

MERLIN HTML5 Viewer: User Manual

Version 2.8



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1 OPERATION INSTRUCTIONS

MERLIN HTML5 Viewer is intended to be used for simple and quick accessing to medical images and reports via a web browser. The system is available on all HTML5 compatible platforms.

Browser settings: Allow cookies, allow script.



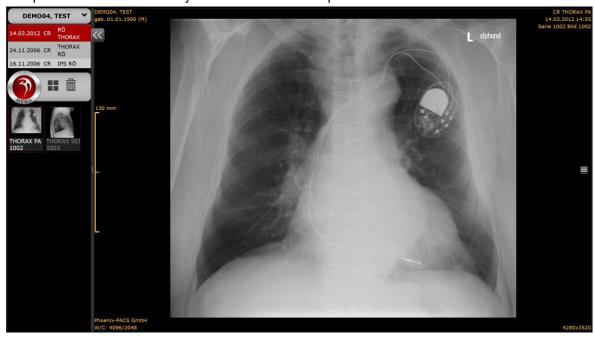
MERLIN HTML5 Viewer offers a range of basic functions for medical image viewing. MERLIN HTML5 Viewer is not a medical product and must not be used for decisions with diagnostic or therapeutic purpose.

MERLIN HTML5 Viewer can be operated by using either a mouse or a touch screen. Operation instructions may differ, depending on the platform that is used.

2 START THE APPLICATION

MERLIN HTML5 Viewer is started via the MERLIN Referring Physician's Portal web interface:

- 1. Click on Patient search in the web interface.
 - The page Patient search opens.
- 2. Start the search for a patient, e.g., by entering the search criteria into the respective input fields.
 - The search result is displayed below the search filters.
- 3. Click on the line of the patient whose images are to be accessed.
 - MERLIN HTML5 Viewer is started.
 - The available studies allocated to the selected patient are displayed.
 - The patient's most recent study is loaded to the work space:





MERLIN HTML5 Viewer may also be started via any third-party software permitting an entry into the images of the patient that is currently in process.



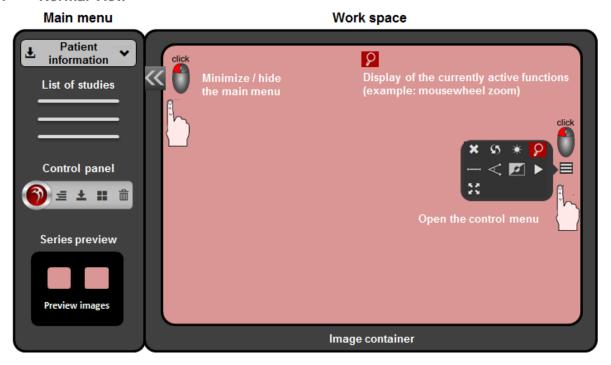
For mobile devices, the layout of the main menu is optimized for saving space.



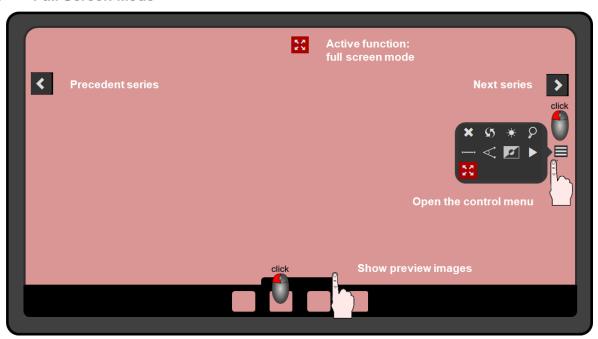
3 USER INTERFACE

3.1 Overview: Menus and Buttons

3.1.1 Normal View



3.1.2 Full Screen Mode





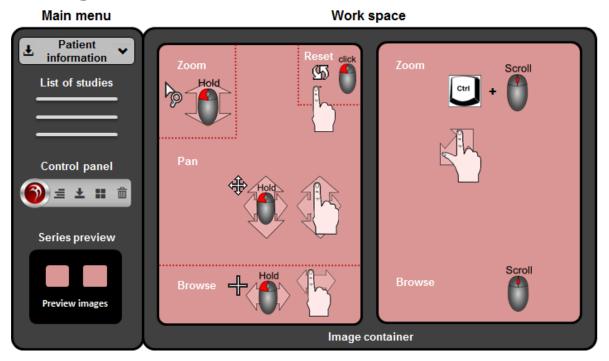
3.1.3 Buttons



Buttons for currently active functions are red in the control menu and in the image container. Buttons for currently inactive functions are grey in the control menu and in the image container.

Clicking on a red button in the control menu or in the image container deactivates the respective function.

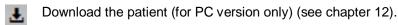
3.2 Hot Regions and other Mouse and Touch Functions



3.3 Main Menu

3.3.1 Patient Information

The patient information is situated in the upper part of the main menu and shows the patient's name.

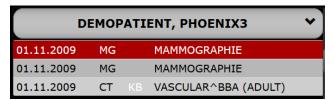


Advanced patient information:

Click this button to show additional information about the patient: date of birth and patient ID.

3.3.2 List of Studies

The list of studies is situated under the patient information:



The list of studies is a chronological list of the currently loaded patient's studies, starting with his most recent study. The currently selected study is highlighted in red.



The list of studies contains the following information:

- Date: date of examination
- MD: modality
- Region: body part examined
- If existing: medical reports (formats: PDF, SR or KB) (display of reports: see chapter 11)

The layout of the main menu adapts automatically to the number of studies.

Browse the list of studies:

Scroll the mouse wheel.

or

Tap on the touch screen and move your finger upwards or downwards.

or

Move the vertical navigation bar up or down.

If the study descriptions are very long, a horizontal navigation bar appears under the list of studies.

3.3.3 Series Preview

The series preview at the bottom of the main menu contains a preview image (thumbnail) for each series of the currently loaded study, accompanied by a short description. The number of images contained in a series is shown in blue lettering on the bottom right of the respective preview image.



Browse the series preview:

Scroll the mouse wheel.

or

Tap on the touch screen and move your finger upwards or downwards.

or

Move the vertical navigation bar up or down.

Download series from the series preview (for PC version only):

- 1. Right click on a thumbnail.
- 2. Click on **Download** in the context menu (see chapter 12).



3.3.4 **Control Panel**

The control panel is situated in the main menu, between the list of studies and the series preview.



It contains the following functions for image viewing:



Show/hide labels (see chapter 5.5)



Download the study which is highlighted in the list of studies (for PC version only) (see chapter 12).



Define the partitioning of the workspace (see chapter 5.1).



Remove all images from the work space (see chapter 5.8.2).



This button opens an advanced menu containing the following additional functions: (If the main menu is minimized, all functions of the control panel are hidden in the advanced menu).



Open the patient search (see chapter 13).



Show the version number, download the user manual (see chapter 14).



Play the series of the selected study one by one (see chapter 5.3.1).



Show the selected study in full screen mode (see chapter 5.2.1).

3.3.5 Minimize / hide the Main Menu

Move the parting line between the main menu and the work space manually by using a drag & drop action.

The main menu is widened / narrowed.

If the parting line is moved manually, the application stores the main menu width during the current session (Window Session Storage).

Click or tap on the following button at top right in the main menu:



The main menu is minimized to the dimension of a single preview image.

Click or tap on the following button at top right in the minimized main menu:



The main menu is hidden.

In order to restore the hidden main menu, click or tap on the following button at top left in the work space:



The main menu is shown in a minimized view.

To resize the minimized main menu, click or tap on the following button at top right in the minimized main menu:



The main menu is resized to its initial dimensions.



Show the control panel functions in the minimized main menu:



This opens a drop down menu with all functions of the control panel.

Browse the list of studies in the minimized main menu:



This button opens the list of studies for the currently loaded patient.

3.4 Work Space

In the work space, the series are displayed in image containers.

The partitioning of the work space depends on the layout selected by the user.

3.5 Control Menu in the Image Container

A button is available on the right side of each image container which opens the following control menu:



The control menu contains the following functions for image viewing and processing:

Empty the image container (see chapter 5.8.1)

Reset (see chapter 6.7).

Windowing (see chapter 6.4).

Mouse wheel zoom (see chapter 6.2.1).

Distance measurement (see chapter 6.6.1).

Angle measurement (see chapter 6.6.2).

Invert colors (see chapter 6.5).

Play the single images of the series (see chapter 5.3.2).

MPR Start MPR (see chapter 10)

Full screen (see chapter 5.2).

If one of these functions is activated, the color of the corresponding symbol in the control menu and in the top center of the image container turns to red.

Click on the red symbol to deactivate the corresponding function.



4 LOAD STUDIES/SERIES

4.1 Load a Study from the List of Studies

4.1.1 To an Image Container

> Double click or tap on a study in the list of studies.

The selected study is highlighted in red.

The first series of the study is loaded to the work space. In the case work space is already filled, the current content is emptied and replaced by the new series.

For each series of the study, a preview image appears in the series preview.

4.1.2 In Full Screen Mode

See chapter 5.2.1.

4.1.3 In Play Mode

See chapter 5.3.1.

4.2 Load a Series from the Series Preview

> Double click or tap on a preview image in the series preview:

The series is loaded to the work space.

In the case work space is already filled, the new series will be appended to the series currently displayed. If required, the raster is expanded automatically.

A series already displayed in the work space cannot be loaded a second time by double clicking. In this case, a yellow frame flashes.

or

Drag & drop:

- By using the mouse: drag the preview image and drop it on the desired position of the work space.
- Via touch screen: touch the preview image for about 2 seconds. As soon as a yellow frame appears, tap on it again and drag it with your finger to the desired position.

In case the respective image container is already filled, the current content is emptied and replaced by the new series.

5 DISPLAY SERIES

5.1 Work Space Partitioning

1. Click or tap on this button in the control panel of the main menu:



A small schema appears, showing the possible raster (maximally 3x3).

2. Click or tap on the desired partitioning.

It is possible to expand the raster retroactively. In this case, the initial order within the partitioning is conserved.

It is also possible to narrow the raster retroactively. In this case, the currently displayed series stay in the work space, but are partially hidden.



5.2 Full Screen Mode

5.2.1 Show all Series of a Study in Full Screen Mode

Activate full screen mode:

Click or tap on the desired study in the list of studies.
 The selected study is highlighted in red.

2. Click or tap on this button in the control panel of the main menu:



The advanced menu is opened.

3. Click or tap on this button in the advanced menu:



The series belonging to the selected study are loaded. The first series of the study is displayed in full screen mode.

Show the previous / next series:

➤ Click or tap on one of these buttons on the left / right side of the work space:



The previous / next series of the study is displayed in full screen mode.

Show any other series:

1. Click on the grey surface on the bottom center of the image:



The color of the surface shortly turns to yellow:



The preview images for all series of the selected study are shown on the bottom of the image container. The preview image of the currently displayed series is highlighted in red.



2. Click or tap on the preview image of the series to be shown next.

The selected series is displayed in full screen mode.

Quit full screen mode:

➤ Click or tap on the following button at the top of the image container:



The full screen mode is closed. The series of the study are displayed in image containers. The partitioning depends on the number of series (maximally 3x3).



5.2.2 Show single Series in Full Screen Mode

Activate full screen mode:

➤ Double click or tap on the desired series in the work space.

or

1. Click or tap on this button at the right side of the image container:



The control menu is opened.

2. Click or tap on this button in the control menu:



The respective series is shown in full screen mode.

Quit full screen mode:

Double click or tap on the work space.

or

Click or tap on this button at the top of the image container:



The full screen mode is closed.

5.3 Play Mode

5.3.1 Play all Series of a Study

Start play mode:

1. Click or tap on the study to be played in the list of studies.

The selected study is highlighted in red.

2. Click or tap on the following button in the control panel of the main menu:



An advanced menu is opened.

3. Click or tap on the following button in the advanced menu:



The series of the selected study are played one by one in an infinite loop.

On bottom, an arrow appears which indicates the position of the current single image within the stack of the currently played study.

Play the current series in an infinite loop:

1. Click or tap on the work space.

The playing is interrupted shortly. The following play menu is shown for a few seconds:



2. Click or tap on this button in the play menu:



The current series is played in an infinite loop.



3. Click or tap on this button in the play menu:



The play mode is executed for all series of the study.

Skip to the precedent/next series:

Click or tap on one of the following buttons on the right or the left side of the work space:



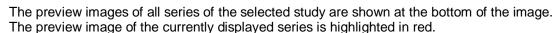
The play mode skips to the next or to the precedent series.

Skip to another series via the corresponding preview image:

1. Click the grey surface on the bottom center of the image:



The color of the surface shortly turns to yellow:





2. Click or tap on the preview image of the series to be displayed next.

The play mode skips to the selected series.

Interrupt playing:

1. Click or tap on this button in the play menu



The symbol on the button turns from 'play' to 'pause':



2. Hold the button showing the ,pause' symbol:

The symbol on the button turns from 'pause' to 'play':



The play mode stops while the left mouse button is being held down.

Stop the play mode:

➤ Click or tap on this button in the play menu:



The play mode is stopped. The last image continues to be displayed.

Quit the play mode:

Click or tap on this button in the play menu:



The full screen mode is closed. The series of the study are displayed in image containers. The partition depends on the number of series (maximally 3x3).



5.3.2 Play individual Series

Start playing:

1. Click or tap on this button at the right side of the image container of the series to be played:



The play menu is opened.

2. Click or tap on this button in the control menu:



The series is played in an infinite loop.

On bottom, an arrow appears which indicates the position of the current single image within the stack.

Stop the infinite loop:

1. Click or tap on the work space.

The playing is briefly interrupted. The following play menu is shown for a few seconds:



2. Click or tap on this button in the play menu:



The infinite loop is stopped. The color of the button turns from red to black:



3. Click this button in the play menu:



The series is played one time.

Interrupt playing:

1. Click or tap on this button in the play menu:



The symbol on the button turns from 'play' to 'pause':



2. Hold the button showing the 'pause' symbol:

The symbol on the button turns from 'pause' to 'play':



The play mode stops while the left mouse button is being held down.

Stop the play mode:

Click or tap on this button in the play menu:



The play mode is stopped. The last image continues to be displayed.

Quit the play mode:

➤ Click or tap on this button in the play menu:



The full screen mode is closed.



5.4 Display Measurements

Measurements made with MERLIN Diagnostic Workcenter or other PACS viewers can be displayed.



This function has to be activated by Phönix-PACS.

5.5 Key Images

Key image flag:

Images marked as key images in MERLIN Diagnostic Workcenter are flagged with a red star symbol in MERLIN HTML5 Viewer.



Compilation of all key images in a study:

All key images contained in a study are compiled in a virtual series which is shown in the series preview and marked with a white star.





This function has to be activated by Phönix-PACS.

5.6 Protected studies

In the series preview and the work space, protected studies are hidden behind a red key symbol against a black background.



Click in the image container with the red key.

The study is displayed.

5.7 Show/hide Labels

> Click or tap on this button in the control panel of the main menu:



The picture labels can be turned off in part or completely. Clicking the label button switches between:

- Click or tap once: minimal label display (only the date of examination is shown)
- Click or tap twice: no label display
- Click or tap three times: full label display.



5.8 Empty the Work Space

5.8.1 Remove an individual Image Container

- 1. Move the mouse to the image container you want to remove.
- 2. Press the **Del** key.

or

1. Click or tap on this button at the right side of the image container:



The control menu is opened.

2. Click or tap on this button in the control menu:



The image container is deleted.

If necessary, the raster is adapted to the modified number of series displayed in the work space.

5.8.2 Empty the complete Work Space

Click or tap on this button in the control panel of the main menu:



The work space is emptied. The current partition is deleted.

6 EDIT SERIES

6.1 Browse a Series



Browsing multi-layer or multi-frame series, the position data of the individual images are displayed pixel accurately.

6.1.1 Use the mouse for browsing

Browse via the Hot Region:

1. Left click in the Hot Region for browsing, at the bottom of the image container.

The cursor arrow turns to the following symbol:



2. Hold the left mouse button down and move the mouse to the left and to the right.

Scroll the mouse wheel:

> Scroll the mouse wheel over the image container.

Use the position arrow for browsing:

1. Left click on the position arrow at the bottom of the image container.



The cursor turns to the following symbol:



2. Hold the left mouse button and move the mouse to the left and to the right.



6.1.2 Use the Keyboard for browsing



6.1.3 Use the Touch Screen for browsing

Browse via the Hot Region:

- 1. Touch the Hot Region for browsing, at the bottom of the image container.
- 2. Move your finger to the left or to the right.

Use the position arrow for browsing:

1. Touch the position arrow at the bottom of the image container.



2. Move your finger to the left or to the right.

6.2 Zoom

6.2.1 Use the Mouse for zooming

Zoom via the Hot Region:

- 1. Click in the Hot Region for zooming in the upper left corner of the image container.
- 2. The cursor arrow turns to the following symbol:



3. Hold the left mouse button and move the mouse vertically up (magnify the image) and down (narrow the image).

Zoom in on a point (mouse wheel zoom), default configuration:

- 1. Left click on the point you want to zoom in on.
- 2. Depending on the image type:
 - Individual image:

Scroll the mouse wheel.

The activation of the function is indicated by the following symbol appearing at the top of the image:



Multilayer/multiframe image:

Hold down the Ctrl key and scroll the mouse wheel.

The image is magnified / narrowed.

Activate mouse wheel zoom (for all image types):

➤ Press the **Z** key.

or

1. Click or tap on this button on the right side of the image container:



The control menu is opened.

2. Click or tap on this button in the control menu:



The mouse wheel is activated.



Deactivate the mouse wheel zoom (for all image types):

> Press the **Z** key.

or

Click or tap on this button at the top of the image:



The mouse wheel zoom is deactivated.

6.2.2 Zoom in to the Point via Touch Screen

Two-finger movement outward.

The image is magnified.

➤ Two-finger movement inward.

The image is narrowed.

6.3 Pan the Image

1. Click or touch the Hot Region for panning, in the center of the image container.

The cursor arrow turns to the following symbol:



2. Hold the left mouse button and move the mouse or move your finger on the screen.

The image is relocated within the image container.

6.4 Windowing

Activate the windowing function:

> Press the **F** key.

or

1. Click or tap on this button on the right side of the image container:



The control menu is opened.

2. Click or tap on this button in the control menu:



The windowing function is activated.

A red preview square is inserted into the image.

Execute the windowing function:

➤ After having activated the windowing function, move the mouse cursor or your finger within the red preview square:



Horizontal movement to the left or to the right:
 The window width is modified.



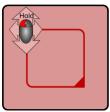
• Vertical movement upward or downward:

The window center is modified.

The new window values appear in the red square, first. Then, they are applied for the whole image.

Magnify/narrow the red preview square:

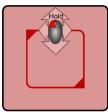
- 1. Tap or click on the upper left or lower right corner of the preview square.
- 2. Hold the left mouse button and move the mouse or your finger on the screen.



The preview square is magnified or narrowed.

Relocate the preview square:

- 1. Click or tap on the upper edge of the preview square.
- 2. Hold the left mouse button and move the mouse or your finger on the screen.



The preview square is relocated.

6.5 Invert Grey Values

> Press the I key.

or

1. Click or tap on this button on the right side of the image container:



The control menu is opened.

2. Click or tap on this button in the control menu:



The grey values of the image are inverted.



6.6 Insert Measurements

The measuring functions are only available for images containing pixel data in their DICOM header.

6.6.1 Linear Distance

Activate linear distance measurement:

1. Click or tap on this button on the right side of the image container:



The control menu is opened.

2. Click or tap on this button in the control menu:



The distance measurement function is activated. A measuring line is inserted into the image.

6.6.2 Angle

Activate angle measurement:

1. Click or tap on this button on the right side of the image container:



The control menu is opened.

2. Click or tap on this button in the control menu:



The angle measurement function is activated. An angle of 90° is inserted into the image.

6.6.3 Edit a Measuring Object

Relocate a measuring object:

1. Click or tap on a measuring object.

The measuring object is activated.

Activated measuring objects are displayed in red and marked by red measuring points.

- 2. Click or tap on the measuring object.
- 3. Hold the left mouse button and move the mouse or your finger on the screen.

The measuring object is relocated.

Modify a measuring object:

1. Click or tap on a measuring point.

The measuring object is activated.

Activated measuring objects are displayed in red and marked by red measuring points.

- 2. Click or tap on a measuring point.
- 3. Hold the left mouse button and move the mouse or your finger on the screen.

The measuring object is modified.

6.6.4 Remove a Measuring Object

- 1. Click or tap on a measuring object.
- 2. Click or tap on the red symbol in the upper part of the image container:



The activated measuring object is deleted.



When there are several measuring objects in the image and none of them has been activated, clicking on the red symbol always removes the object that was inserted last.

6.7 Reset

➤ Click or tap on the Hot Region for resetting, in the upper right corner of the image container.



or

1. Click or tap on this button at the right side of the image container:



The control menu is opened.

2. Click or tap on this button in the control menu:



The image data are reset, i.e., image magnifications and relocations are cancelled, measurements deleted and window values set back.

7 AUTOMATED SYNCHRONIZATION

➤ All series with the same reference UID are synchronized automatically.

8 REFERENCE LINES (LOCALIZER)

The position of the current slice is activated per default. It is given in the localizer as a line. Thus, the localizer is suitable to compare multilayer series (CT/MR) with identic coordinates (the same Reference UID).

> Press the **K** key.

The localizer is deactivated/ reactivated the localizer.

The current setting is saved for the next session.



On mobile devices, the localizer is activated by default.

9 LIVE CURSOR

The live cursor is suitable to compare multilayer series (CT/MR) with identic coordinates (the same Reference UID).

- 1. Press the C key.
- 2. Move the mouse within an image container.

As a yellow cross, the live cursor shows the corresponding position by approximation in the other image containers.

- 3. Press the C key.
- 4. The live cursor is deactivated.



On mobile devices, the live cursor is deactivated by default.



10 Multiplanar Reconstruction (MPR)

When an appropriate cross-sectional series is displayed in the work space, the lateral control menu contains the **MPR** button:



Activate MPR:

Click on the MPR button.

or

Press the M key.

A multiplanar reconstruction is calculated and displayed in the work space.

MPR symbols appear in the top center of the three MPR image containers.



The MPR is only executable for axial series with the same orientation.



The performance of the MPR depends on the device that is used for image viewing.

Deactivate MPR:

Click on one of the three red MPR symbols displayed in the MPR image containers.
 The MPR is deactivated.

11 DISPLAY OF MEDICAL REPORTS

Medical reports are available as Structured Reports, PDF files or preliminary reports ("Kurzbefunde"). In the list of studies, the most recent medical report is shown. It is symbolized by an acronym corresponding to its file format: **SR**, **PDF** or **KB**.

11.1 Show a medical Report on own Page

Click or tap on the acronym SR, PDF or KB in the list of studies.

The corresponding medical report is opened on own page.

11.2 Show a medical Report in the Work Space

This option is available for Structured Reports and PDF files.

- Double click or tap on the preview image of the SR or PDF file in the series preview:
 - The Structured Report or the PDF file is loaded to the work space.
 - In the case work space is already filled, the Structured Report or the PDF file will be appended to the series currently displayed. If required, the raster is expanded automatically.

or

- Drag & drop:
 - By using the mouse: drag the preview image of the SR or PDF file and drop it on the desired position of the work space.



• Via touch screen: touch the preview image for about 2 seconds. As soon as a yellow frame appears, tap on it again and drag it with your finger to the desired position.

In case the respective image container is already filled, the current content is emptied and replaced by the Structured Report or the PDF file.

12 DOWNLOAD



The download function is only available for the PC version of the HTML5 Viewer.

Download patients and studies:

In the PC version, the following button is available in the patient information and in the control panel of the main menu.

1. Click on the following button:



A dialog for data downloading is opened.

- 2. Click on Save file.
- 3. Click on the OK button.

In the file system, a ZIP directory is created, which contains a DICOMDIR, a viewer and the data to be saved:

- Click on the button in the patient information: all studies of the patient are saved.
- Click on the button in the control panel: all series of the currently selected study are saved.

Download series:

- 1. Right click on the desired thumbnail in the series preview.
- 2. Click on **Download** in the context menu.

In the file system, a ZIP directory is created, which contains a DICOMDIR, a viewer and the data to be saved.

13 OPEN PATIENT SEARCH

Open the patient search from the main menu:

1. Click or tap on this button in the control panel of the main menu:



The advanced menu is opened.

2. Click or tap on this button in the advanced menu:



The patient search is opened. The search filters of the precedent request are conserved.

Open the patient search via your browser:

➤ Click on the **One page back** button in the left upper edge of your browser.



The patient search is opened. The search filters of the precedent request are conserved.



14 INFORMATION DISPLAY

14.1 Version Number

1. Click or tap on this button in the control panel of the main menu:



The advanced menu is opened.

2. Click or tap this button in the advanced menu:



A window is opened showing the version number of the currently used MERLIN HTML5 Viewer.

3. Click or tap on the window.

The window is closed.

14.2 Download the User Manual

1. Click or tap on this button in the control panel of the main menu:



The advanced menu is opened.

2. Click or tap on the following button in the advanced menu:



A window is opened.

3. Click on one of the buttons **DE**, **EN** or **FR**.

A window for downloading the German, French or English version of the user manual is opened.

- 4. Save the manual.
- 5. Click or tap on the window.

The window is closed.

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