletion during scanning*).

Please note the following before deleting data:

- Data that has not been archived before deletion is lost and cannot be restored.
- Data will be deleted even if it is used by another user or by a job. This includes background jobs such as the archiving job.

✓ You have the necessary user rights.

✓ Data is not protected from deletion.

1 In the **Results** list, **Series** list, or **Instances** list, select the data you want to delete.



2 On the toolbar, click the **Delete** icon.

The **Delete Permanently** dialog box opens and informs you about the effects of the data deletion.

3 Click **Yes**.

2.4.13.2 Measures after accidental deletion during scanning

Do not delete patient data of the current patient during scanning, not even prior series.

Otherwise, data currently being acquired cannot be reconstructed and no images will be created.

If you deleted data by accident and no images are reconstructed, please use retrospective reconstruction (RetroRecon) to repeat reconstruction.



1 On the access bar, click the **Job View** icon.

2 In the job type control area, select the **MR Reconstructions** job type.

An overview of all protocols is displayed.



3 In the list of protocols, click the **Start** icon to start retrospective reconstruction of the corresponding protocol.

2.4.13.3 Protecting data from deletion

In the **Patient Browser**, you can prevent data from being deleted from the Short Term Storage (STS), for example, to prevent the data from being cleaned from the system by the automatic data deletion.

You can only protect DICOM data from being deleted from the STS.

Raw data cannot be protected from deletion.

In the **Results** list, **Series** list, or **Instances** list, information on the protection state is shown in the **Delete Protection** column. A tooltip shows you who set the protection state and on what date.

If necessary, you can add this column to the appropriate list.

✓ You have the necessary user rights.

1 In the appropriate list, select the data that you want to protect from deletion.

2 Right-click and choose **Set Delete Protection state > Protect from Deletion** from the context menu.

2.4.13.4 Removing the delete protection

In the **Patient Browser**, you can prevent data from being deleted from the Short Term Storage (STS). This delete protection can be removed.

In the **Results** list, **Series** list, or **Instances** list, information on the protection state is shown in the **Delete Protection** column. A tooltip shows you who set the protection state and on what date.

If necessary, you can add this column to the appropriate list.

✓ You have the necessary user rights.

1 In the appropriate list, select the data from which you want to remove the delete protection.

2 Right-click and choose **Set Delete Protection state > Remove Delete Protection** from the context menu.

2.4.14 Displaying the DICOM header of an instance

You can view the attributes of the DICOM header of a specific instance, for example, a single image.

- In the **Instances** list, right-click an instance and choose **Display DICOM Header** from the context menu.

A Web Browser window opens, listing the DICOM header for the selected instance.

(→ Page 139 *Displayed DICOM attributes*)

To compare the DICOM image header of different instances, you can open several Web browser windows in parallel, one for each instance that you want to compare.

2.4.14.1 Displayed DICOM attributes

The DICOM attributes of an instance of the result list can be displayed in a Web Browser window.

(→ Page 139 *Displaying the DICOM header of an instance*)

Attribute Name	Name of the DICOM element, for example, “Series Description”
Tag	Number of the DICOM tag, for example, **0008,103E** A DICOM tag is represented as (gggg,eeee), where gggg is equivalent to the group number and eeee is equivalent to the element number within that group. DICOM tags are represented in hexadecimal notation as specified for each named data element in the DICOM standard.
VR	Value Representation is a standard DICOM parameter and states the type of displayed values, such as **CS** for "short string". This parameter is only relevant to service technicians and for the configuration of image text.

VM	Value Multiplicity is a standard DICOM parameter and states how often the value is available, for example, **1-n** for any number of values. This parameter is only relevant to service technicians.
NoV	Number of Values states how often the value is actually available. This parameter is only relevant to service technicians.
Values (Length)	Current value from the DICOM image header of the selected image together with the length of the value in bytes, for example, **Routine_Head (12)**

2.4.15 Starting an examination from the Patient Browser

From the **Patient Browser**, you can start an additional examination of a selected patient.

1 In the **Results** list of the **Patient Browser**, select a study or a patient.

2 To add a procedure, right-click and choose **New Examination** from the context menu.

The **Scheduler** opens.

A new item is created in the **Patients** list and the **Patient Registration** tab is filled with the patient data of the selected patient.

3 In the **Patient Registration** tab of the **Scheduler**, enter the procedure information in the **Exam Information** area.

If required, you can change all fields in the **Patient Registration** tab except the following:

- **Last Name**
- **Patient ID**
- **Date of Birth**
- **Age**

The changes are applied to all procedures of the selected patient.

4 Click the **Exam** button to start the examination workflow for the specified procedure.

2.4.16 Continuing an examination from the Patient Browser

In the **Patient Browser**, you can continue the examination of the selected patient, for example, for multi-phase examinations.

1 From the **Results** list, select a study.

2 From the context menu, choose **Resume Examination**.

The **Scheduler** opens and the corresponding patient and procedure data are displayed.

The examination workflow for the procedures specified in the **Exam Information** area of the **Patient Registration** tab will be restarted.

If there is no corresponding examination workflow (for example, if you want to continue an imported study), a new procedure is created and the patient and procedure data are taken over from the study attributes.

3 Click the **Exam** button to continue the examination workflow for the specified procedure.

2.5 Creating new series numbers

When converting “Enhanced MR images” (multiframe images) to MR images (single-frame images), you can configure the generation of new series numbers.

✓ You have administrator rights.

✓ Administration Portal is open.

For a remote DICOM node, you can set how series numbers are to be handled.

1 On the **Technical Configuration** tab, select the **Remote DICOM Nodes** card.

2 Configure a PACS or remote DICOM node.

For details on the configuration of remote DICOM nodes, see: Administration Portal.



3 Click **Edit DICOM node** at the top of the **DICOM Remote Node List** dialog box.

The **DICOM Remote Node Editor** dialog box opens.



4 Click **Further Settings** next to the **Storage Settings** service.

The **Storage Settings** dialog box opens.

5 In the **Multiframe Conversion Result Structure** area, decide how series numbers are to be handled for multiframe images converted to single-frame images.

- **Preserve original Series Number for each converted Multiframe Image**: Series numbers are retained.
- **Separate Series for each converted Multiframe Image**: New series numbers are created.



If you selected **Preserve original Series Number for each converted Multiframe Image**, identical series numbers may be created in the PACS, for example, if multiframe images and converted MR images are sent to the same DICOM node.

2.6 Managing voice commands

You can record or edit patient instructions to optimize the communication with the patient.

As a prerequisite, you need to configure the audio devices first.

- (→ Page 143 *Configuring audio devices*)
- (→ Page 144 *Recording new voice commands*)
- (→ Page 144 *Testing voice commands*)
- (→ Page 145 *Changing voice commands*)
- (→ Page 145 *Deleting user-defined voice commands*)
- (→ Page 146 *Configuring languages for voice commands*)

To ensure the quality of your recording, we recommend starting recording in a normal voice at 30 cm from the intercom.

2.6.1 Configuring audio devices

✓ No patient is registered.

1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

The **Configuration Panel** opens.

2 Select the **Scan Application** tab.

3 From the **Audio Input Device** list, select the preferred input device.

4 From the **Audio Output Device** list, select the preferred output device.

5 Click **OK**.

If the sound device is currently not ready (for example, because the audio leads have been unplugged from the system), an overlay indicates that the functionality is currently not available. No interactions with the controls under the overlay are possible while in this state.

2.6.2 Recording new voice commands

✓ No patient is registered.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

The **Configuration Panel** opens.

2 Select the **Scan Application** tab.



3 Click the **Add** icon.

The **Create Voice Command** dialog box opens.

4 Enter a label for the new voice command and click **OK**.

The new label is inserted in the list of voice commands in alphabetical order. It is available in all languages.



5 Click the **Record** icon and record your new instructions using the microphone.

The duration of the recording is displayed (max. 30 s).

6 Adapt the volume using the **Record** volume slider, if necessary.



7 Click the **Stop** icon to stop the recording.

2.6.3 Testing voice commands

✓ No patient is registered.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

The **Configuration Panel** opens.

2 Select the **Scan Application** tab.



3 Select a voice command from the voice command list.



4 Click the **Play** icon.

The voice commands are played back through the loudspeaker or the headphones.

5 Adapt the default playback volume with the **Playback** volume slider, if necessary.

2.6.4 Changing voice commands

✓ No patient is registered.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

The **Configuration Panel** opens.

2 Select the **Scan Application** tab.



3 Select a voice command from the voice command list.



4 Click the **Record** icon.

The **Replace Command** dialog box opens.

5 Click **Yes**.

You can now record the patient instructions.

2.6.5 Deleting user-defined voice commands

You can delete voice commands that are no longer required.



If you delete a voice command that is needed for the automatic instruction of program steps, you must give the patient instructions over the intercom while processing the respective program steps.



The default voice command must not be deleted.



It is not possible to undo a deletion.

✓ No patient is registered.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

The **Configuration Panel** opens.

2 Select the **Scan Application** tab.



3 Select a voice command from the voice command list.



4 Click the **Remove** icon.

The **Delete voice output** dialog box opens.



The button is active only when you locate a voice command for the respective instruction.

5 Click **Yes**.

The voice command is deleted from *all* languages and the label is removed from the instruction list.

2.6.6 Configuring languages for voice commands

✓ No patient is registered.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

The **Configuration Panel** opens.

2 Select the **Scan Application** tab.

3 From the **Default Language** list, select the preferred language of the patient.

4 From the **Command Language** list, select your preferred command language.



The default language for patient instructions does not have to be the same as the command language.

5 Click **OK**.

2.6.7 Configuring defaults for sound settings

In the **Configuration Panel**, you can set the phone and speaker volume settings that will be used as defaults. If required during an examination, you can override these settings in the **Inroom Settings** dialog box. See: Operator Manual MR Examination and Review.



1 On the access bar, click the **Configuration** icon and choose **Configuration Panel** from the menu.

   The **Configuration Panel** opens.

2 Select the **Scan Application** tab.

3 In the **Sound Settings** section, adjust the volume sliders as required.

   Adjustable settings:

   - Patient to operator volume
   - Operator to patient volume
   - Balance between in-room speakers and headphones
   - Music volume for in-room speakers
   - Music volume for headphone

4 Click **OK**.

2.7 Managing background tasks (jobs)

The **Job View** provides an overview of pending, running, and executed jobs.

(→ Page 149 *Job View screen layout*)

(→ Page 151 *Viewing job information*)

(→ Page 152 *Filtering and sorting jobs*)

(→ Page 152 *Customizing filter attributes*)

(→ Page 153 *Restarting jobs*)

(→ Page 153 *Repeating failed jobs*)

(→ Page 154 *Canceling jobs manually*)

(→ Page 154 *Deleting jobs manually*)

Jobs and job types

A job is the representation of a longer running background task, normally using a dedicated processing resource, for example, a network connection, a printer, a media device, or a processor.

Depending on the resource, different job types are defined. These job types can summarize several single jobs, for example, the network job type can include send and retrieve jobs.

Typical examples of jobs

- Sending a series of images to a PACS in the network (network job).
- Exposing a filmsheet on a DICOM printer (print job).
- Writing a cardiac scene on a CD for later study comparison (media job).

Initiation of jobs

You can initiate jobs on the local application, for example, in the **Export** dialog box or in the **Print** workflow step.

Most jobs can be started by any user. Some jobs require clinical administrator rights, for example, deleting procedures permanently. Other jobs are started by the system, for example, automated jobs that are defined in a workflow.

The jobs that are available for the job types are displayed in the job lists of the **Job View**.

Priority of jobs

Jobs are handled by priority. The priority depends on the job type. Very important jobs are handled with a higher priority by the system than less important jobs.

Note that the priority of a job is set by the initiating application and cannot be changed in the **Job View**.

Statuses of jobs

Each job can have a different status, for example, *completed* or *failed*. The statuses that are applicable for a job are defined by the job type. A print job may have other possible statuses than a media job. You can observe the status of a job in the **Status** column of the job lists.

Job behavior when closing Numaris/X

If a workflow is open or a job is running, a warning message is displayed.

A shutdown screen is displayed and a progress bar shows the progress of shutdown.

The system shuts down. Open workflows are closed and results are saved.

To force the shutdown, you can press the **Force Shutdown** button.

CAUTION

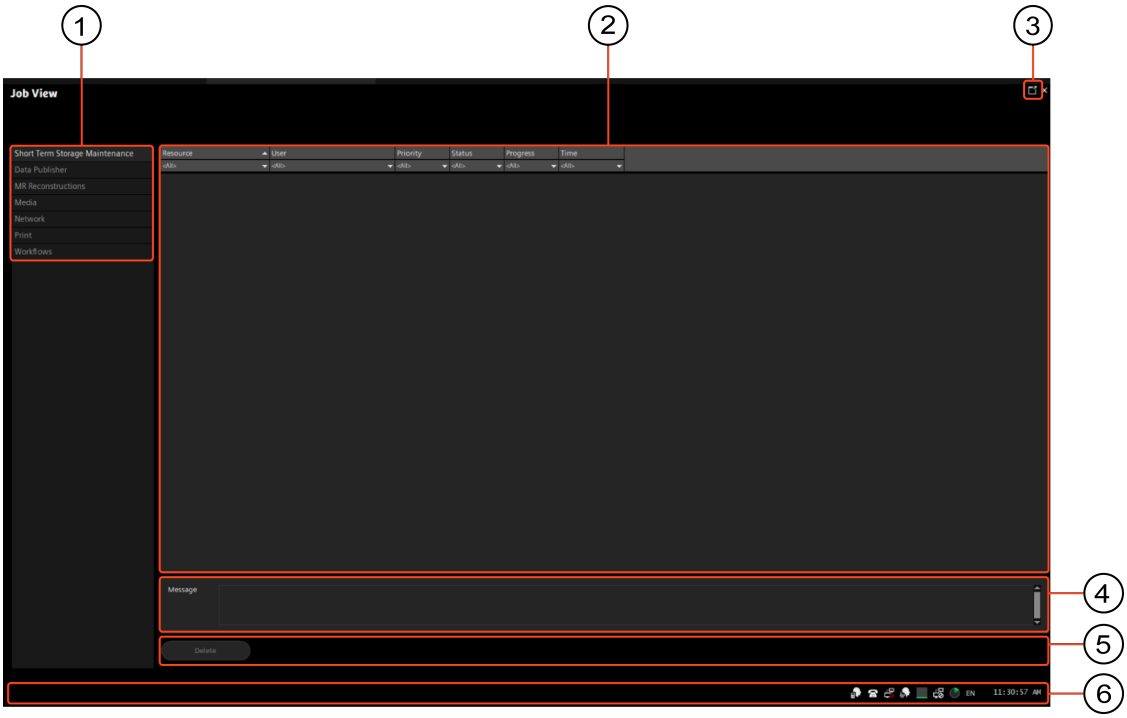
A forced shutdown immediately terminates all running applications and workflows of *all* connected users without saving!

Data loss or inconsistent data

- Before you force a shutdown, close open workflows and applications. Make sure that all findings are saved.
- Inform other connected users at other workstations.

2.7.1 Job View screen layout

The **Job View** screen contains the following main areas:



(1) Job type control area
Allows selection of a certain job type, for example **Network** jobs. The currently selected job type is highlighted and the corresponding jobs are displayed in the job list.

(2) Job list
Shows the jobs corresponding to the selected job type. The columns provide job-related information, for example, the job status or the patient name.

(3) **Dock/Undock** icon
Allows to undock the **Job View** and make it a floating window.
(➔ Page 87 *Docking / undocking windows*)

(4) **Message**
Displays status and processing messages for the selected job.

(5) Buttons
Provides various buttons for the selected jobs, depending on job type and status.

(6) Status bar
Shows small icons as indicators for different job types and statuses.

(➔ Page 151 *Job status icons*)
Additionally, the current time is displayed.

2.7.1.1 Job status icons

Jobs are displayed as small icons on the status bar of the application.

In case of exceptions, warning symbols or error symbols are displayed together with the job type icon. You can move the mouse pointer over a status icon to display details in a tooltip.

The following describes the possible statuses using the print job icons as an example:

	At least one job is running. There are currently no failed jobs of this job type.
	At least one job of the job type failed.
	At least one job of the job type failed and failures have been looked up.

2.7.2 Viewing job information

In the **Job View**, you can view detailed information on the jobs.



1 On the access bar, click the **Job View** icon.

2 In the job type control area, select a job type.

In the **Status** column, the current job status is displayed.

In the **Progress** column, the percentage of completion of the job is displayed.

3 In the job list, click a job to view the corresponding information in the **Message** field.

Note that even after the message field has displayed a result, the corresponding data may not already be available for processing.

4 On the status bar, position the mouse cursor on a status icon to view more information.

After a media import job has been canceled, the number of imported instances might not be equal to the number of instances displayed as imported in the **Job View**. Check the number of instances in **Job View** and compare it with the number of the actually imported instances in the **Patient Browser**.

2.7.3 Filtering and sorting jobs

For better orientation in the **Job View**, you can filter the jobs to be displayed in the job list. You can sort the job list by any column header in ascending or descending order. To make the sorting more efficient, you can rearrange and replace the column headers.

1 On the access bar, click the **Job View** icon.

2 In the job type control area, select a job type to display only jobs of that type in the job list.

3 In the job list, select the desired filter criteria from the column headers.

4 In the job list, click a column header to sort the information in the job list in ascending or descending order.

A small arrow icon indicates the current sorting.

2.7.4 Customizing filter attributes

In the **Job View**, you can customize your filter attributes.

1 On the access bar, click the **Job View** icon.

2 In the job type control area, select a job type.

3 In a job list, right-click a column header.

The **Column Settings** dialog box opens.

4 Select an attribute and click the **Move left** or **Move right** arrows to add or remove the selected attributes to or from the **Selected Attributes** field.

5 To arrange attributes in the **Selected Attributes** field, click the **Move up** and **Move down** arrows.

6 Click **OK**.

The attributes displayed in the **Column Settings** dialog box differ depending on the selected job type. The attributes are displayed in two lists:

Selected Attributes	Lists the attributes that are currently displayed as column headers
All Attributes	Lists the attributes that are available to be displayed as column headers

2.7.5 Restarting jobs

In the **Job View**, you can restart jobs.



1 On the access bar, click the **Job View** icon.

2 In the job type control area, select a job type.

3 Select the jobs from the job list to be restarted (multiple selection with the **Ctrl** key).

4 Click the **Repeat** button to repeat the selected jobs.

The system repeats the jobs. Note that you cannot repeat currently running jobs.

2.7.6 Repeating failed jobs

In the **Job View**, you can repeat the failed processes of a job.



1 On the access bar, click the **Job View** icon.

2 In the job type control area, select a job type.

3 Select the jobs from the list (multiple selection with the **Ctrl** key).

4 Click the **Repeat failed** button.

The system repeats the failed processes for the jobs.

2.7.7 Canceling jobs manually

In the **Job View**, you can manually cancel queued or running jobs.

Canceled jobs remain visible in the job list and can be restarted, if required. (→ Page 153 *Restarting jobs*)



1 On the access bar, click the **Job View** icon.

2 In the job type control area, select a job type.

3 Select the jobs from the list (multiple selection with the **Ctrl** key).

4 Click the **Cancel** button.

2.7.8 Deleting jobs manually

In the **Job View**, you can delete jobs manually. Jobs that you have deleted cannot be restored.



Do not delete jobs that are still in progress.



1 On the access bar, click the **Job View** icon.

2 In the job type control area, select a job type.

3 Select the jobs from the list that you want to remove (multiple selection with the **Ctrl** key).

4 Click the **Delete** button.

5 The **Deleting jobs** dialog box opens.

6 Click **Yes**.

2.7.9 Job types

A job type can include several kinds of jobs that belong to the same subject, for example, the network job type includes send and retrieve jobs.

Depending on your installation, different job types are available.

- (➔ Page 155 *Short Term Storage Maintenance job type*)
- (➔ Page 156 *Data Publisher job type*)
- (➔ Page 158 *MR Reconstructions job type*)
- (➔ Page 159 *Media job type*)
- (➔ Page 161 *Network job type*)
- (➔ Page 163 *Print job type*)
- (➔ Page 164 *Workflow job type*)

2.7.9.1 Short Term Storage Maintenance job type

Automatically triggered deletion jobs, that are processed in the Short Term Storage (STS) are listed as the **Short Term Storage Maintenance** job type.

For the **Short Term Storage Maintenance** job types, the following attributes are displayed:

Resource	Name of the location from which data is removed (**STS**).
User	**Automatic Monitoring** is always displayed as the user name.
Priority	Priority of the job.

Status	All deletion jobs can be in one of the following states: • *Active* The job is currently in progress. • *Aborted* The job cannot be executed. • *Queued* Data is in line to be processed. • *Completed* The job has been successfully completed. • *Suspended* The job has been stopped temporarily. • *Failed* The job cannot be executed or was canceled. Check the **Message** field for details.
Progress	Indicates the percentage of completion.
Time	Time range in which the job was created. Note that deletion jobs, that have not been started, are removed after 4 hours.

2.7.9.2 Data Publisher job type

For each study that is currently running and not has been saved yet, a context folder is kept in the system. As soon as the study is saved, the data is stored in the context folder and written into the Short Term Storage (STS). An automatically started background jobs is created and listed for the **Data Publisher** job type.

For the **Data Publisher** job types, the following attributes are displayed:

User	Name of the user who completed the case.
Priority	Priority of the job. All archiving jobs have the priority 4.
Patient Name	Name of the patient the data belongs to.
State	All data publishing jobs can be in one of the following states: • *Queued* Data is in line to be processed. Note that jobs that have not been executed, are removed after one hour. • *Publishing* The job is currently being processed. • *Published* The job has been completed and data is written to STS. The job will be available in the job list for the next 10 minutes. • *Aborted* The job cannot be executed. Check the **Message** field for details. • *Paused* The job is put on hold. • *Failed* Writing data to STS is currently not possible or the job was canceled. Check the **Message** field for details. The job will be available in the job list for the next 5 days.
Time	Time range, in which the job has been created.

2.7.9.3 MR Reconstructions job type

The raw data supplied by the MR system is reconstructed with the image reconstruction system. The jobs for the image processing of the image reconstruction system are listed as an **MR Reconstructions** job type. Here you can control the status of **MR Reconstructions** jobs. You can also repeat a reconstruction with different parameter sets or cancel long-duration background jobs.

For more information on using retrospective reconstruction (RetroRecon) (→ Page 362 *Reconstructing MR data*)

For the **MR Reconstructions** job types, the following attributes are displayed:

MeasUid	ID of the background job.
Protocol Name	Name of the protocol.
Patient Name	Name of the patient the data belongs to.
Time	Time when the measurement was performed.
Progress	Indicates the percentage of completion.
Raidfile Status	Indicates the status of the RAID file. • **OK**: Data acquisition and image reconstruction successful • **Error**: Data acquisition or image reconstruction failed • **Imported**: RAID file has been imported
Action	Lists possible interactions: •  Save data set (only available if a USB flash drive is attached) •  Edit protocol •  Start retrospective reconstruction of protocol •  Cancel long-duration background jobs

2.7.9.4 Media job type

Importing, exporting, and media creation jobs available on the system are listed for the **Media** job type.

For the **Media** job types, the following attributes are displayed:

Patient Name	Name of the patient the data belongs to.
Status	All media jobs can be in one of the following states: • *Running* Transfer is currently in progress. • *Canceling* The job is currently being canceled. • *Failed* The job cannot be executed or was canceled. Check the **Message** field for details. • *Queued* Data is in line to be transferred • *Waiting* The job has been put on hold because system resources are currently not available • *Completed* All instances were successfully transferred • *Completed (!)* Not all instances have been accepted by the target destination. • *Suspended* The job has been stopped temporarily. Also observe the media status icon on the status bar.
Total No Of Objects	Number of objects to be transferred.

Progress	Indicates the percentage of completion.
Instances	Number of successfully transferred instances.
Workflow Label	Name of the workflow for which the job was started.
Transfer Type	• **import** Displayed for instances that are imported from a local hard disk, removable media, or network node. • **create** Displayed for instances that are written to a CD or DVD. • **file export** Displayed for instances that are transferred to a local hard disk or network node.
Client	Name of the workplace from which the job has been started.
Resource	• Path to the target folder for file export and create jobs. • Path to the source folder for import jobs.
User	Name of the user who started the job.
Time	Time range, in which the job was created.
Job Data Description	Custom description of the job.
Connection Type	Indicates the connection type for a media job: • **Client** Sources are not accessible by the application server • **Server** Sources are accessible by the application server

Priority	Priority of the job.
Taskflow ID	Identifier of the workflow for which the job was started.

2.7.9.5 Network job type

Send, retrieve, and receive jobs available on the system are listed for the **Network** job type.

For the **Network** job types, the following attributes are displayed:

Patient Name	Name of the patient the data belongs to.
Status	All network jobs can be in one of the following states: • *Running* Transfer is currently in progress. • *Canceling* The job is currently being canceled. • *Failed* The job cannot be executed or was canceled. Check the **Message** field for details. • *Queued* Data is in line to be transferred. • *Waiting* The job has been put on hold because system resources are currently not available. • *Completed* The job has finished and all instances were successfully transferred. • *Completed (!)* The job has finished, but not all instances have been accepted by the target node.

	• *Suspended* The job has been stopped temporarily. Also observe the network status icon on the status bar.
Total No of Objects	Number of objects to be transferred.
Progress	Indicates the percentage of completion.
Instances	Number of successfully transferred objects.
Workflow Label	Name of the workflow for which the job was started.
Transfer Type	• **receive** Objects that are sent to your system from other DICOM nodes. • **retrieve** Objects that have been requested from other DICOM nodes. • **send** Objects that are sent to other DICOM nodes.
Client	Not used for network jobs.
Resource	• Name of the target node for send and retrieve jobs. • Name of the source node for receive jobs.
User	Name of the user who started the job.
Time	Time range in which the job was created.
Job Data Description	Custom description of the job.
Connection Type	The connection type for all network jobs is always **Server**.

Priority	Priority of the job. All network jobs have the priority 4.
Taskflow ID	Identifier of the workflow for which the job was started.

2.7.9.6 Print job type

Printing jobs that have been started from the **Print** step, are listed for the **Print** job type.

For the **Print** job type, the following attributes are displayed:

Patient name	Name of the patient whose data was sent for printing.
Resource	Name of the printer.
User	Name of the user who started the printing job.
Priority	The priority of the job. All printing jobs have the priority 3.
State	All printing jobs can be in one of the following states: • *Queued* Data is in line to be printed. • *Printing* The job is currently executed. • *Printed* The job has been printed. The job will be available in the job list for the next 6 hours. Within this time period, you can print the data again. • *Failed* Printing is currently not possible or the job was canceled. Check the **Message** field for details. If necessary, you can repeat the job.

	Also observe the printing status icon on the status bar.
Progress	Displays the number of already printed sheets and the total number of sheets to be printed.

2.7.9.7 Workflow job type

Workflows that are in progress and the preprocessing of images are listed for the **Workflow** job type.

For the **Workflow** job types, the following attributes are displayed:

Workflow	Name of the workflow in progress.
Work item	Name of the work item in progress.
Type	Type of the work item: • *Basic* • *Advanced*
User	Name of the current user in the workflow.
State	The work items can be in one of the following states: • *Global preprocessing* Newly imported images are preprocessed. • *Preprocessing* Preprocessing during the mapping of a work item. • *In Progress* Requested work item is in progress.
No. of slices	Number of scanned slices.
License(s) in use	Licenses assigned to the work item.
Patient name	Name of the patient whose images are evaluated.

2.8 Creating screen videos and screenshots

Camtasia is a software tool that allows you to record your desktop activities.

You can save these recordings as AVI files for documentation and presentation purposes on a USB device that is connected to your host.

Furthermore, you have the possibility within the **Camtasia** software to choose between several additional tools depending on your requirements.

To prevent personal data being displayed in the recordings, you should hide the image text.

To ensure that the single **Camtasia** functionality works accurately, only start one action at a time.

You will find additional information about the **Camtasia** recorder by clicking the **Help** button.

The following tools are integrated in the **Camtasia** software:

- **Recorder**: to capture video files in AVI format

  (➔ Page 165 *Capturing a video*)

- **Player**: to play AVI files

  (➔ Page 168 *Playing the video file*)

You can also create screenshots of your desktop.

(➔ Page 169 *Capturing a screenshot*)

2.8.1 Capturing a video

✓ A USB device is connected to a USB port of your host.



1 On the access bar, click the **Screen Recorder** icon and choose **Camtasia Recorder** from the menu.

  The **Screen Capture Target** dialog box is displayed.

2 Select the USB device from the **Target** selection list and confirm with **Okay**.

The **Camtasia Recorder** window opens.

The entire **Camtasia Recorder** dialog window and the menu of the **Camtasia Recorder** dialog window is visible only if the **Standard** view is selected. If only the title bar and the icon bar of the **Camtasia Recorder** are displayed, click the **Toggle View** dropdown list and select **Standard**.



3 Click the arrow next to the **Record** button to select the capture area.

A bullet in the dropdown list shows you the capture area currently selected. When you move the mouse pointer over selectable areas, they are highlighted.

---

4 Select **Screen** to capture the entire screen.

– or –

Select **Window** to capture a selected window.



5 Click the **Record** button in the Camtasia toolbar.

– or –

Press **F9**.

During the recording process, the **Camtasia Recorder** window is visible. You can move the window as far as possible out of the region of interest to make sure it is not captured in the video.

6 Click the top of the window and hold the mouse button down while moving into another screen area.



7 Click the **Stop** button on the toolbar to stop capturing.

– or –

Press **F10**.

The AVI file is stored automatically in your offline file system.

2.8.1.1 Pausing capturing



- Click the **Pause** button on the toolbar to pause capturing.

  – or –

  Press **F9**.

2.8.1.2 Deleting the current video



- Click the **Delete** button on the toolbar to delete the video currently captured.

  The recording pauses and a message box are displayed.



After confirming the message box, any captured frames are discarded.

2.8.1.3 Adding annotations and effects during recording

During AVI recording, you can add various annotations and effects to the file that is being recorded.

1 In the **Camtasia Recorder**, select **Effects > Options**.

  The **Effects Options** dialog box opens.

2 Add the features you want to have displayed in your video.

You can add following features to your video:

- Date and time
- Caption
- Watermarks
- Highlights/Autohighlights
- Cursor effects
- Audio effects
- Zoom & pan effects

3 In the **Effects** menu, choose the corresponding submenu to activate the selected features.

2.8.2 Saving the video file

During recording, the video is stored as an AVI file. It is stored on the USB device that has been selected in the **Screen Capture Target** dialog box.

The results from Camtasia are only intended to be used for training and communication.

◆ Select **Capture > Output > Live** to make the video available to any live encoding process that may be running on your computer.

2.8.3 Playing the video file

1 On the access bar, click the **Screen Recorder** icon and choose **Camtasia Player** from the menu.

The **Camtasia Player** window opens.

The entire **Camtasia Player** dialog window and the menu of the **Camtasia Player** dialog window is visible only if the **Standard** view is selected. If only the title bar and the icon bar of the **Camtasia Player** are displayed, click the **Toggle View** dropdown list and select **Standard**.

2 Select **File > Open**.

3 Select the desired AVI file.

4 Confirm the selection by clicking the **Open** button to start playing the movie.

2.8.4 Capturing a screenshot

✓ A USB device is connected to a USB port of your host.



1 On the access bar, click the **Screen Recorder** icon and choose **Take Screenshot** from the menu.

The **Screen Capture Target** dialog box is displayed.

2 Select the USB device from the **Target** selection list and confirm with **Okay**.

A screenshot is saved to the selected USB device.

2.9 Using *syngo* Virtual Cockpit

(➔ Page 169 *Configuring the audio devices in syngo Virtual Cockpit*)

(➔ Page 170 *Accepting and ending a call in syngo Virtual Cockpit*)

For a detailed description of *syngo* Virtual Cockpit, see: (➔ *Online Help*)

2.9.1 Configuring the audio devices in *syngo* Virtual Cockpit

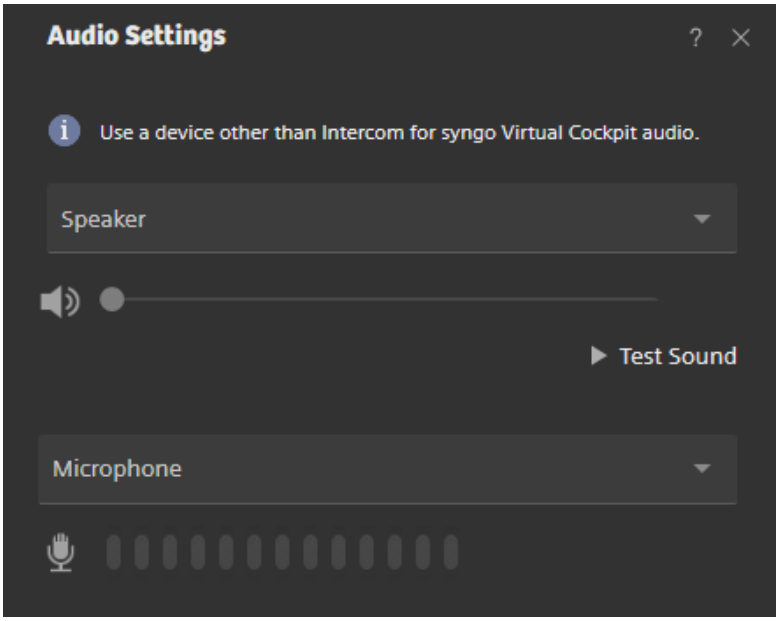
You can configure the input and output audio devices in *syngo* Virtual Cockpit.

✓ *syngo* Virtual Cockpit is open.



1 In *syngo* Virtual Cockpit, click the **Settings** icon.

The **Audio Settings** dialog box opens.



2 From the **Speaker** list, select the preferred output device.

3 To test the quality of the selected audio output device, click **Test Sound**.

4 If necessary, adjust the volume with the slider.

5 From the **Microphone** list, select the preferred input device.

The current volume of the input device is displayed.

6 To mute and unmute both audio devices, click the corresponding icon.

2.9.2 Accepting and ending a call in *syngo* Virtual Cockpit

When a call comes in or goes out in *syngo* Virtual Cockpit, a movable overlay is displayed in the upper center of the monitor where you can accept, decline, or end the call.

✓ *syngo* Virtual Cockpit is open.

1 When a call comes in, click either **Accept** or **Decline**.

2 When a call goes out or during a call, click **End Call**.

2.10 Expert-i: Collaborating with colleagues

With Expert-i, you can invite a colleague to connect remotely to your *syngo* MR Workplace, for example, to ask for a second opinion about special cases.

For this, your colleague requires an access code and information on which workplace you are working on.

You can also directly connect to a *syngo* MR Workplace without being invited beforehand. (➔ Page 182 *Connecting directly to a workplace with Expert-i*)

For that, the Expert-i direct logon functionality has to be configured in the Administration Portal.

Only one Expert-i remote connection can be active at a time.

Expert-i consists of a client side and a server side:

- The client side connects to a workplace.
- The server side is the workplace that shares its desktop.

(➔ Page 176 *Workflow of an Expert-i session*)

If you need **external technical or clinical application support** beyond internal collaboration with colleagues, you can ask Siemens Healthineers for assistance by requesting a remote connection with Siemens Healthineers Customer Services.

With your permission, Siemens Healthineers Customer Services can connect to your client.

(➔ Page 189 *Remote Assistance*)

During examinations, you are required to adhere to the safety measures described in the “Safety” chapter of the Operator Manual MR System and Coils.

CAUTION

Insufficient image quality of the remote computer!

Incorrect interpretation of the MR images

- Do not use the remote computer for diagnoses or reports.

CAUTION

Remote user does not adhere to the currently valid safety guidelines!

Hazard. Patient injury due to uncontrolled actions of the remote user.

Possible injury to patient due to missing control or absence of local user.

- As the local user, you are responsible for the patient during the entire examination.
- Remain continuously at the MR console and monitor the actions of the remote user.
- Stay in constant communication with the remote user.
- Stop the patient table if hazardous conditions are present for the patient or terminate the entire measurement sequence (e.g. via the **table STOP/sequence termination** at the intercom).
- Interrupt the remote connection in case of uncontrolled actions by the remote user.

CAUTION

Selection of wrong patient data while using remote assistance (Expert-i)!

Wrong diagnosis

- Before starting the evaluation with expert-i always check that the patient data (for example, Patient ID, Series number) matches.

Functionality

The remote connection is handled via a suitable computer (remote computer) connected to the local network.

To establish a remote connection, the remote user has to register at the MR console. For this registration, the user needs an access code.

This access code is generated by Expert–i and is only valid for one registration.

In this case, the system can be operated at the MR console as well as the remote computer.

HIPAA audit trail

Each time you use Expert–i, the protocol inputs are entered in the HIPAA audit trail.

The inputs are generated when you perform the following actions:

- The local user activates Expert–i.
- The remote user successfully establishes the remote connection.
- The remote connection was not established within the time reserved for this purpose.
- The local user or the remote user disconnects the remote connection.

Minimum requirements

The following minimum requirements must be met for the remote computer and the local network:

Computer hardware	Current standard hardware
Processor	850 MHz
Operating system	Windows XP, 7, or higher
Primary storage	256 MB
Network card	100 Mbit/s
Display resolution	1280×1024
Color	32 bit
Local network	100 Mbit/s or higher
Min. transfer rate	> 600 kB/s
Response time	<30 ms

If the minimum requirements are not met, the performance and display of the remote computer may be adversely affected.

2.10.1 Compatibility of the Expert-i client

The Expert-i client is compatible with **all** Numaris/X versions and the Numaris/4 versions and systems listed in the table below. That is, you can access various MR systems from a single environment.

Numaris/4 version	MR system
syngo MR A35/A40	• MAGNETOM Harmony • MAGNETOM Sonata • MAGNETOM Symphony • MAGNETOM Concerto • MAGNETOM C!
syngo MR B17/B19	• MAGNETOM Avanto • MAGNETOM Espree • MAGNETOM Symphony a Tim System • MAGNETOM Trio a Tim System • MAGNETOM Verio
syngo MR C15	• MAGNETOM ESSENZA • MAGNETOM MAGNETOM ESSENZA Mobile • MAGNETOM C2!
syngo MR D13	• MAGNETOM Aera • MAGNETOM Avanto

Numaris/4 version	MR system
syngo MR E11/E12	• MAGNETOM Aera • MAGNETOM Skyra • MAGNETOM Avanto • MAGNETOM Verio • MAGNETOM Avanto^{fit} • MAGNETOM Skyra^{fit} • MAGNETOM Prisma • MAGNETOM Spectra • MAGNETOM Amira • MAGNETOM Sempra • MAGNETOM Biograph mMR • MAGNETOM Terra

2.10.2 Certificate for Expert-i communication

A self-signed certificate is used by the Expert-i server that runs on the workplace. This self-signed certificate is generated during installation and assigned to the communication.

Remote Expert-i users may experience a “self-signed certificate” warning. Nevertheless, communication/transfer will be encrypted.

These warnings can be prevented in one of two ways:

- IT administrators may want to apply a valid RA certificate (replacing the self-signed certificate).
- Alternatively, they can store the self-signed certificate from the Expert-i server in the trusted store on the client machine (“certificate export and import”). This solution (described below) does not require purchase of a valid certificate.

In both cases, users no longer receive these warning messages and therefore do not become accustomed to ignoring such warnings.

Use the following command to bind a certificate to the port used by the Expert-i server for HTTPS communication. It is valid for the "Everyone" account.

- On the client **providing** the Expert-i connection, open a command prompt and enter:

  ```
  netsh.exe http add sslcert ipport=0.0.0.0:7443
  certhash=<thumbprint>
  appid={02639d71-0935-35e8-9d1b-9dd1a2a34627}
  certstorename=MY
  ```

  Replace <thumbprint> with the corresponding value for the "syngo.Expert-i" certificate.

  To evaluate the <thumbprint>, either issue the command `syngo.Common.Communication.Tools.EncryptionConfiguration.exe /list` or open the **certlm** store and browse to **Personal > Certificates**.

If you want to restore the old settings again (i.e. unbind the certificate), issue: `netsh.exe http delete sslcert ipport=0.0.0.0:7443`

2.10.3 Workflow of an Expert-i session

Before you start working with Expert-i, we recommend that you preconfigure connections, for example, set host names, IP addresses, or the display quality during the connection.

Once the configuration is set up, you can quickly establish a remote session whenever you need it. (➔ Page 178 *Creating a new connection*)

As the local user, you are responsible for the patient during the entire examination.

Do not leave the MR console at any time during remote connection and monitor the actions of the remote user.

To invite a colleague and establish an Expert-i remote connection, proceed as follows:

- You generate an access code for your colleague to establish a remote connection to your workplace.

  (➔ Page 179 *Enabling an Expert-i remote connection to your workplace*)

- The requested colleague connects to your workplace.

  (➔ Page 180 *Connecting to a workplace with Expert-i*)

  (➔ Page 184 *Connecting to a workplace with Expert-i using a web browser*)

- Both of you can end the Expert-i remote connection and close the remote desktop session.

  (➔ Page 188 *Expert-i: Ending collaboration*)

If the connecting user is idle for a predefined time, the connection is terminated automatically.

You can also directly connect to a *syngo* MR Workplace without being invited beforehand. (➔ Page 182 *Connecting directly to a workplace with Expert-i*)

For that, the Expert-i direct logon functionality has to be configured in the Administration Portal.

At the workplace that shares its desktop, the Expert-i status icon on the status bar indicates the connection state:

	No Expert-i remote connection established
	Waiting for Expert-i remote connection
	Expert-i remote connection is active

2.10.4 Creating a new connection

To connect to other workplaces with Expert-i, you can preconfigure required connection settings, such as the host name, the IP address, and the display quality. If you have a low network bandwidth, reducing the display quality may allow smoother image transmission.

The connection settings apply to all users on your client.



1 On the access bar, click the **Expert-i** icon and choose **Expert-i Connect** from the menu.

The **Expert-i Connect** dialog box opens.



2 Click the **Add** icon to create a new connection.

– or –



Click the **Edit** icon to modify an existing connection.

The **Expert-i Edit Connection** dialog box opens.

3 In the **Name** field, enter the name of the connection.

4 In the **HostName / IP Address** field, enter the host name or the IP address of the remote computer.

5 To allow smooth image transmission, select the **Quality** of the Expert-i display according to your network bandwidth.



Consider that if you select **Medium** or **Low**, the display quality is not sufficient for primary reading.

6 Select the **Security Protocol** for the Expert-i remote connection:

- To connect to workplaces that support HTTPS connections, select the **Use https** check box.
- To connect to workplaces that do not support HTTPS connections, clear the **Use https** check box.

7 Click **Save** to save the connection settings.

2.10.5 Enabling an Expert-i remote connection to your workplace

To allow a colleague to connect to your workplace, you need to generate an access code and specify the access mode for the connecting user (**View Only** or **Full Access**).

The access code is only valid for a single logon to a remote connection.

Your colleague must use the HTTPS protocol to connect to your workplace. If this function is not available, your colleague cannot connect to your workplace.

Alternatively, your colleague can install the current Expert-i standalone client that provides the HTTPS function.

✓ A valid certificate for HTTPS connections is installed on your workplace.



1 On the status bar, click the Expert-i status icon.

The **Expert-i Provide Access** dialog box opens.

The access code is displayed.

Depending on the configured security level for Expert-i, the access code varies in complexity and may be editable.

---

2 To specify the access mode, select the corresponding option in the **Connection Mode** section:

- **View Only**

  The remote user has read-only access.

  The remote user has a separate mouse pointer:

- **Full Access**

  The remote user has full access to your *syngo* MR Workplace.

  The remote user controls your mouse pointer.

3 Click **Allow Connection** to enable an Expert-i remote connection.



The Expert-i status icon indicates that a remote connection is enabled but that the requested colleague has not yet connected.

4 Invite your colleague at the other workplace to the Expert-i remote connection session.

Inform your colleague about the access code and the workplace that your colleague should connect to. Your colleague must use the HTTPS protocol to connect to your workplace.

Now your colleague can connect to your *syngo* MR Workplace within a specified time interval.

(➔ Page 180 *Connecting to a workplace with Expert-i*)



Once the Expert-i remote connection is established, the Expert-i status icon changes.

You can end the collaboration at any time. (➔ Page 188 *Expert-i: Ending collaboration*)

2.10.6 Connecting to a workplace with Expert-i

To answer a collaboration request from a colleague, you can start the Expert-i remote connection from your *syngo* MR Workplace or you can use the Expert-i standalone client.

✓ You know the access code and the IP address or host name of the workplace that you want to connect to.



1 On the access bar, click the **Expert-i** icon and choose **Expert-i Connect** from the menu.

– or –

Open the **Expert-i** standalone client.

The **Expert-i Connect** dialog box opens.

2 Select a connection setting and click **Connect**.

If no appropriate connection setting is available, you can create a new connection setting or modify an existing connection setting. (➔ Page 178 *Creating a new connection*)

Only for HTTPS connections:

A warning message may open indicating that the connection is not secure because the remote computer could not be authenticated. If you trust the computer to which you are connecting, you can click **Connect Anyway** to proceed.

To increase security and avoid this warning message, your IT administrator must replace self-signed certificates with certificates signed by a trusted root Certificate Authority (CA).

For information about the certificate used, click the header of the dialog box.

The **Expert-i** logon dialog box opens.

The appearance of the **Expert-i** logon dialog box may differ slightly depending on the workplace to which you are connecting.

3 In the **PIN or password** field, enter the access code.

4 Click **Connect** to establish the connection.

The Expert-i remote session is started and the *syngo* MR environment of your colleague is displayed in a separate window. You can change the display settings. (➔ Page 186 *Changing the Expert-i display settings on the client side*)

Depending on the access mode configured, you either have read-only access or you use this environment as a normal *syngo* MR application. The access mode can be changed at any time by the requesting colleague. (➔ Page 185 *Changing the Expert-i access mode on the server side*)

If the display of the remote desktop is distorted, click the Expert-i control menu icon at the top of the window and choose **Refresh** from the menu.

When you are working in a collaboration session, the mouse pointer might jump if the mouse button is pressed for a long time.

This is especially true for zoom/pan or rotate operations in the collaboration session.

2.10.7 Connecting directly to a workplace with Expert-i

You can establish an Expert-i remote connection to another *syngo* MR Workplace without being invited. To do this, the Expert-i direct logon functionality has to be configured in the Administration Portal.

To use this direct connection to another workplace, you only have to enter your Windows user credentials.

The user on the server side receives a notification that you want to connect to that workplace.

The user on the server side can deny the logon within a predefined time interval. If required, this time interval can be set to "0" so that logon cannot be denied.

✓ You have appropriate user rights.

✓ The direct logon functionality is configured on the workplace that you want to connect to.



1 On the access bar, click the **Expert-i** icon and choose **Expert-i Connect** from the menu.

– or –

Open the **Expert-i** standalone client.

The **Expert-i Connect** dialog box opens.

2 Select a connection setting and click **Connect**.

If no appropriate connection setting is available, you can create a new connection setting or modify an existing connection setting. (➔ Page 178 *Creating a new connection*)

Only for HTTPS connections:

A warning message may open indicating that the connection is not secure because the remote computer could not be authenticated. If you trust the computer to which you are connecting, you can click **Connect Anyway** to proceed.

To increase security and avoid this warning message, your IT administrator must replace self-signed certificates with certificates signed by a trusted root Certificate Authority (CA).

For information about the certificate used, click the header of the dialog box.

The **Expert-i** logon dialog box opens.

The appearance of the **Expert-i** logon dialog box may differ slightly depending on the workplace to which you are connecting.

3 Enter your Windows user credentials and click **Connect** to establish the connection.

If a Windows screen lock is active at the workplace that you want to connect to, the Expert-i remote connection cannot be established.

The Expert-i remote session is started and the *syngo* MR environment of your colleague is displayed in a separate window. You can change the display settings. (➔ Page 186 *Changing the Expert-i display settings on the client side*)

If the display of the remote desktop is distorted, click the **Expert-i** icon at the top of the window and choose **Refresh** from the menu.

When you are working in a collaboration session, the mouse pointer might jump if the mouse button is pressed for a long time.

This is especially true for zoom/pan or rotate operations in the collaboration session.

2.10.8 Connecting to a workplace with Expert-i using a web browser

You can establish an Expert-i remote connection with a web browser from any computer within the local network.

With the web browser, you can only connect to workplaces that support the HTTPS protocol for Expert-i remote connections.

To connect to workplaces that do not support the HTTPS protocol, use the Expert-i standalone client. (→ Page 180 *Connecting to a workplace with Expert-i*)

✓ You have a recent web browser installed, for example, Microsoft Internet Explorer 11, Google Chrome, or Mozilla Firefox.

✓ You know the access code and the IP address or host name of the workplace that you want to connect to.

1 Open the web browser and enter the following URL:

https://*HostName****:7443/syngo.experti***

Replace *HostName* with the host name or the IP address of the workplace that you want to connect to.

Optionally, you can define display settings by adding parameters to the base URL. Use the **?** symbol to add the first parameter and the **&** symbol to add further parameters:

https://*HostName****:7443/***
syngo.experti?*parameter1[****&****parameter2...]*

You can replace *parameter1*, *parameter2*,... with the following parameters:

Parameter	Description
lang=EN|DE|FR|ES|ZH-HANS|JA	Defines the language of the Expert-i user interface. The corresponding language must be installed on your system.
quality=high|medium|low	Defines the quality of the remote display according to your network bandwidth.

Parameter	Description
scale=fill|<ScaleWidth>x<ScaleHeight> for example, **scale=1680x1050**	Scales the remote display in the web browser. If you select **fill**, the remote display is scaled to completely fit into the web browser window.
uiscale=<ScaleFactor> for example, **uiscale=0.7**	Scales the Expert-i control elements, for example, the Expert-i control menu. The scale factor must be greater than or equal to 0.1.

A warning message may open to indicate that the connection is not secure because the remote computer could not be authenticated.

If you trust the computer to which you are connecting, you can open the detailed information section and click the corresponding option to connect anyway.

To increase security and avoid this warning message, your IT administrator must replace self-signed certificates with certificates signed by a trusted root Certificate Authority (CA).

The **Expert-i** logon page is displayed.

2 Enter your user name and, in the **PIN or password** field, enter the access code.

If the direct logon functionality is configured on the workplace that you want to connect to, enter your Windows user credentials.

3 Click **Connect** to establish the connection.

The Expert-i remote connection is established and the environment of your colleague is displayed. You can change the display settings. (→ Page 186 *Changing the Expert-i display settings on the client side*)

2.10.9 Changing the Expert-i access mode on the server side

The requesting user can change the access mode at any time during the Expert-i remote session.



1 On the status bar, click the Expert-i status icon.

The **Expert-i Connection Status** dialog box opens.

2 To change the access mode, select the corresponding option in the **Connection Mode** section:

- **View Only**

  The remote user has read-only access.

  The remote user has a separate mouse pointer:

- **Full Access**

  The remote user has full access to your *syngo* MR Workplace.

  The remote user controls your mouse pointer.

3 Click **Apply**.

The access mode is changed. The connected user now has the appropriate rights.

2.10.10 Changing the Expert-i display settings on the client side

If the display is distorted during an Expert-i remote session, you can refresh or adapt the quality of the Expert-i display. For example, if you have a low network bandwidth, it is recommended that you reduce the display quality for smoother image transmission.

You can also select which monitor of the remote desktop should be displayed. If you are using an Expert-i standalone client, you can display the remote desktop in dual monitor layout on your computer.



1 Move the cursor to the top of the window and click the Expert-i control menu icon to open the menu.



2 To refresh the monitor, choose **Refresh**.

3 To adapt the display quality according to your network bandwidth, choose one of the following items from the **Connection Quality** menu:

- **High** (Full Color)
- **Medium** (Compressed)
- **Low** (Grayscale)

Consider that if you select **Medium** or **Low**, the display quality is not sufficient for primary reading.



4 To display another monitor of the remote desktop, choose one of the following items from the **Monitors** menu:

To switch the displayed monitor, choose **Switch Monitor**.

– or –

Choose **Select Monitor** and directly select the required monitor in the **Select Monitor** dialog box.

– or –

To display all available monitors, choose **Show All Monitors**.

Only available for Expert-i standalone clients:

5 To display the remote desktop on both of your monitors, choose **Dual Monitor Layout**. This layout is only available if both the client and server side each have two monitors with similar resolutions.

6 To switch to full screen mode, choose **Full Screen**.

– or –

To switch to window mode, choose **Exit Full Screen**.

The appearance of the Expert-i control menu may differ slightly depending on the workplace to which you are connected.

2.10.11 Expert-i: Ending collaboration

Both you and your colleague can end the collaboration and close the Expert-i remote connection session at any time.

2.10.11.1 Ending collaboration from the desktop-sharing workplace (server side)

1 Inform your colleague that you are ending the collaboration.



2 Click the Expert-i status icon to open the **Expert-i Connection Status** dialog box.

3 Click **End Connection** to terminate the Expert-i remote connection session.

The Expert-i remote connection session is terminated.

The user on the client side can no longer see your desktop.

The user on the client side is informed that the connection has terminated.

2.10.11.2 Ending collaboration from the connected workplace (client side)

1 Inform your colleague that you are ending the collaboration.

2 Press **Ctrl** + **Alt** + **Q**.

– or –



Move the mouse pointer to the top of the window and click the Expert-i control menu icon to open the menu and choose **Close**.

The Expert-i remote connection session is terminated.



On the server side, the Expert-i status icon indicates that the connection has been terminated.

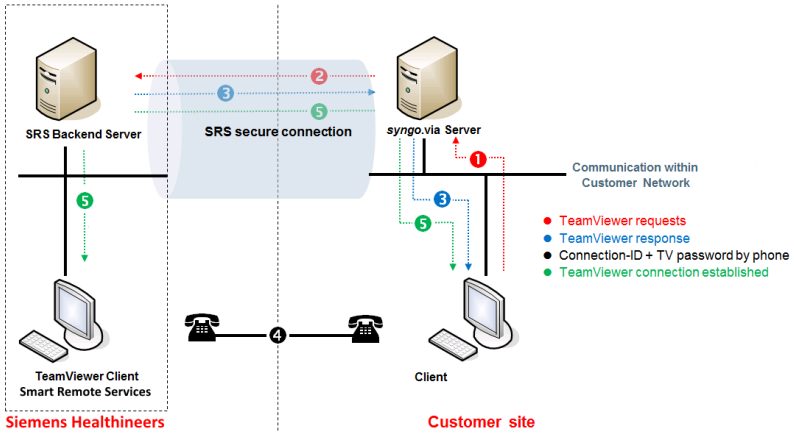
2.11 Remote Assistance

If you require technical support or remote training, you can ask Siemens Healthineers for assistance by requesting a remote desktop connection with your Siemens Healthineers Customer Services.

With your permission, Siemens Healthineers Customer Services can then connect to your *syngo* Acquisition Workplace using TeamViewer and a Siemens Remote Service (SRS) secure connection.

For data security reasons, this connection is entirely tunneled through the SRS infrastructure (there is no connection to the Internet).

The connection is established according to the following scheme:



When the system is connected, it is able to report malfunctions to Siemens Healthineers Customer Services. A remote connection allows inline monitoring, error analysis/identification, and remote repair activities.

Furthermore, you can **share your desktop** with Siemens Healthineers Customer Services to receive direct support if you have any problems or queries.

(→ Page 190 *Using Remote Assistance*)

Further uses of a remote connection:

- You can share your *syngo* Acquisition Workplace desktop **in-house** and ask a colleague for a second opinion about special cases.

  (➔ Page 171 *Expert-i: Collaborating with colleagues*)

- The SRS infrastructure allows Siemens Healthineers Customer Services to perform **administrative activities**, including evaluation of error identification and remote repair.

2.11.1 Using Remote Assistance

With your system, you can request and establish remote connections to Siemens Healthineers Customer Services.

To grant your Siemens Healthineers Customer Services remote access to your workplace:



1 On the access bar, click the **Configuration** icon and choose **Remote Assistance** from the menu.

  – or –

  From the Windows **Start** menu, open **Remote Assistance**.

  The **Remote Assistance** legal disclaimer opens.

2 Click **Agree** to accept the legal disclaimer and to allow the remote desktop connection.

  The **Remote Assistance** dialog box opens containing detailed instructions on how to continue.

  It also provides the unique **Connection-ID** for connecting to Siemens Healthineers Customer Services.

3 Select the **Grant control rights** check box if you wish to allow Siemens Healthineers Customer Services to interact with your system.

  Without this right, only view access is possible.

4 Click **Continue**.

  The **TeamViewer** window opens displaying the individual **TeamViewer Password** required for the remote desktop connection.

5 Contact your Siemens Healthineers Customer Services by phone and provide the assigned **Connection-ID** and the **TeamViewer Password**.

When you have entered the access data provided, your Siemens Healthineers Customer Services initiates a remote desktop connection to your system.

The remote connection has been successfully established when the **TeamViewer** window opens. Your Siemens Healthineers Customer Services starts interaction with your workstation for dedicated application support.

6 When the support session has ended, close the **TeamViewer** window to terminate the remote desktop connection.

To start a new remote desktop connection, a new **Connection-ID** and a new password are required.

2.12 Remote Access

With **Remote Access**, Siemens Healthineers Customer Services can access the Administration Portal on your local MR system. The Administration Portal is a web application with an interface that can be displayed in a standard web browser.

The Administration Portal can be operated via remote access only if you allow **Remote Access**.

(➔ Page 191 *Configuring Remote Access*)

If **Remote Access** is allowed, successful authentication through the authentication dialog is required before you can use the Administration Portal.

2.12.1 Configuring Remote Access



1 On the access bar, click the **Configuration** icon and choose **Remote Access** from the menu.

The **Remote Access Configuration for Service** tab of the Administration Portal opens.

2 In the **User Groups** section, select **Siemens Remote Access** to allow the Siemens Healthineers Customer Services to access your system.

   This includes access to the Administration Portal.

3 In the **Access Rights** section, select whether to grant **Full Access** or **Restricted Access**.

   If **Restricted Access** is activated, certain service tasks, such as DICOM configuration, cannot be performed remotely in order to avoid disturbing clinical usage.

4 Click **Save** to apply the settings.

Your system is always accessible through the local hospital network, for example, from your clinical IT department, regardless of the current settings of Siemens Healthineers Customer Services.

You can only decide whether to grant **Full Access** or **Restricted Access**.

2.13 Access-i remote control

The Access-i feature allows you to operate a MAGNETOM system from another computer (client) near to the *syngo* Acquisition Workplace. Thus you can control and edit examination programs of the MR system from a non-Siemens device.

This chapter only describes how to use the Access-i feature on the MAGNETOM system. The description and operation of the interfaces on the non-Siemens client are not part of this manual. Please refer to the operator manual of the respective manufacturer.

2.13.1 Using Access-i

1 Switch on the Access-i feature on the *syngo* Acquisition Workplace. (➔ Page 194 *Switching the remote control on/off*)

2 Prepare the measurement programs for remote control (create templates). (➔ Page 194 *Preparing measurement programs for remote control - creating templates*)

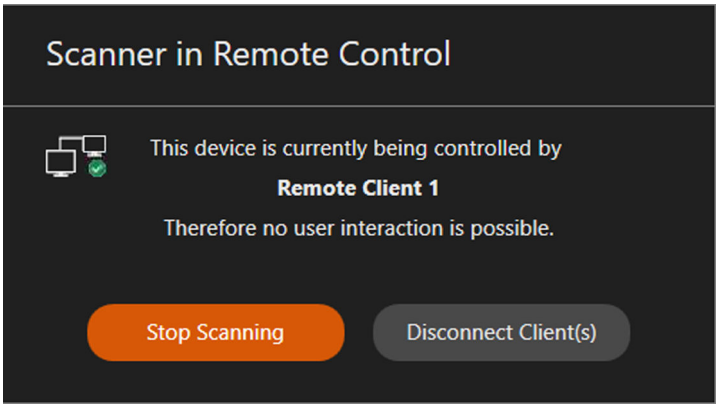
Now you can access the *syngo* Acquisition Workplace from the client. You can access the *syngo* Acquisition Workplace in two ways:

- **Passive**: You just view and receive the acquired MR images on the client. With this type of access, all interactions are performed on the *syngo* Acquisition Workplace or by another active client.
- **Active**: You control the measurements from the client. During active remote access, interactions at the *syngo* Acquisition Workplace are not possible.

In order to establish active remote control, the following preconditions at the *syngo* Acquisition Workplace must be met:

- A patient is registered
- No program step is opened in the measurement queue
- No sequence is running
- No pop-up dialog box is open

An overlay layout on the *syngo* Acquisition Workplace indicates to you that remote control is active:



3 To cancel the current remote operation on the *syngo* Acquisition Workplace, click **Disconnect Client(s)**.

Both active and passive control are canceled. To re-establish remote access, you need to switch on the Access-i feature again.

– or –

During an ongoing measurement, you can also cancel the scan without interrupting the remote connection by clicking **Stop Scanning**.

2.13.2 Switching the remote control on/off

As a prerequisite for accessing the MAGNETOM system remotely, you need to allow access by switching on the remote control (for example, after starting the MR system).



◆ In the lower-right corner of the status bar of the *syngo* Acquisition Workplace, click the icon to switch the remote control on or off.

While remote control is active, access from the client is enabled. The number of connected clients is shown in the upper-left of the icon.

2.13.3 Preparing measurement programs for remote control - creating templates

On the client, you can only control programs that are “enabled” for remote access. Therefore, two preparation steps are necessary:

- Enter `[Remote]` in the **Description** field of the **Directory Properties** of the program in question. (➔ Page 195 *Entering [Remote] in the Description field of the Directory Properties*)
- Add the **Access-i** add-in to the relevant program step. (➔ Page 196 *Adding the Access-i add-in*)

[Template] localizer

[Template] BEAT_interactive

A program step that is "enabled" for remote access is called a template. When you add this program step to the measurement queue, the expression **[Template]** is added as a prefix to the name of the step. The behavior of a template step is also quite different. As soon as you start the template step, a copy of this step is created and started, so that the original template step is never completed. This allows you to remotely control and edit the template step several times.

2.13.3.1 Entering [Remote] in the Description field of the Directory Properties

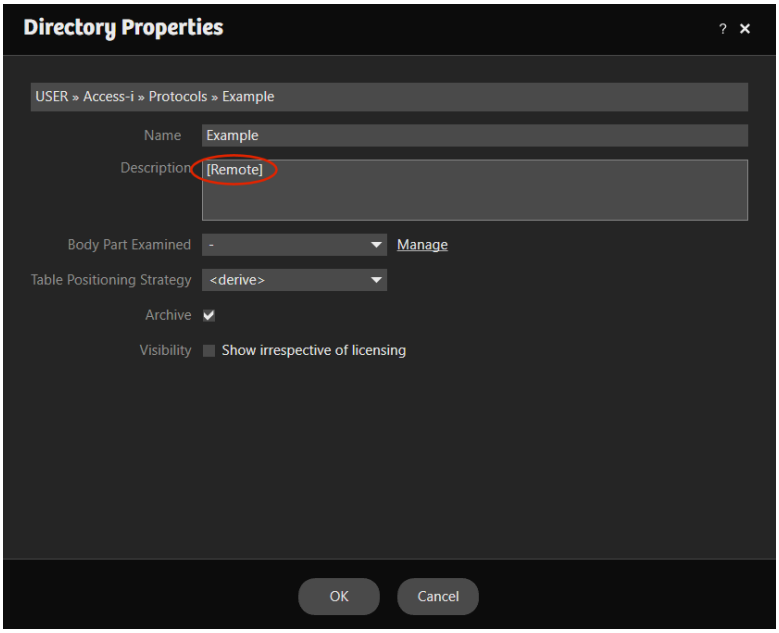
To generally enable a measurement program for remote access, you need to adjust the directory properties.

1 Open the **Browse** tab of the **myExam Cockpit Explorer** and select the measurement program (directory) in the tree view.

2 Right-click and choose **Edit Properties** from the context menu.

The **Directory Properties** dialog box opens.

3 In the **Description** field of the **Directory Properties** dialog box, enter: `[Remote]`



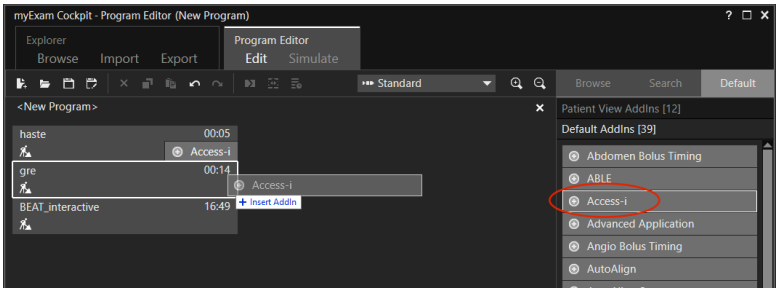
Do not forget to enter the square brackets.

4 Click **OK** to confirm.

The measurement program is prepared for remote access. Now you can remotely add this program to the measurement queue. To control the program steps, you must additionally add the **Access-i** add-in.

2.13.3.2 Adding the Access-i add-in

1 On the **Edit** tab of the **myExam Cockpit Program Editor**, select the program step.



2 From the default add-ins, choose the **Access-i** add-in and drag it to the corresponding program step.

3 Repeat this for each program step that you want to control from the client.

You can now control and edit the program steps from the client.

Configuring the Access-i add-in for interactive sequences

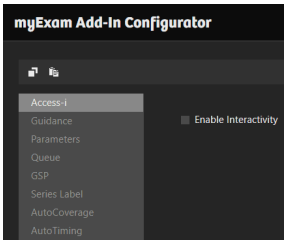
For special interactive sequences, you can adjust the measurement parameters in real time (while a measurement is running). To allow adjustment of these parameters remotely, you need to configure the **Access-i** add-in that is assigned to the program step.

1 On the **Edit** tab of the **myExam Cockpit Program Editor**, select the program step.

2 Right-click and choose **Edit Properties** from the context menu.

The **Step Properties** dialog box opens.

3 In the lower-left of the **Step Properties** dialog box click **AddIn Configuration** to open the **myExam Add-In Configurator** dialog box.



4 Select the **Access-i** card and enable the option **Enable Interactivity**.

5 Click **Close** to confirm.

3 myExam Cockpit

3.1 myExam Cockpit overview

The sequences and parameter settings as well as the typical workflow of frequently performed examinations are stored in your system as measurement programs and myExam Assist programs.

The **myExam Cockpit** gives you an overview of all the measurement programs and myExam Assist programs available in your system. This overview includes all the programs predefined by Siemens and all the programs that were created for or adapted to the specific requirements at your site.

The **myExam Cockpit** user interface comprises two main sections: the **Explorer** and the **Program Editor**.

(➔ Page 199 *The myExam Cockpit Explorer*)

(➔ Page 201 *The myExam Cockpit Program Editor*)

You use the **myExam Cockpit** to organize, create, and adapt measurement programs and myExam Assist programs of your MR scanner. You might also use the **myExam Cockpit** to search for specific program steps or sequences to add them to the queue in an ongoing examination.

If you want to change a program for only a specific study at hand, you do not use the **myExam Cockpit** to edit the program. Instead, you start the study, load the program into the queue, and make adjustments there. These changes will apply to the current study only.

- (➔ Page 199 *Opening the myExam Cockpit*)
- (➔ Page 212 *Searching and browsing*)
- (➔ Page 214 *Creating or modifying a measurement program*)
- (➔ Page 230 *Creating or editing a myExam Assist program*)
- (➔ Page 258 *Organizing trees and directories*)

If your hospital or institution has more than one Siemens MR scanner, you can share measurement programs and myExam Assist programs by exporting and importing them on individual scanners, or you can use the **MR protocols module** to synchronize measurement programs and myExam Assist programs across your fleet of Siemens MR scanners.

- (→ Page 270 *Importing or exporting measurement programs*)
- (→ Page 275 *MR protocols module*)

3.1.1 Opening the myExam Cockpit



1 Click the **myExam Cockpit** icon on the **Home** screen.

– or –

During an ongoing examination, click the **myExam Cockpit** icon on the **Examination** screen.

By default, the **myExam Cockpit** window opens in the same position in which it was last active.

You can drag the **myExam Cockpit** window to any position, even to the **Viewing** screen.

2 Double-click the title bar to show the **myExam Cockpit** in full-screen mode.

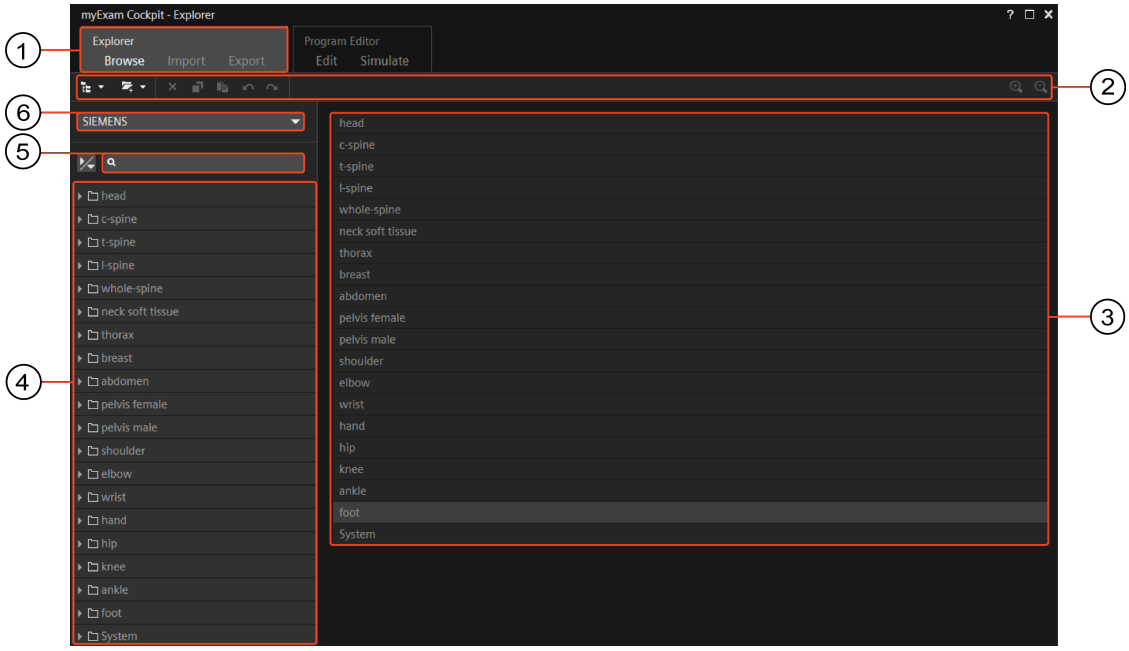
Double-click the title bar a second time to return to window display.

3.1.2 The myExam Cockpit Explorer

You use the **myExam Cockpit Explorer** when you search for measurement programs or protocols, for example, during an examination, when you want to transfer them directly to the queue. You also use the **Explorer** for organizing measurement programs and myExam Assist programs.



With the **Undo** and **Redo** icons on the toolbar, you can reset or repeat the last change in the **myExam Cockpit Explorer**.



(1) Browse, Import, Export
The **myExam Cockpit Explorer** comprises three tabs.
You use **Browse** to search for measurement programs, program steps, or myExam Assist programs in the database of your system. You also use **Browse** to organize user trees in a clear way.
(➔ Page 212 *Searching and browsing*)
(➔ Page 258 *Organizing trees and directories*)
You use **Import** and **Export** to exchange measurement programs or myExam Assist programs with other systems.
(➔ Page 270 *Importing or exporting measurement programs*)

(2) Toolbar

(3) Content area
When you select a measurement program in the tree view, a structure view of this program is shown in the content area.
(➔ Page 204 *Measurement programs and myExam Assist programs*)
(➔ Page 205 *Structure view*)

(4) Tree view

(5) Search field

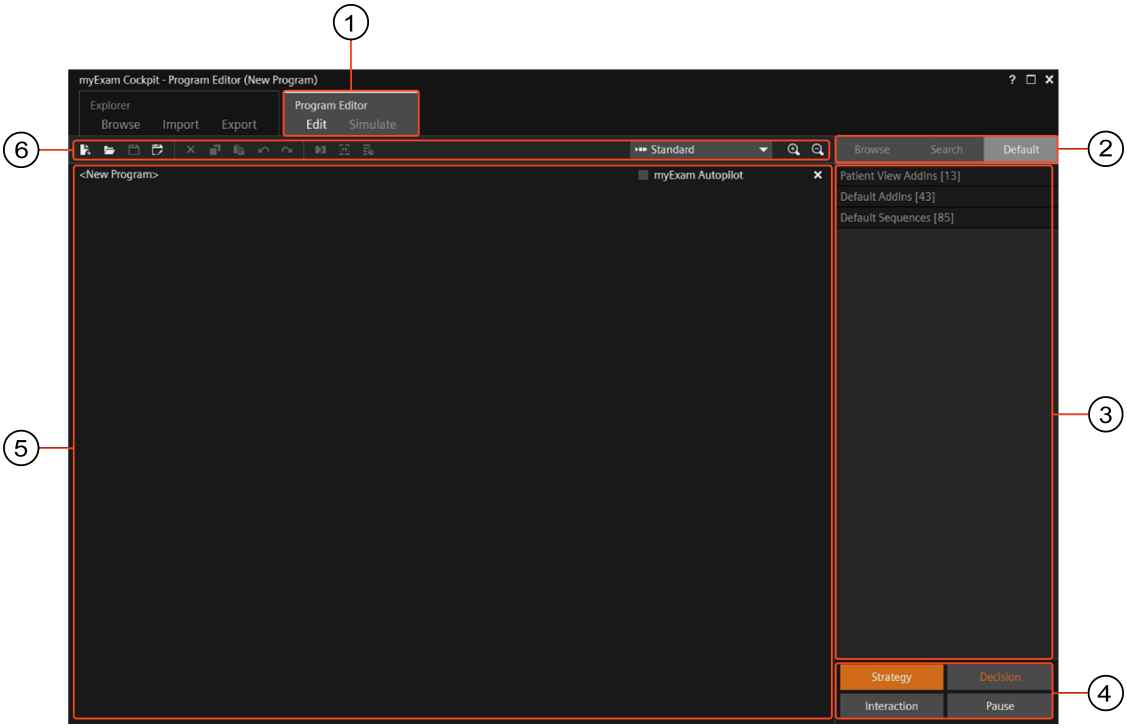
(6) Tree selection

3.1.3 The myExam Cockpit Program Editor

You use the **Program Editor** for creating and editing measurement programs and myExam Assist programs.



With the **Undo** and **Redo** icons on the toolbar, you can reset or repeat the last change in the **myExam Cockpit Program Editor**.



(1) Edit, Simulate

The **myExam Cockpit Program Editor** comprises two tabs.

You use **Edit** to define measurement programs and myExam Assist programs.

(➔ Page 214 *Creating or modifying a measurement program*)

(➔ Page 230 *Creating or editing a myExam Assist program*)

(➔ Page 252 *Creating or modifying a multiregion program*)

You use **Simulate** to test strategy and decision paths as well as the estimated measurement time in myExam Assist programs.

(➔ Page 251 *Simulating strategy and decision paths*)

(2) Sidebar tabs

You use **Browse** and **Search** to find programs and program steps in the Siemens tree or in user trees.

You use **Default** to add Siemens default sequences and myExam add-ins to programs and myExam Assist programs.

(3) Sidebar

On the **Edit** tab, you use this section of the screen to select the program steps that you want to insert in a measurement program.

On the **Simulate** tab, you use this section of the screen to test combinations of strategies and decision paths in myExam Assist programs.

(4) Sidebar building blocks
You use these building blocks for quick insertion of blank program steps.

(5) Workspace
In this section of the screen, you see the measurement program that you are currently working on.
(➔ Page 205 *Structure view*)

(6) Toolbar

The **myExam Autopilot** check box in the **myExam Cockpit Program Editor** can be activated to support creation of a myExam Autopilot program. If the check box is activated, all steps that are incompatible with a myExam Autopilot program are highlighted in red. See: Operator Manual myExam Autopilot.

3.1.4 Siemens tree and user trees

Measurement programs and myExam Assist programs are arranged in trees.

The Siemens tree contains all the measurement programs and myExam Assist programs that come with your system. You can use Siemens tree programs for your studies and you can adapt the workflow or parameter details in the queue.

In the **myExam Cockpit**, the Siemens tree and Siemens tree programs are read-only. When you build your own set of measurement programs and myExam Assist programs, you create one or more user trees. User trees and their regions, examinations and measurement programs can be protected by passwords.

In a tree, the system expects you to group measurement programs according to the following hierarchy:

- Region

  At this level, the system expects you to specify the region of the body, for example, Head, Thorax, Abdomen.

- Examination

  At this level, the system expects you to specify the type of examination a group of alternative measurement programs are designed for.

- Program

  This is the level at which the system expects you to store your measurement programs. Programs are predefined and frequently used workflows that can be used in the clinical routine. They contain sequences and parameter settings as well as the typical workflow.

- Libraries

  Aside from examinations and measurement programs, the Siemens tree also provides libraries. Libraries are collections of predefined program steps that are intended as building blocks. You can drag program steps from libraries when you build measurement programs or drag them to the measurement queue. If required, you can create your own libraries in your user trees.

Libraries are displayed irrespective of licensing, whereas programs are only shown when all program features are licensed.

3.1.5 Measurement programs and myExam Assist programs

The sequences and parameter settings as well as the typical workflow of frequently performed examinations are stored in your system as measurement programs. A measurement program comprises a set of program steps arranged in the sequence in which users will want to perform these steps in an examination. Moreover, program step parameters can be predefined in the measurement program, which saves time when a study is being performed. In the region-examination hierarchy of the Siemens and user trees, alternative programs are available for frequently performed examinations.

myExam Assist programs offer an alternative approach for use alongside linear measurement programs. myExam Assist programs incorporate strategy choices and allow users to decide on alternative routes they might want to take. myExam Assist programs also provide a high level of user guidance.

When you are working with myExam Assist programs, you need to be familiar with the following terms:

- Workflow step

  Every myExam Assist contains exactly one workflow step, namely at the beginning of the program. In this step, users select the examination strategy. Therefore, the workflow step is associated with a **Patient View Add-In**, which provides the user interface of the workflow step.

- Strategy

  myExam Assist programs plan alternative paths that an examination might take. These paths are called strategies. At the beginning of a study, users select a strategy for the examination at hand. For example, *Speed focus* might be a suitable strategy if the patient's condition is poor. However, at any time during the study, users can switch strategies if this becomes necessary.

- Decision

  During a study, the physician frequently needs to make decisions that affect the next program steps. For example, will the next program steps be measured with contrast agent or without contrast agent. myExam Assist programs can either be configured so that such decisions are made in advance, that is, at the beginning of the study, or during the study.

- Interaction

  An interaction is an activity other than scanning. Interaction steps are used to plan such activities at certain points during a study. For example, **MPR Planning**, which is defining MPR reconstruction settings, is a typical interaction step that is required in certain studies.

- myExam add-in

  myExam add-ins are auxiliary software components for myExam Assist programs. myExam add-ins enhance program steps. For example, the **General Views Add-In** presents users with two views. These are the **Guidance** view, with information about the program step, and the **Parameters** view, with a selection of important protocol parameters.

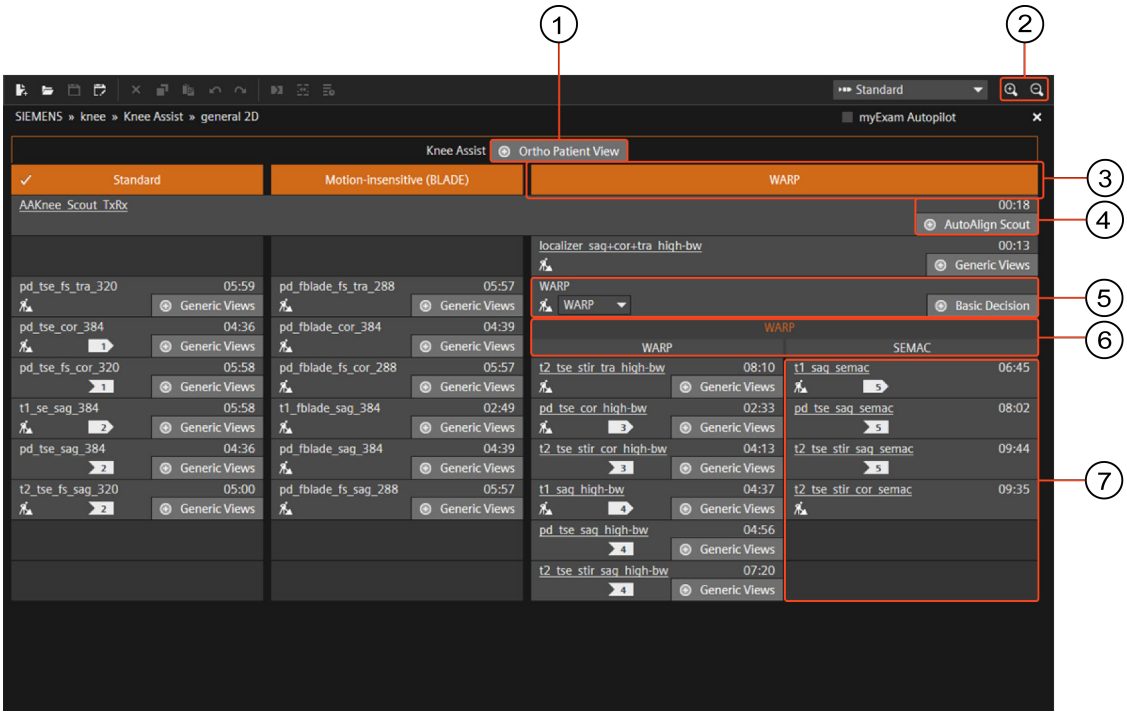
3.1.6 Structure view

In the **myExam Cockpit Explorer** and **Program Editor**, measurement programs are displayed in a way that clearly visualizes their structure.

A linear measurement program, for example, is represented by a simple sequence of program steps.

myExam Assist programs by contrast are represented by a matrix, in which columns represent alternative routes that the examination might take and rows represent individual program steps.

Program steps that are listed in the same row but belong to different strategies or different decision branches correspond to each other in the sequence. If, during a study, the steps in row 1 and 2 have already been measured when the user switches strategies, the system suggests step 3 of the new strategy as the next program step. If strategies or decision branches contain a different number of program steps, cells are left empty. For example, strategy 2 contains steps 1, 2, 3, 4, and 5, whereas strategy 1 contains only step 1, 2, 3, and 5. Therefore, strategy 1 has an empty cell in row number 4.



(1) Workflow step with **Patient View Add-In**
(2) Tools for zooming in on branches or for zooming out for a better overview
(3) Strategy
(4) Program step with myExam add-in
(5) Decision step
(6) Decision
(7) Decision branch

3.1.7 The copy reference concept

A copy reference applies settings that you have defined for one measurement step earlier in a program to one or more steps later in the same program.

A copy reference establishes a link between these program steps. If you change parameters in the source step, these changes will affect the target step as well. However, if you change parameters in a target step, this will not affect the source step.

In the queue or in the structure view of the **myExam Cockpit**, copy reference markers tell you that a copy reference exists between program steps. Copy reference markers are numbered.

A copy reference always refers to an entire group of parameters, for example, all slices and saturation regions or all measurement parameters of a program step. You cannot create a copy reference for an individual measurement parameter only.

Parameter group	Parameters included
Center of slice groups and saturation regions	• Coil element selection • Slice/slab groups: position, orientation, and rotation • Sat. regions: position, orientation, and thickness • Navigators: position, orientation, rotation, extent in the phase-encoding and readout directions, thickness Please note: If **Auto Coil Select** is used for the target protocol, the coil element selection might be different to the source protocol. **Auto Coil Select** is always applied after you have copied measurement parameters with **Copy Parameters** from the context menu.

Parameter group	Parameters included
Slices and saturation regions	• Coil element selection • Slice thickness • Slice/slab groups: – Number of slices/slab groups – Number of slices/slabs per group – Position, orientation, rotation, distance factor • Sat. regions: – Number, position, orientation, and thickness of sat. regions, – Number, thickness and gap of parallel/tracking sat. regions, – sat. mode • Navigators: position, orientation, rotation, extent in the phase-encoding and readout directions, thickness Please note: If **Auto Coil Select** is used for the target protocol, the coil element selection might be different to the source protocol. **Auto Coil Select** is always applied after you have copied measurement parameters with **Copy Parameters** from the context menu.
Slices and Adjustment volume	• Coil element selection • Image numbering • Slice thickness • Slice/slab groups: – Number of slices/slab groups – Number of slices/slabs per group – Position, orientation, rotation, distance factor • Navigators: position, orientation, rotation, extent in the phase-encoding and readout directions, thickness • Shim mode • Position, orientation, rotation, and extent of the adjustment volume Please note: If **Auto Coil Select** is used for the target protocol, the coil element selection might be different to the source protocol. **Auto Coil Select** is always applied after you have copied measurement parameters with **Copy Parameters** from the context menu.

Parameter group	Parameters included
Slices	• Coil element selection • Image numbering • Slice thickness • Slice/slab groups: – Number of slices/slab groups – Number of slices/slabs per group – Position, orientation, rotation, distance factor • Navigators: position, orientation, rotation, extent in the phase-encoding and readout directions, thickness Please note: If **Auto Coil Select** is used for the target protocol, the coil element selection might be different to the source protocol. **Auto Coil Select** is always applied after you have copied measurement parameters with **Copy Parameters** from the context menu.
Saturation regions	• Sat. regions: Position, orientation, position, and thickness • Parallel/tracking sat. regions: number, thickness, and gap • Saturation mode
Measurement parameters	• Coil element selection • Image numbering • FoV slice: – FoV readout FoV phase – Basic resolution, phase resolution, slice resolution, phase oversampling, slice oversampling, slice thickness • Radial views, radial interleaves, BLADE coverage • Slice/slab groups: – Number of slices/slab groups – Number of slices/slabs – Position, orientation, rotation, distance factor, phase-encoding direction

Parameter group	Parameters included
	• Sat. regions: – Number, position, orientation, and thickness of sat. regions, – Number, thickness and gap of parallel/tracking sat. regions, – Sat. mode • VOI for spectroscopy • Interpolation resolution for CSI • Navigators: position, orientation, rotation, extent in the phase-encoding and readout directions, thickness Please note: If **Auto Coil Select** is used for the target protocol, the coil element selection might be different to the source protocol. **Auto Coil Select** is always applied after you have copied measurement parameters with **Copy Parameters** from the context menu.
Adjustment volume	• Shim mode • Position, orientation, rotation, and extent of the adjustment volume
Table position	• Table position of the protocol
Navigators	• Position, orientation, rotation, extent in the phase-encoding and readout directions, thickness
Everything	• All the parameter groups including the sequence

3.1.8 Multiregion examinations and the study part concept

A multiregion examination examines more than one part of the body in a single examination workflow. For example, a multiregion examination might cover the head, the neck, and the upper part of the spine.

Study parts are needed for programs performing multiple requested procedures in one examination. For each requested procedure, one study will be created. The procedure data belonging to it is assigned accordingly, for example, **Accession Number**.

In the **Program Editor**, placeholders for studies (study parts) can be defined. Each step of a program can be assigned to several of these placeholders.

By combining assigning steps to study parts in the **Program Editor** and mapping these study parts to actual requested procedures during patient registration, it is possible to configure exactly which images are assigned to which studies.

Advantage

The use of study parts as placeholders enables you to perform the assignment for a multi-study acquisition already in the **myExam Cockpit**, in which case only the mapping to actually requested procedures has to be performed during patient registration.

During patient registration, all placeholders of a program will be mapped to actually requested procedures.

HIS/RIS

If your system is connected to a RIS, you can obtain work requests via the HIS in the form of procedure steps for your MR system.

Example:

Program step	Study part
FastView	Head, Neck, Spine_I, Spine_II
t1_se_sag	Head
t2_tse_tra	Head
t1_tse_cor	Neck
t2_me2d_tra	Spine_I
t1_vibe_tra	Spine_II
Contrast	
t2_tse_sag	Head, Neck

Configuration myExam Cockpit: Multi-study program

Requested procedures	Mapping in patient registration: Requested procedure → Study part[1)]	Examination: Multi-study program	Study and series results
MRI Brain with contrast	MRI Brain with contrast [1] → Head	FastView [1] [2] [3] t1_se_sag [1] t2_tse_tra [1] t1_tse_cor [2] t2_me2d_tra [3] t1_vibe_tra [3] contrast t2_tse_sag [1] [2]	MRI Brain with contrast 1. FastView 2. t1_se_sag 3. t2_tse_tra 4. t2_tse_sag
MRI Neck with contrast	MRI Neck with contrast [2] → Neck		MRI Neck with contrast 1. FastView 2. t1_tse_cor 3. t2_tse_sag
MRI Spine	MRI Spine [3] → Spine_I, Spine_II		MRI Spine 1. FastView 2. t2_me2d_tra 3. t1_vibe_tra

Examination workflow

3.2 Searching and browsing

In the **myExam Cockpit**, measurement programs are grouped in trees.

(→ Page 203 *Siemens tree and user trees*)

To find out which programs are available, browse the Siemens and user trees, or search for programs, steps, or sequences specifically.

- (→ Page 213 *Browsing the Siemens tree or user trees*)
- (→ Page 213 *Searching for regions, examinations, programs, or program steps*)

1) Learning mode: mapping will be saved and applied at next occurrence

3.2.1 Browsing the Siemens tree or user trees

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.



1 Select a tree.

2 Click items in the tree view or double-click items in the content area to open lower levels.

– or –



Click **Expand All** next to the search field.

3 Select a measurement program in the tree view.

– or –

Double-click a measurement program in the content area.

A preview of the structure view of this program is shown in the content area.

(➔ Page 205 *Structure view*)

4 Double-click a program step.

The **Step Properties** dialog box of this step opens. The information shown here is read-only.

3.2.2 Searching for regions, examinations, programs, or program steps

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Select the tree in which you want to search.

2 In the search field, type your search text.

In the tree view and the content area, all regions that contain items matching the search string are highlighted. In the tree view, numbers in parentheses indicate the number of matches.



3 To clear the search field before you start a new search, click the white cross at the right edge of the search field.

The highlighting is reset.

A search in the **myExam Cockpit Explorer** considers only licensed and consistent elements. Programs for which you have no license or programs that contain inconsistent steps are not shown. This ensures that only usable and valid steps are presented in the list.

3.3 Creating or modifying a measurement program

You use the **myExam Cockpit** to create and edit measurement programs at your site.

(➔ Page 204 *Measurement programs and myExam Assist programs*)

Remember that you can create new programs only in one of the user trees. The Siemens tree and its programs are read-only.

(➔ Page 203 *Siemens tree and user trees*)

When you create a new measurement program, you can either create it from scratch, or you can copy an existing program and then adapt it to your requirements.

- (➔ Page 215 *Creating a new measurement program*)
- (➔ Page 216 *Copying a program from the Siemens tree*)
- (➔ Page 217 *Copying programs or protocols from the measurement queue*)
- (➔ Page 217 *Opening an existing measurement program*)
- (➔ Page 219 *Inserting program steps*)
- (➔ Page 221 *Repairing inconsistent program steps*)
- (➔ Page 222 *Rearranging program steps in a measurement program*)
- (➔ Page 224 *Modifying program step settings*)
- (➔ Page 225 *Modifying settings in identical program steps*)
- (➔ Page 226 *Comparing protocols*)
- (➔ Page 226 *Displaying the history of a protocol*)

- (➔ Page 227 *Creating copy references*)
- (➔ Page 229 *Modifying the image comment*)
- (➔ Page 229 *Saving the measurement program*)

3.3.1 Creating a new measurement program

You can create a new measurement program either from the **myExam Cockpit Explorer** or from the **Program Editor**.

3.3.1.1 Creating a new measurement program in the Explorer

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Select a user tree.



2 If this user tree is password-protected, unlock it before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

3 Browse to or search for the examination for which you want to create a new program.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)



4 On the toolbar, choose **New Program** from the menu of the **Organize Directories** icon.

The new program is shown on the **Edit** tab of the **Program Editor**. The workspace is still empty.

3.3.1.2 Creating a new measurement program in the Program Editor

✓ The **Edit** tab of the **myExam Cockpit Program Editor** is open.



◆ On the toolbar, click **New Program**.

A new measurement program opens. The workspace is still empty.

3.3.2 Copying a program from the Siemens tree

The Siemens tree and its measurement programs are read-only. You cannot modify these programs. However, you can copy programs from the Siemens tree into one of your user trees and then adapt the copy as required.

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

3.3.2.1 Copying a Siemens program to a user tree

1 Select the Siemens tree.

2 Browse to or search for the program that you wish to copy.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)

3 Select the program.



4 On the toolbar, click **Copy**.

5 Open a user tree.



6 If this user tree is password-protected, unlock it before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

7 Browse to or search for the examination into which you want to paste the program.

8 Select the examination.



9 On the toolbar, click **Paste**.

3.3.2.2 Saving a Siemens program in a user tree

1 Select the Siemens tree.

2 Browse to or search for the program that you wish to copy.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)

3 Select the program in the tree view.

The structure view of the program is shown in the content area. In this view, the program is read-only.



4 Click **Edit program**.

The program is shown on the **Edit** tab of the **Program Editor**.



5 On the toolbar, click **Save As** and select the user tree, region, and examination for the copy.

3.3.3 Copying programs or protocols from the measurement queue

You can copy programs or protocols from the measurement queue into one of your user trees and then adapt the copy as required.

✓ User tree is open.

1 In the measurement queue, select a program or protocol.

2 Drag the object to the user tree.

3.3.4 Opening an existing measurement program

You can open a measurement program in order to edit it either from the **myExam Cockpit Explorer** or from the **Program Editor**.

3.3.4.1 Opening a program from the Explorer

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Open a user tree and search for the program that you want to edit.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)



2 If this user tree is password-protected, unlock it before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

3 Select the program in the tree view.

The structure view of the program is shown in the content area. In this view, the program is read-only.



4 Click **Edit program**.

3.3.4.2 Opening a program from the Program Editor

✓ The **Edit** tab of the **myExam Cockpit Program Editor** is open.



1 On the toolbar, click **Open Program**.

2 Select the program in the **Open Program** dialog box.

To find this program, proceed in the same way as when you look for programs in the **myExam Cockpit Explorer**.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)

3 Click **Open** to load the program.

3.3.4.3 Opening recently edited programs

✓ The **myExam Cockpit Explorer** is shown. In the **Program Editor**, no program is currently open.

1 Click the **Program Editor** tab.

The **Start** dialog box is displayed. Up to five recently edited programs are listed here together with their program path.

2 Click one of these programs.

To create a new program, click **New Program**.

(→ Page 215 *Creating a new measurement program in the Program Editor*)

To open a program, click **Open Program**.

(→ Page 218 *Opening a program from the Program Editor*)

3.3.5 Inserting program steps

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

3.3.5.1 Copying steps from existing programs

1 Select the **Browse** tab on the sidebar.

2 Select a tree.

3 Click items in the tree to open lower levels.

4 Select a program.

When you select a linear program, the program steps are listed on the sidebar. When you select a program with multiple columns, only a small preview image (thumbnail) is shown on the sidebar.

5 Drag steps from the sidebar preview into the workspace.

– or –

Click the thumbnail of a multicolumn program to show the program in a separate window. Drag program steps from this window into the workspace.

3.3.5.2 Searching for specific program steps

1 Select the **Search** tab on the sidebar.

2 Select a tree.

3 In the search field, type your search text.

Search results are listed according to relevance.

4 Copy steps by dragging them into the workspace.

3.3.5.3 Inserting a sequence as a measurement step

1 Select the **Default** tab on the sidebar.

2 Open the **Default Sequences** list.

3 Select a sequence and drag it into the workspace.

3.3.5.4 Extracting a protocol from DICOM images

◆ Drag a series from the **Patient Browser** into the structure view of the **myExam Cockpit Program Editor**.

– or –

Drag a series from the **Series** panel into the structure view.

– or –

Drag an image from the GSP into the structure view.

The system extracts the protocol with which these images were acquired and inserts it as a program step.

If this is a protocol is from a previous software version or from a different system, the system automatically converts the protocol. If the protocol cannot be converted, an error message is displayed.

3.3.5.5 Inserting a pause

A pause step interrupts the measurement. You plan pauses, for example, to administer contrast agent, to give voice commands, or for other purposes.



◆ Click the **Pause** building block at the bottom of the sidebar and drag it into the workspace.

3.3.6 Repairing inconsistent program steps

Inconsistent program steps are steps that contain features or settings for which your site has not acquired a license.

Programs that contain such steps are normally hidden. However, you can explicitly choose to show such programs and program steps dimmed.
(→ Page 268 *Non-licensed programs or protocols*)

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

✓ In the **myExam Cockpit Explorer**, **Show Inconsistent** is selected in the menu of the **Organize Tree** icon.

3.3.6.1 Inserting inconsistent steps

When you insert a program containing inconsistent program steps, the system attempts to repair these steps. Repairing means removing features or settings for which you have no license and inserting the steps minus these features and settings. For example, if you drag a program from a myExam Assist into a traditional measurement program, the myExam add-in attached to the steps will be removed.

◆ Select a program with dimmed program steps on the **Browse** tab on the sidebar and drag into the workspace.

  If the conversion is successful, the program steps no longer appear dimmed.

3.3.6.2 Repairing inconsistent steps

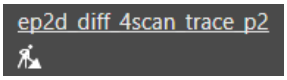
If the program that you are currently editing already contains an inconsistent step, you can trigger repair of the step.

◆ Right-click an inconsistent, that is, dimmed program step in the structure view and choose **Convert** from the context menu.

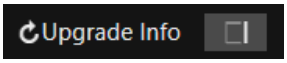
  The system attempts to convert the step and to repair inconsistencies. A popup message box informs you about the progress.

3.3.6.3 Displaying upgrade info

If the system had to change protocol parameters to make the step consistent with the current software version, the step appears underlined in the structure view.



1 Double-click an underlined program step.



2 In the **Step Properties** dialog box, click **Upgrade Info** in the lower right corner of the dialog box.

A list of parameter adaptations is shown.

When you accept the changes, you can choose not to show upgrade information, the protocol will then no longer be underlined.

3.3.7 Rearranging program steps in a measurement program

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

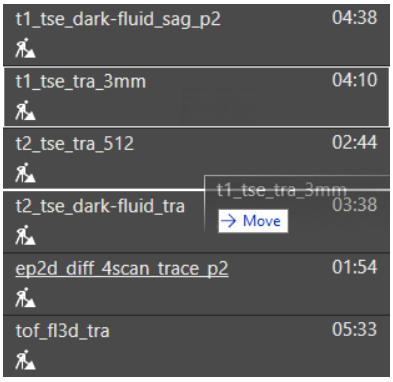
3.3.7.1 Moving a program step

1 Select a program step in the workspace.

– or –

Press and hold the **Ctrl** key or the **Shift** key and select two or more program steps if you want to move more than one step.

2 Drag the step or steps to where you want to move them.



When you move a program step with a copy reference marker, the copy reference information is moved together with the program step.

If you move a source step below the target step or a target step above the source step, the copy reference is lost.

3.3.7.2 Copying a program step

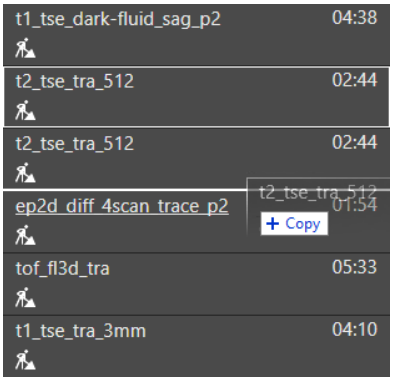
1 Select a program step in the workspace.



2 On the toolbar, click **Copy**.

– or –

Press and hold the **Ctrl** key and drag the program step to where you want to copy it.



When you copy a program step with a copy reference marker, the copy reference information is **not** copied together with the program step.

To keep the copy reference information, copy the source and target program step.

3.3.7.3 Deleting a program step

1 Select a program step in the workspace.

2 On the toolbar, click **Delete**.

3.3.8 Modifying program step settings

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Double-click a program step.

The **Step Properties** dialog box of the selected step opens.

2 Change parameters on the various cards of the **Step Properties** dialog box as required.

(➔ Page 294 *Program step properties*)

3 Click **Ok** to close the **Step Properties** dialog box.

3.3.9 Modifying settings in identical program steps

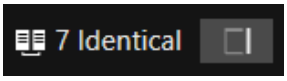
Measurement programs frequently use identical program steps in various contexts. When you open the **Step Properties** dialog box, the identical configurations indicator alerts you to the fact that identical program steps exist in the current or other measurement programs.

You can apply parameter changes to all or to selected identical program steps.

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Double-click a program step.

The **Step Properties** dialog box of the selected step opens.



2 Click the icon to the right of **X Identical**.

A list of all identical program steps is shown.

3 Point to an identical program step in a different measurement program to show complete path information in a tooltip,

4 Change parameters on the various cards of the **Step Properties** dialog box as required.

(➔ Page 294 *Program step properties*)

5 In the **Identical Configuration** section, select the program steps to which you want to apply the parameter changes.

– or –

Select **All measurement steps**.

6 Click **Ok** to close the **Step Properties** dialog box.

7 Save the program.

(➔ Page 229 *Saving the measurement program*)

If you change program steps that are not part of the current program, the **Saving Steps from Other Programs** dialog box opens.

Program steps are grouped according to the trees that they belong to.

8 Click the lock icon next to a password-protected tree.

9 In the **Password Protection: Unlock** dialog box, type the password and click **OK**.

10 Click **OK** in the **Saving Steps from Other Programs** dialog box.

3.3.10 Comparing protocols

A protocol comparison gives you a quick overview of the differences in the parameter settings of different program steps. This comparison only considers parameters and no other settings, such as the study part assignment of program steps, for example.

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select at least two protocols.

We recommend that you do not compare more than eight protocols at a time.



2 On the toolbar, click **Compare Protocols**.

The **Compare Protocols** dialog box opens.

Only the differences between the selected protocols are shown. Parameters that are the same in all the selected protocols are not listed. If a parameter appears on more than one card of the **Step Properties** dialog box, it is listed only once in the **Compare Protocols** dialog box.

3 Click **Close** to close the **Compare Protocols** dialog box.

3.3.11 Displaying the history of a protocol

The protocol history lists all changes to protocol parameters over time. The protocol history considers only parameters but no other settings such as the study part assignment of a program step, for example.

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select a protocol.



2 On the toolbar, click **Show Protocol History**.

The **Show Protocol History** dialog box opens.

Only parameters whose settings were changed are listed. If a parameter appears on more than one card of the **Step Properties** dialog box, it is listed only once in the **Show Protocol History** dialog box.

3 Click **Close** to close the **Show Protocol History** dialog box.

3.3.12 Creating copy references

A copy reference applies settings that you have defined for a program step earlier in a program to a step later in the same program.

(➔ Page 207 *The copy reference concept*)

3.3.12.1 Creating a copy reference

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select the source step, press and hold the **Ctrl** key, and select a target step further down in the program.

The system identifies the step further up in the program as the source step and the step further down in the list as the target step. You cannot reverse this order.



2 On the toolbar, click **Create CopyRef**.

The **Copy References** card of the **Step Properties** dialog box opens.

(➔ Page 303 *Copy References*)

3 Verify that the correct source protocol step is selected.

4 In the **Copy parameter group** list, select the parameter group for which you want to establish a copy reference.

(➔ Page 207 *The copy reference concept*)

5 Click **Ok** to close the **Step Properties** dialog box.

You can also select several target steps at once. When clicking the **Create CopyRef** icon, the **Create Copy Reference** dialog box opens, which is very similar to the **Copy References** card. Proceed as described above.

3.3.12.2 Resolving conflicts in a copy reference

Copy reference conflicts can occur in one of the following situations:

- Changing one parameter requires adapting at least one other parameter, for example, because of limit settings.
- A parameter value cannot be changed, because the new value is not within the permitted soft limits or extended limits for the sequence.

✓ The **Copy Reference Conflicts** dialog box is shown.

If the copy reference conflict involves several target steps, the dialog box looks slightly different. Proceed as described below.

◆ Click **Accept** to resolve the conflict as suggested in the dialog box.

– or –

Click **Undo** to reset parameter changes.

3.3.12.3 Deleting a copy reference

Deleting a copy reference means breaking the link between the source step and the target step or steps.

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select a copy reference marker in the structure view.

2 On the toolbar, click **Delete**.

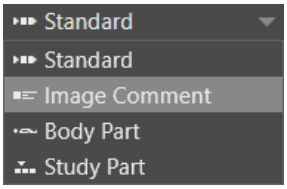
When you delete a copy reference source marker, all copy reference target markers that refer to this source are also removed.

3.3.13 Modifying the image comment

The image comment is shown at the bottom of every image.

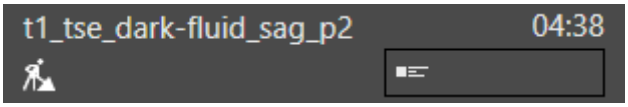
By default, the image comment is the study comment, which users define when registering a patient and starting the study, plus relevant sequence details. When you create or edit a measurement program in the **myExam Cockpit**, you can add additional information to the image comment for individual program steps.

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.



1 Switch protocol markers from **Standard** view to **Image Comment** view.

In the structure view, standard protocol markers, such as copy reference markers, are hidden. Instead, image comment fields are shown next to the program steps.



2 Click an image comment field and type your comment text.

This text will be appended to the study comment plus sequence details in the images resulting from this program step.

3.3.14 Saving the measurement program

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

3.3.14.1 Saving a user tree program



◆ If the open program is a program from a user tree, click **Save** on the toolbar.

3.3.14.2 Saving a program copy



1 If you want to save your measurement program under a new name or at a different location, click **Save As** on the toolbar.

The **Save As** dialog box opens.

2 Select a user tree.



3 If this user tree is password-protected, unlock it before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

4 Select a region and an examination.

5 Type the new program name in the **Name** field.

6 Click **Save**.

3.4 Creating or editing a myExam Assist program

You use the **myExam Cockpit** to create and edit myExam Assist programs at your site.

(➔ Page 204 *Measurement programs and myExam Assist programs*)

Remember that you can create new myExam Assist programs only in one of the user trees. All myExam Assist programs in the Siemens tree are read-only.

(➔ Page 203 *Siemens tree and user trees*)

When you create a new myExam Assist, you can either create it from scratch, or you can copy an existing myExam Assist and then adapt it to your requirements.

When you create a complex myExam Assist for the first time, we recommend that you start with the copy of a Siemens myExam Assist and then modify it as required.

- (➔ Page 231 *Copying a myExam Assist from the Siemens tree*)
- (➔ Page 233 *Opening an existing myExam Assist*)
- (➔ Page 234 *Creating a new myExam Assist*)
- (➔ Page 235 *Defining the myExam Assist structure*)
- (➔ Page 236 *Exchanging the Patient View Add-In*)

- (→ Page 236 *Inserting program steps*)
- (→ Page 240 *Inserting, replacing, or removing default add-ins*)
- (→ Page 241 *Repairing inconsistent program steps*)
- (→ Page 239 *Planning decisions, decision branches, and decision steps*)
- (→ Page 243 *Rearranging program steps in a myExam Assist*)
- (→ Page 245 *Modifying the range of a step*)
- (→ Page 245 *Modifying program step settings and the myExam add-in configuration*)
- (→ Page 246 *Modifying settings and the myExam add-in configuration in identical program steps*)
- (→ Page 247 *Comparing protocols*)
- (→ Page 248 *Displaying the history of a protocol*)
- (→ Page 248 *Creating copy references*)
- (→ Page 250 *Modifying the image comment*)
- (→ Page 251 *Simulating strategy and decision paths*)
- (→ Page 252 *Saving the myExam Assist*)

3.4.1 Copying a myExam Assist from the Siemens tree

The Siemens tree and its programs and myExam Assist programs are read-only. You cannot modify these programs and myExam Assist programs. However, you can copy myExam Assist programs and programs from the Siemens tree into one of your user trees.

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

3.4.1.1 Copying a Siemens myExam Assist to a user tree

1 Select the Siemens tree.

2 Browse to or search for the myExam Assist that you wish to copy.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)

3 Select the myExam Assist.



4 On the toolbar, click **Copy**.

5 Open a user tree.



6 If this user tree is password-protected, unlock it before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

7 Browse to or search for the region or examination where you want to paste the copy.



8 On the toolbar, click **Paste**.

3.4.1.2 Saving a Siemens myExam Assist in a user tree

1 Select the Siemens tree.

2 Browse to or search for the myExam Assist that you wish to copy.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)

3 Select the myExam Assist in the tree view.

The structure view of the program is shown in the content area. In this view the program is read-only.



4 Click **Edit program**.

The program is shown on the **Edit** tab of the **Program Editor**.



5 On the toolbar, click **Save As** and select the user tree, region, and examination for the copy.

3.4.2 Opening an existing myExam Assist

You can open a myExam Assist in order to edit it either from the **myExam Cockpit Explorer** or from the **Program Editor**.

3.4.2.1 Opening a myExam Assist from the Explorer

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Open a user tree and search for the myExam Assist that you want to edit.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)



2 If this user tree is password-protected, unlock it before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

3 Select the myExam Assist in the tree view.

The structure view of the myExam Assist is shown in the content area. In this view the myExam Assist is read-only.



4 Click **Edit program**.

3.4.2.2 Opening a myExam Assist in the Program Editor

✓ The **Edit** tab of the **Program Editor** is shown.



1 On the toolbar, click **Open Program**.

2 Select the myExam Assist in the **Open Program** dialog box.

To find this program, proceed in the same way as when you look for programs in the **myExam Cockpit Explorer**.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)

3 Click **Open** to load the program.

3.4.2.3 Opening recently edited programs

✓ The **myExam Cockpit Explorer** is shown. In the **Program Editor**, no program is currently open.

1 Click the **Program Editor** tab.

The **Start** dialog box is displayed. Up to five recently edited programs are listed here together with their program path.

2 Click one of these programs.

To create a new program, click **New Program**.

(➔ Page 235 *Creating a new myExam Assist in the Program Editor*)

To open a program, click **Open Program**.

(➔ Page 233 *Opening a myExam Assist in the Program Editor*)

3.4.3 Creating a new myExam Assist

You can create a new measurement program either from the **myExam Cockpit Explorer** or from the **Program Editor**.

When you set out to create a myExam Assist from scratch, we recommend that you draft the program structure on a piece of paper before you start.

When you plan to create a complex myExam Assist for the first time, we recommend that you copy a Siemens myExam Assist and then adapt it rather than starting with a blank page.

(➔ Page 231 *Copying a myExam Assist from the Siemens tree*)

3.4.3.1 Creating a new myExam Assist in the Explorer

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Select a user tree.



2 If this user tree is password-protected, unlock it before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

3 Browse to or search for the examination for which you want to create a new program.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)



4 On the toolbar, choose **New Program** from the menu of the **Organize Directories** icon.

The new program is shown on the **Edit** tab of the **Program Editor**. The workspace is still empty.

3.4.3.2 Creating a new myExam Assist in the Program Editor

✓ The **Edit** tab of the **myExam Cockpit Program Editor** is open.

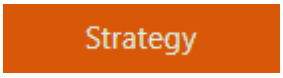


◆ On the toolbar, click **New Program**.

A new program opens. The workspace is still empty.

3.4.4 Defining the myExam Assist structure

✓ A new program is open in the **Edit** tab of the **myExam Cockpit Program Editor**. The workspace is still empty.



1 Click the **Strategy** building block at the bottom of the sidebar and drag it into the workspace.

– or –



Click the **Decision** building block and drag it into the workspace.

As soon as you insert a strategy in a new program, the system acknowledges that you are defining a myExam Assist. The system therefore inserts the workflow step with the generic **Basic Patient View** add-in as the first program step. You can exchange this add-in with a more specific **Patient View Add-In**.

(➔ Page 236 *Exchanging the Patient View Add-In*)

As soon as you insert a decision into a new program, the system automatically inserts the workflow step with the **Basic Patient View** add-in and creates both a strategy branch and decision branches.

2 Insert one or more alternative strategies.

3 Arrange strategies from left to right according to their importance.

4 Right-click a strategy and choose **Rename** from the context menu.

5 Give all your strategies descriptive names.

3.4.5 Exchanging the Patient View Add-In

The first step in every myExam Assist is the workflow step. In this step, users select the initial examination strategy. By default, the workflow step is assigned the **Basic Patient View** add-in. You can replace this add-in with a more specific add-in. For example, replace **Basic Patient View** with **Abdomen Patient View** for examinations of the abdomen.

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select the **Default** tab on the sidebar.

2 Open the **Patient View AddIns** list.

3 Select an add-in and drag it onto the workflow step.

3.4.6 Inserting program steps

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

3.4.6.1 Copying steps from existing programs

1 Select the **Browse** tab on the sidebar.

2 Select a tree.

3 Click items in the tree to open lower levels.

4 Select a program.

5 Drag steps from the sidebar preview into the workspace.

– or –

Click the thumbnail of a multicolumn program to show the program in a separate window. Drag program steps from this window into the workspace.

When you insert a program step in this way, the step might bring along a myExam add-in that was assigned to it in the source program. Be aware of the fact that some myExam add-ins cannot be combined in the same program. Therefore, we recommend that you only copy steps from the same source program in this way.

3.4.6.2 Searching for specific program steps

1 Select the **Search** tab on the sidebar.

2 Select a tree.

3 In the search field, type your search text.

Search results are listed according to relevance.

4 Copy steps by dragging them into the workspace.

3.4.6.3 Inserting a sequence as a measurement step

1 Select the **Default** tab on the sidebar.

2 Open the **Default Sequences** list.

3 Select a sequence and drag it into the workspace.

3.4.6.4 Extracting a protocol from DICOM images

- Drag a series from the **Patient Browser** into the structure view of the **myExam Cockpit Program Editor**.

  – or –

  Drag a series from the **Series** panel into the structure view.

  – or –

  Drag an image from the GSP into the structure view.

  The system extracts the protocol with which these images were acquired and inserts it as a program step.

  If this is a protocol is from a previous software version or from a different system, the system automatically converts the protocol. If the protocol cannot be converted, an error message is displayed.

3.4.6.5 Inserting a pause or an interaction step

A pause step interrupts the measurement. You plan pauses, for example, to administer contrast agent, to give voice commands, or for other purposes.

An interaction step is a pause with a myExam add-in. The myExam add-in provides user guidance and predefines settings for specific tasks that users will perform at this point.



- Click the **Pause** building block at the bottom of the sidebar and drag it into the workspace.

  – or –



  Click the **Interaction** building block and drag it into the workspace.

  Exchange the myExam add-in, if necessary.

  (➔ Page 240 *Inserting, replacing, or removing default add-ins*)

3.4.7 Planning decisions, decision branches, and decision steps

One of the characteristics that distinguish myExam Assist programs from traditional measurement programs is that they allow users to make decisions that affect the course that the study will take. When designing a myExam Assist, you plan these alternative routes as strategies and decision branches.

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

3.4.7.1 Planning a decision



◆ Click the **Decision** building block at the bottom of the sidebar and drag it into the workspace.

A decision with two decision branches is inserted: branch **Yes** and branch **No**.

3.4.7.2 Renaming choices

1 Right-click **Yes** and choose **Rename** from the context menu.

2 Type the choice label.

3 Proceed in the same way for the **No** choice.

3.4.7.3 Adding decision branches

1 Right-click the decision and choose **Edit Properties** from the context menu.



2 In the **Step Properties** dialog box, click the plus icon next to the list of choices (**Decision Point**).



3 Click this button and overwrite the choice label.

4 Click **OK** to close the **Step Properties** dialog box.

A third decision branch has been added.

A decision branch position can be altered in the decision point menu by using the up and down arrow keys.

3.4.7.4 Adding a decision step

Users select an examination strategy in the **Patient View AddIns** of the workflow step, typically at the beginning of the study.

Regarding decisions and planning when users are prompted to make them, choose one of the following options:

- Request users to make all decisions the moment they decide about the examination strategy.

  In this case, the **Patient View AddIns** prompts users not only to select an overall examination strategy but also to make all the fine-grained decisions that this strategy entails.

- Allow users to make decisions during the study.

  In this case, you plan decision steps, which are steps with a myExam add-in that interrupts the measurement to allow the user to make their decision.

◆ In the structure view, right-click a decision and choose **Add Decision Step** from the context menu.

  A decision step, which includes a myExam add-in, is inserted above the decision. When the queue will reach this point during the examination, users will be prompted to decide which route to take next.

You can also insert a decision step by selecting the corresponding **Decision Type** in the **Step Properties** dialog box of a decision.

(➔ Page 309 *Decision properties*)

3.4.8 Inserting, replacing, or removing default add-ins

myExam add-ins are auxiliary software components for myExam Assist programs.

(➔ Page 204 *Measurement programs and myExam Assist programs*)

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

3.4.8.1 Adding a myExam add-in to a program step

1 In the structure view, select a program step.

2 Select the **Default** tab on the sidebar.

3 Open the **Default AddIns** list.

4 Select an add-in and drag it onto a program step in the workspace.

You can also add an add-in by dragging it from a step of an existing myExam Assist.

3.4.8.2 Exchanging the myExam add-in of a program step

1 In the structure view, select a program step with a myExam add-in.

2 On the **Default** tab of the sidebar, open the **Default AddIns** list.

3 Select a different add-in and drag it onto a program step in the workspace.

This replaces the myExam add-in assigned to the program step.

3.4.8.3 Removing a myExam add-in from a program step

myExam add-ins cannot be removed from program steps that require myExam add-ins (for example, from the workflow step).

- In the structure view, right-click the myExam add-in of a program step and choose **Delete** from the context menu.

3.4.9 Repairing inconsistent program steps

Inconsistent program steps are steps that contain features or settings for which your site has not acquired a license. Programs that contain such steps are normally hidden. However, you can explicitly choose to show such programs and program steps. Inconsistent programs and program steps appear dimmed.

(→ Page 268 *Non-licensed programs or protocols*)

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

✓ In the **myExam Cockpit Explorer**, **Show Inconsistent** is selected in the menu of the **Organize Tree** icon.

3.4.9.1 Inserting inconsistent steps

When you insert a program containing inconsistent program steps, the system attempts to repair these steps. Repairing means removing features or settings for which you have no license and inserting the steps minus these features and settings.

◆ Select a program with dimmed program steps on the **Browse** tab on the sidebar and drag into the workspace.

If the conversion is successful, the program steps no longer appear dimmed.

3.4.9.2 Repairing inconsistent steps

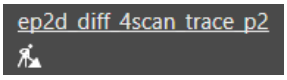
If the program that you are currently editing already contains an inconsistent step, you can trigger repair of the step.

◆ Right-click an inconsistent, that is, dimmed program step in the structure view and choose **Convert** from the context menu.

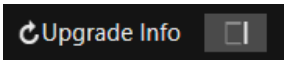
The system attempts to convert the step and to repair inconsistencies. A popup message box informs you about the progress.

3.4.9.3 Displaying upgrade info

If the system had to change protocol parameters to make the step consistent with the current software version, the step appears underlined in the structure view.



1 Double-click an underlined program step.



2 In the **Step Properties** dialog box, click **Upgrade Info** in the lower right corner of the dialog box.

A list of parameter adaptations is shown.

When you accept the changes, you can choose not to show upgrade information, the protocol will then no longer be underlined.

3.4.10 Rearranging program steps in a myExam Assist

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

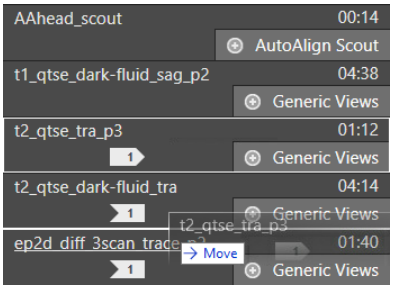
3.4.10.1 Moving a program step

1 Select a program step in the workspace.

– or –

Press and hold the **Ctrl** key or the **Shift** key and select two or more program steps if you want to move more than one step.

2 Drag the step or steps to where you want to move them.



When you move a program step with a copy reference marker, the copy reference information is moved together with the program step.

If you move a source step below a target step or a target step above a source step, the copy reference is lost.

3.4.10.2 Copying a program step

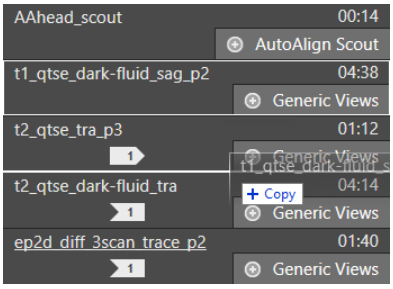
1 Select a program step in the workspace.



2 On the toolbar, click **Copy**.

– or –

Press and hold the **Ctrl** key and drag the program step to where you want to copy it.



When you copy a program step with a copy reference marker, the copy reference information is **not** copied together with the program step.



To keep the copy reference information, copy the source and target program step.

3.4.10.3 Deleting a program step

1 Select a program step in the workspace.



2 On the toolbar, click **Delete**.

Deleting the workflow step deletes all strategy branches and program steps in the myExam Assist.

Deleting a strategy deletes the entire strategy branch.

Deleting a decision choice deletes the entire decision branch. Deleting a decision branch is possible only if a decision has three or more branches.

3.4.11 Modifying the range of a step

The range of a program step defines whether a step applies to only one strategy or decision branch or to all branches.

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

3.4.11.1 Increasing the range of a program step

◆ In a strategy branch or a decision branch, right-click a program step and choose **Expand** from the context menu.

The step is applied to all branches.

3.4.11.2 Decreasing the range of a program step

◆ Right-click an expanded program step and choose **Collapse** from the context menu.

The program step appears only in the leftmost branch now.

3.4.12 Modifying program step settings and the myExam add-in configuration

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Double-click a program step.

The **Step Properties** dialog box opens.

2 Change parameters on the various cards of the **Step Properties** dialog box as required.

(➔ Page 294 *Program step properties*)

3 If a myExam add-in is assigned to the program step, also click **AddIn Configuration**.

4 Configure the myExam add-in on the cards of the **myExam Add-In Configurator**.

(➔ Page 312 *myExam Add-In Configurator*)

5 Click **Close** to close the **myExam Add-In Configurator**.

6 Click **Ok** to close the **Step Properties** dialog box.

3.4.13 Modifying settings and the myExam add-in configuration in identical program steps

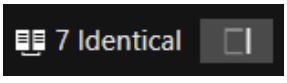
myExam Assist programs frequently use identical program steps or myExam add-ins, for example, in alternative strategies or decision branches or in different programs. When you open the **Step Properties** dialog box, the identical configurations indicator alerts you to the fact that identical program steps exist in the current or other myExam Assist programs.

You can apply parameter changes to all or to selected identical program steps.

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Double-click a program step.

The **Step Properties** dialog box opens.



2 Click the icon to the right of **X Identical**.

A list of all identical program steps is shown.

3 Point to an identical program step in a different myExam Assist to show complete path information in a tooltip,

4 Change parameters on the various cards of the **Step Properties** dialog box as required.

(➔ Page 294 *Program step properties*)



5 In the **Identical Configuration** section, select the parameters check box for all program steps to which you want to apply these parameter changes.

– or –

Select the parameters check box for **All measurement steps**.

6 If a myExam add-in is assigned to the program step, also click **AddIn Configuration**.

7 Configure the myExam add-in on the cards of the **myExam Add-In Configurator**.

8 Close the **myExam Add-In Configurator**.



9 In the **Identical Configuration** section, select the add-in check box for all program steps to which you want to apply these myExam add-in changes.

– or –

Select the add-in check box for **All measurement steps**.

10 Click **Ok** to close the **Step Properties** dialog box.

11 Save the program.

(➔ Page 252 *Saving the myExam Assist*)

If you change program steps that are not part of the current program, the **Saving Steps from Other Programs** dialog box opens.

Program steps are grouped according to the trees that they belong to.

12 Click the lock icon next to a password-protected tree.

13 In the **Password Protection: Unlock** dialog box, type the password and click **OK**.

14 Click **OK** in the **Saving Steps from Other Programs** dialog box.

3.4.14 Comparing protocols

A protocol comparison gives you a quick overview of the differences in the parameter settings of different program steps. This comparison only considers parameters and no other settings, such as the myExam add-in assignment or configuration of a program steps, for example.

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select at least two protocols.

We recommend that you do not compare more than eight protocols at a time.



2 On the toolbar, click **Compare Protocols**.

The **Compare Protocols** dialog box opens.

Only the differences between the selected protocols are shown. Parameters that are the same in all the selected protocols are not listed. If a parameter appears on more than one card of the **Step Properties** dialog box, it is listed only once in the **Compare Protocols** dialog box.

3 Click **Close** to close the **Compare Protocols** dialog box.

3.4.15 Displaying the history of a protocol

The protocol history lists all changes to protocol parameters over time. The protocol history considers only parameters but no other settings such as the myExam add-in assignment or configuration of a program steps, for example.

✓ A measurement program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select a protocol.



2 On the toolbar, click **Show Protocol History**.

The **Show Protocol History** dialog box opens.

Only parameters whose settings were changed are listed. If a parameter appears on more than one card of the **Step Properties** dialog box, it is listed only once in the **Show Protocol History** dialog box.

3 Click **Close** to close the **Show Protocol History** dialog box.

3.4.16 Creating copy references

A copy reference applies settings that you have defined for a program step earlier in a program to a step later in the same program.

(➔ Page 207 *The copy reference concept*)

3.4.16.1 Creating a copy reference

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select the source step, press and hold the **Ctrl** key, and select a target step further down in the program.

The system identifies the step further up in the program as the source step and the step further down in the list as the target step. You cannot reverse this order.



2 On the toolbar, click **Create CopyRef**.

The **Copy References** card of the **Step Properties** dialog box opens.

(➔ Page 303 *Copy References*)

3 Verify that the correct source protocol step is selected.

4 In the **Copy parameter group** list, select the parameter group for which you want to establish a copy reference.

(➔ Page 207 *The copy reference concept*)

5 Click **Ok** to close the **Step Properties** dialog box.



You can also select several target steps at once. When clicking the **Create CopyRef** icon, the **Create Copy Reference** dialog box opens, which is very similar to the **Copy References** card. Proceed as described above.

3.4.16.2 Resolving conflicts in a copy reference

Copy reference conflicts can occur in one of the following situations:

- Changing one parameter requires adapting at least one other parameter, for example, because of limit settings.
- A parameter value cannot be changed because the new value is not within the permitted soft limits or extended limits for the sequence.

✓ The **Copy Reference Conflicts** dialog box is shown.

If the copy reference conflict involves several target steps, the dialog box looks slightly different. Proceed as described below.

- Click **Accept** to resolve the conflict as suggested in the dialog box.

  – or –

  Click **Undo** to reset parameter changes.

3.4.16.3 Deleting a copy reference

Deleting a copy reference means breaking the link between the source step and the target step or steps.

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select a copy reference icon in the structure view.

2 On the toolbar, click **Delete**.

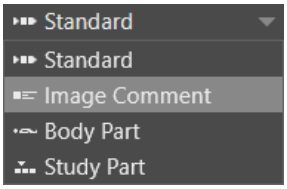
When you delete a copy reference source icon, all copy reference target icons that refer to this source are also removed.

3.4.17 Modifying the image comment

The image comment is shown at the bottom of every image.

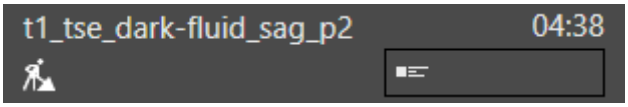
By default, the image comment is the study comment, which users define when registering a patient and starting the study, plus relevant sequence details. When you create or edit a measurement program in the **myExam Cockpit**, you can add additional information to the image comment for individual program steps.

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.



1 Switch protocol markers from **Standard** view to **Image Comment** view.

In the structure view, standard protocol markers, such as copy references, are hidden. Instead, image comment fields are shown next to the program steps.



2 Click an image comment field and type your comment text.

This text will be appended to the study comment plus sequence details in the images resulting from this program step.

3.4.18 Simulating strategy and decision paths

Before you finalize a myExam Assist, we recommend that you test strategy and decision paths.

✓ A myExam Assist is open on the **Simulate** tab of the **myExam Cockpit Program Editor**.

1 In the **Examination Preview**, select the first strategy and decision combination.

In the structure view, the route that the examination will take now is highlighted. Any other branches appear dimmed.

At the bottom of the **Examination Preview**, the duration of the examination given this combination of choices is shown.

2 Verify that this route includes all the correct program steps.

3 If you detect errors, such as missing steps, return to the **Edit** tab.

You cannot modify the structure view on the **Simulate** tab.

4 Repair errors and return to the **Simulate** tab.

5 Select the next strategy and decision combination.

6 Continue in this way until you have simulated all strategy and decision combinations in your myExam Assist.

3.4.19 Saving the myExam Assist

✓ A myExam Assist is open on the **Edit** or **Simulate** tab of the **myExam Cockpit Program Editor**.

3.4.19.1 Saving a user tree program



◆ If the open myExam Assist is from a user tree, click **Save** on the toolbar.

3.4.19.2 Saving a program copy



1 If you want to save the myExam Assist under a new name or at a different location, click **Save As** on the toolbar.

The **Save As** dialog box opens.

2 Select a user tree.



3 If this user tree is password-protected, unlock it before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

4 Select a region and an examination.

5 Type the new program name in the **Name** field.

6 Click **Save**.

3.5 Creating or modifying a multiregion program

A multiregion examination examines more than one part of the body in a single examination workflow.

For the purpose of communication with a HIS/RIS (hospital or radiology information system), the MR system employs the study parts concept to map program steps to procedures.

(➔ Page 210 *Multiregion examinations and the study part concept*)

You plan multiregion programs, also known as multistudy programs, in the **myExam Cockpit** and assign program steps to study parts in the process. Study parts will be mapped to procedures in the **Scheduler**, right before users start the study.

When you define a multiregion examination in the **myExam Cockpit**, you typically proceed in the following order:

- (➔ Page 253 *Creating a multiregion and an examination*)
- (➔ Page 254 *Creating a multiregion program*)
- (➔ Page 254 *Defining or importing study parts*)
- (➔ Page 255 *Assigning program steps to study parts*)
- (➔ Page 256 *Assigning program steps to body parts*)
- (➔ Page 257 *Saving the multiregion program*)

3.5.1 Creating a multiregion and an examination

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Select a user tree.



2 If this tree is password-protected, unlock it before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)



3 On the toolbar, choose **New Region Directory** from the menu of the **Organize Directories** icon.

4 Overwrite *New Region* with the correct region name, for example, *Multiregion*.

5 Accept the new name either by pressing the **Return** key or by clicking anywhere outside the text field.

6 Select the new region.

7 On the toolbar, choose **New Exam Directory** from the menu of the **Organize Directories** icon.

8 Overwrite *New Exam* with the correct examination name, for example, *HeadNeckSpine*, and press **Return**.

3.5.2 Creating a multiregion program

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Select a user tree.



2 If this user tree is password-protected, unlock it before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

3 Select the region and the examination for which you want to create a new program.



4 On the toolbar, choose **New Program** from the menu of the **Organize Directories** icon.

The new program is shown on the **Edit** tab of the **Program Editor**. The workspace is still empty.

5 Assemble and arrange program steps and edit program step settings.

(➔ Page 219 *Inserting program steps*)

(➔ Page 222 *Rearranging program steps in a measurement program*)

(➔ Page 221 *Repairing inconsistent program steps*)

(➔ Page 224 *Modifying program step settings*)

(➔ Page 227 *Creating copy references*)

(➔ Page 229 *Modifying the image comment*)

Next, assign each program step to a study part and to a body part.

(➔ Page 255 *Assigning program steps to study parts*)

(➔ Page 256 *Assigning program steps to body parts*)

3.5.3 Defining or importing study parts

Study part labels can correspond to parts of the body or to typical requested procedure names.

You can either define your own set of study part labels or import them from a csv file that contains a list of procedures separated by semicolons. This csv file may have been exported from another system or provided by the HIS/RIS (hospital or radiology information system).

✓ A multiregion program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

3.5.3.1 Defining study part labels

1 Double-click a program step.

The **Step Properties** dialog box opens.

2 On the **General** card of the **Step Properties** dialog box, click the **Manage** button next to the **Study Part** field.

The **Manage Studies** dialog box opens.



3 Type the name of the new study part in the **New Label** field and click the **Plus** icon to create a new label.

4 Repeat this step and add more study parts.

5 Click **Ok** to return to the **Step Properties** dialog box.

3.5.3.2 Importing study part labels

1 Double-click a program step.

The **Step Properties** dialog box opens.

2 On the **General** card of the **Step Properties** dialog box, click the **Manage** button next to the **Study Part** field.

The **Manage Studies** dialog box opens.



3 Click the **Import** icon and select the csv file that contains the study parts or procedures list.

4 Click **Ok** to return to the **Step Properties** dialog box.

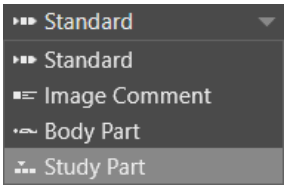
Use the **Export** icon if you want to create a csv file of the study part or procedure list defined in your system in order to import the list on another system.

3.5.4 Assigning program steps to study parts

Study part assignment serves as an intermediate step in the assignment of program steps to requested procedures.

(→ Page 210 *Multiregion examinations and the study part concept*)

✓ A multiregion program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.



1 Switch protocol markers from **Standard** view to **Study Part** view.

In the structure view, standard protocol markers, such as copy reference markers, are now hidden. Instead, the study part assignment of program steps is shown.

2 Click the study part field next to a program step.



3 In the **Assign Studies** dialog box, select all the study parts that this program step belongs to.

4 Click **Ok** to close the dialog box.

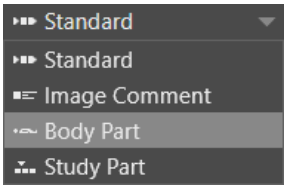


3.5.5 Assigning program steps to body parts

Information about the part of the body that is examined by a program step is required by the DICOM series this program step will create. The DICOM tag Body Part is part of the DICOM header of an image file.

In single-region studies, program steps inherit **Body Part Examined** from the region and examination in the user tree in which the program is stored. In multiregion examinations, assign program steps to the parts of the body that they examine step by step.

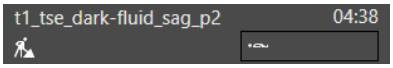
✓ A multiregion program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.



1 Switch protocol markers from **Standard** view to **Body Part** view.

In the structure view, standard protocol markers, such as copy reference markers, are now hidden. Instead, the body part assignment of program steps is shown.

2 Click the **Body Part** field next to a program step.



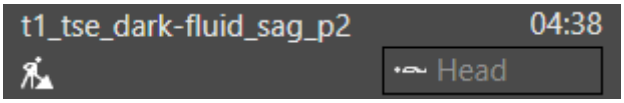
3 In the **Body Part Examined** dialog box, select a part of the body from the list.

If the list in this dialog box is incomplete, click **Manage** and add body part labels.

In the **Manage Body Part Examined** dialog box, you can add body part labels and define whether the body parts are paired or not. In this dialog box, you can rename or remove only those labels that you or another user has created. Default body part labels provided by the system cannot be modified or deleted.

4 Also select the laterality.

5 Click **Ok** to close the dialog box.



3.5.6 Saving the multiregion program

✓ A multiregion program is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

3.5.6.1 Saving a user tree program



◆ If the open program is a program from a user tree, click **Save** on the toolbar.

3.5.6.2 Saving a program copy



1 If you want to save your measurement program under a new name or at a different location, click **Save As** on the toolbar.

The **Save As** dialog box opens.

2 Select a user tree.



3 If this user tree is password-protected, unlock it before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

4 Select a region and an examination.

– or –

Click **New directory** and create a new examination or a new region and examination for the new program first.

5 Type the new program name in the **Name** field.

6 Click **Save**.

3.6 Organizing trees and directories

The measurement programs that you create in the **myExam Cockpit** are stored in user trees.

(➔ Page 203 *Siemens tree and user trees*)

You use the **Browse** tab of the **myExam Cockpit Explorer** to create and organize these user trees.

- (➔ Page 259 *Creating user trees*)
- (➔ Page 259 *Creating new regions and examinations*)
- (➔ Page 260 *Assigning a body part examined to a region*)
- (➔ Page 261 *Copying regions and examinations*)
- (➔ Page 262 *Searching for changes in trees*)
- (➔ Page 262 *Protecting user trees*)
- (➔ Page 264 *Unlocking and locking user trees*)
- (➔ Page 266 *Renaming user trees, regions, examinations, or programs*)
- (➔ Page 266 *Deleting user trees, regions, examinations, or programs*)
- (➔ Page 268 *Non-licensed programs or protocols*)
- (➔ Page 269 *Printing a tree, region, examination, program, or step*)

Remember that the Siemens tree is read-only, it cannot be modified.

3.6.1 Creating user trees

You can either create a new user tree from scratch or by duplicating an existing tree. For example, you can duplicate the Siemens tree and then adapt its organization and programs to your requirements.

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

3.6.1.1 Creating a new tree



1 On the toolbar, choose **Create Tree** from the menu of the **Organize Tree** icon.

2 In the **New Tree** dialog box, type the name of the new tree.

3 Decide whether you want to protect this new tree with a password.

(➔ Page 262 *Protecting user trees*)

4 Click **OK**.

3.6.1.2 Duplicating a tree

1 Select the tree that you want to copy.



2 On the toolbar, choose **Duplicate Tree** from the menu of the **Organize Tree** icon.

3 In the **Duplicate Tree** dialog box, type the name of the new tree.

3.6.2 Creating new regions and examinations

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Select a user tree.

2 If this tree is password-protected, unlock the tree before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)



3 On the toolbar, choose **New Region Directory** from the menu of the **Organize Directories** icon.

4 Overwrite *New Region* with the correct region name.

5 Accept the new name either by pressing the **Return** key or by clicking anywhere outside the text field.

The region name is no more than a descriptive label. Therefore, do not forget to define **Body Part Examined** for the new region.

(➔ Page 260 *Assigning a body part examined to a region*)

---

6 Select the new region.



7 On the toolbar, choose **New Exam Directory** from the menu of the **Organize Directories** icon.

8 Overwrite *New Exam* with the correct examination name and press the **Return** key.

3.6.3 Assigning a body part examined to a region

Body Part Examined is a DICOM tag that is required in the DICOM header information of the images that will be created by measurement programs and their program steps.

Examinations, programs, and program steps inherit this information from the next higher level in the region-examination–program hierarchy of the Siemens and user trees. Therefore, we recommend that you use the region directory level consistently to define regions of the body and assign the correct **Body Part Examined** tags to them. Arrange examinations and measurement programs in the correct regions.

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Select a user tree.

2 If this tree is password-protected, unlock the tree before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

3 Right-click a region and choose **Edit Properties** from the context menu.

– or –

Press the **Alt + Enter** keys.

4 In the **Directory Properties** dialog box, select **Body Part Examined** from the list.

If the list in this dialog box is incomplete, click **Manage** and add body part labels.

In the **Manage Body Part Examined** dialog box, you can add body part labels and define whether the body parts are paired or not. In this dialog box, you can rename or remove only those labels that you or another user has created. Default body part labels provided by the system cannot be modified or deleted.

5 Click **OK**.

3.6.4 Copying regions and examinations

When you compile a user tree, you can copy entire regions or examinations from other trees. For example, you can copy regions or examinations from the Siemens tree.

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Select the source tree.

2 In the tree view, select the region or examination that you want to copy.



3 On the toolbar, click **Copy**.

4 Select the destination tree.

5 If this tree is password-protected, unlock the tree before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

6 Select a directory of the same hierarchy level.

That is, select a region if you have copied a region, or select an examination if you have copied an examination.



7 On the toolbar, click **Paste**.

A copy of the selected directory is inserted in the tree view.

If you have copied a directory from the same tree, the new directory is labeled *Copy of (original region or examination name)*.

8 Rename the new directory as required.

(→ Page 266 *Renaming user trees, regions, examinations, or programs*)

3.6.5 Searching for changes in trees

In trees, you can search for changed items (regions, exams, programs, and protocols). Search results will be highlighted in the tree view.

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.



1 Select a tree and choose **Highlight Changes** from the menu of the **Organize Tree** icon.

The **Highlight Changes** dialog box opens.

2 Select the time range for which the changes are to be highlighted.

3 Click **Save**.

In the tree view and the content area, all items matching the search criteria are highlighted.

To clear the highlighting, select **Off** in the **Highlight Changes** dialog box.

3.6.6 Protecting user trees

User trees can each be protected with a password.

If a tree is protected by a password, users can select measurement programs from this tree and use them for their examinations. Users can also edit the program and its program steps in the queue. However, only users who know the password can modify this tree and its programs in the **myExam Cockpit**.

As a clinical user, if you want to protect a user tree with a password, you must define this when you create the tree.

Administrator mode

The **myExam Cockpit** supports an administrator mode. Administrator mode is active when you open the **myExam Cockpit** while you are logged on to the system as an administrator or when you switch users while working in the **myExam Cockpit**.

In administrator mode the following operations can be performed:

- Assigning passwords to existing and as yet unprotected user trees.
- Changing or removing the password of a tree without knowing the current password, which may become necessary when users forget passwords.

3.6.6.1 Protecting a user tree

✓ The **Create Tree** dialog box is open. See (➔ Page 259 *Creating a new tree*).

1 Select **Protect tree against unauthorized changes**.

2 Type the password in the **Password** field and repeat it in the **Confirm Password** field.

The password must be at least four characters long and can contain any type of characters.

3 Click **OK**.

Locked user trees cannot be modified and you cannot save programs in a locked tree. You need to unlock the tree first.

(➔ Page 265 *Unlocking a user tree*)

3.6.6.2 Changing the password of a user tree

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.



1 Select a password-protected user tree.



2 On the toolbar, choose **Password Protection** from the menu of the **Organize Tree** icon.

3 In the **Password Protection** dialog box, type the current password in the **Old Password** field.

4 Type the password in the **Password** field and repeat it in the **Confirm Password** field.

The password must be at least four characters long and can contain any type of characters.

5 Click **OK**.

3.6.6.3 Removing the password from a user tree

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.



1 Select a password-protected user tree.



2 On the toolbar, choose **Password Protection** from the menu of the **Organize Tree** icon.

3 In the **Password Protection** dialog box, type the current password in the **Old Password** field and clear the check box **Protect tree against unauthorized changes**.

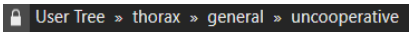
4 Click **OK**.

3.6.7 Unlocking and locking user trees

If a user tree is protected by a password, this is indicated by a lock icon next to the tree selection list on the **Browse** tab of the **myExam Cockpit Explorer**.



In the **Program Editor**, the lock icon is shown in the program path.



Locked user trees cannot be modified and you cannot save programs in a locked tree. You need to unlock the tree first.

3.6.7.1 Unlocking a user tree

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Select the locked user tree from the tree selection list.

2 Click the lock icon.

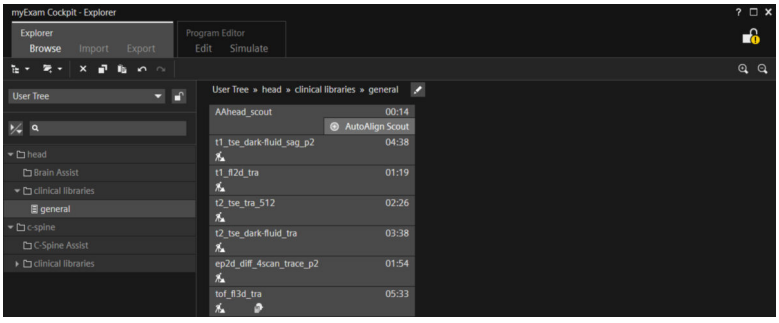
3 In the **Password Protection: Unlock** dialog box, type the password.

4 Click **OK**.

The icon next to the tree now indicates that the tree is unlocked.



The unlocked tree icon is now shown in the top right corner of the **myExam Cockpit** window. This icon reminds you of the fact that at least one user tree in the background is unlocked. When you click this icon all unlocked user trees are locked.



3.6.7.2 Locking a user tree



✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Select the unlocked user tree from the tree selection list.

2 Click the lock icon.

The icon now indicates that the tree is locked again.

3.6.8 Renaming user trees, regions, examinations, or programs

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

3.6.8.1 Renaming a user tree

1 Select a user tree.

2 If this tree is password-protected, unlock the tree before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)



3 Choose **Rename Tree** from the menu of the **Organize Tree** icon.

4 In the **Rename Tree** dialog box, specify the new tree name.

5 Click **OK**.

3.6.8.2 Renaming a region, examination, or program

1 Select a user tree.

2 If this tree is password-protected, unlock the tree before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)

3 Double-click the region, examination, or program.

4 Overwrite the old name.

5 Accept the new name by either pressing the **Return** key on your keyboard or clicking anywhere outside the text field.

3.6.9 Deleting user trees, regions, examinations, or programs

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

3.6.9.1 Deleting a user tree

1 Select a user tree.

2 If this tree is password-protected, unlock the tree before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)



3 Choose **Delete Tree** from the menu of the **Organize Tree** icon.

4 In the **Delete Tree** dialog box, click **Yes** to confirm.

3.6.9.2 Deleting a region, examination, or program

1 Select a user tree.

2 If this tree is password-protected, unlock the tree before you proceed.

(➔ Page 264 *Unlocking and locking user trees*)



3 Select the region, examination, or program and click **Delete** on the toolbar.

4 Click **Yes** to confirm.

3.6.10 Modifying properties in several protocols or program steps

The **Find and Set Parameters** dialog box offers an easy way to make global changes to protocol parameters or program step settings across all the measurement programs of a user tree.

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Right-click a region, examination, or program in any tree and choose **Find** from the context menu.

2 In the **Find and Set Parameters** dialog box, select a user tree and type the name or part of the name of the protocols or steps that you want to change.

3 Select several or all of the program steps that were found.

4 Click **Edit selected**.

In the **Find and Set Parameters** dialog box, the parameter cards of the first selected program step are displayed.

5 Change the relevant parameter or parameters.

(➔ Page 294 *Program step properties*)

The changes are displayed in the **History of Changes** section of the **Find and Set Parameters** dialog box.

Only parameters displayed in the **History of Changes** section will be updated.

6 Click **Accept Changes**.

The modifications are applied to all the selected steps.

3.6.11 Non-licensed programs or protocols

By default, measurement programs for which you do not have a license are not shown in the **myExam Cockpit**. The same is true for programs that contain protocols or add-ins for which you do not have a license.

You can nevertheless show non-licensed programs or programs that contain elements for which you have no license. However, these programs appear dimmed and you cannot display programs details, in the **myExam Cockpit Explorer**, not even view-only.

3.6.11.1 Showing all non-licensed and inconsistent programs and protocols

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.



◆ On the toolbar, choose **Show Inconsistent** from the menu of the **Organize Tree** icon.

Non-licensed programs are now shown as additional dimmed items in the tree view of the **myExam Cockpit Explorer**. Moreover, non-licensed programs, protocols, and add-ins are also shown in the sidebar of the **Program Editor**.

3.6.11.2 Checking licenses

During start-up, the system checks installed licenses and shows or hides programs in the Siemens and user trees accordingly.

On rare occasions, you might want to trigger a license check manually, for example, if a new license was installed only recently.

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

1 Select a tree.

2 Right-click any item in the tree view and choose **Check license** from the context menu.

3.6.11.3 Displaying individual non-licensed programs permanently

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

✓ **Show Inconsistent** is selected in the menu of the **Organize Tree** icon.

1 Select a user tree.

2 Browse to or search for the non-licensed program.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)

3 Right-click the program and choose **Edit Properties** from the context menu.

4 In the **Directory Properties** dialog box, select **Visibility, Show irrespective of licensing**.

5 Click **Ok**.

The system now considers this program to be a library of program steps. The program will always be shown in the tree from now on. However, it will appear dimmed.

3.6.12 Printing a tree, region, examination, program, or step

Printing means creating a pdf file or an xml file of the structure and protocol details of a tree, region, examination, program, or program step and saving it in the Windows file system.

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.



1 Select a tree and choose **Print** from the menu of the **Organize Tree** icon on the toolbar.

– or –

Press and hold the **Ctrl** or **Shift** keys down and select several regions, examinations, programs or program steps in the content area and choose **Print** from the context menu.

2 In the **Print** dialog box, select what you want to print out.

Table of Contents prints a structure view of the regions, examinations, programs, and program steps of a user tree, for example.

Protocols prints a list of all the program steps of a selected program, for example, together with their parameter setting.

Only Programs with Archive Flag prints only programs with the **Archive** flag.

(➔ Page 293 *Program properties*)

3 Under **File Type**, select whether you want to create a pdf file or an xml file.

4 Accept the path and file name suggestion of the system.

– or –

Use the **Browse** button to the right of the **File Name** field to browse to a different destination folder.

– or –

Overwrite the path and file name suggestion.

5 Click **Print**.

3.7 Importing or exporting measurement programs

On the **Import** and **Export** tabs of the **myExam Cockpit Explorer**, you can exchange measurement programs with other Siemens MR systems. You can import or export individual program, examinations, or regions, or entire trees.

When exchanging measurement programs between MR systems, observe the following rules regarding system requirements:

- You can exchange measurement programs between Siemens MR systems with identical system configurations.
- You can exchange measurement programs between different Siemens MR systems. When you import data from a different Siemens MR system, the data is converted automatically.
- You can exchange measurement programs between MR systems with different software versions.

Data exchange uses exchange files, these are files with the extension exar1. When exchanging data between systems, you can use a single exchange file for subsequent data export and import sessions. You can add data to an exchange file or delete data from it. Exchange files can be transferred over the Windows network or by using external media, such as USB flash drives.

If your hospital or institution has teamplay, you can use this platform to exchange measurement programs.

- (→ Page 271 *Importing a measurement program, examination, or region*)
- (→ Page 272 *Exporting measurement programs, examinations, or regions*)
- (→ Page 274 *Importing an entire tree*)
- (→ Page 274 *Exporting an entire tree*)
- (→ Page 275 *teamplay configuration*)

3.7.1 Importing a measurement program, examination, or region

✓ The **Import** tab of the **myExam Cockpit Explorer** is open.

1 Select the user tree where you want to import the measurement program, examination, or region.

2 Select the **From Existing File** option if you want to import an existing exchange file.

– or –

Select the **From teamplay** option if you want to import data from an external protocol management system. (Prerequisite: an enterprise management system is implemented.)

3 Click **Import**.

4 Select the exchange file in your Windows file system and click **Open**.

Supported exchange file format is exar1.

5 Select a region, examination, or measurement program from the exchange file.



6 Click this icon.

– or –

Drag the region, examination, or measurement program from the exchange file into your user tree.

While importing, the system checks whether you have all the required licenses for these programs and their program steps and components and converts the data to your system and software version.

3.7.2 Exporting measurement programs, examinations, or regions

✓ The **Export** tab of the **myExam Cockpit Explorer** is open.

1 Select the tree from where you want to export a measurement program, examination, or region.

2 Select the **To Existing File** option if you want to add data to an existing exchange file.

Select the exchange file in your Windows file system and click **Open**.

Supported exchange file format is exar1.

– or –

Select the **To New File** option if you want to create a new exchange file.

Select where you want to create the exchange file in your Windows file system, type the file name, and click **Save**.

– or –

Select the **To teamplay** option if you want to export data to an external protocol management system. (Prerequisite: an enterprise management system is implemented.)

3 Select the program, examination, or region in the local database.



4 Click this icon.

– or –

Drag the program, examination, or region from the local database (left side) into the exchange file window (right side).

5 Add more programs, examinations, or regions to the exchange file, if necessary.

6 Arrange programs, examinations, and regions in the exchange file as required.

When arranging data in the exchange file you proceed in the same way as when you organize trees and directories in the local database.

(➔ Page 258 *Organizing trees and directories*)

3.7.3 Importing an entire tree

You can import entire trees from one database or system configuration to another. Directory structures will be merged. Programs with identical names within an identical directory structure in the source and target will be copied without the name being changed, for example, no prefix “Copy of”, but rather appear as duplicates if they do not refer to different system configurations. For example, you can import the user tree of your MAGNETOM Vida system into your fleet database and subsequently import the user tree of a MAGNETOM Sola system. The structure of the fleet database will not be disrupted with tree items like “Copy of” prefixes or numbered suffixes, as happens when you use copy and paste.

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.

✓ The tree to be imported has approximately the same structure as the target tree.

1 On the toolbar, choose **Import Tree** from the menu of the **Organize Tree** icon.

The **Import Tree into Database** dialog box opens.

2 Specify the source of the tree to be imported.

3 Select the system configuration of the target system from the **Convert to** list.

If the **System Configuration** of the source tree is supported, conversion is optional. If the **System Configuration** of the source tree is not supported, conversion is mandatory to ensure that the copied programs can be used.

If **Convert to** is not selected, programs will only be copied, but not converted.

4 Specify the target to which you want to import the entire tree.

5 Click **OK** to start importing.

3.7.4 Exporting an entire tree

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.



1 Select the tree that you want to export.

2 On the toolbar, choose **Export** from the menu of the **Organize Tree** icon.

If an exchange file is currently open on the **Export** tab, the selected tree is added to this exchange file.

If no exchange file is currently open on the **Export** tab, the **Save As** dialog box opens. Select an exchange file in the Windows file system, or type a file name to create a new exchange file.

3.7.5 teamplay configuration

If your hospital or institution uses teamplay to exchange measurement programs and myExam Assist programs, the **Settings** icon is shown on the toolbar of the **myExam Cockpit Explorer**.

Settings > teamplay Configuration opens a dialog box with connection details for teamplay.

Do not modify or delete any information displayed in the **teamplay Configuration** dialog box. Contact Siemens Healthineers Customer Service for help with configuring the connection to teamplay.

3.8 MR protocols module

The **MR protocols module** is the solution for central configuration and management of measurement programs and myExam Assist programs across fleets of Siemens MR scanners. Even if you use the **MR protocols module** in conjunction with only one Siemens MR scanner, you enjoy the advantage of not having to block the scanner when you create or modify measurement programs.

The **MR protocols module** is a licensed add-on for Siemens MR scanners of software version *syngo* MR XA20 and higher. The **MR protocols module** requires the MR protocols module license and one Connect license for every MR scanner in your fleet. The **MR protocols module** is installed and configured by Siemens Healthineers Customer Service. Contact Siemens Healthineers Customer Service for information about hardware requirements or if you wish to connect more Siemens MR scanners in your fleet.

- (→ Page 276 *The MR protocols module concept*)
- (→ Page 277 *Recommendations for working with the MR protocols module*)
- (→ Page 278 *Opening the MR protocols module*)
- (→ Page 279 *Organizing trees in the MR protocols module*)
- (→ Page 280 *Creating or modifying measurement programs in the MR protocols module*)
- (→ Page 288 *Publishing new measurement programs and modifications*)
- (→ Page 288 *Resolving conflicts*)
- (→ Page 290 *MR protocols module configuration*)

3.8.1 The MR protocols module concept

After installation and configuration of the **MR protocols module**, an additional user tree appears in your system. The fleet tree is initially empty after program installation. You are expected to fill it with the measurement programs and myExam Assist programs that you want to synchronize across your fleet.

Technically speaking, the fleet tree is stored in the fleet database. A central master version of the fleet database resides on a network share. The **MR protocols module** that has been installed on an office PC and the **myExam Cockpit** of every scanner in your fleet has a local copy of the fleet database.

When you create or edit measurement programs or protocols in the **MR protocols module**, you work in the local copy of the fleet database. Only when you are certain that your modifications are complete, will you publish them in the central master version of the fleet database on the network share. From there, your modifications will be distributed to connected scanners in your fleet automatically and immediately.

For the purpose of appropriate distribution of measurement programs and protocols, scanners of the same type form a group. If your hospital has five MAGNETOM Vida scanners and one MAGNETOM Sola scanner, for example, you have a Vida and a Sola group in your fleet. When you connect a sixth scanner that is neither a MAGNETOM Vida nor a MAGNETOM Sola, a new group will be created. Program and protocol adaptations are automatically synchronized within a scanner group only.

With the **MR protocols module**, you will typically use this software program on an office PC to configure and manage measurement programs and myExam Assist programs in your fleet. However, in some cases it might also make sense to edit a measurement program in the **myExam Cockpit** of a scanner, for example, because you want to test program and protocol modifications before you publish them. In the **myExam Cockpit** of one of your MR scanners, you can only create and edit programs for the scanner group that this scanner belongs to. Scanner group and scanner selection boxes are therefore not available in the local **myExam Cockpit** of a scanner.

3.8.2 Recommendations for working with the MR protocols module

When you use the **MR protocols module** for central measurement program and protocol configuration, we recommend that you adopt a very structured and well-documented mode of working. We recommend that you establish guidelines for how to proceed.

These guidelines should include the following recommendations:

- Click Publish only when you have completed the task.

  When you create or modify measurement programs or protocols in the **MR protocols module** or in the **myExam Cockpit** of a scanner,, always complete the task before you publish your modifications.

  Never publish intermediate versions of new or modified measurement programs or protocols.

- Define a schedule.

  Agree on when new or modified measurement programs or protocols should be published.

  For example, publish new programs or completed modifications on Friday afternoon so that they will be available across your fleet on Monday morning.

- Communicate and document modifications

  Communicate modifications to measurement programs to all your users so that they will know what to expect when they return to work at the scanners.

- Password protection for fleet trees

  We recommended that you protect fleet trees with a password to avoid distribution of unintended protocol modifications.

- Define naming conventions for fleet trees

  If you use more than one fleet tree for management and maintenance of measurement programs across your fleet, use tree names that will help you to distinguish between strictly local user trees and trees that are stored in the fleet database.

- Make use of both the local and fleet database for program maintenance in the **MR protocols module**.

  Creation of a complex measurement program, such as a myExam Assist, might take some time. You might want to publish minor changes to other programs in the meantime.

  Use a local user tree in the **MR protocols module** for such complex tasks and do not copy the completed program to the fleet tree until just before publication.

3.8.3 Opening the MR protocols module

1 Start the PC on which the **MR protocols module** software was installed by Siemens Healthineers Customer Service and log on.

– or –

Connect to this PC via Remote Desktop.



2 Click the **MR protocols module** icon on the desktop of the PC.

The **MR protocols module** user interface is the same as the **myExam Cockpit** user interface at a scanner, however, additional options for selecting scanner groups and scanners are available.

Access to the **MR protocols module** is not restricted and can only be protected via the operating system logon.

3.8.4 Organizing trees in the MR protocols module

Measurement programs and myExam Assist programs are arranged in trees. The read-only Siemens tree contains all the measurement programs and myExam Assist programs that are provided with your system. When you build your own set of measurement programs and myExam Assist programs, you create one or more user trees.

With the **MR protocols module** solution, user trees can either be strictly local or they can be available to the entire fleet. Local user trees are available at the individual scanner or in the **MR protocols module** on the office PC only.

When you create a tree, you decide where to store this user tree: in the local customer database or in the fleet database. Once user trees have been created, they are listed in the tree selection, however without any indication of the database that they are stored in. Therefore, we recommend that you use tree names that will help you to distinguish between local user trees and trees that you publish in the fleet.

3.8.4.1 Creating a new user tree in the fleet database

✓ The **Browse** tab of the **MR protocols module Explorer** is open.



1 On the toolbar, choose **Create Tree** from the menu of the **Organize Tree** icon.

– or –

Select a tree that you want to copy and choose **Duplicate Tree** from the menu of the **Organize Tree** icon.

The **Create Tree** or the **Duplicate Tree** dialog box opens.

2 Type the name of the new tree and select a database.

Fleet is the local copy of the fleet database. When you create a user tree in this database, you can publish it to your entire fleet of Siemens MR scanners from here.

Customer is the local examination database of your scanner or PC. You cannot publish to the entire fleet from here.

3 Decide whether you want to protect the new tree with a password.

Protecting a user tree with a password is possible only when you create a new tree but not when you copy a tree.

(➔ Page 262 *Protecting user trees*)

As soon as you have published your modifications, the new tree will immediately be available in all scanner groups and therefore on all scanners in your fleet.

3.8.4.2 Creating new regions and examinations

In a user tree, you create regions and examinations to arrange measurement programs in a systematic and hierarchical way. The region and examination structure that you create in a fleet tree applies to all scanner groups in the tree. Only when you come to creating and customizing measurement programs will you do this for specific scanner groups only.

When you create regions and examinations in a fleet tree, you proceed in the same way as when you create regions and examinations in a local user tree of a scanner.

(➔ Page 259 *Creating new regions and examinations*)

(➔ Page 260 *Assigning a body part examined to a region*)

(➔ Page 261 *Copying regions and examinations*)

3.8.5 Creating or modifying measurement programs in the MR protocols module

When you create a new measurement program in the **MR protocols module**, you first select the scanner group and scanner that will use this program and then the tree in which the program will be stored.

Selecting a scanner is relevant in this process because not all scanners in a scanner group have identical hardware configurations and an identical repertoire of licensed software components. The **MR protocols module** is aware of the hardware and software configuration of the individual scanners in a group. Therefore, when you create or edit a measurement program or program step, you might want to select a scanner with a typical hardware and software configuration. Or you select the scanner with the minimum hardware and software configuration in this scanner group. In some cases, you might also select a particular scanner because the new measurement program will be used at this scanner only. Depending on the scanner you select, some program steps in your measurement program might be considered inconsistent.

(➔ Page 281 *Creating a new measurement program in a fleet tree*)

(➔ Page 282 *Copying a program from the Siemens tree*)

(➔ Page 284 *Opening an existing program in a fleet tree*)

(➔ Page 286 *Distributing new or modified programs across scanner groups*)

Regarding any other tasks or options, you proceed in the same way as when you create or edit a measurement program for an individual scanner.

3.8.5.1 Creating a new measurement program in a fleet tree

You can create a new measurement program either from the **MR protocols module Explorer** or from the **Program Editor**.

Creating a new measurement program in the Explorer

✓ The **Browse** tab of the **MR protocols module Explorer** is open.



1 Select a scanner group and a scanner.

2 Select a tree that is stored in the fleet database.

3 If this tree is password-protected, unlock the tree before you proceed.

(➔ Page 262 *Protecting user trees*)

4 Browse to or search for the examination for which you want to create a new program.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)



5 On the toolbar, choose **New Program** from the menu of the **Organize Directories** icon.

The new program is shown on the **Edit** tab of the **Program Editor**. The workspace displays the full path of the new program (including scanner group and tree) but is otherwise empty.

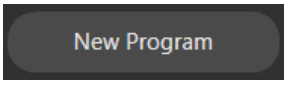
Creating a new measurement program in the Program Editor

✓ The **Edit** tab of the **MR protocols module Editor** is open.

✓ No measurement program is currently open in the **Program Editor**.

✓ The dialog box **Start** is shown.

1 Under **Select Target System**, select a scanner group and a scanner.



2 Click **New Program**.

A new measurement program opens. The workspace displays the full path of the new program (including scanner group and tree) but is otherwise empty.

3.8.5.2 Copying a program from the Siemens tree

The Siemens tree and its measurement programs are read-only. You cannot modify these programs. However, you can copy programs from the Siemens tree into one of your user trees and then adapt the copy as required.

Copying a Siemens program to a fleet tree

✓ The **Browse** tab of the **MR protocols module Explorer** is open.



1 Select a scanner group and a scanner.

2 Select the Siemens tree.

In the Siemens tree, only programs that are appropriate for the selected scanner group are shown.

3 Browse to or search for the examination from which you want to copy a program.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)

4 Select the program.



5 On the toolbar, click **Copy**.

6 Select a tree that is stored in the fleet database.

7 If this tree is password-protected, unlock the tree before you proceed.

(➔ Page 262 *Protecting user trees*)

8 Browse to or search for the region or examination where you want to paste the copy.



9 On the toolbar, click **Paste**.

Saving a Siemens program in a fleet tree

✓ The **Browse** tab of the **MR protocols module Explorer** is open.



1 Select a scanner group and a scanner.

2 Select the Siemens tree.

In the Siemens tree, only programs that are appropriate for the selected scanner group are shown.

3 Browse to or search for the program that you wish to copy.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)

4 Select the program in the tree view.

The structure view of the program is shown in the content area. In this view, the program is read-only.



5 Click **Edit program**.

The program is shown on the **Edit** tab of the **Program Editor**.



6 On the toolbar, click **Save As** and select the tree, region, and examination for the copy.



Note that you cannot copy programs from one scanner group to another with the **Save As** function. Use copy and paste in the **myExam Cockpit Explorer** if you want to copy a measurement program from one scanner group to another.

(➔ Page 286 *Distributing new or modified programs across scanner groups*)

3.8.5.3 Opening an existing program in a fleet tree

You can open a measurement program in order to edit it either from the **MR protocols module Explorer** or from the **Program Editor**.

Opening a program from the Explorer

✓ The **Browse** tab of the **MR protocols module Explorer** is open.



1 Select a scanner group and a scanner.

2 Open a fleet tree.

In this tree, only the programs of the selected scanner group are shown.

3 If this tree is password-protected, unlock the tree before you proceed.

(➔ Page 262 *Protecting user trees*)

4 Select the program in the tree view.

The structure view of the program is shown in the content area. In this view, the program is read-only.



5 Click **Edit program**.

Opening a program from the Program Editor

✓ The **Edit** tab of the **MR protocols module Program Editor** is open.



1 On the toolbar, click **Open Program**.



2 Select a scanner group and a scanner.

3 Open a fleet tree.

In this tree, only the programs of the selected scanner group are shown now.

4 If this tree is password-protected, unlock the tree before you proceed.

(➔ Page 262 *Protecting user trees*)

5 Select the program in the **Open Program** dialog box.

To find this program, proceed in the same way as when you look for programs in the **Explorer**.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)

6 Click **Open** to load the program.

Opening recently edited programs

✓ The **MR protocols module Explorer** is shown.

✓ In the **Program Editor**, no program is currently open.

1 Click the **Program Editor** tab.

The **Start** dialog box is displayed. Up to five recently edited programs are listed here.

The path information displayed for these recently edited programs does not indicate the scanner group that a program belongs to. You will see this information only after you have opened the program.

2 Click one of these programs.

The measurement program is now open in the **Program Editor** workspace. The full path of the new program (including scanner group and tree) is now shown.

3.8.5.4 Distributing new or modified programs across scanner groups

With the **MR protocols module**, when you create or edit a measurement program, you do this for one scanner group at a time. To make a new measurement program available for another scanner group, too, you have to copy it. To apply modifications that you made in a program of one scanner group to the programs of another scanner group, you either repeat these modifications or you copy or replace program steps.

When you copy programs or program steps from one scanner group to the next, the system converts them to make them consistent with the hardware and software configuration of the target scanner group. Review all programs and program steps that you copied from one scanner group to another. Check that you agree with the parameter modifications that the system makes during conversion. Remove or replace program elements that the system could not convert.

Copying a program from one scanner group to another

✓ The **Browse** tab of the **MR protocols module Explorer** is open.



1 Select a scanner group and a scanner.

2 Open a fleet tree.

In this tree, only the programs of the selected scanner group are shown.

3 Browse to or search for the examination from which you want to copy the program.

(➔ Page 213 *Browsing the Siemens tree or user trees*)

(➔ Page 213 *Searching for regions, examinations, programs, or program steps*)

4 Select the program.



5 On the toolbar, click **Copy**.

6 Select the scanner group where you want to paste the program.

7 Browse to or search for the examination where you want to paste the program.

8 Select the examination.



9 On the toolbar, click **Paste**.

The system now converts the program so as to make it consistent with the hardware and software configuration of the target scanner group.

Repeating modifications or replacing program steps

You have modified a program step in the measurement program of a specific scanner group. You now want to apply these changes to a corresponding step in a measurement program of another scanner group.

- Use the **Show Protocol History** function to display a list of recent parameter changes in the program step of the first scanner group.

  Make notes of these changes and repeat them in the corresponding program and program step of the second scanner group.

  (➔ Page 226 *Displaying the history of a protocol*)

  – or –

  Open the measurement program in the second scanner group.

  Replace a program step with the corresponding program step from the first scanner group.

  Use the scanner group filter on the sidebars of the **Program Editor** to find the correct source program and program step.

  (➔ Page 219 *Inserting program steps*)

Reviewing copied programs or program steps

✓ You have copied a measurement program or program step from one scanner group to another.

✓ The copied program or program step is shown in the **MR protocols module Explorer** or in the **Program Editor**.

✓ Program steps that the system altered during conversion are underlined.

✓ Program steps that the system could not convert for the hardware and software configuration of the target system are grayed out.

1 Double-click an underlined program step and display **Upgrade Info**.

2 Repair inconsistent (grayed out) steps or replace them with consistent program steps.

(➔ Page 221 *Repairing inconsistent program steps*)

3.8.6 Publishing new measurement programs and modifications

Publish new measurement programs or program modifications only when you are certain that you have completed the task. Never publish intermediate versions of new or modified measurement programs or program steps.

✓ You have created or modified regions, examinations, measurement programs, or program steps in a fleet database.



1 Click **Publish** in the upper right corner of the program window.

The **Publish** icon is available only when you have added to or modified a fleet database.

The **Synchronization Progress** message box is shown.

2 Review the list of published changes.

3 Click **Close**.

After publication, your modifications will be available at all of the scanners of the relevant scanner groups immediately. However, modifications are not highlighted in the fleet tree of these scanners. Therefore, be sure to inform your users about any modifications in the fleet and where they will find them. For example, send an email to all users when you publish. Suggest that they use **Show Protocol History** for details about parameter changes in individual program steps.

(→ Page 226 *Displaying the history of a protocol*)

3.8.7 Resolving conflicts

Conflicts occur when you edit a region, examination, measurement program, or program step and another user publishes changes to the same region, examination, measurement program, or program step in the meantime. The system can resolve some of these conflicts automatically. In such cases, updates are distributed across the fleet automatically and in the background. User interaction is required only when the system cannot resolve conflicts automatically.

3.8.7.1 Updates available

✓ Another user has published modifications to the fleet database from the **myExam Cockpit** of a scanner in the fleet.

✓ You have had the **MR protocols module** open for a while but have not made any changes yet.



◆ Click **Update** when the system informs you that the fleet database has been modified by another user.

3.8.7.2 Updating before publishing

✓ Another user has published modifications to the fleet database from the **myExam Cockpit** of a scanner in the fleet.

✓ At the same time, you have been working in a fleet tree in the **MR protocols module**.



◆ Click **Update** before you click **Publish**.

3.8.7.3 Resolving merge conflicts

✓ Another user has published modifications to the fleet database from the **myExam Cockpit** of a scanner.

✓ At the same time, you have been working on the same region, examination, measurement program, or program step in the **MR protocols module**.



1 Click **Update**.

The **Merge Conflict Resolution** dialog box is shown.

2 In region or examination name conflicts, select whether to keep the modification published by the other user (**Take Server Version**) or whether to overwrite it with your own version (**Keep Local Version**).

– or –

In conflicts regarding measurement programs or program steps, choose between **Take Server Version**, **Keep Local Version**, or **Keep Both**.

In the latter case, the system creates a copy of the program or program step in question.

3.8.8 MR protocols module configuration

In the **MR protocols module**, the **Settings** icon is shown on the toolbar of the **MR protocols module Explorer**.

Settings > Fleet Configuration opens a dialog box with connection details to the central master version of the fleet database.

Do not modify or delete any information displayed in the **Fleet Configuration** dialog box. Contact Siemens Healthineers Customer Service for help with configuring the connection to the fleet database on the network share.

3.9 Directory properties

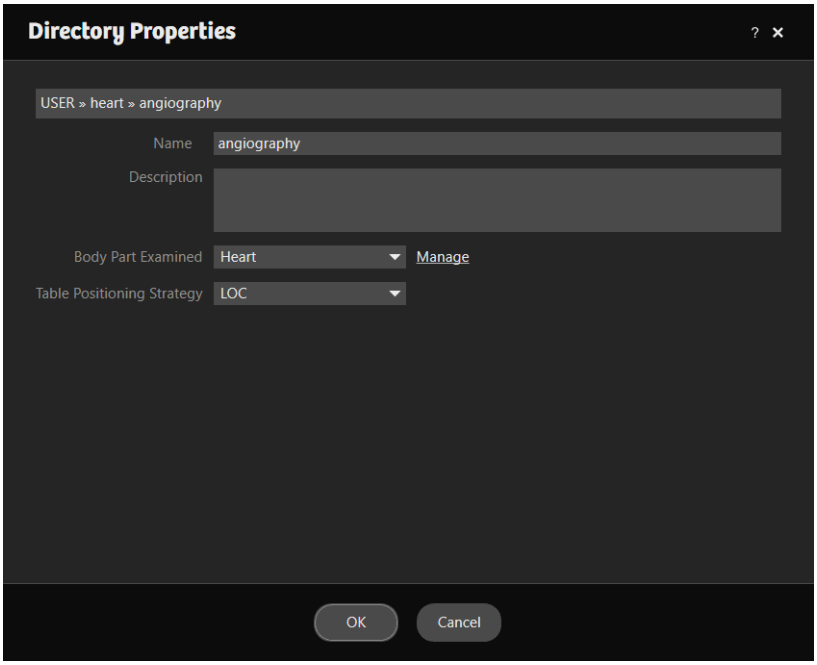
Directory properties define regions, examinations, and measurement programs. **Directory Properties** dialog boxes are available from the **myExam Cockpit Explorer**.

- (➔ Page 290 *Region directory properties*)
- (➔ Page 292 *Examination directory properties*)
- (➔ Page 293 *Program properties*)

3.9.1 Region directory properties

Parameter or option	Description
Name	The name of the region.
Description	Free text description of this region. For multiline text, use the **Return** key to start a new line.
Body Part Examined	Body Part Examined is a DICOM tag that is required in the DICOM header information of the images that will be created by measurement programs and their program steps. Body Part Examined is typically defined on the region level of the Siemens or user trees. If the list in this dialog box is incomplete, click **Manage** and add body part labels.
Table Positioning Mode	Selection of the table positioning mode for this region: • LocalRange (LOC) The table stays in the same position as long as the center of the slice groups stays within a local tolerance range and as long as the volume of the slice groups stays within a volume tolerance range. • IsoCenter (ISO) The table moves to the isocenter of the magnet for each measurement. • Fixed The table will not move during the examination but remain in a fixed position (relevant for interventional applications, for example).

3.9.2 Examination directory properties



Parameter or option	Description
Name	The name of the examination.
Description	Free text description of this examination. For multiline text, use the **Return** key to start a new line.
Body Part Examined	Body Part Examined is a DICOM tag that is required in the DICOM header information of the images that will be created by measurement programs and their program steps. Examinations inherit this information from the region they belong to. You will specify this information on the examination level, for example, if it has not been specified at the region level. If the list in this dialog box is incomplete, click **Manage** and add body part labels.

Parameter or option	Description
Table Positioning Mode	Selection of the table positioning mode for this region: • LocalRange (LOC) The table stays in the same position as long as the center of the slice groups stays within a local tolerance range and as long as the volume of the slice groups stays within a volume tolerance range. • IsoCenter (ISO) The table moves to the isocenter of the magnet for each measurement. • Fixed The table will not move during the examination but remain in a fixed position (relevant for interventional applications, for example). • <derive> The table positioning mode of the region is applied to this examination.

3.9.3 Program properties

Parameter or option	Description
Name	The name of the measurement program.
Description	Free text description of this program. For multiline text, use the **Return** key to start a new line.
Body Part Examined	Body Part Examined is a DICOM tag that is required in the DICOM header information of the images that will be created by measurement programs and their program steps. Programs inherit body part examined information from the region and examination they belong to. You will specify this information on the program level, for example, if it has not been specified at the region or examination level. If the list in this dialog box is incomplete, click **Manage** and add body part labels.

Parameter or option	Description
Table Positioning Mode	Selection of the table positioning mode for this region: • LocalRange (LOC) The table stays in the same position as long as the center of the slice groups stays within a local tolerance range and as long as the volume of the slice groups stays within a volume tolerance range. • IsoCenter (ISO) The table moves to the isocenter of the magnet for each measurement. • Fixed The table will not move during the examination but remain in a fixed position (relevant for interventional applications, for example). • <derive> The table positioning mode of the examination is applied to this program.
Archive	When you change parameters or program step settings in a measurement program, the **Archive** check box is selected automatically. Clear this option, if you do not want to archive a particular program.
Visibility	By default, measurement programs or myExam Assist programs for which you do not have a license are not shown in the **myExam Cockpit**. The same is true for programs that contain protocols or add-ins for which you do not have a license. Select this option, to make a specific measurement program permanently visible in the **myExam Cockpit**, even though you have no license for some of the protocols or myExam add-ins it contains.

3.10 Program step properties

You can open program step properties from the queue, that is, when you want to check or change parameters in the context of a current examination. Or you can open program step properties from the **myExam Cockpit**, that is, in the context of creation or adaptation of a measurement program.

Depending on the program step type, the **Step Properties** dialog box displays a different set of cards and parameter options:

- (→ Page 295 *Measurement step properties*)
- (→ Page 306 *Pause step properties*)
- (→ Page 307 *Workflow step properties*)
- (→ Page 307 *Strategy step properties*)
- (→ Page 308 *Decision step properties*)
- (→ Page 309 *Decision properties*)
- (→ Page 311 *Interaction step properties*)

Program steps that are part of a myExam Assist can be assigned a myExam add-in. You can open the **myExam Add-In Configurator** for the myExam add-in of a program step from its **Step Properties** dialog box.

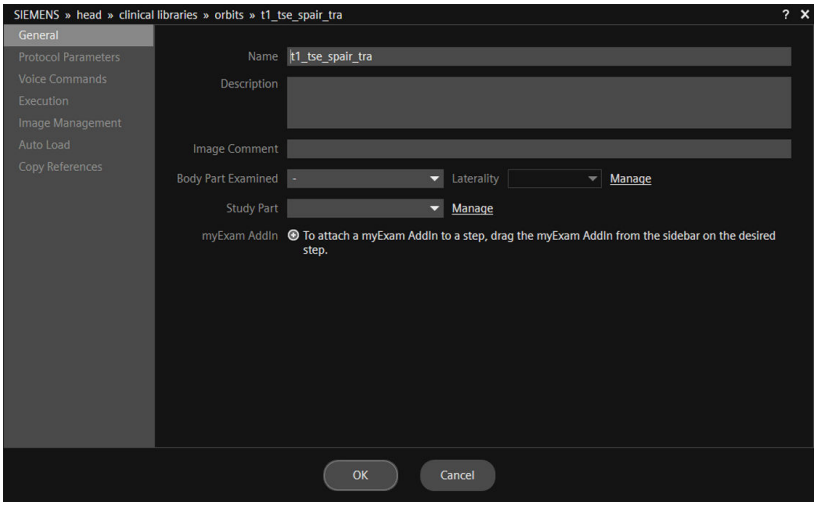
3.10.1 Measurement step properties

The **Step Properties** dialog box of a measurement step comprises the following cards, which are available from the navigation pane:

- (→ Page 295 *General*)
- (→ Page 297 *Protocol Parameters*)
- (→ Page 298 *Voice Commands*)
- (→ Page 299 *Execution*)
- (→ Page 301 *Image Management*)
- (→ Page 302 *Auto Load*)
- (→ Page 303 *Copy References*)
- (→ Page 305 *Preview*)

3.10.1.1 General

Step Properties dialog box of a measurement step: **General** card



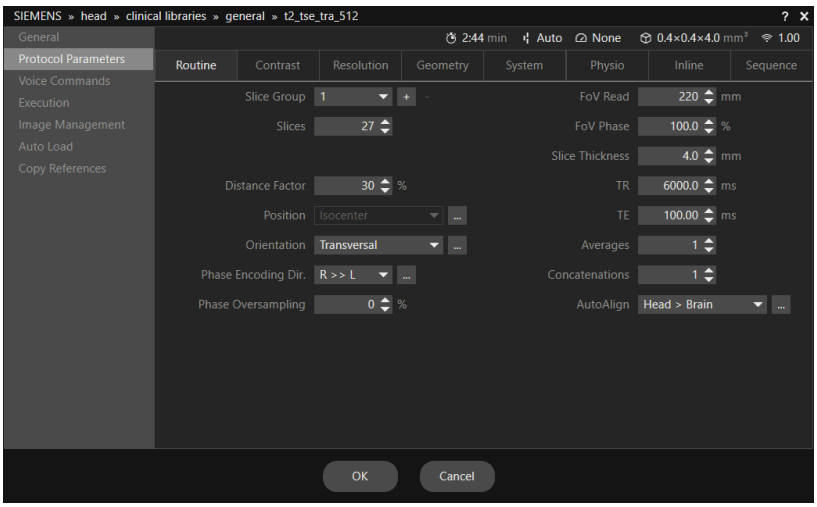
Parameter or option	Description
Name	Name of the protocol that is used in this measurement step. The protocol name will be appear as the series description, for example, in the **Patient Browser**.
Description	Free text description of the protocol or measurement step. For multiline text, use the **Return** key to start a new line. Protocol name and protocol description appear as a tooltip when users move the mouse pointer over the program step in the queue.
Image Comment	The image comment is shown at the bottom of every image. By default, the image comment is the study comment, which users define when registering a patient and starting the study, plus relevant sequence details. You can add additional information to the image comment for individual program steps. This text will be appended to the study comment plus sequence details in the images resulting from this program step.
Body Part Examined	Information about the part of the body that is examined by a program step is required by the DICOM series that this program step will create. The DICOM tag **Body Part Examined** is part of the in the DICOM header of an image file. Unless specified otherwise here, program steps inherit **Body Part Examined** from the region, examination, or the program to which they belong.

Parameter or option	Description
Laterality	Depending on the **Body Part Examined**, this field assigns the laterality information to program steps. Unless specified otherwise here, program steps inherit **Laterality** from the region, examination, or the program to which they belong.
Study Part	In a multiregion program, this field defines the **Study Part** to which this program step is assigned. (➔ Page 210 *Multiregion examinations and the study part concept*)
myExam add-in	Indicates the myExam add-in that is assigned to this program step. You cannot change the myExam add-in assigned to the step here.

3.10.1.2 Protocol Parameters

Step Properties dialog box of a measurement step: **Protocol Parameters** card

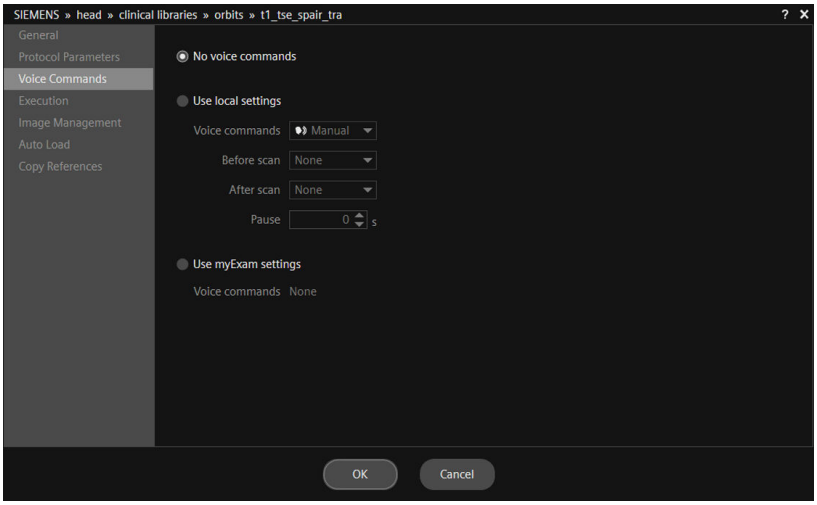
On this card, you can view or edit the protocol parameter settings of a program step.



See: Addendum MR Reference Handbook.

3.10.1.3 Voice Commands

Step Properties dialog box of a measurement step: **Voice Commands** card

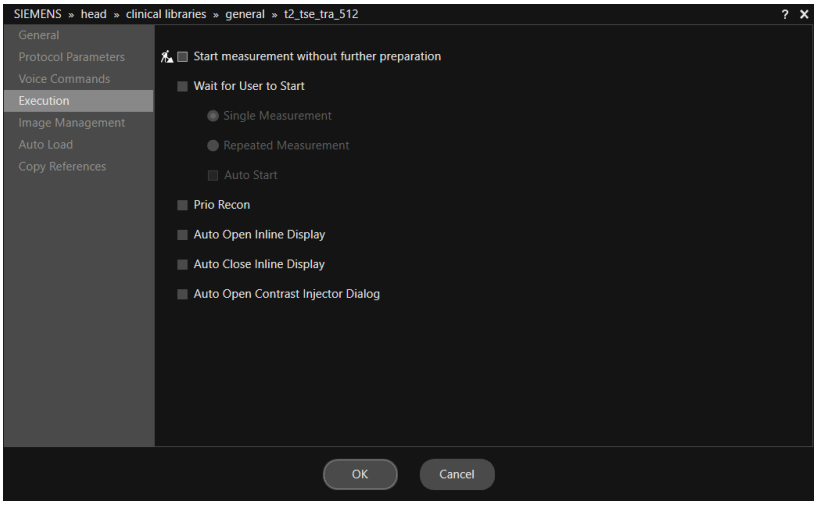


Parameter or option	Description
No voice commands	If this option is selected, voice commands are not required before or after this program step.

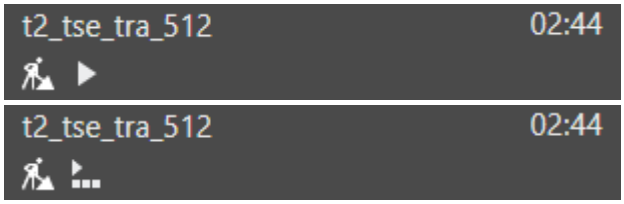
Parameter or option	Description
Use local settings	If this option is selected, the system uses the following voice command settings: • **Voice commands** – **Manual** This option defines that users will give voice commands over the intercom. In the queue, steps with manual voice commands are marked with a sonic symbol.  – **Automatic** This option defines that voice commands will be played back automatically. In the queue, steps with automatic voice commands are marked with a loudspeaker symbol.  • **Before scan / After scan** Selection of the sound files for automatic voice commands before and after measurement of this program step. • **Pause** Defines the pause between breathholds and before the first breathhold.
Use myExam settings	If this option is selected, The system uses the voice command settings users define in the **Patient View Add-In** of the myExam Assist.

3.10.1.4 Execution

Step Properties dialog box of a measurement step: **Execution** card is selected

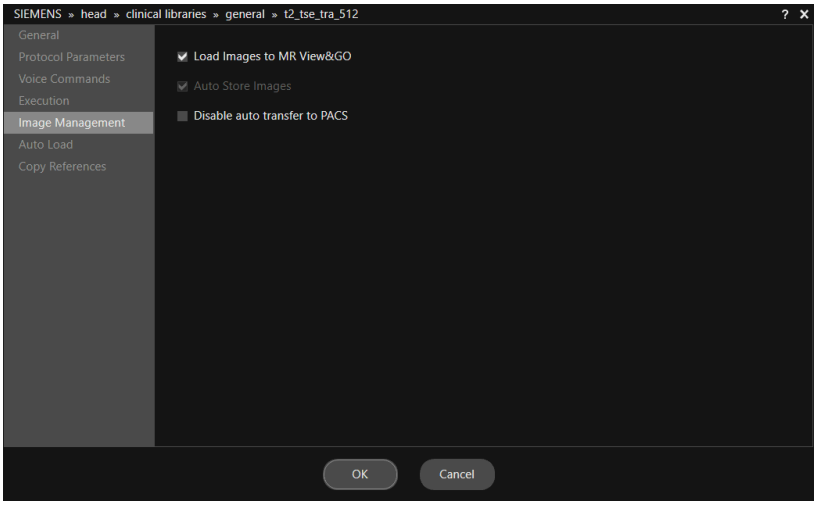


Parameter or option	Description
Start measurement without further preparation	If you select this check box, measurement of this program step will start immediately after the previous step has been completed. If you clear this check box, the queue will halt when it reaches this program step, which gives users a chance to check or adapt parameters. In the queue, the step is marked with the construction worker symbol. 
Wait for User to Start	If this check box is selected, measurement of this program step will not start automatically. The system will wait for the user to start the step.

Parameter or option	Description
	• **Single Measurement / Repeated Measurement** Defines whether the protocol will be measured once or several times. In the queue, single measurement steps are marked with an arrow, measurement steps that will be performed repeatedly are marked with an arrow and three dots.  • **Auto start** This option is suitable for countdown measurements. When a user clicks **Start** in the **Exam Paused** dialog box, the system starts counting down and then starts the measurement automatically.
Prio Recon	If this check box is selected, image reconstruction for this protocol is performed with higher priority. Please use this option only for simple and short protocols, for example, localizers and not for more complex protocols, for example, multistep protocols.
Auto Open Inline Display	If this check box is selected, the **Inline Display** will be shown while the protocol is being measured. Users can view and check the acquired images there.
Auto Close Inline Display	If this check box is selected, the **Inline Display** will close as soon as this program step has been completed.

3.10.1.5 Image Management

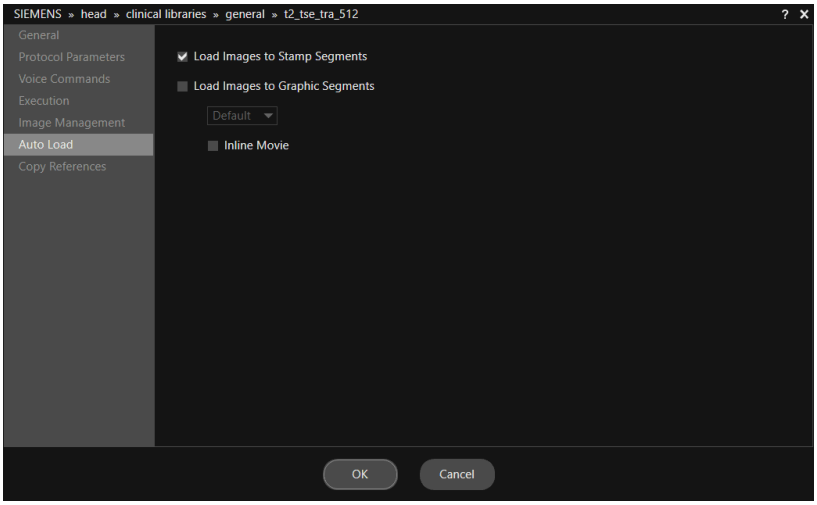
Step Properties dialog box of a measurement step: **Image Management** card



Parameter or option	Description
Load Images to MR View&GO	If this check box is selected, images are loaded in **MR View&GO** automatically.
Auto Store Images	If this check box is selected, acquired images are stored automatically. For most protocols, this check box cannot be cleared. **Auto Store Images** can be switched off only for specific protocols (for example, for real-time protocols), where users are expected to save individual images from the **Inline Display** manually.
Disable auto transfer to PACS	If this check box is selected, images from the current protocol are not sent to the PACS automatically.

3.10.1.6 Auto Load

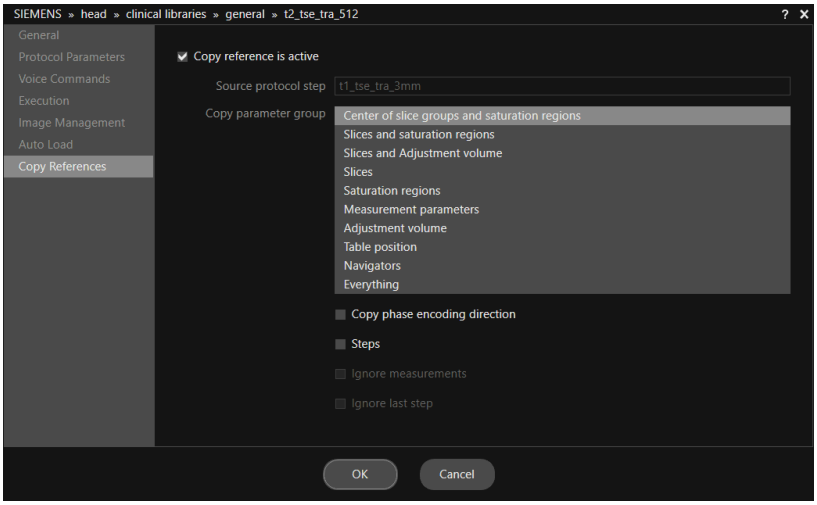
Step Properties dialog box of a measurement step: **Auto Load** card



Parameter or option	Description
Load Images to Stamp Segments	If this check box is selected, images are loaded into the stamp segments of the GSP automatically.
Load Images to Graphic Segments	If this check box is selected, images are loaded into the planning segments of the GSP automatically.
Inline Movie	If this check box is selected, movie playback is started with the movie properties predefined in the GSP.

3.10.1.7 Copy References

Step Properties dialog box of a measurement step: **Copy References** card



Parameter or option	Description
Copy reference is active	If this check box is selected, a link exists between source step the target step.
Source protocol step	This field defines the source step from where parameter settings will be copied.
Copy parameter group	This field defines the parameter group whose settings will be copied to the target step. See (➔ Page 207 *The copy reference concept*).
Copy phase encoding direction	This check box is available only if the phase-encoding direction is relevant for the selected parameter group. Note that the phase-encoding direction of navigators cannot be overwritten.
Steps	If this check box is selected, all steps of a Set-n-Go protocol are copied to the target protocol.
Ignore measurements	If this check box is selected, the number of measurements is not copied to the target protocol. This check box is available only if the parameter group **Everything** is selected above.

Parameter or option	Description
Ignore last step	If this option is selected, the settings of the parameter **Last Step** is not copied to the target protocol for Inline Composing. This check box is available only if the parameter group **Everything** is selected above.

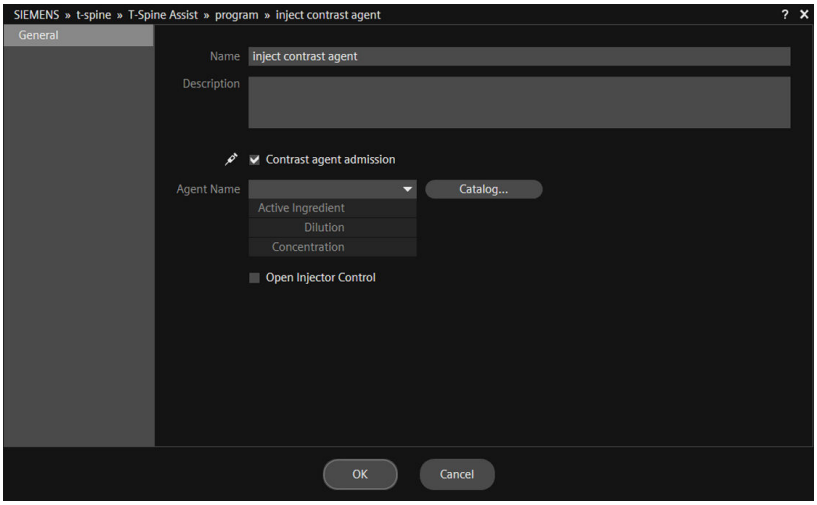
3.10.1.8 Preview

Step Properties dialog box of a measurement step: **Preview** card

This card is available only if a myExam add-in is assigned to the program step. The card shows the **Guidance** view and **Parameters** view as configured in the **myExam Add-In Configurator**.



3.10.2 Pause step properties



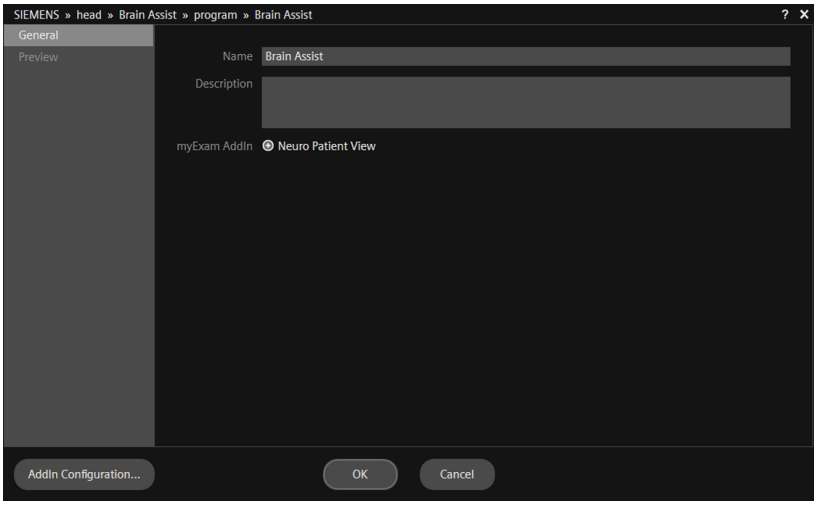
Parameter or option	Description
Name	The name of the pause step. This name should indicate the purpose of the pause.
Description	Free text description of this pause step. For multiline text, use the **Return** key to start a new line. Pause name and pause description appear as a tooltip when users position the mouse pointer on the program step in the queue.
Contrast agent admission	If this check box is selected, the purpose of the pause is to administer contrast agent. • **Agent Name** If the list does not contain the correct contrast agent, you can edit the contrast agent catalog. Click **Catalog** to open the relevant dialog box. • **Active Ingredient**, **Dilution**, **Concentration** These fields are filled automatically from the contrast agent catalog.

3.10.3 Workflow step properties

Every myExam Assist contains exactly one workflow step, namely at the beginning of the program. In this step, users select the examination strategy. Therefore, the workflow step is associated with a **Patient View Add-In**, which provides the user interface of the workflow step.

In the **Step Properties** dialog box of the workflow step, you can change the name of the workflow step and add a description. Moreover, you can preview the selected **Patient View Add-In**. However, you cannot remove or replace the **Patient View Add-In** in this dialog box. To exchange the **Patient View Add-In** of a workflow step, drag the new **Patient View Add-In** onto the workflow step in the **myExam Cockpit Program Editor**.

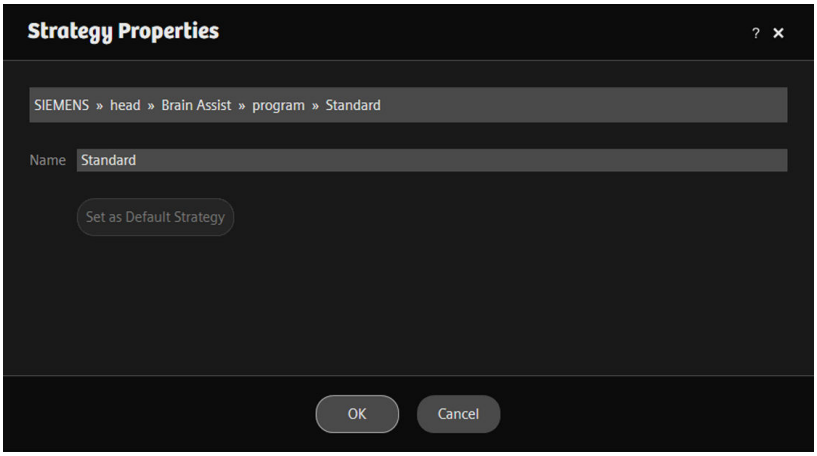
(➔ Page 236 *Exchanging the Patient View Add-In*)



3.10.4 Strategy step properties

myExam Assist programs plan alternative paths an examination might take. These paths are called strategies. Users select an examination strategy at the beginning of the study. However, users can also switch strategies later during the study if this becomes necessary.

In the **Step Properties** dialog box of a strategy step, you can change the strategy name and make the selected strategy the default strategy in its myExam Assist.



3.10.5 Decision step properties

During a study, physicians frequently need to make decisions that affect the next program steps, for example, whether the next program steps will be measured with contrast agent or without contrast agent.

A myExam Assist can be designed in such a way that users are prompted to make decisions in the workflow step at the start of the study, when they also select the overall examination strategy. Or users are prompted to make decisions during the study. In this case, a decision is preceded by a decision step, which is a step with a myExam add-in that interrupts the measurement to allow the user to make their decision.

In the **Step Properties** dialog box of a decision step, you can change the name of the decision step, add a description and check the list of available choices (decision points). Moreover, you can preview the selected myExam add-in.

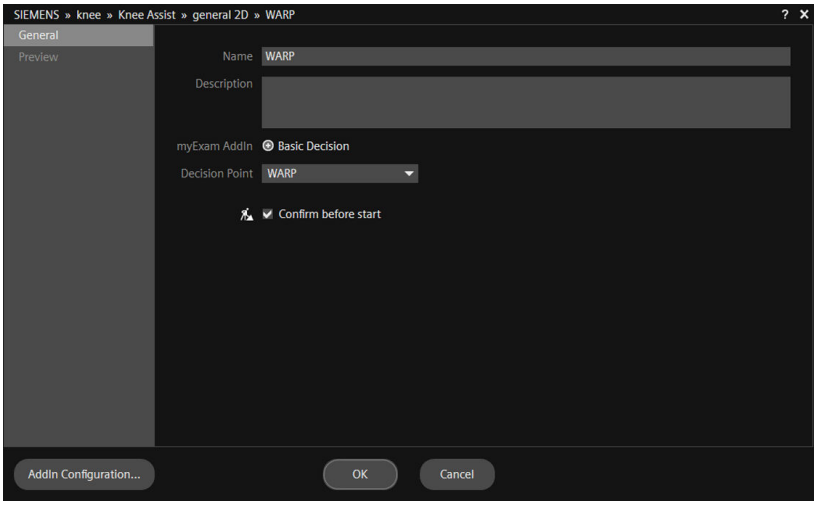
You cannot edit the list of decision points in this dialog box. To edit decision point labels or add or remove decision points, use the **Step Properties** dialog of the relevant decision.

(➔ Page 309 *Decision properties*)

Moreover, you cannot remove or replace the myExam add-in in the **Step Properties** dialog box of a decision step. To exchange the myExam add-in of a decision step, drag the new myExam add-in onto the decision step in the **myExam Cockpit Program Editor** when you design a myExam Assist.

(➔ Page 239 *Planning decisions, decision branches, and decision steps*)

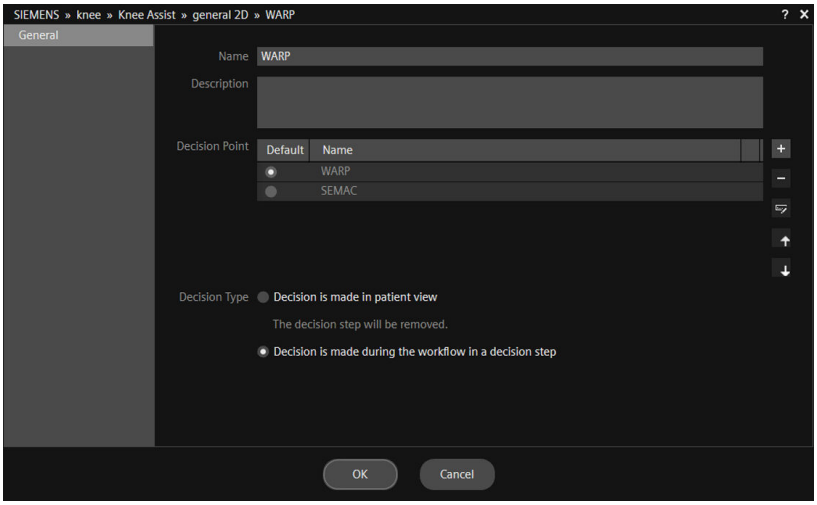
If the check box **Confirm before start** is selected, users are prompted to confirm step parameters when the queue reaches this step. The decision step is marked with the construction worker symbol.



3.10.6 Decision properties

A myExam Assist can be designed in such a way that users can make decisions at one or various points during a study that affect the choice and parameter settings of subsequent program steps. In the structure view of a myExam Assist (as displayed in the **myExam Cockpit**), a decision creates two or more decision branches.

(➔ Page 205 *Structure view*)



Parameter or option	Description
Name	Decision name as displayed in the structure view of the myExam Assist.
Description	Free text description of the decision. For multiline text, use the **Return** key to start a new line.
Decision Point	List of choices. You can edit this list with the buttons on the right.  Adds a new decision point.  Removes the selected decision point.  Use this button to rename a decision point.  Moves a decision point up or down in the list.

Parameter or option	Description
Decision Type	The system makes a distinction between the following types of decisions: • **Decision is made in patient view** Users are expected to make these decisions in the workflow step at the start of the study, when they also select the overall examination strategy. • **Decision is made during the workflow in a decision step** Users will make these decisions during the study. The system adds a decision step before such a decision. A decision step is a pause with a myExam add-in that provides the user interface for decision making.

3.10.7 Interaction step properties

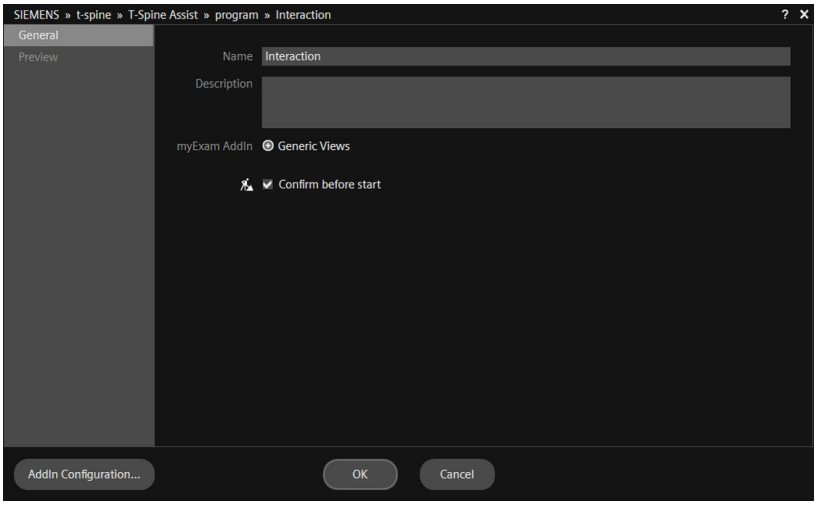
An interaction step is an activity other than scanning. Interaction steps plan such activities at certain points during a study. For example, MPR Planning, that is the definition of MPR reconstruction settings, is a typical interaction step required in certain studies.

In the **Step Properties** dialog box of an interaction step, you can change the name of the interaction step and add a description. Moreover, you can preview the selected myExam add-in.

You cannot remove or replace the myExam add-in in this dialog box. To exchange the myExam add-in of an interaction step, drag the new myExam add-in onto the workflow step in the **myExam Cockpit Program Editor** when you design a myExam Assist.

(→ Page 240 *Inserting, replacing, or removing default add-ins*)

If the check box **Confirm before start** is selected, users are prompted to confirm step parameters when the queue reaches this step. The interaction step is marked with the construction worker symbol.

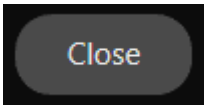


3.11 myExam Add-In Configurator

In a myExam Assist, program steps can be enhanced with myExam add-ins. myExam add-ins are auxiliary software components that offer user guidance, predefine parameters, and preselect settings.

(→ Page 204 *Measurement programs and myExam Assist programs*)

If a program step is enhanced by an attached myExam add-in, you can open the **myExam Add-In Configurator** via the **Step Properties** dialog box.



When you close the **myExam Add-In Configurator**, your changes have not been applied yet. Changes are applied only when you click **Ok** in the **Step Properties** dialog box of the program step the myExam add-in is assigned to.

In the **myExam Add-In Configurator**, groups of parameters are arranged on cards, which are available from the navigation pane.



Use the **Copy** and **Paste** icons to copy settings from one myExam add-in to another myExam add-in. Only the settings on the currently displayed card are copied. Additionally, only settings that are compatible between the myExam add-ins can be copied.

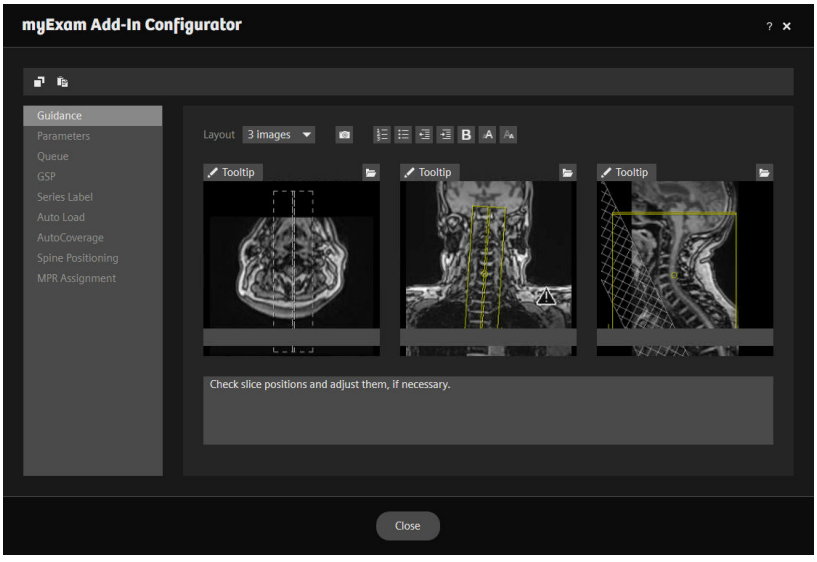
Different myExam add-ins comprise a different set of cards:

- (→ Page 314 *Guidance*)
- (→ Page 315 *Parameters*)
- (→ Page 316 *Queue*)
- (→ Page 317 *GSP*)
- (→ Page 319 *Series Label*)
- (→ Page 320 *Auto Load*)
- (→ Page 321 *Auto Coverage*)
- (→ Page 323 *Auto Timing*)
- (→ Page 324 *MPR Planning*)
- (→ Page 326 *MPR Assignment*)
- (→ Page 327 *Spine Positioning*)
- (→ Page 328 *AutoAlign Verification*)
- (→ Page 330 *RT Planning*)
- (→ Page 330 *Onco Auto Coverage Scout*)
- (→ Page 331 *Care Bolus*)
- (→ Page 332 *ABLE*)
- (→ Page 334 *Bolus Timing*)
- (→ Page 335 *Auto Start Workflow*)
- (→ Page 335 *PhaseRev*)
- (→ Page 336 *Access-i*)
- (→ Page 336 *Table Positioning Strategy*)
- (→ Page 337 *Autopilot Image QA*)
- (→ Page 337 *Autopilot Spine Planning*)

3.11.1 Guidance

Guidance card of the **myExam Add-In Configurator**

The **Guidance** view of a myExam add-in contains text and images that are displayed when a step opens in the queue. The **Guidance** view gives instructions on how to perform this step. This text is intended to be configured so that it contains site-specific information. Site-specific **Guidance** view configuration can be used to replace paper folders and sticky notes with tips and advice for specific program steps.



Parameter or option	Description
Layout	Defines how many images can be displayed in the **Guidance** view.
	Hides the **myExam Add-In Configurator** and switches to screenshot mode. In this mode, you can create screenshots of one or more planning segments in the graphical slice positioning.

Parameter or option	Description
	Opens the **Load File** dialog box to upload an image from the Windows file system. Images should have a square format. Images are resized when they are uploaded in order to save memory. Image data are saved in the configuration. The path that is shown on the **Guidance** card is no more than an indication of the original location of an image.
Image caption	An area directly below an image where you can add an image caption.
Text field and formatting options	Guidance text can be formatted with the icons above the images.
Tooltip	A short description, which appears when the mouse pointer is moved over an image.

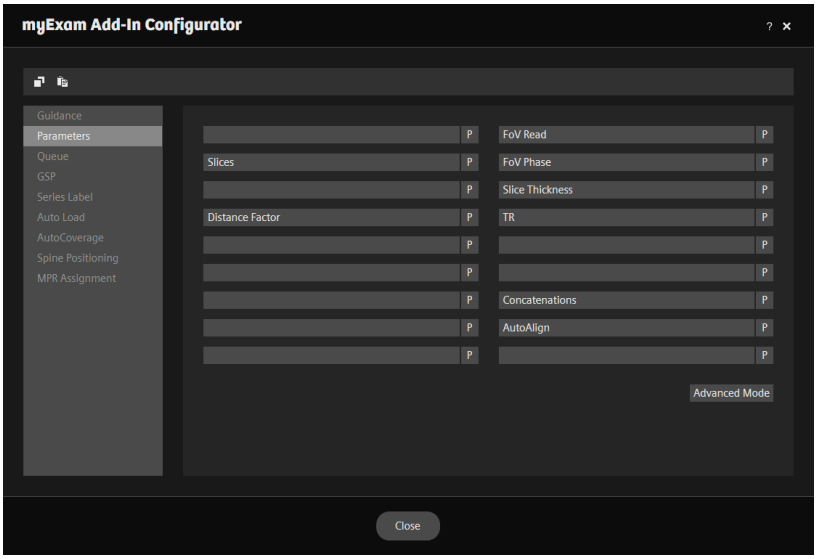
3.11.2 Parameters

Parameters card of the **myExam Add-In Configurator**

On this card, you can configure the appearance of the **Parameters** view of a myExam add-in.

The card provides 18 slots in which you can either show a parameter or that you can use to add text. With the button to the right of each slot, you can switch from parameter to text display and vice versa.

In a parameter slot (P), start typing the parameter name and then select the parameter from the list that appears now. If this list does not contain the parameter that you are looking for, click **Advanced Mode** and then search for the parameter again.

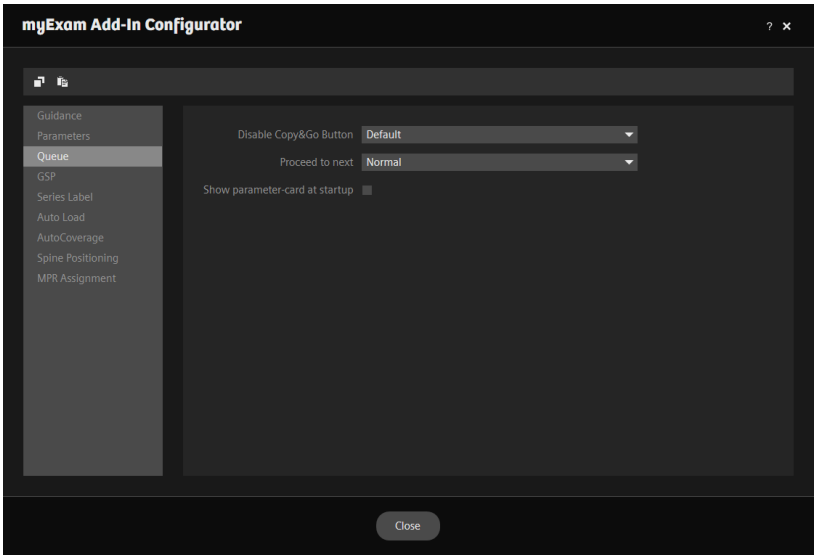


Use the **Preview** card of the **Step Properties** dialog box to check how the **Parameters** view will be presented to users.

3.11.3 Queue

Queue card of the **myExam Add-In Configurator**

This card defines the appearance and behavior of the queue.

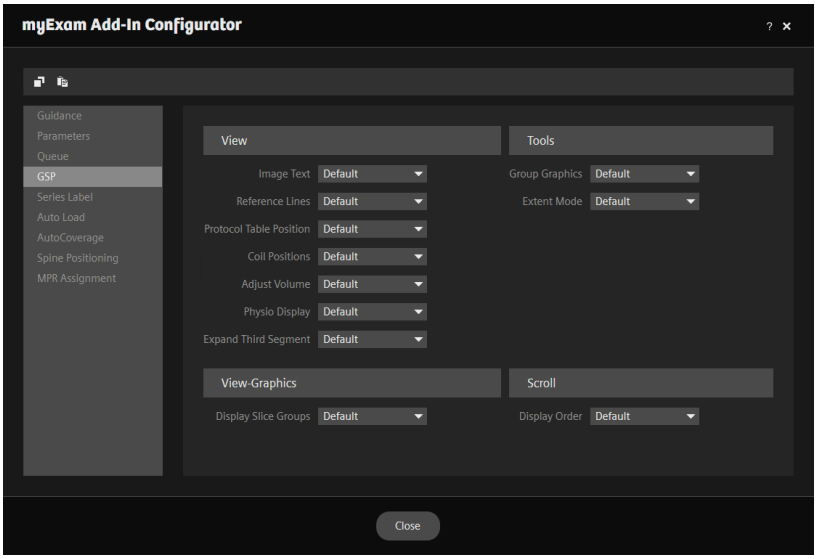


Parameter or option	Description
Disable Scan Button	Defines the availability of the **Go** button. In a program step, **Default** applies the settings defined in the **Patient View Add-In** to this program step.
Proceed to next	• **Normal**: the next program step will open as soon as measurement of this program step has been started. • **On Image Reconstruction Finish**: the next program step will open when image reconstruction of this program step has been completed.
Show parameter card at startup	If this option is selected, the **Parameter** view is shown instead of the **Guidance** view when this program step opens in the queue.

3.11.4 GSP

GSP (graphical slice positioning) card of the **myExam Add-In Configurator**

Regarding all parameters that can be defined on this card: in a program step, **Default** applies the settings defined in the **Patient View Add-In** to this program step.



Parameter or option	Description
View	
Image Text	Shows or hides image text.
Reference Lines	Displays reference lines, which indicate the position of other reference images and facilitate spatial orientation.
Protocol Table Position	Displays the table position of the isocenter protocol as a blue line.
Coil Positions	Displays the connected coils and their coil elements.
Adjust Volume	Displays the adjustment volume in the reference images.
Physio Display	Displays the **Physio Display**.
Expand Third Segment	Enlarges the third GSP segment toward the lower right segment.
View- Graphics	
Display Slice Groups	• **Line Mode**: displays the center line of each slice • **Package Mode**: displays the slice group boundaries but hides position lines of individual slices.

Parameter or option	Description
Tools	
Group Graphics	This parameter groups GSP graphical objects. When users move a graphical object in a GSP segment, the other graphical objects are moved as well. For example, if a slice group is moved, the saturation regions are also moved.
Extent Mode	Defines how a slice group in the GSP is increased or decreased in the slice direction. • **Distance**: adapts the distance factor in the slice group • **Number of Slices**: adapts the number of slices in the slice group
Scroll	
Display Order	Defines a scheme for sorting images in a series.

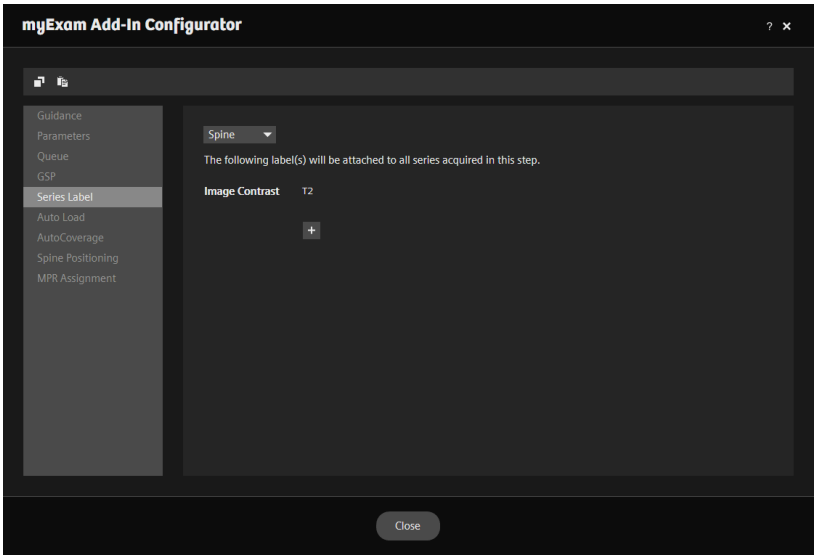
3.11.5 Series Label

Series Label card of the **myExam Add-In Configurator**

On this card, you can assign labels to the images resulting from a program step. In a step later in the program, you can refer to these labels to load images into the GSP automatically.

(➔ Page 320 *Auto Load*)

Labels are grouped by region.



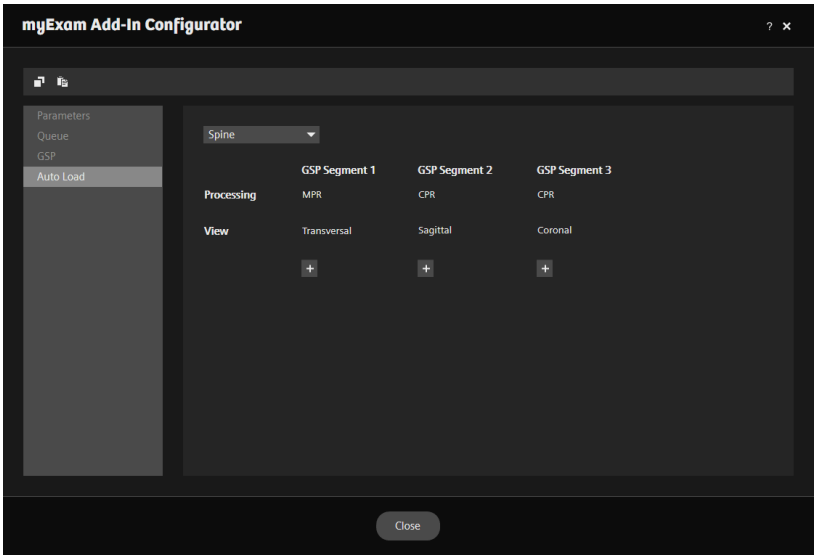
3.11.6 Auto Load

Auto Load card of the **myExam Add-In Configurator**

On this card, you define rules for automatic loading of images into the GSP for the current program step. When you define these rules, you refer to series labels that you assigned to the images resulting from program steps earlier in the measurement program.

(➔ Page 319 *Series Label*)

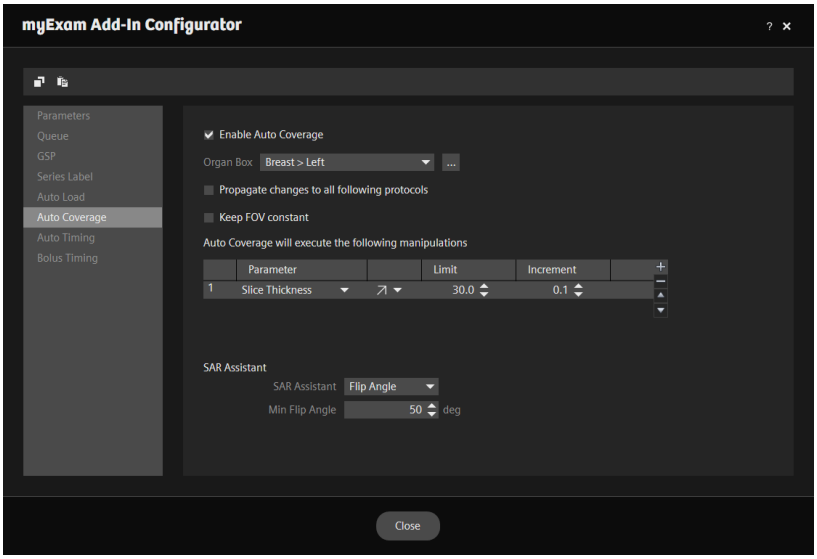
If the same labels were assigned to more than one program step, the images of the most recent step will be loaded.



3.11.7 Auto Coverage

Auto Coverage card of the **myExam Add-In Configurator**

Auto Coverage adapts protocol parameters in a way that saves measurement time while at the same time making sure that the region of interest is covered completely. Parameter adaptation will follow rules and respect limits, which you can configure on this card.

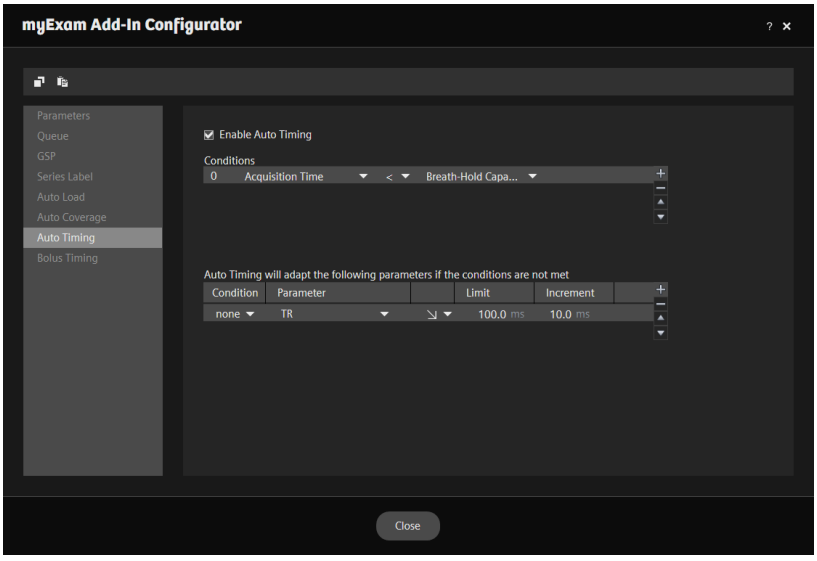


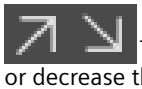
Parameter or option	Description
Enable Auto Coverage	If this check box is selected, Auto Coverage is performed in this program step.
Organ box	Selection of an appropriate organ box.
Propagate changes to all following protocols	If this check box is selected, manual changes to the size of the field of view and/or the slice group after Auto Coverage has finished will apply to all protocols later in the queue that use the same organ box.
Keep FOV constant	If this check box is selected, Auto Coverage will only adapt the slice group (number of slices, slice thickness, distance factor) and not the field of view. However, you can adapt the field of view manually.

Parameter or option	Description
Auto Coverage will execute the following manipulations	Defines rules that will be applied when Auto Coverage adjusts protocol parameters to match the organ box. • **Parameter**  These icons define whether Auto Coverage will attempt to increase or decrease the parameter. • **Limit**: the permitted minimum or maximum • **Increment**: the increment by which the value will be increased or decreased These steps will be performed one after the other until the result is satisfactory.
SAR Assistant	From the **SAR Assistant** list, select the measurement parameters to be used for protocol changes. For details on the **SAR Assistant**, see: Addendum MR Reference Handbook.

3.11.8 Auto Timing

Auto Timing card of the **myExam Add-In Configurator**



Parameter or option	Description
Enable Auto Timing	Selection of this check box turns on automatic correction of time parameters.
Conditions	Define when a time parameter should be corrected automatically. Conditions are numbered 0 to n. Conditions are optional. You can turn Auto Timing on without defining conditions.
Auto Timing will adapt the following parameters if the conditions are not met	Lists the parameters that Auto Timing will correct automatically. • **Condition**: links adaptation of a time parameter by Auto Timing to a condition as defined above. – **none**: this parameter will be adapted irrespective of any of the conditions defined above. – **0**: this parameter will be adapted if the first condition in the list is true. – **all**: this parameter will only be adapted if all the above conditions are true. • **Parameter**  These icons define whether Auto Timing will attempt to increase or decrease the parameter. • **Limit**: defines the permitted minimum or maximum. • **Increment**: defines the increment by which Auto Timing will attempt to correct a parameter. These steps will be performed one after the other until the result is satisfactory.

3.11.9 MPR Planning

MPR Planning card of the **myExam Add-In Configurator**

On this card, you preconfigure the **MPR Planning** step.

MPR Planning is an interaction step that prompts users to select MPR ranges and verify parameters for reconstruction of MPR series from 3D data acquired by one or various program steps of a measurement program.

MPR Planning is also part of the **AutoPilot MPR Generation** add-in. See: Operator Manual myExam Autopilot.

Please note that only **one** **MPR Planning** step is allowed in the measurement queue. **MPR Planning** applies to all protocol steps in the measurement program to which **MPR Assignment** is assigned.

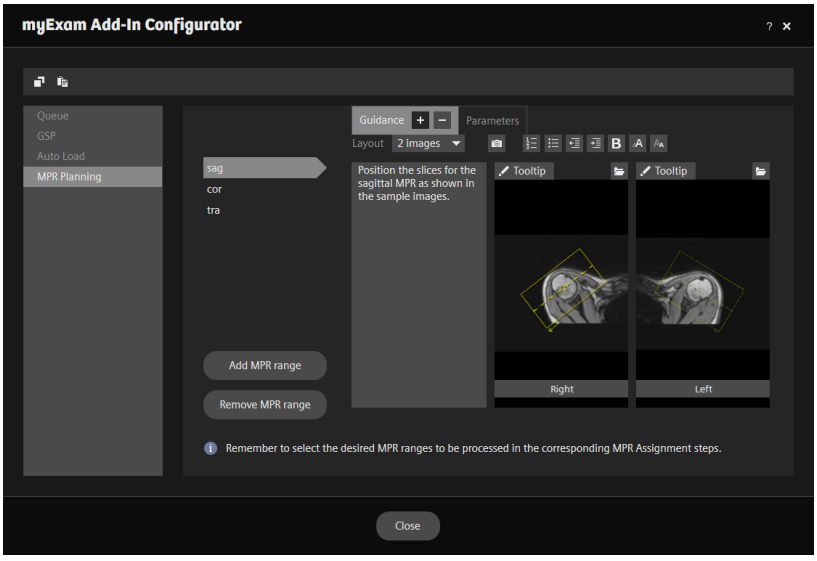
Use **MPR Add Range** to add a reconstruction range, which will result in an additional series of MPR images. Right-click a newly created MPR range and select **Rename** to give it a descriptive name.

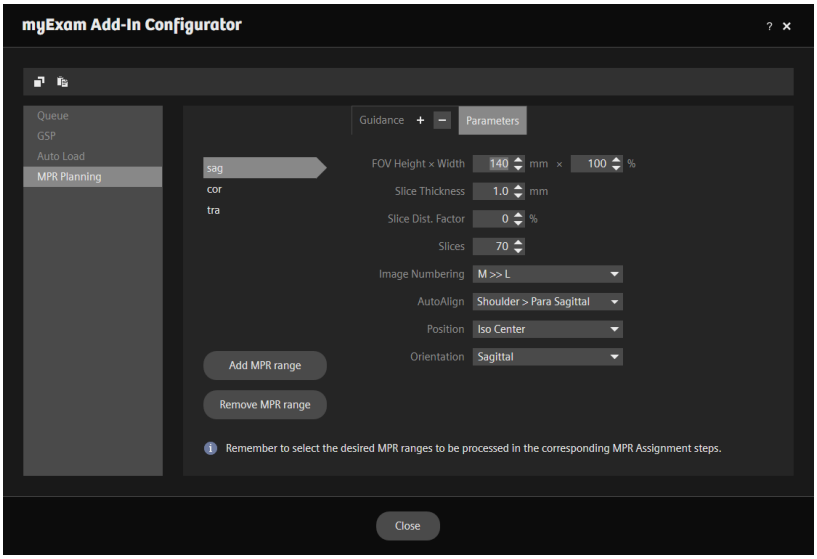
Use the **Parameters** tab of the **MPR Planning** card to specify reconstruction parameters. Add a **Guidance** view to the **MPR Planning** step, if necessary. The **Guidance** tab of the **MPR Planning** card offers the same configuration options as the **Guidance** card available in other myExam add-ins.

(➔ Page 314 *Guidance*)

In the **MPR Assignment** card of the **MPR Assignment**, **Autopilot MPR Assignment**, or **AutoPilot MPR Generation** add-in, you will select which of these predefined MPR ranges will actually be reconstructed from the data acquired by this step.

(➔ Page 326 *MPR Assignment*)





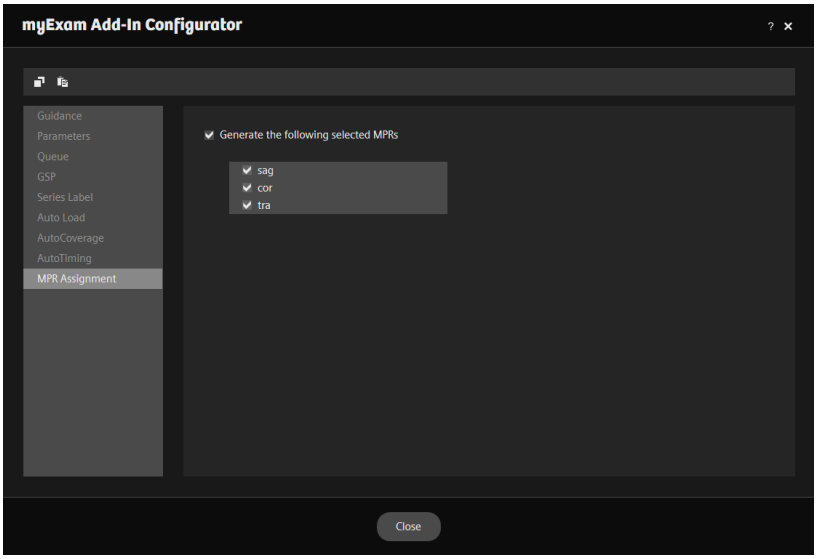
3.11.10 MPR Assignment

MPR Assignment card of the **myExam Add-In Configurator**

The **MPR Assignment** card is part of the **MPR Assignment** add-in, the **Autopilot MPR Assignment** add-in, and the **AutoPilot MPR Generation** add-in.

On this card, you define which of the MPR ranges that you defined in a **MPR Planning** step will be reconstructed from the data acquired by the current step.

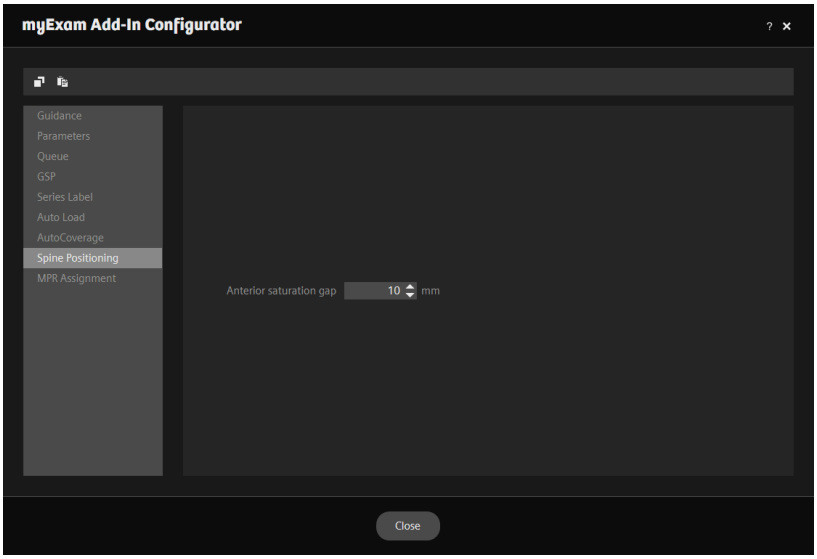
(→ Page 324 *MPR Planning*)



3.11.11 Spine Positioning

Spine Positioning card of the **myExam Add-In Configurator**

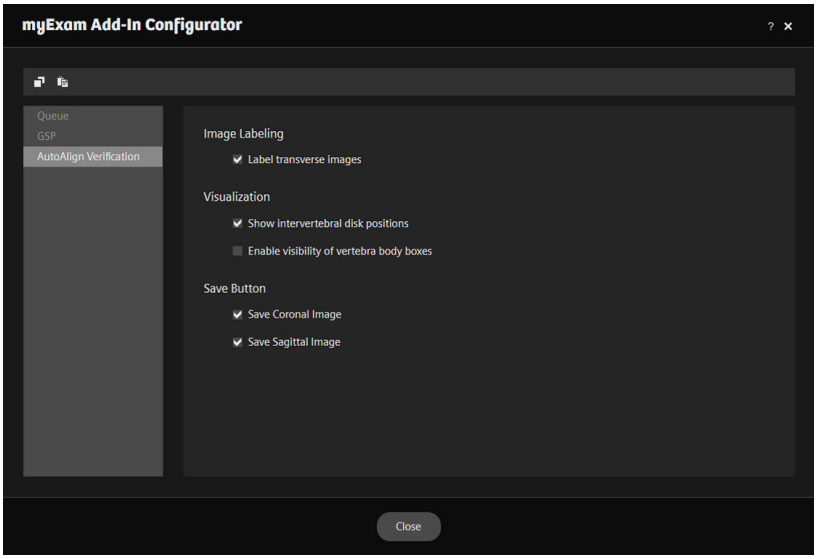
On this card, you define the gap between the anterior saturation band and the spine.



3.11.12 AutoAlign Verification

AutoAlign Verification card of the **myExam Add-In Configurator**

On this card, you define features that will be available in the **AutoAlign Verification** step.



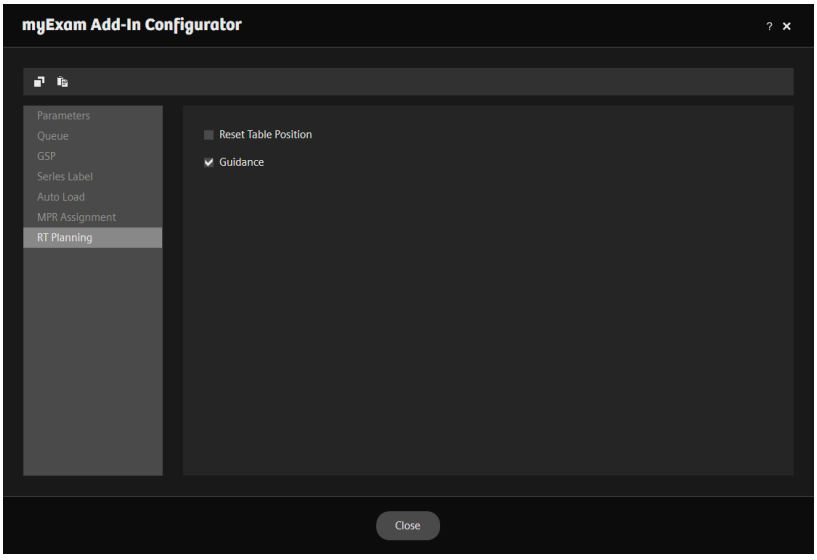
Parameter or option	Description
Image Labeling	
Label transverse images	Presets whether the **Label transverse images** check box on the **AutoAlign Verification** card will be selected by default or not. During the examination, the setting can still be changed.
Visualization	
Show intervertebral disk positions	Presets whether the **Show intervertebral disk positions** check box on the **AutoAlign Verification** card will be selected by default or not. During the examination, the setting can still be changed.
Enable visibility of vertebra body boxes	Shows or hides the **Enable visibility of vertebra body boxes** check box on the **AutoAlign Verification** card.
Save Button	
Save Coronal Image	Presets whether the **Save Coronal Image** check box that appears when users click the **Save** icon on the **AutoAlign Verification** card will be selected by default or not. If the check box is selected the coronal images displayed in the graphical slice positioning will be saved.

Parameter or option	Description
Save Sagittal Image	Presets whether the **Save Sagittal Image** check box that appears when users click the **Save** icon on the **AutoAlign Verification** card will be selected by default or not. If the check box is selected the sagittal images displayed in the graphical slice positioning will be saved.

3.11.13 RT Planning

RT Planning card of the **myExam Add-In Configurator**

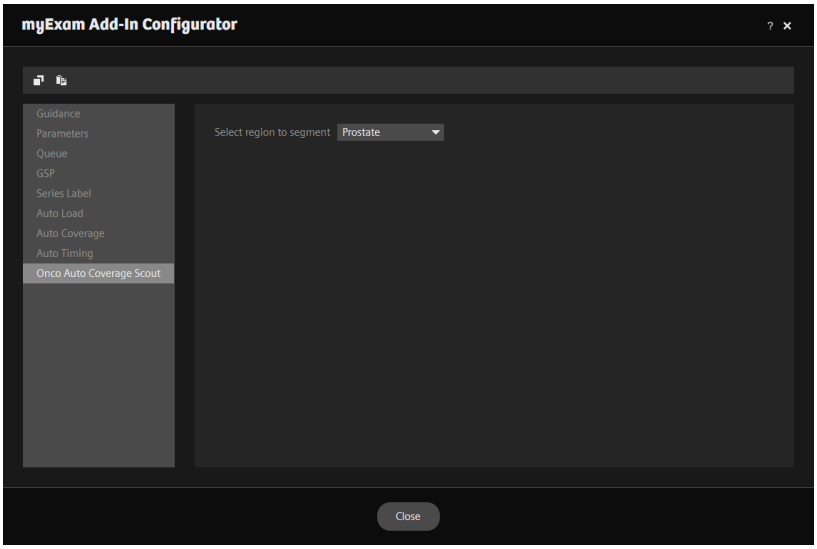
On this card, you define whether the table position is reset to zero for this program step. If the **Guidance** check box is selected, the **RT Planning** Guidance view is shown when this program step opens in the queue.



3.11.14 Onco Auto Coverage Scout

Onco Auto Coverage Scout card of the **myExam Add-In Configurator**

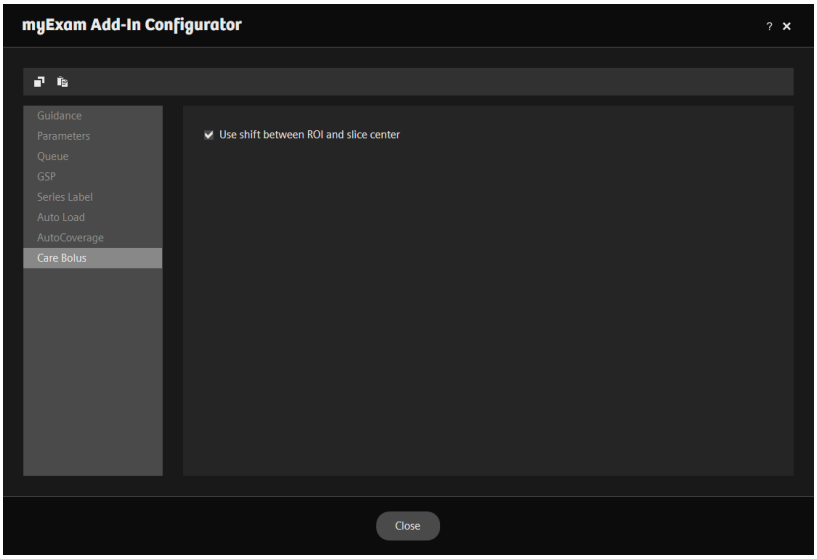
On this card, you select the organ that will be segmented.



3.11.15 Care Bolus

Care Bolus card of the **myExam Add-In Configurator**

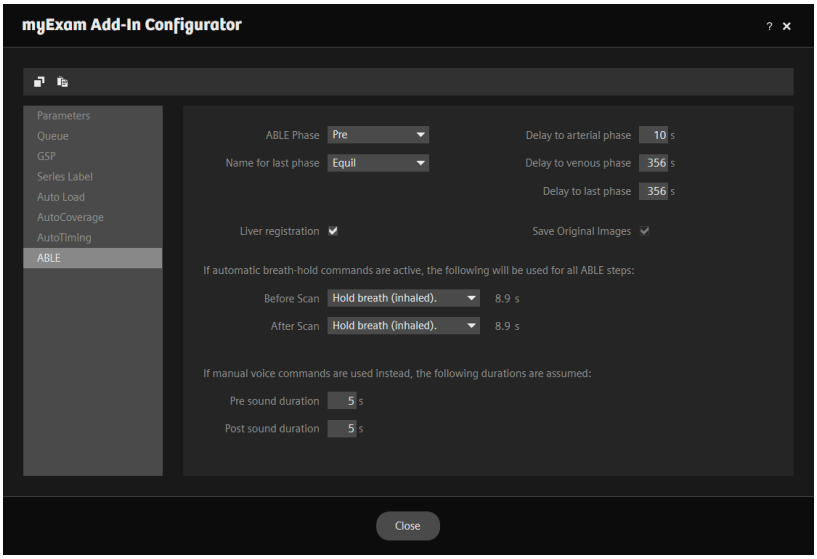
On this card, you define whether the Care Bolus slice will be moved together with the ROI (check box selected) or whether the Care Bolus slice will remain static, even if the ROI is moved by users (check box cleared).



3.11.16 ABLE

ABLE card of the **myExam Add-In Configurator**

On this card, you define parameters for ABLE (automatic breathhold liver examination).



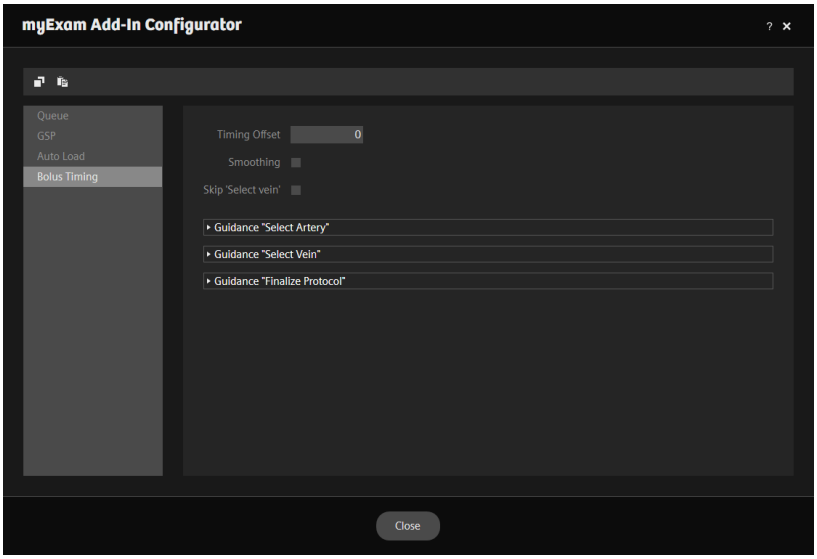
Example: ABLE phase "Pre" selected

Parameter or option	Description
ABLE phase	Indicates which phase in the ABLE study is going to be measured by the current program step.
Name for last phase	Defines whether the last phase will be labeled **equilibrium** or **delayed** on the user interface and in the images.
Delay to arterial phase	Defines the delay between the detection of the Care Bolus and the k-space of the arterial phase.
Delay to venous phase	Defines the delay between the detection of the Care Bolus and the k-space of the venous phase.
Delay to last phase	Defines the delay between the detection of the Care Bolus and the k-space of the last phase.
Liver registration	If this check box is selected, liver registration will be performed in the current program step. As a result, the liver will be shown in the same position in all slices.
If automatic breath-hold commands are active ...	Defines the voice commands that will be given automatically before and after the measurement.

Parameter or option	Description
If manual voice commands are used instead...	Defines the duration of the manual voice commands before and after measurement of this step.

3.11.17 Bolus Timing

Bolus Timing card of the **myExam Add-In Configurator**

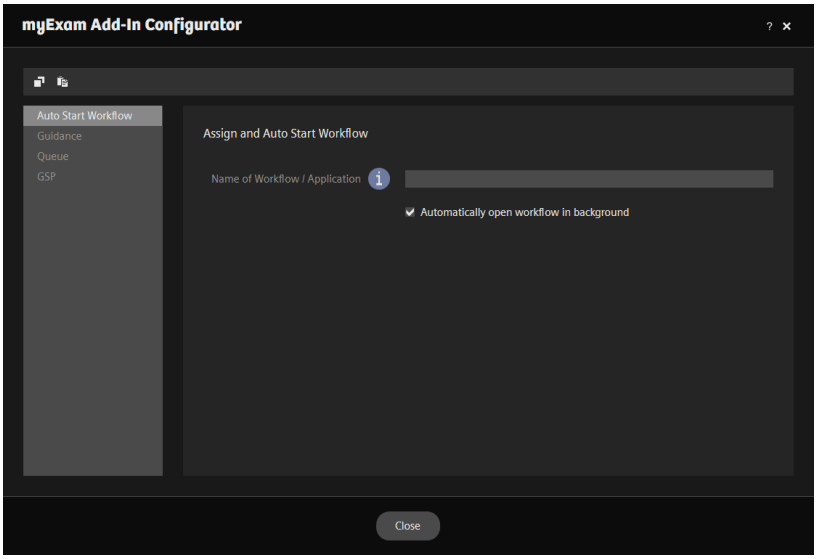


Parameter or option	Description
Timing Offset	This defines the offset from the test bolus signal peak to the signal peak of the (assumed) arterial signal (mean curve).
Smoothing	If this check box is selected, spline interpolation is used for plotting mean curves. If the check box is cleared, linear interpolation is used.
Skip 'Select vein'	If this check box is selected, evaluation of the venous vessel segment is skipped.

3.11.18 Auto Start Workflow

Auto Start Workflow card of the **myExam Add-In Configurator** (prerequisite: **Advanced Application** add-in is assigned to the program step)

On this card, you can define a *syngo*.via workflow, which will be started automatically on the **Viewing** screen once a program step has been completed.

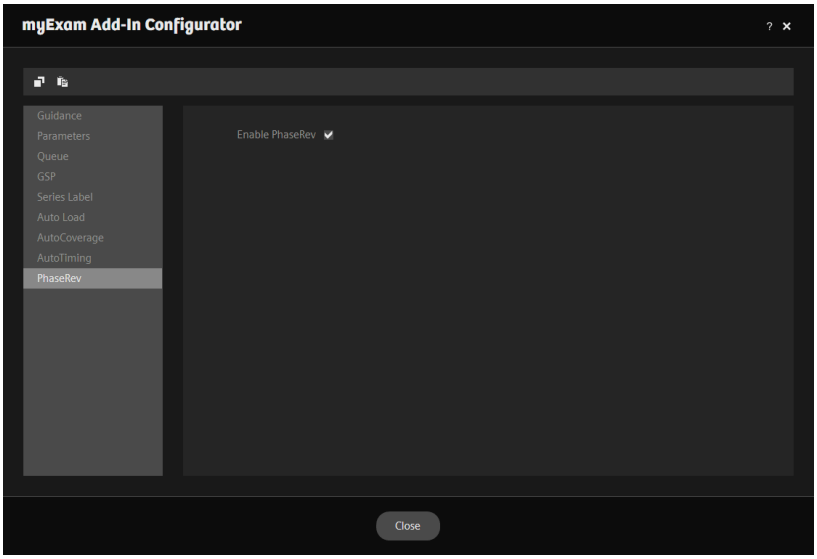


3.11.19 PhaseRev

PhaseRev card of the **myExam Add-In Configurator**

The **PhaseRev** add-in automatically copies a protocol step to the measurement queue but flips the phase-encoding direction, for example, from **A>>P** to **P>>A**. The name of the flipped protocol step comprises the original protocol name plus the suffix "_flipped".

You can attach this add-in to any protocol step.



Parameter or option	Description
Enable PhaseRev	Selection of this check box copies a flipped protocol step to the measurement queue.

3.11.20 Access-i

The Access-i feature allows you to operate a MAGNETOM system from another computer (client) near to the *syngo* Acquisition Workplace. Thus you can control and edit examination programs of the MR system from a non-Siemens device.

For more information (➔ Page 192 *Access-i remote control*)

3.11.21 Table Positioning Strategy

Table Positioning Strategy card of the **myExam Add-In Configurator**

By inserting a **Table Positioning Strategy** step in the measurement program, you can switch the positioning strategy for the current examination prior to measuring the subsequent protocols. Or you can change the position focus for a **LOC** positioning strategy or change the fixed table position for a **FIX** positioning strategy.

For more information, see: Operator Manual MR Examination and Review.

3.11.22 Autopilot Image QA

Autopilot Image QA card of the **myExam Add-In Configurator**

By inserting an **Autopilot Image QA** step in the measurement program, you can review the images of the step while the workflow is paused.

For more information, see: Operator Manual myExam Autopilot.

3.11.23 Autopilot Spine Planning

Autopilot Spine Planning card of the **myExam Add-In Configurator**

By inserting an **Autopilot Spine Planning** step in the measurement program, you can select the region and the scan volume that will be scanned in the following measurement steps.

For more information, see: Operator Manual myExam Autopilot.

4 Advanced User

4.1 Advanced User overview

An Advanced User can use additional features and functionalities, which are associated with certain user roles. Roles are a central element of the authorization system. A role is assigned to a set of tasks. A user will therefore only be allowed to perform a task if the user's account was assigned to a role.

You can use the user management to configure authentication and authorization of Numaris/X.

(→ Page 339 *User management*)

An Advanced User sets up the myExam Assist and has some additional myExam add-ins available to them.

(→ Page 358 *Enhancing program steps in a myExam Assist*)

The reconstruction of MR data is available for an Advanced User.

(→ Page 362 *Reconstructing MR data*)

An Advanced User can configure access to teamplay.

(→ Page 370 *Connecting to teamplay*)

An Advanced User can connect to **MR protocols module**.

(→ Page 372 *Connecting to MR protocols module*)

An Advanced User can configure access to *syngo* Virtual Cockpit.

(→ Page 374 *Connecting to syngo Virtual Cockpit*)

You can access teamplay Fleet and the Services Knowledge Base.

(→ Page 375 *teamplay Fleet*)

The Integrated Development Environment for Applications (IDEA) is a set of tools available to the Advanced User to develop sequences, image reconstruction programs, etc.

(→ Page 377 *IDEA*)

4.2 User management

Only local users have the required authorizations for operating a Numaris/X system. Active Directory is not supported.

(→ Page 339 *Authentication*)

(→ Page 340 *Authorization*)

Users and user groups are assigned to Numaris/X roles with .NET SQL Authorization Manager (NetSqlAzMan).

(→ Page 341 *NetSqlAzMan*)

Windows user management allows you to create new users and to configure their respective authentication and authorizations for Numaris/X.

(→ Page 341 *Use cases for user management*)

(→ Page 342 *Creating local user accounts for Numaris/X*)

(→ Page 343 *Changing passwords for local users*)

After installation of Numaris/X, a number of predefined accounts already exist. There is also a predefined set of service roles. Each service role is associated with a service access level and a set of service functions that can be invoked.

(→ Page 344 *Predefined accounts*)

(→ Page 345 *Access control to the Administration Portal based on service levels*)

Roles are a central element of the authorization system. A task is assigned to a role. A user will therefore only be allowed to perform a task if their user account was assigned to a specific role.

(→ Page 346 *Access rights and roles*)

(→ Page 354 *Assigning users to roles*)

Some troubleshooting hints are available for the following use cases:

(→ Page 358 *Logging on to Numaris/X fails*)

4.2.1 Authentication

For authentication, Numaris/X relies on standardized user management solutions.

Authentication means to identify a user. Unique identification of the user is the basis and prerequisite for access control and logging of relevant user activities. In principle, Numaris/X users are identified by their user name, password, and their domain.

For authentication, Numaris/X uses local Windows user accounts, managed by the Security Accounts Manager (SAM).

The Administration Portal supports an additional authentication system based on service keys, which is only used by the Siemens Customer Care Center.

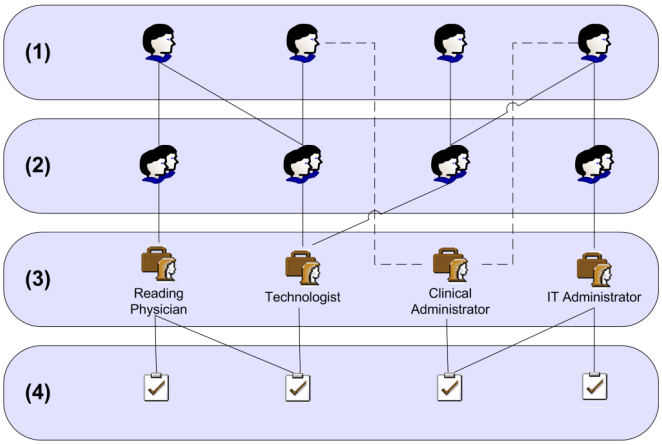
4.2.2 Authorization

Authorization is the act of specifying user permissions for dedicated tasks.

The mapping between user roles and *syngo* tasks is configured with the Numaris/X Authorization Store. The Authorization Store allows you to assign Windows users and user groups to designated *syngo* roles. A Numaris/X user can only invoke a *syngo* task if the user's *syngo* role matches the role assigned to the *syngo* task.

The Authorization Store stores the configuration in an SQL database.

The following picture shows the relationship between users, roles, and tasks:



(1) Clinical user – Windows user
(2) Clinical role – Windows user group
(3) *syngo* role – Authorization Store role
(4) *syngo* task – Authorization Store task

4.2.3 NetSqlAzMan

NetSqlAzMan

The .NET SQL Authorization Manager (NetSqlAzMan) is an application programming interface (API) used for user authorization. The NetSqlAzMan is used to assign users and user groups to *syngo* roles.

4.2.4 Use cases for user management

There are a few typical situations that require changes to the user management.

- *After Installation*

  Create users with the Windows user management.

  Create user groups with the Windows user management.

  Assign users to user groups with the Windows user management.

  Assign users or user groups to *syngo* roles with NetSqlAzMan.

- *Add new users*

  Create users with the Windows user management.

  Assign users to user groups with the Windows user management. The users inherit the roles and permissions associated with the user group.

- *Modify user or user group roles*

  Remove *syngo* roles assigned to users or user groups with NetSqlAzMan.

  Assign users or user groups to new *syngo* roles with NetSqlAzMan.

- *Remove users*

  Delete users with the Windows user management.

  Delete users from user groups with the Windows user management.

  Remove users from the *syngo* role assignment with NetSqlAzMan.

4.2.5 Creating local user accounts for Numaris/X

Besides the Administration Portal, you can also use the user management of Windows to configure authentication and authorization of Numaris/X. You can also mix both methods.

CAUTION

Security measures may hinder system access.

System is not available in an emergency.

- Check if emergency access is necessary at your site and set it up if necessary. This may include some or all of the following:
- An emergency user account with limited access. Make sure that the logon information is deposited at an available and safe location.
- A license strategy to ensure that a license is always available at certain clients.
- Disabling of the screensaver at certain clients.

✓ You have administrator rights.

✓ You are logged on to the Administration Portal.

1 In the Administration Portal, select the **User and Role Administration** tab and click the **User Manager** button.

The **Local Users and Groups** console starts.

Defined users are shown in the content area.

2 Right-click **Users** and choose **New User...** from the context menu.

3 In the **New User** dialog box, fill in the new user information.

There are no Numaris/X-specific rules for user names or passwords. But the Windows password policy enforces complexity requirements by default. New passwords must meet the following minimum requirements:

- Passwords cannot contain the user's account name or parts of the user's full name that exceed two consecutive characters.
- Passwords must be at least 14 characters in length.
- Passwords must contain characters from three of the following four categories:
  - English uppercase characters (A through Z).
  - English lowercase characters (a through z).
  - Digits (0 through 9).
  - Non-alphabetic characters (for example, !, $, #, %).

You can disable the complexity requirements at **Computer Configuration > Windows Settings > Security Settings > Account Policies > Password Policy** in the Group Policy Object Editor (**gpedit.msc**).

4 Select the **Password never expires** check box.

5 Click the **Create** button.

6 Fill in user information for an additional user or click **Close**.

7 Depending on your local policies, add users to user groups in the **Local Users and Groups** console.

4.2.6 Changing passwords for local users

✓ You have administrator rights.

✓ You are logged on to the Administration Portal.

1 In the Administration Portal, select the **User and Role Administration** tab and click the **User Manager** button.

The **Local Users and Groups** console starts.

Defined users are shown in the content area.

2 Right-click the user whose password you wish to change and choose **Set Password**.

3 Confirm the displayed warning by clicking **Proceed**.

4 Enter in the desired password in the corresponding fields and click **OK** to save the changes.

5 Provide the new password to the user concerned.

4.2.7 Predefined accounts

After the installation of Numaris/X, the following predefined user accounts exist:

- “MedAdmin”

  The “MedAdmin” account is essential for proper operation of the Numaris/X server. It is only used for local logon (console session). The “MedAdmin” account cannot be used to log on with Remote Desktop Connection.

After installing the Numaris/X server, the IT Administrator must change the default passwords both of the MedAdmin and RemoteAdmin user accounts.

- "meduser"

  The "meduser" is the standard Numaris/X user. This user is logged in when a startup without authentication window is configured (default setting). The password for this user is unknown. It cannot therefore be used by a person for authentication. The default role for this account is **Technologist**, which means that the user is authorized to perform routine examinations.

- “alocal”

  This account is only used by the Siemens Healthcare Customer Care Center. The account is available for local logon.

- “medclient”

  This account is required for operation of the *syngo* MR Workplace.

- “aremote”

  This is a remote service account.

4.2.8 Access control to the Administration Portal based on service levels

Numaris/X features a dedicated concept for managing service users. There is a predefined set of service roles. Each service role is associated with a service access level and a set of service functions that can be invoked.

Siemens service users log on to the Administration Portal using a service key. This key is translated by the system into the service access level and role.

Administration, authentication, and authorization for service users are performed using a Siemens proprietary solution.

A clinical user may also act as service user. However, the clinical user does not need to enter a service key to log on. Instead, each Numaris/X role is assigned to a certain service access level that contains the set of service functions offered to the user.

In Numaris/X, the following service access levels are available:

- **FREE** (service level 1)

  General service functions for every user (for example, site information, system status).

- **BASIC** (service level 3)

  Configuration and administration functions for clinical administrators and IT administrators (for example, DICOM configuration).

- **EXPERT** (service level 5)

  Extended service functions for clinical administrators and IT administrators to allow certain troubleshooting (for example, Software Update, Event Viewer).

  Prerequisite: The service license EXPERT is available.

- **SIEMENS** (service level 7)

  Service functions for Siemens service users only (for example, System Management, Remote Service Configuration, Auto Report).

4.2.9 Access rights and roles

Roles are a central element of the authorization system. A task is assigned to a *syngo* role. A user will therefore only be allowed to perform a task if their user account was assigned to a *syngo* role.

Only user accounts that are assigned to at least one *syngo* role are able to log on to Numaris/X.

The mapping of tasks and roles is already implemented in Numaris/X when it is distributed. You only have to assign users to the preset *syngo* roles.

Numaris/X is delivered with the following *syngo* roles:

- "Technologist"
  - Measurement: common clinical routine tasks (examinations, reading, postprocessing)
  - myExam Cockpit: changing / deleting tree(s)
- "Clinical Administrator"
  - Measurement: common clinical routine tasks (examinations, reading, postprocessing)
  - MR View&GO: setting default layout and deleting layouts
  - myExam Cockpit: changing / deleting tree(s)
  - myExam Cockpit: changing tree password
  - Reconstructing MR data, saving physiological data
  - Scanner configuration

- "IT-Administrator"
  - Local machine: Windows administrator rights
  - Measurement: common clinical routine tasks (examinations, reading, postprocessing)
  - MR View&GO: setting default layout and deleting layouts
  - myExam Cockpit: changing / deleting tree(s)
  - myExam Cockpit: changing tree password
  - Reconstructing MR data, saving physiological data
  - Sequence development / Watch Dog access
  - Scanner configuration
  - Audit trail setup
- "Service (local & remote)"
  - Local machine: Windows administrator rights
  - Measurement: common clinical routine tasks (examinations, reading, postprocessing)
  - MR View&GO: setting default layout and deleting layouts
  - myExam Cockpit: changing / deleting tree(s)
  - myExam Cockpit: changing tree password
  - Reconstructing MR data, saving physiological data
  - Sequence development / Watch Dog access
  - Scanner configuration
- "Researcher": Deactivating kiosk mode

The "Technologist" role is mapped to "Everyone".



Never change role or task names!

The following table provides an overview of the basic tasks, their default role assignment, and their relevance for authorization.

Task name	Default roles	Authorized function
AccessControl_Require_Authentication	ITAdministrator	Allows the authorized user to enable or disable explicit authentication in the **Configuration Panel**.
AdvancedLayoutOperations	ClinicalAdministrator, ITAdministrator	Allows the authorized user to perform the following operations with public layouts in the **Layout Gallery**: • switch to a layout • set a layout as the default • sort layouts
COMPLETE_READ_WORKITEM	Technologist	Allows the authorized user to save a workflow and to send the results to the archive.
CONF_MONITOR_SETTINGS_PERMISSION	ITAdministrator	Allows the authorized user to change the monitor layout in the **Multi Monitor Setup** section of the **Client Settings** tab of the **Configuration Panel**.
CONF_WORKPLACE_SETTINGS_PERMISSION	ClinicalAdministrator, ITAdministrator	Allows the authorized user to configure the idle time after which the workplace is locked and a lock screen is activated to protect the system against unauthorized access.
DATA_ADMINISTRATION	ClinicalAdministrator, ITAdministrator	Allows administration of data related functionalities and options.
DATA_CORRECTION_AND_REARRANGEMENT	ClinicalAdministrator, ITAdministrator, Technologist	Allows correction and rearrangement of patient and study data.
DATA_PERMANENT_DELETION	ClinicalAdministrator, ITAdministrator, Technologist	Allows data to be permanently deleted from the local database.

Task name	Default roles	Authorized function
DATA_READ_ACCESS	ClinicalAdministrator, ITAdministrator, Technologist	Allows read-only access to data.
DATA_SYNCCONTEXTFOLDER_DELETION	ClinicalAdministrator, ITAdministrator, Technologist	Allows implicit deletion during SyncContextfolder operation.
ENVPROFILES_ACTIVATE_PROFILE_ACCESS	ClinicalAdministrator, ITAdministrator	Allows the authorized user to activate profiles on the **Environment Profiles** page in the Administration Portal.
ENVPROFILES_MANAGE_PROFILE_ACCESS	ClinicalAdministrator, ITAdministrator	Allows the authorized user to manage profiles on the **Environment Profiles** page in the Administration Portal.
FavoritesToolbox.Site.Edit	ClinicalAdministrator, ITAdministrator	Allows the authorized user to customize the content of the **Favorite Tools** panel for all users.
INSTALL_SOFTWARE	ITAdministrator	Allows installation of software updates and upgrades provided by Siemens.
LeaveKioskMode	ClinicalAdministrator, ITAdministrator, Researcher	Allows the authorized user to deactivate kiosk mode without being prompted for credentials. This task should only be assigned to specific users, **never** to the group "Everyone". Otherwise anyone with access to the system may deactivate kiosk mode.
MR_AuditTrailAccess	ITAdministrator	Allows the authorized user to access the audit trail records on the local file system.
MR_DC-ChangeTreePasswordWithoutPassword	ClinicalAdministrator, ITAdministrator, MR_Service	Allows the authorized user to change a tree password without knowing the password.

Task name	Default roles	Authorized function
MR_ImpExpRetroReconAndPhysioData	ClinicalAdministrator, ITAdministrator, Researcher, MR_Service, Technologist	Allows the authorized user to see all performed image reconstructions in the **Job Viewer**, to store their raw data, and to start retrospective reconstruction with this data.
MR_SequenceDevelopment	ITAdministrator, Researcher, MR_Service	Allows the authorized user to restart or reboot the MARS within the sequence development workflow.
NAV_ADMINISTRATION_MODE	ClinicalAdministrator, ITAdministrator	Allows access to the following functions of the Patient Browser: • display of internal DICOM objects • display of TaskflowID in the result list
NAV_ARCHIVE_STATE_CHANGE	ClinicalAdministrator, ITAdministrator, Technologist	Prevents marking or allows marking of data for automatic archiving.
NAV_COMMUNICATION_EXPORT	Technologist, ClinicalAdministrator, ITAdministrator	Allows export of data from the local database to a remote node or to removable media.
NAV_COMMUNICATION_IMPORT	Technologist, ClinicalAdministrator, ITAdministrator	Allows import of data from the file system to the local database in the Patient Browser.
NAV_COMMUNICATION_SEND_TO_ARCHIVE	Technologist, ClinicalAdministrator, ITAdministrator	Allows the authorized user to directly send data from the local database to the configured default archive in the Patient Browser.
NAV_EXTERNAL_DICOM_ACCESS	Technologist, ClinicalAdministrator, ITAdministrator	Allows access to DICOM Query/Retrieve from the Patient Browser.

Task name	Default roles	Authorized function
NAV_PUBLIC_FILTER_MANIPULATION	ClinicalAdministrator, ITAdministrator, Technologist	Allows creation, modification, and deletion of public work lists.
NAV_THIRD_PARTY_APPLICATION_CALLUP	no default roles	Allows the authorized user to start third-party applications from within the Patient Browser (via icon and context menu).
NAV_WORKFLOW_ADMINISTRATION	ClinicalAdministrator, ITAdministrator, Technologist	Allows access to the following workflow administration functions in the Patient Browser: • cancel workflow • batch assign workflow
OpenApps.Download	ClinicalAdministrator, ITAdministrator	Allows the authorized user to download and install OpenApps from the Digital Marketplace.
OpenApps.EditConfig	ClinicalAdministrator, ITAdministrator	Allows the authorized user to edit the OpenApps processing configuration in the **Configuration Panel**.
PERFORM_CLINICAL_ADMIN_TASK	ClinicalAdministrator, ITAdministrator	Allows configuration of clinical settings in the *syngo*.via Administration Portal (e.g. configuration of anatomy processing).
PERFORM_IT_ADMIN_TASK	ITAdministrator	Allows configuration of IT settings in the *syngo*.via Administration Portal (e.g. license configuration).
PreferredLayouts.Edit	ClinicalAdministrator, ITAdministrator	Allows the authorized user to set and delete layouts in MR View&GO.
PresetShortcut.Site.Edit	ClinicalAdministrator, ITAdministrator	Allows the authorized user to modify the keyboard shortcuts for windowing presets for all users.

Task name	Default roles	Authorized function
PresetShortcut.Site.Restore	ClinicalAdministrator, ITAdministrator	Allows the authorized user to restore the factory settings of the keyboard shortcuts for windowing presets for all users.
PresetShortcut.User.Edit	Technologist	Allows the authorized user to modify the keyboard shortcuts for windowing presets for the current user.
PresetShortcut.User.Restore	Technologist	Allows the authorized user to restore the factory settings of the keyboard shortcuts for windowing presets for the current user.
Print.ReArrangeLayouts	ClinicalAdministrator, ITAdministrator	Allows the authorized user to rearrange layouts within the **Layout Gallery** of the **Print** step.
PRIOR_QR_SOURCE_AND_FILTER_MANIPULATION	ClinicalAdministrator, ITAdministrator, Technologist	Allows the authorized user to modify the data sources and filter conditions in the **Add Study** dialog.
RangesTools.SharePreset	ClinicalAdministrator, ITAdministrator	Allows the authorized user to provide a range preset for all users.
SaveDefaultLayoutForAllUsers	ClinicalAdministrator, ITAdministrator, MR_Service	Allows the authorized user to configure whether all clinical users can create and save private layout collections.
SEE_HIDDEN_JOBS	ClinicalAdministrator	Allows the authorized user to see jobs that are marked as hidden in the **Job View** (e.g. DICOM communication jobs).
TROUBLESHOOT_SYSTEM	ClinicalAdministrator, ITAdministrator	Grants access to functions for error analysis and troubleshooting (e.g. Message Viewer).

Task name	Default roles	Authorized function
VrtPreset.Site.Create	ClinicalAdministrator, ITAdministrator	Allows the authorized user to create VRT presets for all users.
VrtPreset.Site.Edit	ClinicalAdministrator, ITAdministrator	Allows the authorized user to modify VRT presets for all users.
VrtPreset.Site.Restore	ClinicalAdministrator, ITAdministrator	Allows the authorized user to restore factory settings of VRT presets for all users.
VrtPreset.User.Create	Technologist	Allows the authorized user to create VRT presets for the current user.
VrtPreset.User.Edit	Technologist	Allows the authorized user to modify VRT presets for the current user.
VrtPreset.User.Restore	Technologist	Allows the authorized user to restore the factory settings of VRT presets for the current user.
WindowingPreset.Site.Create	ClinicalAdministrator, ITAdministrator	Allows the authorized user to create windowing presets for all users.
WindowingPreset.Site.Edit	ClinicalAdministrator, ITAdministrator	Allows the authorized user to modify windowing presets for all users.
WindowingPreset.Site.Restore	ClinicalAdministrator, ITAdministrator	Allows the authorized user to restore factory settings of windowing presets for all users.
WindowingPreset.User.Create	Technologist	Allows the authorized user to create windowing presets for the current user.
WindowingPreset.User.Edit	Technologist	Allows the authorized user to modify windowing presets for the current user.

Task name	Default roles	Authorized function
WindowingPreset.User.Restore	Technologist	Allows the authorized user to restore the factory settings of windowing presets for the current user.

4.2.10 Assigning users to roles

In the Administration Portal, you can authorize Numaris/X access for local Windows users or groups.

(→ Page 354 *Adding users or groups via the Role Manager*)

(→ Page 356 *Adding users or groups via the Administration Portal*)

(→ Page 357 *Removing users or groups*)

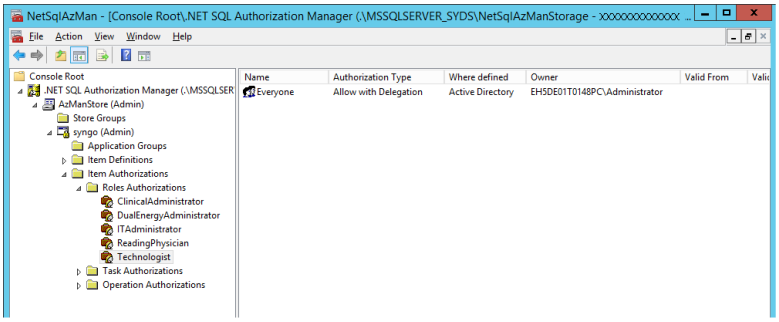
4.2.10.1 Adding users or groups via the Role Manager

✓ You have administrator rights.

✓ You are logged on to the Administration Portal.

1 In the Administration Portal, select the **User and Role Administration** tab and click the **Role Manager** button.

The **Authorization Manager** opens with the *syngo* authorization store.



2 Expand the tree down through **.NET SQL Authorization Manager** / **AzManStore** / **syngo** / **Item Authorizations** / **Roles Authorizations**, and select the role to which you would like to add a user or group.

3 Right-click a role and choose **Manage Authorizations**.

The **Item Authorizations** dialog box opens.

4 Click **Add Windows Users and Groups**.

The **Select Users or Groups** dialog box opens.

5 Click **Locations**.

The **Locations** dialog box opens.

6 Select your local computer.

7 Click **OK**.

The **Select Users or Groups** dialog box opens.

8 Enter the user or group name that you want to add in the entry field. Use one of the following syntax examples: **`DisplayName`** (example: FirstName LastName) **`UserName`** (example: User1) **`ObjectName@DomainName`** (example: User1@Domain1) **`DomainName\ObjectName`** (example: Domain1\User1) You can search for multiple objects by separating each name with a semicolon.

– or –

Click the **Advanced...** button and search users or groups in the **Select Users or Groups** dialog box.

If you start a new session, Windows Security will prompt you to enter user name and password of an account with permission to access the domain of the selected user.

---

9 Click **Check Names** and **OK**.

The **Item Authorizations** dialog box opens.

10 Select the **Authorization Type** check box and click **OK**.

The user or group is listed in the content area and added to the role assignment.

4.2.10.2 Adding users or groups via the Administration Portal

Users are only allowed to perform tasks in Numaris/X if their user accounts or groups are assigned to a role that covers the corresponding rights and permissions.

In the Administration portal, you can assign Windows users/groups to *syngo* roles without having to access the operating system, for example, when the system is in kiosk mode.

✓ You have administrator rights.

✓ You are logged on to the Administration Portal.

✓ You know the name of the Windows user or group to be authorized.

1 First select the **Technical Configuration** workspace and then choose **User and Role Administration** from the navigation tree.

The **User and Role Administration** window opens and displays the current role assignments.

2 To add a new assignment, click the **Add** button.

A new line appears in which you can select a user/group and role.

3 To specify a Windows user or group that is not available on the local system, enter the corresponding domain or the name of the host computer on which the user/group is managed in the **Domain/host name** field.

4 Enter the user/group name in the **Windows User or Group** field.

– or –



Enter at least three initial letters of the user/group name and click the **Search** icon.



Do not assign internal users/groups such as “db_owner” or “OpenAppsUser” that are only used for internal management tasks.

5 From the **Role** field, select the role that you want to assign to the user/group.



6 Click the **Add** icon.

The Windows user/group is assigned to the role.

To delete a role assignment, click the **Delete** icon at the end of the corresponding table row.



The changes take effect when the affected user logs on again.

(➔ Page 427 *Accessing the Windows user and authorization management in kiosk mode*)

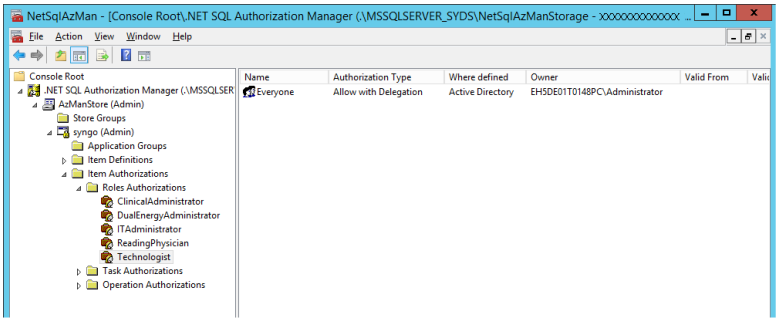
4.2.10.3 Removing users or groups

✓ You have administrator rights.

✓ You are logged on to the Administration Portal.

1 In the Administration Portal in the **User and Role Administration** tab, click the **Role Manager** button.

The **Authorization Manager** opens with the *syngo* authorization store.



2 Expand the tree down through **.NET SQL Authorization Manager** / **AzManStore** / **syngo** / **Item Authorizations** / **Roles Authorizations**, and select the role from which you would like to remove a user or group.

3 Select the user or group from the content area and press **Del**.

The user or group is removed from the role assignment.

4.2.11 Logging on to Numaris/X fails

If a user cannot log on, the following may be helpful:

- (→ Page 358 *Checking the user account*)

4.2.11.1 Checking the user account

Check whether there is a problem with the user account:

1 Check whether the user credentials are correct (in the Windows user management). If in doubt, reset the password.

Passwords are case-sensitive!

2 Check whether the user is assigned to at least one role in the NetSqlAzMan configuration. If user groups are used for the role assignment, check whether the user belongs to one of these groups (Windows user management).

4.3 Enhancing program steps in a myExam Assist

In a myExam Assist, program steps can be enhanced with myExam add-ins. myExam add-ins are auxiliary software components that offer user guidance, predefine parameters, and preselect settings.

Additional myExam add-ins are available for an Advanced User.

(→ Page 359 *Configuring the start of an Advanced Application*)

(→ Page 360 *Configuring decision points*)

(→ Page 360 *Defining oncological Auto Coverage*)

(→ Page 361 *Defining breast Auto Coverage*)

For further information on myExam add-ins (→ Page 312 *myExam Add-In Configurator*)

4.3.1 Configuring the start of an Advanced Application

Using the **myExam Cockpit**, you can configure the start of an Advanced Application on the RHS (right screen). In the "Advanced Applications" myExam component UI, a string identifies a workflow on the RHS. During runtime (in the queue), the component will trigger the start of the pre-configured workflow.

The start of Advanced Application is only possible within an interaction step.

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select the **Default** tab on the sidebar.

2 Open the **Default AddIns** list.

3 Select the **Advanced Application** add-in and drag it onto an interaction step in the workspace.

4 Right-click the **Advanced Application** add-in within the program step and choose **Edit Properties** from the context menu.

5 Click **Addin Configuration**.

The **Auto Start Workflow** card of the **myExam Add-In Configurator** opens.

On the **Auto Start Workflow** card, you can define a workflow, which will be started automatically on the **Viewing** screen once a program step has been completed.

An Advanced Application starts only after all preceding reconstructions have finished.

---

6 Select the **Automatically open workflow in background** check box.

Deselect the **Automatically open workflow in background** check box if you want the workflow to start fast on the satellite console.

---

7 Click **Close**.

When you close the **myExam Add-In Configurator**, your changes have not been applied yet. Changes are applied only when you click **Ok** in the **Step Properties** dialog box of the program step to which the myExam add-in is assigned.

4.3.2 Configuring decision points

Using the **myExam Cockpit**, you can define your own decision points for an examination workflow, and thus define which protocol steps will be added (e.g. routine or research case).

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select the **Default** tab on the sidebar.

2 Open the **Default AddIns** list.

3 Select the **Basic Decision** add-in and drag it onto a program step in the workspace.

4 Right-click the **Basic Decision** add-in within the program step and choose **Edit Properties** from the context menu.

5 Click **Addin Configuration**.

The **Basic Decision** card of the **myExam Add-In Configurator** opens.

On the **Basic Decision** card, you can type a text formulating a decision.

6 Click **Close**.

When you close the **myExam Add-In Configurator**, your changes have not been applied yet. Changes are applied only when you click **Ok** in the **Step Properties** dialog box of the program step to which the myExam add-in is assigned.

4.3.3 Defining oncological Auto Coverage

Using the **myExam Cockpit**, you can define the region of interest to be visualized so that the system adapts the physically required FOV (field of view) for cardiac and liver to the organ size of the patient. The FOV is application-specific and applies within defined steps and limits.

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select the **Default** tab on the sidebar.

2 Open the **Default AddIns** list.

3 Select the **Onco Auto Coverage Scout** add-in and drag it onto a program step in the workspace.

4 Right-click the **Onco Auto Coverage Scout** add-in in the program step and choose **Edit Properties** from the context menu.

5 Click **Addin Configuration**.

The **Onco Auto Coverage Scout** card of the **myExam Add-In Configurator** opens.

On the **Onco Auto Coverage Scout** card, you can select the corresponding FOV.

6 From the **Select region to segment** list, select the corresponding value.

7 Click **Close**.

When you close the **myExam Add-In Configurator**, your changes have not been applied yet. Changes are applied only when you click **Ok** in the **Step Properties** dialog box of the program step to which the myExam add-in is assigned.

4.3.4 Defining breast Auto Coverage

Using the **myExam Cockpit**, you can define the region of interest to to be visualized so that the system adapts the physically required FOV (field of view) for the breast. The FOV is application-specific and applies within defined steps and limits.

✓ A myExam Assist is open on the **Edit** tab of the **myExam Cockpit Program Editor**.

1 Select the **Default** tab on the sidebar.

2 Open the **Default AddIns** list.

3 Select the **Breast Auto Coverage Scout** add-in and drag it onto a program step in the workspace.

4 Right-click the **Breast Auto Coverage Scout** add-in in the program step and choose **Edit Properties** from the context menu.

5 Click **Addin Configuration**.

The **Breast Auto Coverage Scout** card of the **myExam Add-In Configurator** opens.

On the **Breast Auto Coverage Scout** card, you can select the corresponding FOV.

6 From the **Select region to segment** list, select the corresponding value.

7 Click **Close**.

When you close the **myExam Add-In Configurator**, your changes have not been applied yet. Changes are applied only when you click **Ok** in the **Step Properties** dialog box of the program step to which the myExam add-in is assigned.

4.4 Reconstructing MR data

In the **Job View**, an Advanced User can use a retrospective reconstruction (RetroRecon) of a measurement to repeat a reconstruction with a different parameter set but without restarting the actual scan.

RetroRecon should only be performed by experienced users.

The MR parameters used for RetroRecon are not validated prior to retrospective reconstruction. Even if the MR parameters remain unchanged, it is still possible that other settings may have been changed since the reconstruction, for example, global configurations on the measurement and reconstruction system and the *syngo* Acquisition Workplace.

Without in-depth knowledge of the interaction of the different parameters, it is very easy to cause preparation and reconstruction errors by changing any parameter.

Therefore, all images processed with RetroRecon are marked with the DICOM Content Qualification tag "RESEARCH", resulting in the image text “Not for diagnostic use”.

A message in the bottom area of the **Job View** also points out this fact: “Please take care that all results created with RetroRecon might not be suited for diagnostic use any more. Results need to be checked carefully. Parameter changes are not checked for consistency hence preparation or reconstruction errors might occur.”



1 On the access bar, click the **Job View** icon.

2 In the job type control area, select the **MR Reconstructions** job type.

An overview of all protocols is displayed.



3 In the list of protocols, click the **Start** icon to start the retrospective reconstruction of the corresponding protocol.

– or –



In the list of protocols, click this icon to export RAID files. (Only available if a USB flash drive is attached.)

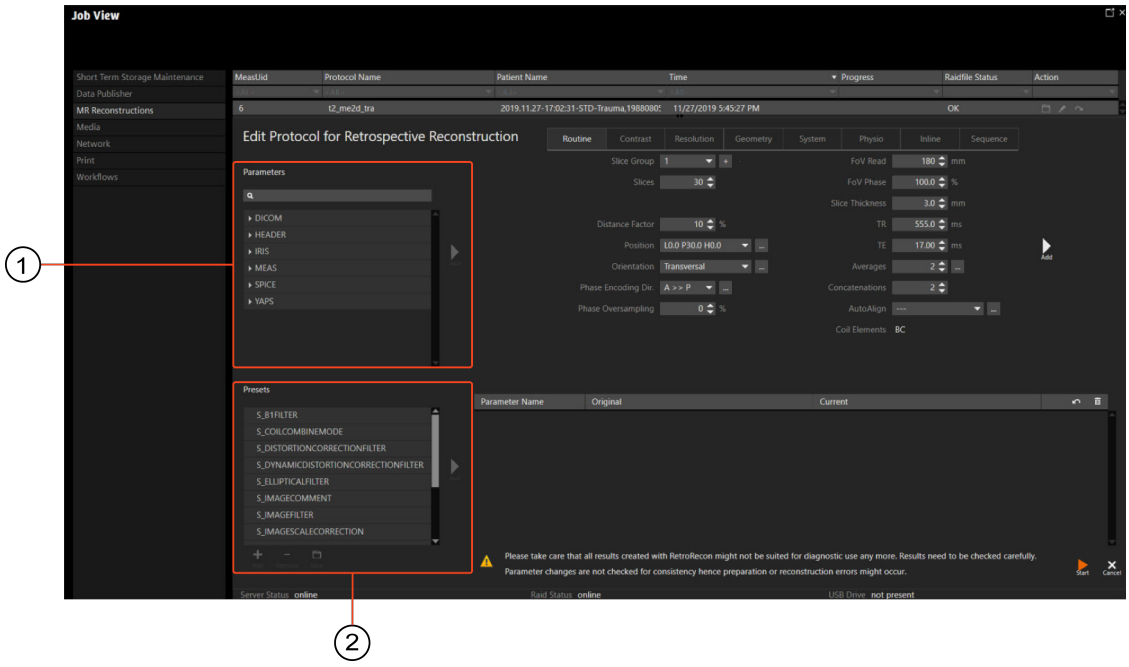
– or –



In the list of protocols, click the **Edit** icon to edit the corresponding protocol.

The **Edit Protocol for Retrospective Reconstruction** screen opens.

(➔ Page 369 *Creating your own MR reconstruction presets*)



(1) **Parameters**
Parameter sets available for retrospective reconstruction.

(2) **Presets**
Presets available for retrospective reconstruction.

Raidfile Status

- **OK**: Data acquisition and image reconstruction successful
- **Error**: Data acquisition or image reconstruction failed
- **Imported**: RAID file has been imported



4 In the **Parameters** list, select a parameter and click the **Add** icon.



5 Below the **Presets** list, click the **Add** icon.

A list of presets is displayed.



6 Select a preset and click the **Add** icon.

If all parameters and presets are selected, you can start retrospective reconstruction of the MR data.



7 Click the **Save** icon to save the selected parameters and presets.



8 Click the **Start** icon to start retrospective reconstruction.

In the **Progress** column in the overview, the status of the retrospective reconstruction is displayed.

4.4.1 Predefined MR reconstruction presets

Siemens provides a number of predefined MR reconstruction presets.

Each preset is modeled as a single file (.rrt) on the host located in %MRISITEDATA%\Cocos\JobViewer\Presets.

New presets can be installed by copying the .rrt files into this folder and restarting *syngo*.

B1Filter(BiFiC)

MEAS.sBiFiCFilter.ucOn	• Enabled: True • Disabled: False
MEAS.sBiFiCFilter.ucMode	• Weak: 1 • Medium: 2 • Strong: 4
MEAS.sBiFiCFilter.ucSaveUnfiltered	• Enabled: True • Disabled: False

CoilCombineMode

MEAS.ucCoilCombineMode	• Sum of squares: 1 • Adaptive combine: 2

CoilCombineMode	
MEAS.ucUncombImages	• Enabled: True • Disabled: False

DistortionCorrectionFilter	
MEAS.sDistortionCorrFilter.ucMode	• NDIS: 1 • DIS2D: 2 • DIS3D: 4
MEAS.sDistortionCorrFilter.ucSaveUnfiltered	• Enabled: True • Disabled: False

DynamicDistortionCorrectionFilter	
MEAS.sDynDistCorrFilter.ucMode	• None: 1 • Direct: 2 • Adj: 4
MEAS.sDynDistCorrFilter.ucSaveUnfiltered	• Enabled: True • Disabled: False

EllipticalFilter	
MEAS.sEllipticalFilter.ucOn	• Enabled: True • Disabled: False
MEAS.sEllipticalFilter.ucMode	• Inplane: 1 • Volume: 2

ImageComment	
YAPS.tSequenceImageComment	Any string

ImageFilter

MEAS.sImageFilter.ucOn	• Enabled: True • Disabled: False
MEAS.sImageFilter.ucMode	• Sharp: 16 • Medium: 2 • Smooth: 32
MEAS.sImageFilter.lSmoothing	1...5
MEAS.sImageFilter.lEdgeEnhance	1...5
MEAS.sImageFilter.ucSaveUnfiltered	• Enabled: True • Disabled: False

ImageScaleCorrection

MEAS.sCoilSelectMeas.dOverallImageCorrectionFactor	• Float value

iPat

MEAS.sPat.ucPATMode (do not change if original value is None==1)	• None: 1 • GRAPPA: 2 • SENSE: 4 (also set ucCoilCombineMode to 1) • CAIPIRINHA: 16
MEAS.ucCoilCombineMode	• Sum of squares: 1 • Adaptive combine: 2

NormalizeFilter

MEAS.sNormalizeFilter.ucOn	• Enabled: True • Disabled: False

NormalizeFilter

MEAS.sNormalizeFilter.ucMode	• Weak: 1 • Medium:2 • Strong: 4 • Free: 8
MEAS.sNormalizeFilter.lCutOff	1...99 (only used if ucMode==Free)
MEAS.sNormalizeFilter.lWidth_256	2...16 (only used if ucMode==Free)
MEAS.sNormalizeFilter.ucSaveUnfiltered	• Enabled: True • Disabled: False

PreScanNormalizeFilter

MEAS.sPreScanNormalizeFilter.ucOn	• Enabled: True • Disabled: False
MEAS.sPreScanNormalizeFilter.ucMode	• Moderate: 1 • Normal: 2 • Broad range: 4
MEAS.sPreScanNormalizeFilter.ucSaveUnfiltered	• Enabled: True • Disabled: False

RawFilter

MEAS.sRawFilter.ucOn	• Enabled: True • Disabled: False
MEAS.sRawFilter.ucMode	• Weak: 1 • Medium: 2 • Strong: 4 • Free: 8

RawFilter	
MEAS.sRawFilter.lSlope_256	0...128 (only valid if ucMode==Free)

ReconstructionMode	
MEAS.ucReconstructionMode	• Magnitude:1 • Phase: 2 • Real: 4 • Magnitude phase: 8 • Real phase 16

SINCInterpolation	
MEAS.sKSpace.fl2DInterpolation	• Disable: 0 • Enable: 1,0...4,0
MEAS.sKSpace.uc2DInterpolation	• Disable: False • Enable: True

Hints for Sinc interpolation

Note that “Enable” has precedence over “Disable”.

To disable Sinc interpolation, enter the following values:

- fl2DInterpolation = 0
- uc2DInterpolation = False

4.4.2 Creating your own MR reconstruction presets

Presets are collections of one or more MR reconstruction protocol settings, which can be applied to a protocol prior to running a retrospective reconstruction (RetroRecon).

To create your own presets, perform the following steps.



1 In the list of the protocols, click the **Edit** icon to edit the corresponding protocol.

   The **Edit Protocol for Retrospective Reconstruction** screen opens.

2 Select the requested parameter from the **Parameters** list.

3 Double-click to add the parameter to the main set of parameters.

   – or –



   Click the **Add** icon.

4 To add more parameters, repeat the steps above.

5 If requested, change the value of the parameters.



6 Click the **Add** icon below the **Presets** list.

   A new preset with the name "_unnamed_" is created.

7 To rename the preset, double-click the "'_unnamed_" preset.

8 Enter a preset name.

4.5 Connecting to teamplay

With **teamplay Protocols** you can manage the protocols of your imaging fleet. It allows you to map institution protocols to standard protocols, and it offers guidance on local naming conventions to make the process easier on an ongoing basis.

To transfer data with the **myExam Cockpit**, you need to configure the connection of your system to teamplay on the **teamplay Configuration** card of the Administration Portal or in the **teamplay Configuration** dialog box of the **myExam Cockpit**.

4.5.1 teamplay configuration in the Administration Portal

✓ You have administrator rights.

1 On the access bar, click the **Configuration** icon and choose **Administration Portal** from the menu.

The Administration Portal opens.

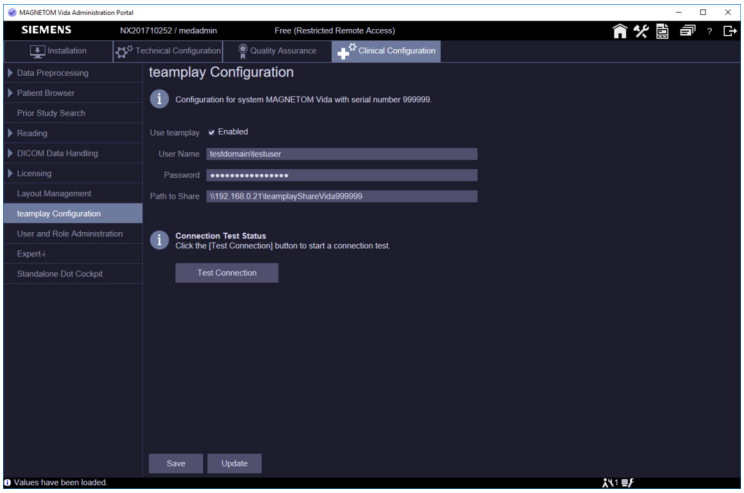
2 Enter your credentials.

3 On the **Clinical Configuration** tab, select the **teamplay Configuration** card.

4 Select the **Enabled** check box.

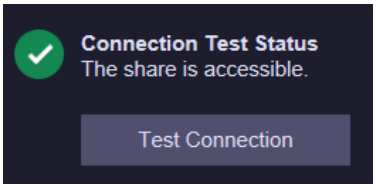
5 Enter the user name and password that your system will use to log on to teamplay.

6 Enter the path to the teamplay network share.



7 Click **Save**.

8 To check whether a connection to teamplay can be established, click **Test Connection**.



In the **myExam Cockpit**, you can now transfer data with teamplay.

(→ Page 270 *Importing or exporting measurement programs*)

4.5.2 teamplay configuration in myExam Cockpit

✓ You are logged on as an administrator when you open **myExam Cockpit** at a scanner, or you are working in **MR protocols module**.

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.



1 On the toolbar, choose **teamplay Configuration** from the menu of the **Settings** icon.

2 Select the **Enable Feature** check box.

3 Enter the path to the teamplay network share.

4 Enter the user name and password that your system will use to log on to teamplay.

5 Click **Save**.

4.6 Connecting to MR protocols module

MR protocols module is the solution for central configuration and management of measurement programs and myExam Assist programs across fleets of Siemens MR scanners. If your hospital or institution uses **MR protocols module**, this feature has been installed for you by Siemens Healthineers Customer Service. Siemens Healthineers Customer Service has typically also connected all scanners in your fleet.

If you want to connect additional scanners, you need to purchase one Connect license for every additional scanner. Once this license has been installed on a scanner, you can connect the new scanner to the fleet on the **Fleet Configuration** card of the Administration Portal or in the **Fleet Configuration** dialog box of the **myExam Cockpit**.

4.6.1 Fleet configuration in the Administration Portal

✓ You have administrator rights.

✓ A Connect license has been installed on the scanner.

1 On the access bar, click the **Configuration** icon and choose **Administration Portal** from the menu.

The Administration Portal opens.

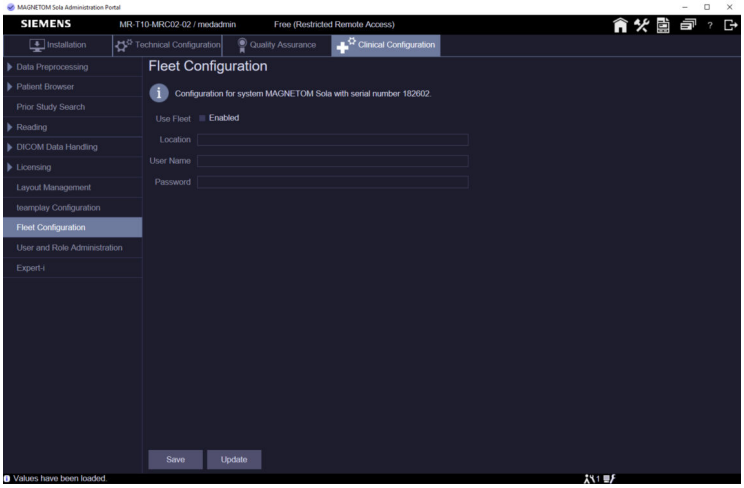
2 Enter your credentials.

3 On the **Clinical Configuration** tab, select the **Fleet Configuration** card.

4 Select the **Enabled** check box.

5 Enter the user name and password that your system will use to log on to the central master version of the fleet database.

6 Enter the path to the network share where the central master version of the fleet database is stored.



7 Click **Save**.

4.6.2 Fleet configuration in myExam Cockpit

✓ A Connect license has been installed on the scanner.

✓ You are logged on as an administrator when you open **myExam Cockpit** on the scanner.

✓ The **Browse** tab of the **myExam Cockpit Explorer** is open.



1 On the toolbar, choose **Fleet Configuration** from the menu of the **Settings** icon.

2 Select the **Enable Feature** check box.

3 Enter the path to the network share where the central master version of the fleet database is stored.

4 Enter the user name and password that your system will use to log on to the central master version of the fleet database.

5 Click **Save**.

4.7 Connecting to *syngo* Virtual Cockpit

To establish a connection to *syngo* Virtual Cockpit (sVC), you need to configure the sVC client identity, the sVC display name, and the sVC server information in the Administration Portal.

If you start *syngo* Virtual Cockpit and no sVC configuration data is available in the Administration Portal, an error message with a **Try Again** button is displayed. After you have completed the configuration, you can click **Try Again** to establish a connection to *syngo* Virtual Cockpit.

4.7.1 *syngo* Virtual Cockpit configuration in the Administration Portal

✓ You have administrator rights.

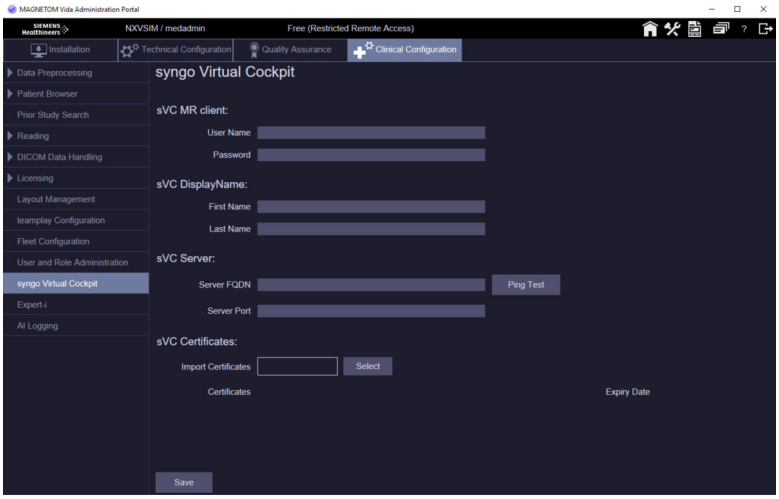


1 On the access bar, click the **Configuration** icon and choose **Administration Portal** from the menu.

The Administration Portal opens.

2 Enter your credentials.

3 On the **Clinical Configuration** tab, select the **syngo Virtual Cockpit** card.



4 Under **sVC MR client**, enter the user name and password that your system will use to log on to *syngo* Virtual Cockpit.

5 Under **sVC DisplayName**, enter the first name and last name to be displayed in *syngo* Virtual Cockpit.

6 Specify the **sVC Server**.

- **Server FQDN**: Enter the fully qualified domain name (FQDN) of the sVC server.
- **Server Port**: Enter the port for accessing the sVC server.

To check whether the sVC server is reachable, click **Ping Test**.

7 Import the **sVC Certificates**.

8 Click **Save**.

4.8 teamplay Fleet

teamplay Fleet is a teamplay digital health platform solution that enables you to streamline the management of your fleet from Siemens Healthineers and to optimize your asset performance holistically, 24/7, and from any browser-capable device.

With its broad range of features, teamplay Fleet offers you a clear overview of your equipment data, helping to maintain and optimize your asset performance while keeping your equipment cybersecure and allowing you to make sound decisions about the future of your fleet.

Access to teamplay Fleet is password-protected. You have to register to use it.

As soon as an account is created by Siemens Healthineers, you will receive instructions on how to log on for the first time. You will also receive a temporary password that you will have to change when you first log on. Use this changed password and your email address each time you log on thereafter.

(→ Page 376 *Accessing the Services Knowledge Base*)

4.8.1 Accessing the Services Knowledge Base

Siemens Healthineers provides administrators access to the Services Knowledge Base. The Knowledge Base is a helpdesk for sharing information among administrators. It provides troubleshooting information, articles, and answers to frequently asked questions.

✓ You have administrator rights.

To access the Services Knowledge Base, perform the following steps.

1 Enter the following URL in a web browser with Internet access:

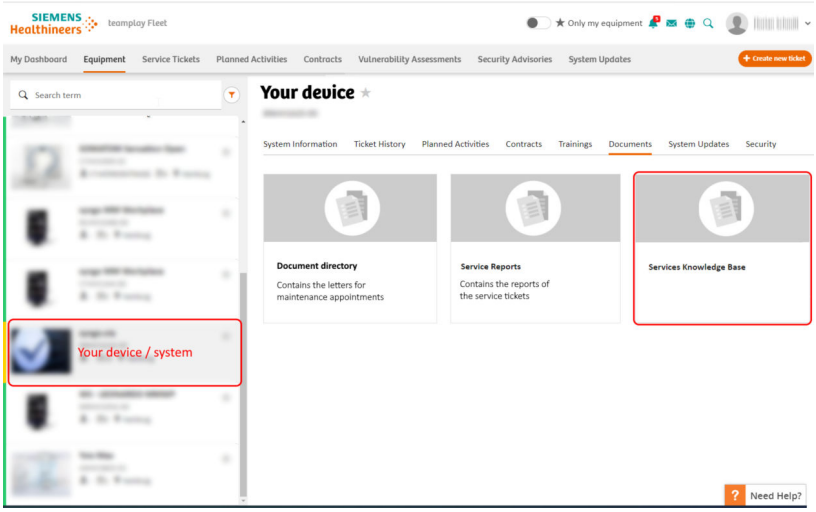
https://fleet.siemens-healthineers.com

2 On the website, select **Login/Register** to either log on or register.

3 Enter your email address and password.

The **teamplay Fleet** page opens.

4 Select your device/system and then click **Services Knowledge Base**.



Sample screen

If you do not have an account or have issues with your account, please contact: lifenet-infocenter.healthcare@siemens-healthineers.com

4.9 IDEA

The Integrated Development Environment for Applications (IDEA) is a set of tools available to the user for developing sequences, image reconstruction programs, etc.

The following part describes the functionality of IDEA.

However, it does not cover how to write a sequence or ICE program which is suitable for a correct diagnosis and without any risk for the patient. Here, we are only concerned with IDEA software issues. Neither the measurement framework, nor the actual physics, nor correctly labeled images are explained.

For a detailed description of IDEA, please refer to the IDEA Users Guide on the IDEA DVD or in your IDEA installation.

4.9.1 Introduction to IDEA

4.9.1.1 Product goal

IDEA is a toolkit that offers the MR programmer a way for developing and testing sequences and image reconstruction programs. Additional support tools help with exchanging protocols.

IDEA is a development environment and is therefore intended for programmers developing sequences or reconstruction programs for a special Numaris/X software version.

IDEA allows you to compile, test, and execute sequences and image reconstruction programs (IDEA targets).

IDEA can be installed on a stand-alone Windows PC only, not on a Numaris host.

The targets can then be transferred to the Numaris host and are executed on the appropriate target hardware.

4.9.1.2 Product profile

The IDEA component includes all tools and utilities that are necessary for programming and debugging sequences and image reconstruction programs. The necessary compilers (excluding Microsoft compilers) are already included in IDEA when it is distributed. IDEA offers the possibility of activating tracing and gathering other runtime information. There are additional tools for graphical visualization of sequences and RF pulses and an image reconstruction pipeline.

IDEA is not part of the standard delivery of Numaris, but is provided only for selected customers after special training. Installation of IDEA targets on the scanner requires an additional license (IDEA license).

In addition, the Numaris/X sequences delivered are internally marked to identify them as original **Siemens** sequences. IDEA sequences created by the customer cannot be marked this way. **Siemens** and **Customer** sequences can therefore be identified and separated with absolute certainty.

4.9.1.3 IDEA components and functionalities

IDEA consists of several components:

- IDEA installation routine
  - Automatic detection of installation and runtime environment (stand-alone PC)
  - Installation of missing software packages (if required and possible)
  - Multiple IDEA versions can be installed and used side by side
- Sequence development
  - Compilation of sequences
  - Unit test of sequences
  - Simulation and visualization of sequences
  - Handling of release/debug versions and programs
  - Quick and easy installation of the newly compiled sequence on the MR system (host and MARS binaries)
- ICE program development
  - Compilation of ICE programs
  - Test (simulation) of ICE programs on stand-alone PC
  - Inspection of raw data flags
  - Examine raw data (measured on MR host)
- Protocol handling
  - Off-line protocol editor (on stand-alone PC)
  - Solve handler in sequences
  - Batch-driven generation of protocols from token files
  - Listing of protocol parameters

- Utilities
  - Examination/modification of external RF pulses
  - A number of test scenarios can be simulated using commands in the development environment.

4.9.1.4 IDEA environment and user interface

The IDEA user interface is a shell-like command window.

IDEA is located in its own subdirectory tree for each software version.

On the scanner, only the compiled .dlls/.so and protocols can be installed, so there is no interaction between IDEA and the scanner software as used in the daily routine.

On the Windows PC

Installation of multiple IDEA versions on a single PC is possible, and supported by the installation routine.

Every time IDEA is started, the user is asked to select the desired version. This starts a command shell containing the appropriate environment for compilation and testing.

Within this command window, a number of utilities and short-hand commands for compilation and testing are available.

On the Numaris host

Once the targets have been compiled and tested, they must be transferred to the Numaris host.

For a file transfer to the Numaris host, you require write access to the host. To allow execution of the copied binaries, the binaries must be signed with a valid and installed certificate.

(→ Page 396 *Installing IDEA sequences or ICE programs on a hardened system*)

IDEA targets are added to the file system of the Numaris host, and must not overwrite any existing files.

These files are not accessed during standard clinical use of the system. When IDEA is used as intended, there is no interaction between IDEA or IDEA targets and the scanner software as used in the daily routine.

4.9.1.5 Requirements for IDEA

The platform for IDEA is a PC with an installation of Microsoft Windows 10 64-bit (at least v1809 for .NET Framework 4.7 and up required).

Hardware requirements

For the installation of IDEA, the following minimum hardware requirements need to be fulfilled:

- Processor:
  - 64-bit capable processor
  - Processor must support hardware virtualization (Intel VT-x/AMD-v)

    (Intel and AMD provide tools to look this up in your computer.)
  - at least Dual-Core processor (better: Quad-Core)
- RAM: at least 8 GB (better: 32 GB)

  (Less then 8 GB might result in Poet start up issues.)
- HDD: 23 GB free hard disk space

Software requirements

The following software must be installed **prior** to IDEA installation:

- Microsoft Visual Studio 2019 (16.6)

  (When using a later version of Visual Studio 2019, please refer to the IDEA Users Guide.)
- Microsoft Windows SDK 10.0 (10.0.16299.0 + 10.0.18362.0)
- Internet Browser, e.g. Microsoft Edge
- Pdf reader, e.g. Acrobat Reader, for pdf documentation

If you intend to develop ICE programs, you additionally need:

- A DICOM conform image viewer

This software is **not** shipped with IDEA when it is distributed, but has to be provided by the customer.

Other necessary software packages, which are freeware or redistributable, are contained on the IDEA DVD and are installed within the installation of IDEA.

For example:

- Compiler tool chain for MARS
- Required Microsoft .NET version for IDEA
- Required Microsoft C++ redistributable packages required for the compiler and delivered Numaris/X tools
- ORACLE VirtualBox
- HashiCorp Vagrant
- Perl (5.10.0)

Some software packages are distributed under the GNU license, are freeware, or are Microsoft redistributable packages. Delivery of these software packages complies with their individual license conditions.

If a required additional software package cannot be delivered (e.g. license issues), you are informed about the additional package you require, the required software version, and where to obtain it.

Compiler for Linux targets:

- The compilation for Linux is performed within a virtualized image of the MARS system, so a native compilation is possible.
- The virtualization software used is VirtualBox (www.virtualbox.org). You can either download the correct version yourself, or use the IDEA delivered version.

4.9.1.6 Safety notes for IDEA

IDEA as a very powerful tool that the programmer can use to generate and change sequences and image post-reconstruction. It is the duty of the programmer to carefully exclude all risks arising from improper use of this software by carefully testing applications prior to use (unit tests, test forms, etc.).

Proper, safe use of IDEA requires:

- C++ programming skills
- Scientific knowledge about MR physics
- Technical knowledge about the hardware and software user interface of a MAGNETOM MR scanner and a high degree of familiarity with the IDEA Users Guide.

Therefore, read all manuals carefully before you start to experiment with IDEA. We highly recommended that you attend an IDEA course offered by Siemens.

Especially, the following issues have to be kept in mind:

- IDEA is a tool limited to investigational use only.
- Because magnetic resonance image quality is fundamentally dependent on the timing and parameters of the sequence, the user must ensure sufficient testing of clinical utility for all sequences developed for use on humans.
- In addition, it is possible to inadvertently create and incorrectly labeled images with sequences developed using IDEA. All labeling of images from investigational sequences must be verified by the user on phantoms before use on humans.
- Examinations performed using sequences and ICE programs generated with this package are for investigational purposes only, and must not be used for diagnosis without corroborative examination using Siemens standard sequences.
- The use of sequences developed with IDEA that were not supplied with the product and ICE programs on humans must comply with local laws and regulatory requirements. Please be aware that IDEA targets (sequences and ICE programs) are not covered by the scanner's CE-labeling, FDA approval, or other country-specific regulations. This is the sole responsibility of the IDEA user.

Gradient noise Loud gradient noise can cause a hearing damage.

IDEA enables the programmer to make full use of the gradient system. During sequence operation, this noise might exceed the permitted levels and cause hearing damages to patients or operating personnel. Use hearing protection (headset or ear plugs) to protect patients from injury. Ensure that personnel in the examination room wear hearing protection during the examination.

Acoustic resonances in the MR scanner

Siemens sequences are written in a way that keeps the gradient system away from the mechanical resonances of the system. IDEA enables the programmer to make full use of the gradient system. This allows sequences to be written using gradient waveforms that operate at these mechanical resonance frequencies. In this case, higher acoustic noise levels and an unexpectedly high helium boil-off may occur.

Furthermore, mechanical resonances can damage the hardware (e.g. the connectors to the gradient coil). We therefore strongly recommend that you avoid critical echo-spacing values in custom sequences, too.

Access to the file system

The user has direct access to the file system after leaving kiosk mode.

(➔ Page 398 *Deactivating kiosk mode on the host*)

Due to the protection of the Numaris directories, substantial parts of this software cannot be modified. But not all important data is protected against intentional misuse. Therefore, no modification of Siemens files or installation of unauthorized software on the MAGNETOM scanner is allowed.

Image correctness

The developer is responsible for image correctness.

Sequences are not checked by IDEA for 'correct' images. A sequence that compiles without error messages may still not run correctly. Furthermore, a sequence that runs correctly may still not generate correctly labeled images (correct marking of left/right, correct slice position, ...).

It is the responsibility of sequence developers to make sure that their new sequences create correct images. Sequences developed by the user must be checked very carefully before they are used for patient examinations.

Furthermore, correct contrast behavior and the image quality that can be achieved are the sole responsibility of the sequence / ICE program developer.

Every image created with a Siemens sequence carries a special marker, which cannot be created by a customer.

4.9.1.7 Important notes for IDEA

Backups

When a backup is made by the service engineer, not all files in the `C:\ProgramData\Siemens\Numaris\MriCustomer` tree will be saved. It is responsibility of customers to regularly back up their own files located in the directories mentioned.

Restore backups

When restoring `CustomerSeq` after a reinstallation of your host, ensure that the required certificates are also restored on the scanner.

For detailed information about installation of certificates, see:
(➔ Page 399 *Adding your certificate to Device Guard (host)*).

Native language

The programs provided by the IDEA package do **not** provide native language support, but are English only.

Transferability, portability

Due to the use of Numaris system libraries, the software versions of IDEA must match the software version of Numaris on the MAGNETOM.

To find the Numaris software version, perform the following steps.



On the access bar, click the **Help** icon and choose **About** from the menu.

The **About** dialog box opens.

Click the **System Info** button.

You will find the Numaris version in the **Siemens Software Packages** area.

If you double-click the Numaris/X label, for example, “Numaris/X VA11A-XXXX”, the second label type will be displayed for a few seconds along with the unique “Change Set” (CS) number that identifies the software state in the database.

This second label type is printed on the IDEA DVD and stored in the file “DVD:\tfs_standalone.txt”.

Maintainability

As soon as a new Numaris version is installed on the scanner, a new version of IDEA must be used. In rare cases, this applies also to the installation of a ServicePack.

Error handling

Errors are caught by the module from which the error originated. For the scripts, errors are classified into the following categories:

- `FATAL`: Severe error that causes the program to abort immediately
- `ERROR`: An error was detected, but could not be corrected. Program execution will continue in a defined way, but the task will not be completed successfully.
- `WARNING`: An unexpected condition occurred that was remedied by using default parameters. Program execution continues, but the user should check the results carefully.

4.9.2 Using IDEA

The usage of IDEA can be split into the following parts:

- IDEA installation (➔ Page 386 *Installing IDEA*)
- Startup of IDEA (➔ Page 387 *Starting IDEA*)
- Sequence compilation (➔ Page 387 *Sequence development*)
  - Sequence testing (➔ Page 391 *Sequence testing*)
  - Sequence execution (➔ Page 393 *Sequence execution*)
- ICE program compilation (➔ Page 393 *ICE program development*)
  - ICE program testing (➔ Page 394 *Testing ICE programs*)
  - ICE program installation (➔ Page 394 *Installing/activating ICE programs*)

4.9.2.1 Installing IDEA

The typical installation duration ranges from 20 to 40 minutes.

✓ Prior to the installation of IDEA, make sure that your system meets the hardware and software requirements. (➔ Page 381 *Requirements for IDEA*)

✓ Make sure that Microsoft Visual Studio is installed according to the instructions that are provided on the IDEA DVD.

✓ For IDEA, it is mandatory to use an account with administrator privileges.

1 Start the installation procedure by running `ideainstall.cmd` directly from the DVD root directory.

This will trigger the actual installation, in which you are asked to define a root directory for the IDEA installation. Typically, this should be `D:\MIDEA`. Avoid spaces or special characters.

After the definition of this root directory, additional packages and IDEA itself are installed.

Additional help and options to the `ideainstall`-command can be obtained by running `ideainstall -h` in a command window.

2 The installation procedure might ask for additional DVDs (if required): Insert these disks and start the installation via `ideainstall_append.cmd`

4.9.2.2 Starting IDEA

1 Start IDEA via **IDEA > IDEA.Net** in the Windows **Start** menu.

A list of available IDEA versions will be presented.

2 Choose the required IDEA version.

It will automatically switch to the selected root directory and start up a special shell window, the IDEA shell.

Since multiple software versions can coexist on the stand-alone system, multiple work directories may be available – one for each software version.

The IDEA shell contains all necessary environment settings, and also several registry settings are adapted to the selected software version. Depending on the selected Numaris software version the environment is set up accordingly.

The IDEA shell is just a `cmd.exe`, with modified environment and `PATH` settings, so all the Windows functionalities remain available. You can use your favorite programs and add your path extensions easily. The IDEA commands reside in one main directory, which is added to the `PATH`, and are short-hand notations for often used commands.

Only within the IDEA shell, the environment is suited for compilation and testing of IDEA targets.

4.9.2.3 Sequence development

The IDEA shell is the common environment for sequence and ICE development.

The base functionality of IDEA for sequence and ICE development is covered by following commands:

- `ms` to compile a sequence
- `mi` to compile an ICE program
- `mc` to compile different configurations of an ICE program or sequence
- `mt` to compile an ICE program or sequence
- `mkcert` to create a new customer code signing certificate
- `ut` to start a sequence unit test
- `poet` to start an offline protocol editor
- `sim` to simulate the gradient and RF timing
- `ns` to create a new sequence based on an existing sequence directory
- `cs` and `ci` to jump to a sequence source or ICE program source directory
- `IdeaDoc` to open the IDEA manual directory
- `IceDoc` to open the ICE manual directory
- `IceStart` and `IceStop` to start and stop the ICE environment
- `IceSimu` to run an ICE program with measurement data inside a running ICE environment
- `vis` to open an already created simulation result in the simulation result viewer
- `vut` to open the last sequence unit test result
- `mephisto` and `mp` to create protocols from token files
- `SeqTestFrame` to run and test a sequence or protocol
- `mdb` (measurement data browser) to browse data and MDH flags of raw data measured by a sequence run
- `PhysStart` and `PhysStop` to start and stop the physics service to support simulation of pTX-enabled sequences
- `PerACDCStart` and `PerACDCStop` start and stop background services for better execution performance

- `vboxctrl` to control the virtual MARS appliance
- `sys` to switch available system configurations
- `externalmars` to enable or disable the external MARS feature
- `runmode` to switch between available run modes (and binary paths)
- `hrp` to show the current PATH environment (human readable path)
- `ProtocolStart` and `ProtocolStop` to start and stop protocol background services for better execution performance (for example, `poet`, `mephisto`, and `ut`)



You can obtain a list of the commands that are possible in this shell by executing `menu` in the IDEA shell.

You can write your own sequences or modify sequences delivered by Siemens (if source code has been provided), compile and test them, and run them on the scanner.

Due to the use of Numaris system libraries, the build versions of the released Numaris version and of the IDEA package must be identical (IDEA depends on the Numaris version).

A sequence compiled within IDEA will run on the corresponding Numaris host.

Sequence documentation

The sequences se_15b130, FLASH, FLASH_ptx, MiniFLASH, and fid are provided as source code and explained in detail in the IDEA documentation.

It contains a description about making sequences, about the unit test (both the technical aspect of execution and the formal requirements of testing a sequence such as code reading prior to the release for patient examination).

Reference documentation about the sequence support libraries and the classes that are usually used in the sequence and measurement framework is provided in a help file.

Creating a new sequence

The IDEA command `ns` creates a new sequence based on an existing sequence.

- ◆ To create a new sequence based on existing sequence, run `ns <sequencename>`.

The base sequence is copied into the same parent directory with the new sequence name as the new directory name.

The `make file` is also updated to the new sequence name and the new sequence is registered in the `make` system.

After successful creation of the new sequence, you can compile the sequence as usual and the output files are named correctly according to the new sequence name.

Selecting a sequence

The source code for a sequence is located in a separate directory for each sequence.

- To select a sequence, use the command `cs <sequencename>`.

  If `cs` is executed with no parameters, the list of all sequences found is shown and you can select one from the list.

Selecting a platform

Since sequences are executed on different platforms (the Numaris host and the measurement control system), a sequence needs to be compiled for both platforms.

For the Windows platform, the targets can be compiled as a release (`x64_r\bin\<sequence>.dll`) and as a debug version (`x64_d\bin\<sequence>.dll`). The release version is required on the Numaris system; the debug version is required for debugging on the IDEA PC.



As of Numaris/X, the debug files have the same name as the release files (debug-`d` has been removed).

Since the hardware of the measurement control system differs for the different IDEA versions, the relevant platform must be selected.

- To change the target platform, run `mc` and toggle the settings as desired.

Compiling a sequence

For the host processor, the build of both the debug and the release version is supported. For the MARS processor, the release version can be built.

The MARS Linux targets are compiled in a virtualized Linux image, which has access to the sources via a CIFS-mounted shared folder or a directly exported folder.

For every sequence, `make files` are provided.

When you create new sequences, you must also write the `make files` or use the `ns` command to create a new sequence based on an existing template sequence.

For convenience, the `make` commands for the compilation are provided as an additional command `ms`.

- To compile a sequence, switch to the sequence directory with `cs` and run `ms`.

There might be slight differences in the behavior of the C++ compiler between the standalone PC and MARS because the MARS runs a 64-bit Linux operating system while the PC uses a Windows operating system. In addition, the imager uses multithreading technology.

4.9.2.4 Sequence testing

Before a sequence is applied to humans, it must be carefully tested. On a scanner, the behavior of the sequence and the correct labeling / orientation of the generated images must be checked on phantoms. Before this step, the sequence should be tested in the IDEA environment itself.

A simulated run (i.e. the events will not be played out to the DSP hardware) of a sequence or a protocol can be executed using the `SeqTestFrame` program. This program uses the same libraries as the real measurement system and exhibits the same behavior in relation to sequence calculation and parameter handling.

Example command line: `seqtestframe.exe -s %MED_BIN%\MiniFLASH UTResultFile %IDEA_BASE%\src\MrImagingFW\seq\a_MiniFLASH \MiniFLASH.html 0x100001f`

For a list of all options and parameters run `SeqTestFrame` without parameters.

`SeqTestFrame` can be executed on protocols, and there are two ways to modify a protocol: `poet` and `mephisto`.

Off-line protocol editor

`poet` is an off-line protocol editor available on the stand-alone PC, which can be called together with a protocol (`.pro`, `.asc`, or `.edb` extensions are possible). The parameters of the sequence can be modified and the behavior of the hard and soft limits can be investigated. The protocol can be stored and simulated. GSP support is not available.

Synopsis: `poet <protocol>`

For a list of all options and parameters and a detailed explanation run program with option `-h`.

Batch-controlled protocol generation

The program `mephisto` allows you to create protocols from token files. These files contain tokens that describe protocol modifications that are equivalent to those performed with the console UI. The modifications conform to the limits of the specified sequence. The requested changes are automatically checked for consistency. The changed protocol is written to a separate file.

Synopsis: `mephisto [-h] | [-lvf] [-c <coil_context>] [-o <outfile>] [-a <analysisfile>] <seqname> <token_file>`

For a list of all options and parameters and a detailed explanation run program with option `-h`.

Unit test

A unit test (UT) for sequences is provided. During the UT, several test cases are executed for the sequence to check compliance with safety-related requirements as well as a number of other consistencies. The sequence runs in a simulation mode and the real-time events (such as gradients or RF pulses) are played out by the sequence are analyzed.

Instead of protocol files, supply token files (text files that describe parameter changes in a meta language) can be provided. These are fed though `mephisto` to generate a valid protocol. The sequence can be tested with a set of different token files.

The command `ut` can be used to run the UT on a sequence, i.e. on the default protocol or on a given protocol.

- The unit test for the combination of all sequences, token files and MR systems can be performed by the program `MultiSeqUT`. The scope of the global test is configurable.
- The unit test for a single sequence (but for all token files and MR systems) can be performed by calling `ut -2`.

A result page is generated with the "`passed`" or "`failed`" statement for each test case.

The result page is an html page, which can be opened using the `vut` command after execution of the unit test.

Simulation and visualization of sequences

The system can be switched into simulation mode and the DSP commands will be evaluated. The calculations usually performed by the DSPs will be simulated and some important derived values will be calculated additionally. The results will be written into an output file.

This program provides a way for examining the gradient duty cycle and the gradient stimulation level.

Simulation can be started from the command line with the commands `sim` and `vis`.

If a sequence is opened with `poet`, both execution of `SeqTestFrame` and simulation can be started directly in **POET** in the **Tools** menu.

4.9.2.5 Sequence execution

After a sequence has been compiled for the Windows platform (release version) and the appropriate measurement and reconstruction platform, these targets must be copied to the Numaris host.

(➔ Page 396 *Installing IDEA sequences or ICE programs on a hardened system*)

The only directory allowed on the Numaris host is `C:\ProgramData\Siemens\Numaris\MriCustomer\CustomerSeq`

Once a sequence is available there, a measurement protocol can be created by using the **myExam Cockpit**.

1. Right-click into a program, choose **Insert Sequence**, and switch the selection box over to **USER**.
2. Then, select the desired sequence.

4.9.2.6 ICE program development

An ICE program is an (XML-like) `.ipr` file, which refers to so-called configurators. These configurators build up the reconstruction pipeline using functors. Both, configurators and functors, are C++ modules.

To write a new ICE program, an existing ICE program can be used as a template.

ICE documentation

The ICE programming tools and how to write an ICE program are explained in the ICE documentation.

In the reference manual, the ICE framework is described where it is relevant to write your own ICE programs.

Compiling ICE programs

You can compile ICE programs for both the host and MARS platforms. IDEA delivers ICE example programs with `make files`.

The MARS Linux targets are compiled in a virtualized Linux image, which has access to the sources via a CIFS-mounted shared folder or a directly exported folder.

1. Start IDEA via the task bar (**Start > IDEA > IDEA.Net**).
2. Select the software version you want to work with.
3. In the IDEA shell, change to the directory containing your ICE program using the `ci` or `cd` command.

   If `ci` is executed with no parameter, the list of all ICE programs found is shown and you can select one from the list.
4. Start the compilation using the `mi`, `mt`, or `mc` command.

Testing ICE programs

1. Retrieve measured data sets from the scanner using the `twix` utility.
2. The MDH flags and other information of this dumped measurement data can be inspected using the `mdb` tool.
3. Using these dumped measurement data (`meas.dat`), the ICE program can be run on a stand-alone PC to test the ICE program. The `meas.dat` file must be copied to the PC.
4. Use `icestart` in the IDEA shell to start the simulation environment and `icesimu <filename>` to simulate the dataset.

   The created image can be viewed with an image viewer.

Installing/activating ICE programs

Before you run a new ICE program, the corresponding release `DLL`, `.so`, `.evp`, and `.ipr` must be made available for the host and imager.

The ICE program can be used from within a sequence running on the MAGNETOM. The sequence configures the ICE program used and, after sequence execution, the ICE program is then executed on the MAGNETOM.

The minimal example sequence 'MiniFLASH' can be used to execute the 'IceInverter' example program. To run an ICE program created by the customer, the sequence has to be configured to use the ICE program from within the customer ICE directory instead of the Siemens ICE directory.

(→ Page 396 *Installing IDEA sequences or ICE programs on a hardened system*)

1 Copy the release version of `x64_r\bin\myNewIceFunctor.evp` and `myNewIceFunctor.dll` to the scanner directory `C:\ProgramData\Siemens\Numaris\MriCustomer\Ice`

2 Copy `myNewIceProg.ipr` to `C:\ProgramData\Siemens\Numaris\MriCustomer\Ice`

   (Demo configurators can be found in `C:\Program Files\Siemens\Numaris\MriProduct\Ice\IceConfigurators`)

3 Copy `libmyNewIceFunctor.so` to `C:\ProgramData\Siemens\Numaris\MriCustomer\Ice`

4 To activate your new ICE program, restart the **Examination** screen or (more conveniently), restart **CoCos** by calling **ideacmdtool** and select item **Restart CoCos**.

4.9.2.7 Other utilities

Recon Config Editor

The **Recon Config Editor** is a graphical helper tool to create new ICE programs.

Tool for pulse libraries

The `PulseTool` is provided to examine or modify external RF pulses. Refer to the IDEA Users Guide for further details.

The original external RF pulse file delivered by Siemens cannot be modified.

The sequence framework allows only one external RF pulse file to be specified. However, it is possible to copy some or all pulses from the Siemens pulses file into a new file and add custom pulses.

Simulator system setup

The `magnetom` tool sets up the parameter and initialization files of a virtual MR scanner. These files are needed to simulate a sequence run. The tool can also be used to reset a misconfigured scanner configuration inside IDEA.

Measurement and Acquisition Test Environment (MATE)

MATE is an interface tool for communication with the measurement framework.

It provides and controls the following features:

- Activate sequence dump mode of the measurement server
- Set the debug mask
- Dump measured raw data into file
- Disable phase encoding during measurement
- Simulation of ECG, pulse, respiratory, and trigger signals
- Prepare and run sequence (needed on stand-alone PC for testing ICE programs)

On the host, some functions of MATE that might corrupt system integrity in case of improper use are protected by a password.

Switch between available MAGNETOM configurations

The available MAGNETOM configurations can be selected and switched with the `sys` command. If the configuration is switched, the parameters of the new configuration are displayed.

You can show the parameters of the current configuration with the `imprint` command.

4.9.2.8 Installing IDEA sequences or ICE programs on a hardened system

As of Numaris/X, the operating system of the MR scanner is hardened with Device Guard to provide the best security for the system.

When Device Guard is enabled, the operating system runs in kiosk mode.

- In order to access the file system, the kiosk mode must be disabled.
- No uncertified or unknown certified software can be executed on the secured system.

When Device Guard is enabled, it is not possible to execute any binaries that are not signed with an allow-listed or installed certificate on the host.

Script execution is still possible.

Signing an IDEA sequence or ICE program

To be able to use new IDEA sequences, ICE programs, or other IDEA artifacts to your hardened Numaris/X host, these binaries must be signed with a code signing certificate and this certificate has to be enabled in the host.

You will need a key pair that is suitable for code signing. This can be a self-signed certificate.

IDEA will ask you to create your own certificate during installation.

Use only standard characters for the certificate subject X500 name (for example, CN=Fred Dews). Special characters (such as [ ] ! @ # $ % ^ * ( ) ~ ? > < & / \ , . " ') are not allowed.

1 You can also create a new certificate with the IDEA command `mkcert` later.

   The certificate files will be stored in

   `\Certificates\Developer\`

   using following files:

   - `Siemens_Healthcare_DI_MR.cer`: transport file for public key (to be used for installation on host)
   - `Siemens_Healthcare_DI_MR.pfx`: transport file for private and public key
   - `Siemens_Healthcare_DI_MR.passwd`: password file used for automatic signing of compiled binaries in IDEA
   - `Siemens_Healthcare_DI_MR.CA.Developer*`: files for self-created root certificate for self-signing the code certificate

To use the same certificate on a new development machine, you need to copy at least the `.pfx` and the `.passwd` files.

All binaries compiled within IDEA will automatically be signed with the generated certificate stored in `\Certificates\Developer\`. Please note that the file names cannot be changed and do not reflect your certificate name.

2 If you want to manually sign a binary with your certificate, use the following command: `<PATH_TO_SIGNTOOL>\signtool.exe sign /fd SHA256 /p <passphrase>/f <PathToYourKey.pfx> <PathToYourBinary>`

– or –

`mrbt codesign` <file or folder to sign with certificate in `Certificates\Developer`>

The path to the signtool can be copied from the output at the end of a sequence build (for example, `C:\Program Files (x86)\Windows Kits\8.1\bin\x64`).

For advanced use cases, please refer to the IDEA Users Guide.

Deactivating kiosk mode on the host

In Numaris/X, access to operation system features, like **Windows Explorer** or **Command** shell, are protected by kiosk mode.

Users with **Researcher**, **Clinical Administrator**, and **IT Administrator** roles are allowed to deactivate kiosk mode to access expert tools and operating system features.

Users with an assigned **LeaveKioskMode** task are also allowed to deactivate kiosk mode. (➔ Page 346 *Access rights and roles*)

✓ The host system or secondary console is hardened and allow listing is active using Device Guard.

1 Press the **Tab** + **Del** + **+** (plus key on numerical keypad) key combination.

A logon window is displayed.

2 Enter your account and password.

Before you can log on and deactivate kiosk mode, your account must be in the predefined **Researcher** role (to ensure your account is automatically configured for the **Administrators** group).

If you are logged on as a user with the **LeaveKioskMode** task you do not have to provide credentials to exit kiosk mode.

Now kiosk mode is disabled and you have access to the following features:

- Windows Explorer: **Ctrl**+**Esc** (Start menu) > **File Explorer**
- Environment shell: **Ctrl**+**Esc** (Start menu) > **Environment shell**

  Administrator shell: **Ctrl**+**Esc** (Start menu) > **Admin shell**

Kiosk mode will remain disabled until it is manually activated again or until the next system reboot. As long as kiosk mode is deactivated, all users have access to advanced system features.

To reactivate kiosk mode, press the kiosk mode key combination again.

Adding your certificate to Device Guard (host)

Device Guard allow listing is configured by a single code integrity policy ("CIPolicy"). Your certificate (the public key part) needs to be added as a rule to this policy.

Starting with *syngo* MR XA20, you need administrator rights to add new certificates to the Numaris host. If necessary, ask your IT administrator to add new certificates to the host.

If the certificate cannot be imported or does not work after import, check the subject/common name (CN) of the certificate that you used for unsupported characters.

1 Disable kiosk mode.

2 Use Windows Explorer to copy your public certificate(s) (*.cer file(s)), for example, `Siemens_Healthcare_DI_MR.cer` to `C:\TEMP\`.

To add the certificate(s) and all of its/their parents (up to the root certificate) to the Windows Certificate Store, perform the following steps.

3 Double-click a certificate.

A window containing some certificate information opens.

4 Click **Install Certificate...**.

A **Certificate Import Wizard** opens.

5 Select **Local Machine** as the **Store Location** and click **Next**.

6 Enter the administrative credentials.

7 Select **Place all certificates in the following store** and click **Browse...**.

8 Select **Trusted Root Certification Authorities** and click **Ok**.

9 Click **Next**.

10 Click **Finish**.

11 **Repeat** steps 3–10 **for each certificate** that you wish to import.

12 Open an elevated command prompt, for example, Admin Cmd on the desktop, and insert your administrative credentials.

13 Call `cd %MED_BIN%\Scripts` to switch to the NUMARIS bin\Scripts directory.

14 Call `powershell` to open the PowerShell interpreter prompt.

15 Execute the following commands inside the PowerShell prompt (each command may take a minute):

- `Set-ExecutionPolicy Bypass`
- `Get-ExecutionPolicy` (check that Bypass mode is actually set)
- `DeviceGuardPreparation.ps1 <your_certificate_file>`, for example, `DeviceGuardPreparation.ps1 C:\temp\Siemens_Healthcare_DI_MR.cer`

  Alternatively, use the following command to import the certificate from a file (for example, `CustomerSeq`) directly:
  `& $env:MED_BIN\Scripts\DeviceGuardPreparation.ps1 -addCertificateFromFile [full path to file]`

  Please note that this will check and work only if the attached certificate is valid.

  This step will take approximately 10 minutes.

Repeat the last command **for each certificate** that you wish to import.

16 Close the PowerShell prompt and command prompt and reboot the system to activate the new policy (and kiosk mode).

After the system has rebooted, all signed binaries with the installed certificate can be executed.

4.9.2.9 Important installation paths

The installation directories for IDEA sequences or ICE programs written by the customer are as follows:

Type	Path on host
Sequences (both `.dll` and `.so`)	`C:\ProgramData\Siemens\Numaris\MriCustomer\CustomerSeq`
ICE programs (typically hand-written, `.ipr`)	`C:\ProgramData\Siemens\Numaris\MriCustomer\Ice`
ICE libraries and typelibs (`.dll`, corresponding `.evp` and also `.so`)	`C:\ProgramData\Siemens\Numaris\MriCustomer\Ice`

Type	Path on host
Additional ICE config files	`C:\ProgramData\Siemens\Numaris\MriCustomer\Ice\config`
Pulse files (`.dat`)	A file anywhere in `C:\ProgramData\Siemens\Numaris\MriCustomer\extrf` The exact path has to be set in the `SeqLim` structure by the sequence (`setExtSrfFilename`)

4.10 IDEA glossary

CIFS Common Internet File System: a network protocol providing shared access to files, printers, serial ports and miscellaneous communications between nodes on a network.

DLL Dynamic Link Library

DSP Digital Signal Processor

EDB Examination Data Base

EDB file Examination data base file. It consists of an ASCII header with information for the examination database. For protocol steps, additional ASCII protocol information is provided.

Event A DSP command played out by the sequence to perform some "hardware" action, such as switching a gradient, an RF pulse or an ADC.

EXAR1 file A compact examination data base file. It contains all EDB files of a certain examination region stored in one file. This file has a proprietary format.

GSP Graphical Slice Positioning

Host The computer system that the user interface is running on.

ICE Image Calculation Environment

ICE program Image Calculation Environment program: a program running on the image reconstruction system that calculates images from the acquired measurement data.

IDEA	Integrated Development Environment for Applications
IDEA PC	Personal Computer with Windows and IDEA installed.
IDEA target	A measurement sequence or an ICE program that can be created by a compilation process within the IDEA environment for the target operating system.
Image reconstruction system	The computer that performs the reconstruction of images from the measured data (MRIR, MARS)
Kiosk mode	Software mode of the operating system that prevents all applications other than the permitted applications from being executed in order to prevent misuse. When kiosk mode is activated, only allow listed and certified programs can be started. As of Numaris/X, the operating system of the MR scanner is hardened with Device Guard to provide the best security for the system.
MARS	Measurement And Reconstruction System: the computer system on which the measurement, control, physiological, and image calculation software runs.
MCIR	Measurement Control and Image Reconstruction system (synonymous for MARS)
MDB	Measurement Data Browser
MDH	Measurement Data Header
Measurement control system	The computer that controls execution of the sequence (MPCU, MARS).
MRC	MR Console (also referred as the “Host”)
MRIR	MR Image Reconstruction: the computer system on which the image calculation software of Numaris is running, here a subcomponent and synonym to the MARS.
NLS	Native Language Support
POET	Protocol Off-line Editing Tool: graphical user interface for creating and simulating sequence protocols
PRO File	ASCII protocol file that contains a measurement protocol. This file type is used only for development purposes and is not recognized by the **myExam Cockpit**.
RF	Radio Frequency

Scanner	The MAGNETOM system
Sequence	A C++ program that controls the scanner during image acquisition.
UI	User Interface
UT	Unit Test: the test and validation of safety-related and some non-safety-related aspects of a module. This expression is an abstract process step and does not refer to a special program.

5 IT Configuration and Security

5.1 IT configuration & Security overview

Security in *syngo* MR provides the infrastructure that is necessary to protect patient data from unauthorized access.

The following security topics are described:

- (→ Page 405 *Protected information*)
- (→ Page 411 *Remote service security measures*)
- (→ Page 412 *Information for IT administrators*)
- (→ Page 425 *Kiosk mode*)
- (→ Page 428 *Configuring the logon disclaimer*)
- (→ Page 428 *Encrypting network communication*)
- (→ Page 433 *Enabling Strict Security*)
- (→ Page 437 *SaveLogs*)
- (→ Page 439 *Audit trail*)
- (→ Page 445 *Time synchronization at the server*)

For further information regarding security, see: Product & Solution Security Whitepaper.

5.2 Protected information

Patient data is sensitive information that must be protected from unauthorized access, modification, transfer, or deletion.



Images contain protected health information (PHI) and protected personal information (PPI). Therefore, exported media should be handled discreetly.

For further information about user management and authentication
(➔ Page 339 *User management*)

In order to prevent theft of sensitive data (for example, PHI and PII), we strongly recommend that you physically protect the *syngo* Acquisition Workplace and the *syngo* MR Workplace systems (if present) from theft.

- (➔ Page 406 *Protected health information (PHI)*)
- (➔ Page 408 *Protected personal information (PPI) and pseudonymization*)
- (➔ Page 410 *Minimizing patient information in images*)

5.2.1 Protected health information (PHI)

Protected health information is any information about health status, provision of health care, or payment for health care that can be linked to a specific individual. This includes any part of a patient's medical record or payment history.

Only authorized *syngo* users can access PHI data. The accounts of users can be protected by passwords.

For details, see:

(➔ Page 346 *Access rights and roles*)

(➔ Page 343 *Changing passwords for local users*)

Transfer PHI (patient images) as soon as possible to a storage device (for example, PACS), since the MR system is not intended as a long-term storage.

Encryption must be used to protect PHI data (present in DICOM protocol) from unauthorized access and manipulation during transfer. If DICOM encryption cannot be used, Siemens Healthineers recommends that the communication partners are located in a protected subnet, for example, a virtual local area network (VLAN).

(➔ Page 428 *Encrypting network communication*)

It should be assumed that all storage media (hard disks or SSDs) installed in the system contain sensitive information, either PHI or customer proprietary information. This includes the drives installed in the MARS component (in the equipment room). Siemens Healthineers Customer Services is instructed to wipe clean such disks when they are decommissioned or replaced. Upon request, Siemens Healthineers Customer Services can remove these storage devices and hand them over to the customer.

Make sure that you know which parts of your work deal with PHI and need special attention:

- **Patient registration**: You enter patient information and therefore PHI.
- **Image acquisition and postprocessing**: Acquired image data is PHI and contains sensitive patient data. Image postprocessing may create new PHI as new series. If you view images, PHI may be shown as image text.
- **Data transfer**: Whenever you transfer (send/receive) patient or image data, make sure that you use secure communication. This also applies when sending data, for example, to a CD.

For security reasons, it is recommended that your restrict access to the operator room to authorized personnel only. For installations with elevated security requirements, it is recommended that you make the operator room inaccessible to patients and unauthorized persons.

The equipment room should always be locked and be opened only for Siemens Healthineers Customer Services. It is recommended that you make the equipment room inaccessible to patients and unauthorized persons. If the room is left open for mitigation of fire hazards, at least an intrusion alarm should be present.

Optional system components:

- The hospital network and all components outside the MR systems are assumed to be under the control of the customer. Siemens Healthineers makes no prescriptions about how to structure the network. However, there are some recommendations for secure networking. We recommend operating the system in a secured network environment, for example, a separate network segment or a virtual local area network (VLAN). This also prevents the possible spread of malware if it has infiltrated the network.

  For further details, please contact your administrator.

- The *syngo* MR Workplace is an optional workstation for image viewing and postprocessing. It could even be located in a separate room. Sensitive information is transferred over the hospital network between the *syngo* Acquisition Workplace and the *syngo* MR Workplace. For systems with elevated security requirements, it is recommended that either you do not use the *syngo* MR Workplace or that you make sure that the network communication between the *syngo* Acquisition Workplace and the *syngo* MR Workplace is secure.

5.2.2 Protected personal information (PPI) and pseudonymization

The MR system produces MR images as DICOM data (images, series, and studies). DICOM data can contain all kinds of personal information, which is protected by law in many countries.

Please inform yourself about the specific regulations in your country.

In addition to exporting DICOM data, MR systems can also import DICOM data from other sources. In this case, your system may even store more information than described above. Some of this information may also be protected personal information.

First and foremost, **protected personal information** is any information that can be used to identify the patient: Name, birthdate, personal or social security number, etc. In addition, protected personal information is also any information that identifies operators or doctors. In some countries, even the hospital name is considered personal information.

The MR system has a feature called **Data Minimization** which applies to to the export of images and similar data. In terms of data protection, however, this is either minimization or pseudonymization, depending on the profile used.

Details about anonymization/pseudonymization, the de-identification levels, and which DICOM attributes are removed, are documented in the DICOM conformance statement.



It is also possible that personal information may be found in unexpected places, for example, in descriptive texts in the image itself or in other free-text fields. It might also be possible to identify patients by physical properties present in the images (for example, by reconstructing the face). Using the pseudonymization feature does not relieve the clinician of his or her responsibility for making sure that no protected information is contained in the images!

PHI can occur in several objects, such as the image text, free text, secondary capture images, and so on.

5.2.2.1 Protected personal information in log files

If there is an unexpected response from the system or an obvious defect occurs, the operator can create a so-called SaveLog. This is a collection of information about the current state of the system that will help Siemens Service and developers to find a potential defect.

The SaveLog may contain protected personal information under the following circumstances.

- A SaveLog may optionally contain a screenshot, which may contain information about the current patient, for example. While a screenshot can be helpful in diagnosing the defect, the operator may need to omit the screenshot from the SaveLog.
- The following patient information is kept for log file analysis.
  - Patient's sex, height, and weight as registered,
  - Patient's age, limited to full years for patients above 2 and below 90 years; limited to 0.1 years for patients below 2 years, and 90 for patients above 90 years.

5.2.3 Minimizing patient information in images

You have several options for minimizing patient information in images.

To prevent personal data being displayed in screen movies and snapshots, you should hide the image text.

When exporting data to the file system, minimize patient information in images as follows.

1 In the **Export Data** dialog box, select the **Data Minimization** check box.

Select the type of data minimization from the **Profile** list:

- **High privacy**: Most of the original patient information is removed. The patient name is changed to a pseudonym that you can specify.
- **Reduced privacy**: Most of the original patient information is removed, except the following:
  - Retains temporal information, such as examination date
  - Retains certain patient characteristics (for example, age, size, weight, pregnancy status, etc.)
- **Low privacy**: This profile is designed for service use cases only.

  Please note that with this profile, the probability of identifying the patient based on the patient information provided is high.

2 In the **Pseudonym** field, enter the name that you want to have displayed as the patient name.

Please keep in mind that this information will be exported with the patient data (for example, Patient Name, PatientID) and therefore must not contain any PHI/PII.

5.2.3.1 Transferring image data from your system to remote SRS

For service analysis purposes, you can export image data to a special service folder of the file system using the **Export Data** dialog box. From there, data can be easily transferred to the Siemens Remote Service (SRS).

By default, the "Service folder" is located in **`%MED_ROOT%\OperationalManagement\Autoreport\autotransfer`**.

1 Open the **Export Data** dialog box and select the **File System** as the export target.

2 Select "Service folder" from the **Destination** list.

3 Click **Export**.

If the "Service folder" is not available as the **Destination** and you have administrator rights, proceed as follows:

On the Windows desktop of your system, open an **Admin Cmd** shell, enter **`syngo.common.starter -IKM.OpmWebStart`**, and press **Enter**.

5.3 Remote service security measures

Systems are usually connected to the Siemens Healthineers central service department via VPN router, which ensures a secure connection over the Internet.

You should not open the HTTP/HTTPS ports 80 and 443 directly to the Internet since this would be an invitation to any hacker anywhere.

Before accessing a customer system, Siemens Healthineers Customer Services engineers have to identify themselves to the VPN gateway server. An audit trail is written, and we can trace each access to a customer system to an individual service engineer. (➔ Page 439 *Audit trail*)

5.4 Information for IT administrators

5.4.1 Network connectors

Connection to the hospital network requires a RJ45-type Ethernet connector. Transmission speeds up to 1 Gbps are supported. Use at least a Cat.5e cable for optimum communication speed.

5.4.2 Physical node protection

USB removable media are considered as possible initial attack vectors. To reduce the attack surface of the MR system, the usage of commercial off-the-shelf USB port locks for all accessible USB ports is strongly recommended.

5.4.3 DICOM communication

The MR system is connected to the hospital network via Ethernet. Image transfer to the archive system and postprocessing nodes is performed using the DICOM protocol.

For protection of PHI data in transit, DICOM encryption is supported.

An external network connection (via the hospital network) is not mandatory to operate MAGNETOM systems. If a network connection is unavailable (for a reasonable limited time), images can still be acquired and archived later or transferred to the archive system using an external USB flash drive.

5.4.4 DICOM encryption

The DICOM protocol supports encryption using transport layer security (TLS). Instead of port 104 used for unencrypted communication, usually port 2762 is taken for this purpose. Please contact your service engineer to set up your system for encrypted DICOM communication.

(→ Page 428 *Encrypting network communication*)

5.4.5 Operating system services

The *syngo* Acquisition Workplace and the *syngo* MR Workplace will run the following Windows services (also known as "demons"):

Service Name	Display Name	Description
ADAM_SyngoConfiguration	SyngoConfiguration	AD LDS instance
AppHostSvc	Application Host Helper Service	Provides administrative services for IIS, for example configuration history and Application Pool account mapping. If this service is stopped, configuration history and locking down files or directories with Application Pool specific Access Control Entries will not work.
AppIDSvc	Application Identity	Determines and verifies the identity of an application. Disabling this service will prevent AppLocker from being enforced.
Appinfo	Application Information	Facilitates the running of interactive applications with additional administrative privileges. If this service is stopped, users will be unable to launch applications with the additional administrative privileges they may require to perform desired user tasks.
AppVClient	Microsoft App-V Client	Manages App-V users and virtual applications.
AudioEndpointBuilder	Windows Audio Endpoint Builder	Manages audio devices for the Windows Audio service. If this service is stopped, audio devices and effects will not function properly. If this service is disabled, any services that explicitly depend on it will fail to start.
Audiosrv	Windows Audio	Manages audio for Windows-based programs. If this service is stopped, audio devices and effects will not function properly. If this service is disabled, any services that explicitly depend on it will fail to start.
AzureAttestService	AzureAttestService	

Service Name	Display Name	Description
BFE	Base Filtering Engine	The Base Filtering Engine (BFE) is a service that manages firewall and Internet Protocol security (IPsec) policies and implements user mode filtering. Stopping or disabling the BFE service will significantly reduce the security of the system. It will also result in unpredictable behavior in IPsec management and firewall applications.
BITS	Background Intelligent Transfer Service	Transfers files in the background using idle network bandwidth. If the service is disabled, then any applications that depend on BITS, such as Windows Update or MSN Explorer, will be unable to automatically download programs and other information.
BrokerInfrastructure	Background Tasks Infrastructure Service	Windows infrastructure service that controls which background tasks can run on the system.
CDPSvc	Connected Devices Platform Service	This service is used for Connected Devices Platform scenarios.
CertPropSvc	Certificate Propagation	Copies user certificates and root certificates from smart cards into the current user's certificate store, detects when a smart card is inserted into a smart card reader, and, if needed, installs the smart card Plug and Play minidriver.
COMSysApp	COM+ System Application	Manages the configuration and tracking of Component Object Model (COM)+-based components. If the service is stopped, most COM+-based components will not function properly. If this service is disabled, any services that explicitly depend on it will fail to start.
CoreMessagingRegistrar	CoreMessaging	Manages communication between system components.

Service Name	Display Name	Description
CryptSvc	Cryptographic Services	Provides three management services: Catalog Database Service, which confirms the signatures of Windows files and allows new programs to be installed; Protected Root Service, which adds and removes Trusted Root Certification Authority certificates from this computer; and Automatic Root Certificate Update Service, which retrieves root certificates from Windows Update and enable scenarios such as SSL. If this service is stopped, these management services will not function properly. If this service is disabled, any services that explicitly depend on it will fail to start.
DcomLaunch	DCOM Server Process Launcher	The DCOMLAUNCH service launches COM and DCOM servers in response to object activation requests. If this service is stopped or disabled, programs using COM or DCOM will not function properly. It is strongly recommended that you have the DCOMLAUNCH service running.
Dhcp	DHCP Client	Registers and updates IP addresses and DNS records for this computer. If this service is stopped, this computer will not receive dynamic IP addresses and DNS updates. If this service is disabled, any services that explicitly depend on it will fail to start.
DiagTrack	Connected User Experiences and Telemetry	The Connected User Experiences and Telemetry service enables features that support in-application and connected user experiences. Additionally, this service manages the event driven collection and transmission of diagnostic and usage information (used to improve the experience and quality of the Windows Platform) when the diagnostics and usage privacy option settings are enabled under Feedback and Diagnostics.

Service Name	Display Name	Description
Dnscache	DNS Client	The DNS Client service (dnscache) caches Domain Name System (DNS) names and registers the full computer name for this computer. If the service is stopped, DNS names will continue to be resolved. However, the results of DNS name queries will not be cached and the computer's name will not be registered. If the service is disabled, any services that explicitly depend on it will fail to start.
DPS	Diagnostic Policy Service	The Diagnostic Policy Service enables problem detection, troubleshooting and resolution for Windows components. If this service is stopped, diagnostics will no longer function.
DusmSvc	Data Usage	Network data usage, data limit, restrict background data, metered networks.
EventLog	Windows Event Log	This service manages events and event logs. It supports logging events, querying events, subscribing to events, archiving event logs, and managing event metadata. It can display events in both XML and plain text format. Stopping this service may compromise security and reliability of the system.
EventSystem	COM+ Event System	Supports System Event Notification Service (SENS), which provides automatic distribution of events to subscribing Component Object Model (COM) components. If the service is stopped, SENS will close and will not be able to provide logon and logoff notifications. If this service is disabled, any services that explicitly depend on it will fail to start.
ExternalApplicationExecutionService	External Application Execution Service	
FileTransferService	syngo.Services.FileTransferService	Hosts the FileTransfer services.
FLEXlmLicenseServer	FLEXlm License Server	

Service Name	Display Name	Description
FontCache	Windows Font Cache Service	Optimizes performance of applications by caching commonly used font data. Applications will start this service if it is not already running. It can be disabled, though doing so will degrade application performance.
hasplms	Sentinel LDK License Manager	Manages licenses secured by Sentinel LDK.
IKEEXT	IKE and AuthIP IPsec Keying Modules	The IKEEXT service hosts the Internet Key Exchange (IKE) and Authenticated Internet Protocol (AuthIP) keying modules. These keying modules are used for authentication and key exchange in Internet Protocol security (IPsec). Stopping or disabling the IKEEXT service will disable IKE and AuthIP key exchange with peer computers. IPsec is typically configured to use IKE or AuthIP; therefore, stopping or disabling the IKEEXT service might result in an IPsec failure and might compromise the security of the system. It is strongly recommended that you have the IKEEXT service running.
iphlpsvc	IP Helper	Provides tunnel connectivity using IPv6 transition technologies (6to4, ISATAP, Port Proxy, and Teredo), and IP-HTTPS. If this service is stopped, the computer will not have the enhanced connectivity benefits that these technologies offer.
KeyIso	CNG Key Isolation	The CNG key isolation service is hosted in the LSA process. The service provides key process isolation to private keys and associated cryptographic operations as required by the Common Criteria. The service stores and uses long-lived keys in a secure process complying with Common Criteria requirements.
KioskBackendService	syngo Kiosk backend	Service responsible for setting user restrictions when switching to Kiosk mode.
LanmanServer	Server	Supports file, print, and named-pipe sharing over the network for this computer. If this service is stopped, these functions will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.

Service Name	Display Name	Description
LanmanWorkstation	Workstation	Creates and maintains client network connections to remote servers using the SMB protocol. If this service is stopped, these connections will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.
lmhosts	TCP/IP NetBIOS Helper	Provides support for the NetBIOS over TCP/IP (NetBT) service and NetBIOS name resolution for clients on the network, therefore enabling users to share files, print, and log on to the network. If this service is stopped, these functions might be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.
LSM	Local Session Manager	Core Windows Service that manages local user sessions. Stopping or disabling this service will result in system instability.
mpssvc	Windows Defender Firewall	Windows Defender Firewall helps protect your computer by preventing unauthorized users from gaining access to your computer through the Internet or a network.
MSDTC	Distributed Transaction Coordinator	Coordinates transactions that span multiple resource managers, such as databases, message queues, and file systems. If this service is stopped, these transactions will fail. If this service is disabled, any services that explicitly depend on it will fail to start.
MsDtsServer150	SQL Server Integration Services 15.0	Provides management support for SSIS package storage and execution.
MSMQ	Message Queuing	Provides a messaging infrastructure and development tool for creating distributed messaging applications for Windows-based networks and programs. If this service is stopped, distributed messages will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.
MSSQL$MSSQLSERVER_SYDS	SQL Server (MSSQLSERVER_SYDS)	Provides storage, processing and controlled access of data, and rapid transaction processing.

Service Name	Display Name	Description
NcbService	Network Connection Broker	Brokers connections that allow Windows Store Apps to receive notifications from the internet.
NetPipeActivator	Net.Pipe Listener Adapter	Receives activation requests over the net.pipe protocol and passes them to the Windows Process Activation Service.
netprofm	Network List Service	Identifies the networks to which the computer has connected, collects and stores properties for these networks, and notifies applications when these properties change.
NetTcpActivator	Net.Tcp Listener Adapter	Receives activation requests over the net.tcp protocol and passes them to the Windows Process Activation Service.
NetTcpPortSharing	Net.Tcp Port Sharing Service	Provides ability to share TCP ports over the net.tcp protocol.
NlaSvc	Network Location Awareness	Collects and stores configuration information for the network and notifies programs when this information is modified. If this service is stopped, configuration information might be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.
nsi	Network Store Interface Service	This service delivers network notifications (e.g. interface addition/deleting etc) to user mode clients. Stopping this service will cause loss of network connectivity. If this service is disabled, any other services that explicitly depend on this service will fail to start.
PcaSvc	Program Compatibility Assistant Service	This service provides support for the Program Compatibility Assistant (PCA). PCA monitors programs installed and run by the user and detects known compatibility problems. If this service is stopped, PCA will not function properly.
PlugPlay	Plug and Play	Enables a computer to recognize and adapt to hardware changes with little or no user input. Stopping or disabling this service will result in system instability.

Service Name	Display Name	Description
PolicyAgent	IPsec Policy Agent	Internet Protocol security (IPsec) supports network-level peer authentication, data origin authentication, data integrity, data confidentiality (encryption), and replay protection. This service enforces IPsec policies created through the IP Security Policies snap-in or the command-line tool "netsh ipsec". If you stop this service, you may experience network connectivity issues if your policy requires that connections use IPsec. Also,remote management of Windows Defender Firewall is not available when this service is stopped.
Power	Power	Manages power policy and power policy notification delivery.
ProfSvc	User Profile Service	This service is responsible for loading and unloading user profiles. If this service is stopped or disabled, users will no longer be able to successfully sign in or sign out, apps might have problems getting to users' data, and components registered to receive profile event notifications won't receive them.
RpcEptMapper	RPC Endpoint Mapper	Resolves RPC interfaces identifiers to transport endpoints. If this service is stopped or disabled, programs using Remote Procedure Call (RPC) services will not function properly.
RpcSs	Remote Procedure Call (RPC)	The RPCSS service is the Service Control Manager for COM and DCOM servers. It performs object activations requests, object exporter resolutions and distributed garbage collection for COM and DCOM servers. If this service is stopped or disabled, programs using COM or DCOM will not function properly. It is strongly recommended that you have the RPCSS service running.
SamSs	Security Accounts Manager	The startup of this service signals other services that the Security Accounts Manager (SAM) is ready to accept requests. Disabling this service will prevent other services in the system from being notified when the SAM is ready, which may in turn cause those services to fail to start correctly. This service should not be disabled.

Service Name	Display Name	Description
Schedule	Task Scheduler	Enables a user to configure and schedule automated tasks on this computer. The service also hosts multiple Windows system-critical tasks. If this service is stopped or disabled, these tasks will not be run at their scheduled times. If this service is disabled, any services that explicitly depend on it will fail to start.
SCPolicySvc	Smart Card Removal Policy	Allows the system to be configured to lock the user desktop upon smart card removal.
SecurityHealthService	Windows Security Service	Windows Security Service handles unified device protection and health information
SENS	System Event Notification Service	Monitors system events and notifies subscribers to COM+ Event System of these events.
SgrmBroker	System Guard Runtime Monitor Broker	Monitors and attests to the integrity of the Windows platform.
ShellHWDetection	Shell Hardware Detection	Provides notifications for AutoPlay hardware events.
Spooler	Print Spooler	This service spools print jobs and handles interaction with the printer. If you turn off this service, you won't be able to print or see your printers.
SQLAgent$MSSQLSERVER_SYDS	SQL Server Agent (MSSQLSERVER_SYDS)	Executes jobs, monitors SQL Server, fires alerts, and allows automation of some administrative tasks.
SQLTELEMETRY$MSSQLSERVER_SYDS	SQL Server CEIP service (MSSQLSERVER_SYDS)	CEIP service for Sql server
SQLWriter	SQL Server VSS Writer	Provides the interface to backup/restore Microsoft SQL server through the Windows VSS infrastructure.
SSDPSRV	SSDP Discovery	Discovers networked devices and services that use the SSDP discovery protocol, such as UPnP devices. Also announces SSDP devices and services running on the local computer. If this service is stopped, SSDP-based devices will not be discovered. If this service is disabled, any services that explicitly depend on it will fail to start.

Service Name	Display Name	Description
SSISTELEMETRY150	SQL Server Integration Services CEIP service 15.0	CEIP service for Sql server Integration Services
StateRepository	State Repository Service	Provides required infrastructure support for the application model.
StorSvc	Storage Service	Provides enabling services for storage settings and external storage expansion.
SVCM	Application Publishing Service (APS)	If this service is disabled, any services that explicitly depend on it will fail to start.
syngoRemoteConnectionSupportService	syngo RemoteConnectionSupport Service	Hosts the Remote Connection Support services.
syngo.Common.LCMService	syngo.Common.LCMService	Starts, observes and stops syngo processes and services.
syngo.MR.DhcpService	syngo.MR.DhcpService	DHCP SERVICE for Ethernet Components
syngo.MR.HostInfra.RunAsAdminService	syngo.MR.HostInfra.RunAsAdminService	
syngo.MR.HostInfra.StartupService	syngo.MR.HostInfra.StartupService	Bootstrapping service for MR hosts. Depending on the current system state, this service performs initial host configuration, handles update installation or starts the LCM.
syngo.Services.sDM.Server	syngo.Services.sDM.Server	Hosts Data Module WCF Services
syngo.Services.TF.Component.Media.CDDVDServiceManager	syngo.Services.TF.Component.Media.CDDVDServiceManager	Syngo service for media burning.
SysMain	SysMain	Maintains and improves system performance over time.
SysMgmt.WcfService	SysMgmt.WcfService	
SystemEventsBroker	System Events Broker	Coordinates execution of background work for WinRT application. If this service is stopped or disabled, then background work might not be triggered.

Service Name	Display Name	Description
TabletInputService	Touch Keyboard and Handwriting Panel Service	Enables Touch Keyboard and Handwriting Panel pen and ink functionality
TermService	Remote Desktop Services	Allows users to connect interactively to a remote computer. Remote Desktop and Remote Desktop Session Host Server depend on this service. To prevent remote use of this computer, clear the checkboxes on the Remote tab of the System properties control panel item.
TFTPServer	Open TFTP Server	
Themes	Themes	Provides user experience theme management.
TimeBrokerSvc	Time Broker	Coordinates execution of background work for WinRT application. If this service is stopped or disabled, then background work might not be triggered.
TokenBroker	Web Account Manager	This service is used by Web Account Manager to provide single-sign-on to apps and services.
TrkWks	Distributed Link Tracking Client	Maintains links between NTFS files within a computer or across computers in a network.
UserManager	User Manager	User Manager provides the runtime components required for multi-user interaction. If this service is stopped, some applications may not operate correctly.
VaultSvc	Credential Manager	Provides secure storage and retrieval of credentials to users, applications and security service packages.
VGAuthService	VMware Alias Manager and Ticket Service	Alias Manager and Ticket Service
W32Time	Windows Time	Maintains date and time synchronization on all clients and servers in the network. If this service is stopped, date and time synchronization will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.
W3SVC	World Wide Web Publishing Service	Provides Web connectivity and administration through the Internet Information Services Manager.

Service Name	Display Name	Description
WAS	Windows Process Activation Service	The Windows Process Activation Service (WAS) provides process activation, resource management and health management services for message-activated applications.
Wcmsvc	Windows Connection Manager	Makes automatic connect/disconnect decisions based on the network connectivity options currently available to the PC and enables management of network connectivity based on Group Policy settings.
WdiServiceHost	Diagnostic Service Host	The Diagnostic Service Host is used by the Diagnostic Policy Service to host diagnostics that need to run in a Local Service context. If this service is stopped, any diagnostics that depend on it will no longer function.
WdiSystemHost	Diagnostic System Host	The Diagnostic System Host is used by the Diagnostic Policy Service to host diagnostics that need to run in a Local System context. If this service is stopped, any diagnostics that depend on it will no longer function.
WebClient	WebClient	Enables Windows-based programs to create, access, and modify Internet-based files. If this service is stopped, these functions will not be available. If this service is disabled, any services that explicitly depend on it will fail to start.
WinHttpAutoProxySvc	WinHTTP Web Proxy Auto-Discovery Service	WinHTTP implements the client HTTP stack and provides developers with a Win32 API and COM Automation component for sending HTTP requests and receiving responses. In addition, WinHTTP provides support for auto-discovering a proxy configuration via its implementation of the Web Proxy Auto-Discovery (WPAD) protocol.
Winmgmt	Windows Management Instrumentation	Provides a common interface and object model to access management information about operating system, devices, applications and services. If this service is stopped, most Windows-based software will not function properly. If this service is disabled, any services that explicitly depend on it will fail to start.

Service Name	Display Name	Description
wmiApSrv	WMI Performance Adapter	Provides performance library information from Windows Management Instrumentation (WMI) providers to clients on the network. This service only runs when Performance Data Helper is activated.
WpnService	Windows Push Notifications System Service	This service runs in session 0 and hosts the notification platform and connection provider which handles the connection between the device and WNS server.
WSearch	Windows Search	Provides content indexing, property caching, and search results for files, e-mail, and other content.
cbdhsvc_46226	cbdhsvc_46226	This user service is used for Clipboard scenarios.
CDPUserSvc_46226	CDPUserSvc_46226	This user service is used for Connected Devices Platform scenarios.
OneSyncSvc_46226	OneSyncSvc_46226	This service synchronizes mail, contacts, calendar and various other user data. Mail and other applications dependent on this functionality will not work properly when this service is not running.
WpnUserService_46226	WpnUserService_46226	This service hosts Windows notification platform which provides support for local and push notifications. Supported notifications are tile, toast and raw.

5.5 Kiosk mode

For security reasons, *syngo* MR is executed in kiosk mode. This is a mode in which all functions and keyboard shortcuts that provide access to the operating system are disabled.

During startup, the Windows desktop is covered by a splash screen to prevent users from accessing it.

As long as the kiosk mode is enabled, the printing destinations are restricted because of security reasons. In this case, you cannot print to your local file system “C:” or the desktop.

As a Windows administrator, you are allowed to access the desktop, for example, to maintain the Windows system or to manage users.

(➔ Page 426 *Accessing the Windows desktop*)

(➔ Page 427 *Accessing the Windows user and authorization management in kiosk mode*)

(➔ Page 427 *Stopping the application server*)

5.5.1 Accessing the Windows desktop

For security reasons, *syngo* MR prevents you from accessing the Windows desktop of your system. Users to whom the "LeaveKioskMode" task is assigned, can access the desktop and use the Windows operating system (OS) functions.

(➔ Page 346 *Access rights and roles*)

✓ You are assigned the "LeaveKioskMode" task.

1 Press the **Tab** + **Del** + **+** (plus key on numerical keypad) key combination to enable access to the Windows desktop.

The **Logon** dialog box opens.

2 Enter the user name and password of your account.

If you are logged on as a user with the "LeaveKioskMode" task, you do not have to provide credentials to leave kiosk mode.

The Windows desktop and all OS functions are accessible.

Before reactivating kiosk mode, close all applications and windows (for example, the Windows Explorer). Any windows left open can be accessed in kiosk mode by pressing the **Alt** + **Tab** keys or the **Shift** + **Alt** + **Esc** keys.

Kiosk mode will remain disabled until the next system reboot. So all users have access to advanced system features.

To reactivate kiosk mode without restarting the system, press the **Tab** + **Del** + **+** key combination. This will prevent access to the Windows desktop and to the OS functions again.

5.5.2 Accessing the Windows user and authorization management in kiosk mode

In the **Administration Portal**, you can access the Windows user and authorization management of your local machine without leaving the *syngo* MR user interface (for example, in kiosk mode).

(➔ Page 356 *Adding users or groups via the Administration Portal*)

✓ You have administrator rights.

1 Log on to the **Administration Portal** at the *syngo* Acquisition Workplace.



You cannot access the Windows user and authorization management from remote using a Web browser.

---

2 First select the **Technical Configuration** workspace and then choose **User and Role Administration** from the navigation tree.

The **User and Role Administration** window opens.

3 To launch the local user and group management of the Windows operating system, click the **User Manager** button.

– or –

To launch the Authorization Store for role management, click the **Role Manager** button.

4 Enter the user credentials of your administrator account.

The corresponding manager opens.

5.5.3 Stopping the application server

In order to perform maintenance or, for example, after adding a new license, you must stop the application server.

1 Go to your Windows desktop.

(➔ Page 426 *Accessing the Windows desktop*)

2 On the desktop, open an **Admin Cmd** shell.

3 Type `syngo.Common.LCMService.exe /StopAll` and press **Enter**.

The application server is stopped.



As an alternative, you can click the **Stop Backend** icon on the windows desktop and enter your user credentials of your administrator account.

5.6 Configuring the logon disclaimer

In the **Site Information** of the **Administration Portal**, you can configure a disclaimer message that users have to acknowledge before they can log on.

Thus, you can force the user to confirm that he or she will use the system with specified restrictions.

1 Log on to the **Administration Portal**.

2 First select the **Technical Configuration** workspace and then choose **Site Information** from the navigation tree.

3 Select the **Customer** tab.

4 Select the **Enable Banner text** check box to enable a logon disclaimer.

5 Enter the text for the logon disclaimer.

The logon disclaimer can display up to 1400 characters including blank characters in a maximum of 25 lines.

6 Click **Save**.

5.7 Encrypting network communication

In order to protect network communication against attacks or unauthorized access and to protect patient health information (PHI) in particular, you can activate communication encryption between your network nodes:

- **DICOM Encryption** is used to encrypt communication between the *syngo* Acquisition Workplace and another DICOM node. Encryption also activates authentication for handshakes between DICOM nodes.
- **Client/Server Encryption** is used to encrypt communication between the *syngo* Acquisition Workplace (server) and an optionally connected *syngo* MR Workplace (client). All channels that may contain PHI data are encrypted.

To enable encryption, a certificate must be installed. The certificate is usually obtained from a certification authority.

If a signed certificate from a certification authority is not available, you can create a self-signed certificate and use it for communication encryption.

Please note that you are responsible for acquiring, installing, and maintaining the certificates.

An X.509 certificate contains a public key and an identity (a hostname or an organization, or an individual), and is either signed by a certification authority or is self-signed.

When a certificate is signed by a certification authority (CA) or validated by other means, the holder of that certificate can use the public key it contains to establish secure communication with another party or to validate documents digitally signed by the corresponding private key.

Before you can create or import certificates and configure communication encryption, you must exit kiosk mode to gain access to the Windows desktop. (➔ Page 426 *Accessing the Windows desktop*)

You enable or disable communication encryption in the **Numaris Security Center** window on the *syngo* Acquisition Workplace and on all other network nodes concerned. (➔ Page 430 *Opening the Numaris Security Center*)

The application server has to be shut down while you configure communication encryption. Notify clinical users before you stop the application server.

After switching encryption on or off, you must restart the host or client in question.

5.7.1 Enabling encryption on the *syngo* Acquisition Workplace

Encryption is deactivated by default.

✓ An X.509 certificate supporting key exchange is available and is valid for the host name of the *syngo* Acquisition Workplace.

✓ The public certificate of the other DICOM node or the *syngo* MR Workplace is accessible.

5.7.1.1 Opening the Numaris Security Center

✓ You are logged on as an administrator (“medadmin”).

✓ Kiosk mode is disabled.



1 On the Windows desktop, double-click this icon.

2 Enter the “medadmin” logon name and password.

The **Numaris Security Center** window is displayed.

5.7.1.2 Configuring communication encryption

1 In the **Numaris Security Center** window, select **Communication Encryption Configuration**.

The **Communication Encryption Configuration** page is displayed.

2 Click **Import Encryption Key**.

3 Browse and open the **pfx** file for the *syngo* Acquisition Workplace.

You will be prompted to stop the application server.

4 Notify clinical users working at the *syngo* MR Workplace. Confirm with **OK**.

5 Enter the password for the **pfx** file.

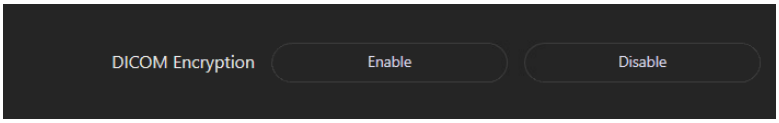
6 If a Windows Firewall warning message is displayed, click **Allow access**.

If the **self-signed certificate** message is displayed, click **Yes** to add the certificate to the trusted root store.

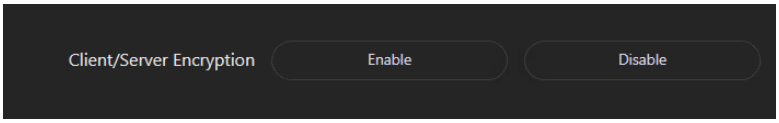
7 Click **Import Peer Certificate** to import the public key of the other DICOM node or the *syngo* MR Workplace.

8 Browse and open the **crt** file for the other system.

9 Click **Yes** if you are prompted to add the certificate to the trusted root store.



10 Click **Enable** in the **DICOM Encryption** area to activate encrypted communication with the DICOM node.



11 Click **Enable** in the **Client/Server Encryption** area to activate encrypted communication with the *syngo* MR Workplace.

12 Exit the **Numaris Security Center** window by clicking **Back** and then **Exit**.

13 Click **Reboot Now** in the message window that is now displayed.

5.7.2 Configuring encryption on the DICOM node

✓ The DICOM node is able to receive encrypted data.

✓ Remote DICOM nodes are configured and data can be transferred between this node and the *syngo* Acquisition Workplace.

✓ An X.509 certificate supporting key exchange is available and is valid for the host name of the DICOM node.

◆ Refer to the manual of the DICOM node for information on how to configure and activate communication encryption.

If the DICOM node is a PACS, you will still have to import the public part of the certificate for the PACS to the *syngo* Acquisition Workplace.

If the DICOM node is another *syngo* MR host, please note that the **Numaris Security Center** is not available before software version XA11.

5.7.3 Configuring encryption on the *syngo* MR Workplace

✓ The server name (environment variable %MED_SERVER%) of the client must be identical to the common name stated in the certificate. Clients must use the fully qualified domain name of the server.

✓ A valid X.509 server certificate (Enhanced key usage = Server Authentication) with its private key is installed on the server. In addition, it is recommended to use a key length of 2048 bits and a thumbprint algorithm that is stronger than SHA1.

1 On the *syngo* MR Workplace, open the **Numaris Security Center** window. (➔ Page 430 *Opening the Numaris Security Center*)

2 Open the **Communication Encryption Configuration** page. (➔ Page 430 *Configuring communication encryption*)

3 Click **Import Peer Certificate** to browse and import the (public) certificate that was issued for the *syngo* Acquisition Workplace as the client's host.

4 If you are prompted to stop the application server, notify clinical users and then confirm with **OK**.

5 If the **self-signed certificate** message is displayed, click **Yes** to add the certificate to the trusted root store.

6 Exit the **Numaris Security Center** and reboot.

5.7.4 Validating certificates for communication encryption

A valid certificate is a prerequisite for activating communication encryption. With the encryption tool, you can identify problems that occur during certificate validation.

When encryption is activated, the certificate obtained is automatically validated.

✓ You are logged on as an administrator (“medadmin”).

✓ Kiosk mode is disabled.

1 On the Windows desktop, open an **Admin Cmd** shell.

2 Enter the command `syngo.Common.Communication.Tools. EncryptionConfiguration /list` and press **Enter**.

All certificates that have a private key and are part of the personal store of the APS are listed.

3 Copy the thumbprint value of your selected certificate.

4 Enter the command `syngo.Common.Communication.Tools. EncryptionConfiguration /validate <value you copied>` and press **Enter**.

The certificate is validated according to standard criteria, such as expiration of validity period, certificate revocation, completeness of certificate chain, and correct DNS identity of the remote endpoint.

If no parameter is given, the currently configured certificate thumbprint is taken as the default.

The message **Certificate was successfully validated** is shown if the certificate is valid.

If the certificate is not valid, the message contains an error description and the a remedy for the following cases:

- Valid but revoked certificate
- Out-of-date certificate
- Invalid common name certificate
- Untrusted certificate
- Entered non-existing certificate thumbprint

5 If possible, remedy the problem as described or contact the certificate authority to obtain a new certificate.

5.8 Enabling Strict Security

Strict Security is used to apply DoD (U.S. Department of Defense) hardening settings to the *syngo* Acquisition Workplace and the *syngo* MR Workplace that are not part of the default installation.

Activating **Strict Security** will encrypt the hard disk drive of the system with BitLocker Drive Encryption. During the encryption process, the encryption key is stored on a USB flash drive. This USB drive has to be inserted every time the system is started. Otherwise the system is blocked by Bitlocker Drive Encryption.

The following security settings are implemented:

- Enable BitLocker Drive Encryption
- Remove remote software (TeamViewer and Expert-i)
- Modify firewall settings
- Disable remote access
- Remove Camtasia
- Enable SMB client security signature
- Perform infrastructure check (run VCheck)

Before enabling **Strict Security**, you must exit kiosk mode to gain access to the Windows desktop. (➔ Page 426 *Accessing the Windows desktop*)

You enable **Strict Security** in the **Numaris Security Center** on the *syngo* Acquisition Workplace and the *syngo* MR Workplace. (➔ Page 430 *Opening the Numaris Security Center*)

Activation of **Strict Security** consists of two parts:

- Fully automated configuration process by running the **Enable Strict Security** configuration tool. (➔ Page 435 *Configuring Strict Security*)

  This step will take about 15 min for a newly deployed system. The time required increases with increasing disk space usage.

- Manual activation of a logon disclaimer and user authentication via the Administration Portal and Configuration Panel. (➔ Page 436 *Activating the logon disclaimer and user authentication*)

  This step will take about 5 – 10 min.



Important: Execute the activation steps exactly in the given order!

Note that the system will perform several restarts during the activation process.

5.8.1 Configuring Strict Security

✓ The *syngo* Acquisition Workplace or *syngo* MR Workplace is completely installed and ready for use.

✓ The USB flash drive to store the Bitlocker startup key has been inserted.

✓ Kiosk mode is disabled.

1 On the *syngo* MR Workplace, open the **Numaris Security Center** window. (➔ Page 430 *Opening the Numaris Security Center*)

2 Select **Enable Strict Security**.

The **Enable Strict Security** page is displayed.

3 In the **USB Drive for Encryption Key** selection list, select the USB flash drive for storing the Bitlocker startup key.

Please note that the flash drive will be formatted!

---

4 Confirm with **OK**.

The **Enable Strict Security** configuration tool starts. It will run fully automatically without any user interaction.

During the activation process, the system performs several restarts and continues automatically.

As soon as the **Enable Strict Security** process has been succesfully completed, a corresponding message will be displayed.

5 Click **OK**.

The system performs a final reboot.

The hard disk drive (HDD) is now locked with Bitlocker. To unlock the HDD, the USB flash drive with the encryption key must be inserted every time the system is started.

---

6 Continue with manual activation of the logon disclaimer and user authentication. (➔ Page 436 *Activating the logon disclaimer and user authentication*)

5.8.2 Activating the logon disclaimer and user authentication

✓ Service Key level 7 or higher is available.

1 Log on to the **Administration Portal** and configure the logon disclaimer. (➔ Page 428 *Configuring the logon disclaimer*)

2 Log off from the **Administration Portal** and close it.

3 Switch user to “medadmin” and confirm the disclaimer text with **OK**.

4 Log on with “medadmin” credentials.

5 On the access bar, open the **Configuration Panel** and select the **Client Settings** tab.

6 Select the **Require authentication on startup** checkbox.

7 Click **Apply** and close the **Configuration Panel** with **OK**.

8 Restart the system

The disclaimer text will be displayed after the system has restarted..

9 Confirm the disclaimer with **OK**.

If the logon screen is displayed, **Strict Security** has been successfully activated. You can now log on as any registered user.

5.8.3 Enabling automatic updates of the *syngo* MR Workplace

For security reasons, the **Enable Strict Security** configuation process closes the port that is required for automatic transfer of software updates from the *syngo* Acquisition Workplace to the *syngo* MR Workplace.

The firewall of the *syngo* Acquisition Workplace has to be reconfigured to allow automatic transfer of software updates again.

5.8.3.1 Identifying the IP address of the *syngo* MR Workplace

✓ Kiosk mode is disabled.

1 Press the Windows key and type `cmd`.

2 Click the **cmd** prompt.

3 In the command shell, type `ipconfig /all`.

4 Make a note of the IP address (IPv4 address).

5.8.3.2 Configuring the firewall of the *syngo* Acquisition Workplace

✓ IP address of the *syngo* MR Workplace is known.

✓ Kiosk mode is disabled.

1 Press the Windows key and type `cmd`.

2 Click the **Admin cmd** prompt.

3 Enter the "medadmin" credentials.

4 In the admin shell, modify the firewall settings by entering the following commands, replacing **<MRWP IP address>** with the correct IP address of the *syngo* MR Workplace:

```
powershell
```

```
New-NetFirewallRule -DisplayName 'Web Server HTTP'
-Direction Inbound -Action Allow -RemoteAddress <MRWP
IP address> -Protocol TCP -LocalPort 80
```

5.9 SaveLogs

Using SaveLog files, Siemens Service can investigate the system health status, check for error events, and then troubleshoot the system.

SaveLogs are essential to understanding the activity of complex systems.

Your system includes the logging of various software components, frameworks, and services.

Log files are collected and can be accessed with the **Message Viewer**.

(→ Page 439 *Opening the Message Viewer*)

Log files are usually retained in up to five versions and are classified by severity:

- Information
- Warning
- Error
- Success

Log files contain at least the following information:

- Affected component
- Timestamp
- Message details

(→ Page 438 *Creating a SaveLog*)

5.9.1 Creating a SaveLog

If you need support by Siemens Service, you can collect and store configuration and status information of your scanner.

Saving log files can interfere with a running measurement and subsequent workflows or even crash them.

Make sure no measurement is in progress before starting the SaveLog creation.

1 On the access bar, click the **Configuration** icon and choose **SaveLog** from the menu.

   The **Create SaveLog** dialog box opens.

2 Provide additional information and attach screenshots.

3 Click **OK** to start creation of the SaveLog.

While the SaveLog is being created, its progress and scanning restrictions are displayed in the dialog box.

The SaveLog file collector generates the log files and stores them in a .zip file.

5.9.2 Opening the Message Viewer

In the **Message Viewer**, you can view the log files that are created and stored while you operate your system.

✓ The **Home** screen is open.

1 Click the **System Check** icon.

The Administration Portal opens.



2 On the access bar of the Administration Portal, click the **Open Message Viewer** icon.

The **Message Viewer** opens.

5.10 Audit trail

Whenever patient data is accessed or processed by a user, the action is logged and stored in the so-called audit trail if the audit trail is enabled.

- (→ Page 440 *Actions logged in the audit trail*)
- (→ Page 440 *Audit trail content*)
- (→ Page 441 *Audit trail storage*)
- (→ Page 442 *Audit trail records on the local file system*)
- (→ Page 443 *Configuring automatic forwarding of audit trails to a Syslog Server*)
- (→ Page 445 *Audit trail archive*)



The audit trail record is subject to security and data protection.

5.10.1 Actions logged in the audit trail

The following actions are logged according to the audit record trigger events, which are specified in Integrating the Healthcare Enterprise (IHE):

- Access to patient data: create, modify, delete, or read
- Query/retrieve of image data, or reports
- Access to protected procedures: create, modify, delete, or read
- Patient data sent or received over network transfer
- Patient data imported or exported
- Captured screenshots
- Actors start/stop: system, Workflow, log on, log off
- Security configuration activities
- Security-sensitive application events: for example, unsuccessful login, access attempt by unauthorized user
- Installation of software updates (including patches or hotfixes)

Audit trail records from the **Administration Portal** provide a supervision instrument to the administrator. The following actions are logged:

- Start of service session
- Stop of service session
- Change of the remote access mode
- Change of the DICOM node configuration



The audit trail only logs actions that are performed in the *syngo* software. Actions that are performed in Windows or in third-party software are not logged.

5.10.2 Audit trail content

The audit trail consists of numerous audit trail records.

In order to reduce the number of audit trail records that are generated, all accesses to a single patient are summarized in a single audit record at the level of studies.

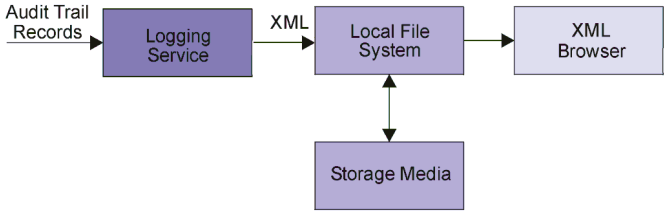
The system stores the following information in each audit trail record:

- Host name or IP address of the server node from which the audit was triggered
- AET of local node, where applicable
- Event creation date and time
- User ID (for example, account name)
- Type of audit event
- When the actor has had access to patient data: patient identifier
- User name or service key, IP address, and service level at the start of a **Administration Portal** service session
- User name or service key, IP address, and source of termination (service user, administrator, or timeout) at the end of a **Administration Portal** service session

5.10.3 Audit trail storage

All actions to be logged are collected by the Logging Service.

Audit trail records are stored in the local file system in XML format (in alignment with the DICOM schema definition). (➔ Page 442 *Audit trail records on the local file system*)



The local file system is used as a logging repository.

Once audit trail records have been added to the audit trail repository, they should not be modified.

In order to protect the audit trail repository against modification and deletion, the administrator can define Access Control Lists using the Windows operating system. These lists can restrict access to the audit trail repository for certain Windows user or user groups (by default only the “Administrators” group).

An audit trail autodeletion mechanism is implemented, which deletes all old log files until the folder size is less than 300 MB. Therefore, regular archiving of audit trail log files is recommended. (➔ Page 445 *Audit trail archive*)

In the **Administration Portal**, you can configure automatically forwarding the audit trails to an external Syslog Server. (➔ Page 443 *Configuring automatic forwarding of audit trails to a Syslog Server*)

5.10.4 Audit trail records on the local file system

On the local file system, audit trails are stored in **%MED_LOG%\AuditMessages.log** (default configuration is **C:\Store\log\Audit\AuditMessages.log**).

- When the log file reaches the maximum file size of 10 MB, a copy of the file is created and a new **AuditMessages.log** file is started. The copy is compressed to save disk space and is stored in the same folder. The file name contains a time stamp: AuditMessages_yyyy-MM-dd HH-mm-ss.zip.
- When the log file folder size exceeds 500 MB, a warning message is sent to the administrator by email, if configured.

  The warning is a reminder to move the existing log files to an external archive.
- When the folder size exceeds 700 MB, the **Audit trail** component in **Status Monitoring** changes to “faulted” status and the audit trail autodeletion mechanism starts: Old log files are deleted until the folder size is less than 300 MB.

A local file system is used as the audit trail repository. For this reason, no audit trail records can be generated for the following actions:

- Exporting an audit trail file to a storage medium (network-share or USB DVD drive)
- Deleting an audit trail file from the local file system

5.10.5 Configuring automatic forwarding of audit trails to a Syslog Server

In addition to the normal audit trail mechanism, you can use an external Syslog Server to collect and evaluate log files from different sources in one central repository.

In the **Administration Portal**, you can configure automatically forwarding audit trails to this Syslog Server.

If you choose the **Secure TCP** protocol, the data transfer is encrypted.

Sending audit trails to the Syslog Server does not impact the audit trail autodeletion mechanism on the system. The audit trails are still stored on the local file system and you must perform regular archiving. (➔ Page 445 *Audit trail archive*)

✓ You have IT administrator rights.

✓ To use **Secure TCP**: On the application server, a valid certificate that is known to the Syslog Server, needs to be imported to the **Trusted Root Certification Authorities** certificate store as well as to the **Personal** certificate store of the **Local Computer** account.

1 Log on to the **Administration Portal**.

2 First select the **Technical Configuration** workspace and then choose **Auditing to Syslog Server** from the navigation tree.

The **Auditing to Syslog Server** diakog box opens.

3 To enable automatic forwarding of audit trails to the Syslog Server, select the **Enable Auditing to Syslog Server** check box.

4 In the **Hostname** field, enter the fully qualified name of the Syslog Server.

Do not enter an IP address because it does not work for **Secure TCP**.

5 In the **Port** field, enter the port number of the Syslog Server.

The standard port is 514.

6 Select the **Protocol** that should be used for communication. Note that it is highly recommended to use **Secure TCP** to encrypt the data transfer.

7 For **Secure TCP** connections only: In the **Certificate Thumbprint** field, enter the thumbprint of the encryption certificate.

To access the certificate thumbprint, proceed as follows:

- In a command prompt on the server, enter **`certlm.msc`** to open the Windows Certificate Manager.
- Double-click the required certificate and copy the thumbprint from the **Details** tab of the **Certificate** dialog.

As soon as a valid certificate thumbprint was entered, the **Certificate Information** section displays detailed information about the certificate, such as the issuer and the validity period.

8 To check the connection to the Syslog Server, click **Test Connection**.

9 If the test was successful, click **Save**.

10 Restart the server to apply the changes.

All audit trails are now forwarded to the Syslog Server. Previous audit trails are not sent to the Syslog Server.

In a multi-server environment, the connection settings for the Syslog Server are synchronized.

5.10.6 Audit trail archive

Regulatory requirements enforce the archiving of audit trails. If this is not done properly and the folder size exceeds the threshold, an autodeletion mechanism starts and the system will automatically delete old audit trail log files until the folder size is less than 300 MB. (➔ Page 442 *Audit trail records on the local file system*)

On the local file system, audit trails are stored in **%MED_LOG%\AuditMessages.log** (default configuration is **C:\Store\log\Audit\AuditMessages.log**).

It is advisable to archive audit trails at regular intervals on a network share.

(➔ Page 443 *Configuring automatic forwarding of audit trails to a Syslog Server*)

Store backup media containing audit trail records in a fireproof location.

To comply with HIPAA (Health Insurance Portability and Accountability Act, USA only) requirements, retain your audit trail records for at least six years.

5.11 Time synchronization at the server

For full functionality of your system, you must ensure a consistent system time within your IT environment. We recommend that you use Windows time synchronization.

- Only adjust the system clock when the database and application server are not running.
- Changing the time zone will not become effective until you reboot the server.
- Turning back the server system date/time by more than 24 hours renders licenses invalid.

The server needs to synchronize the system time with a Network Time Protocol (NTP) server. This may either be an NTP server provided by the clinical IT infrastructure or a public NTP server.

In compliance with the “CTP” (Consistent Time Profile) of the IHE, a list of public NTP time servers can be found at http://support.ntp.org/bin/view/Servers/StratumOneTimeServers. Use the Windows Date & Time user interface (Internet Time Settings) to configure the NTP time server.

Whenever a computer joins or leaves a domain, Windows will reset its NTP time server settings to unwanted values. To prevent this, the system will detect the name change and trigger a corrective action.

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