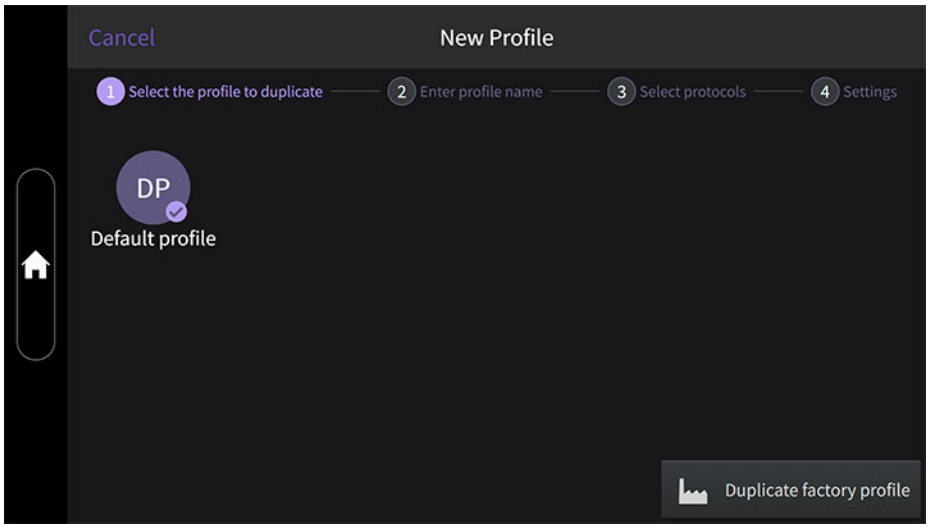
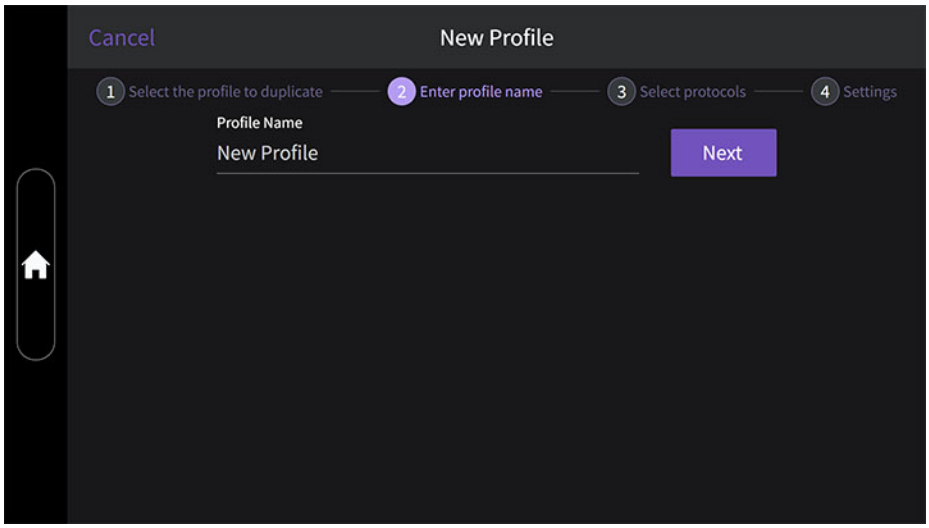
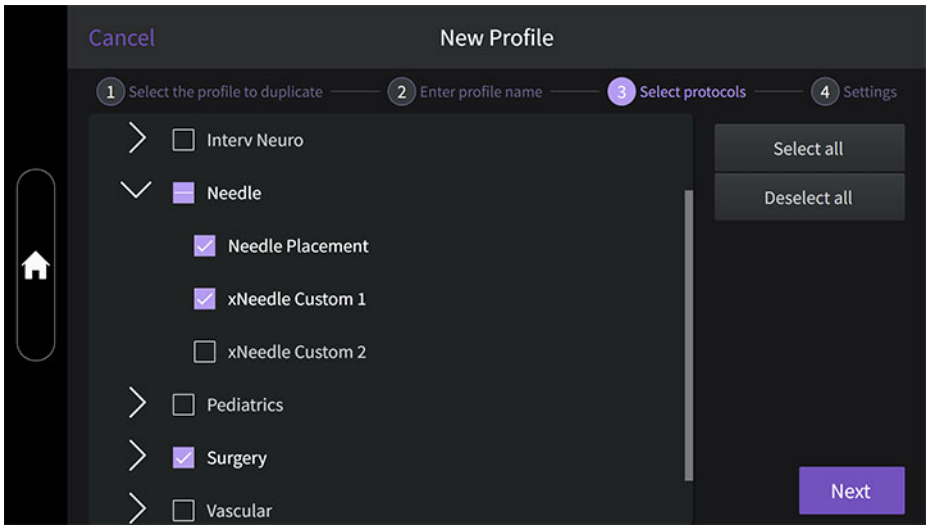


Step 2: Enter a name for the new profile (see Figure below).



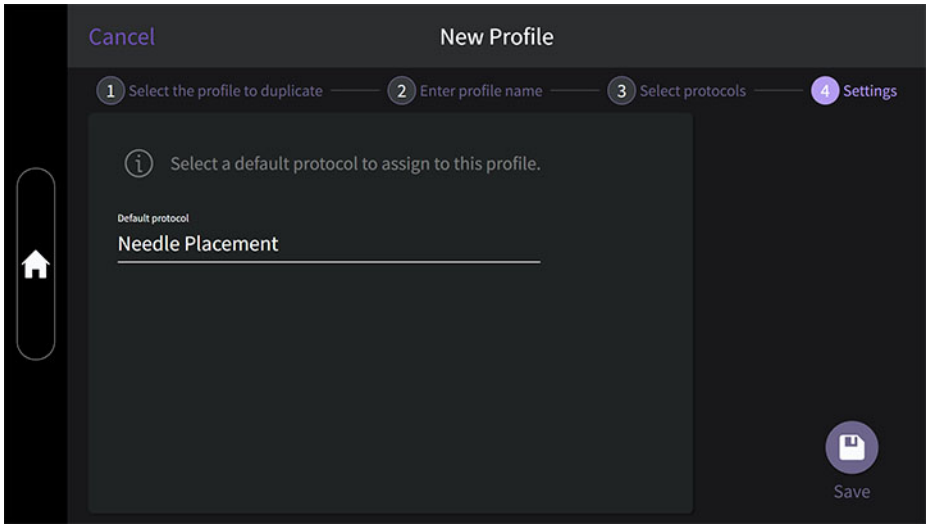
Step 3: Select the protocols to be included in the profile.

The protocol list is structured inside categories, you can add any full categories or select any protocols from any categories.



Step 4: Choose the protocol to be selected by default upon profile selection.

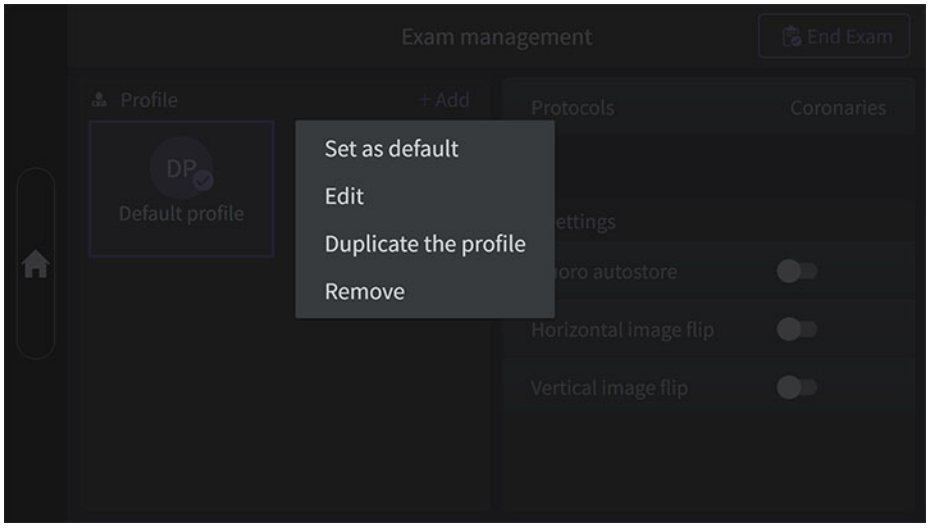
Then click on **Save** to complete the profile creation workflow.



At any time you can go back to any previous step by clicking on the step number to adjust the profile settings.

9.3 How to manage profiles

A long press on a profile in the **Exam management** page opens a menu:



Set as default

The default profile is selected when the system is turned on and it is highlighted through a blue checkmark.

Figure 9-1 Purple check-mark illustrating the default profile

Edit/Duplicate the profile

Selecting Edit or Duplicate the profile jumps to step 2 of the profile creation workflow.

Remove

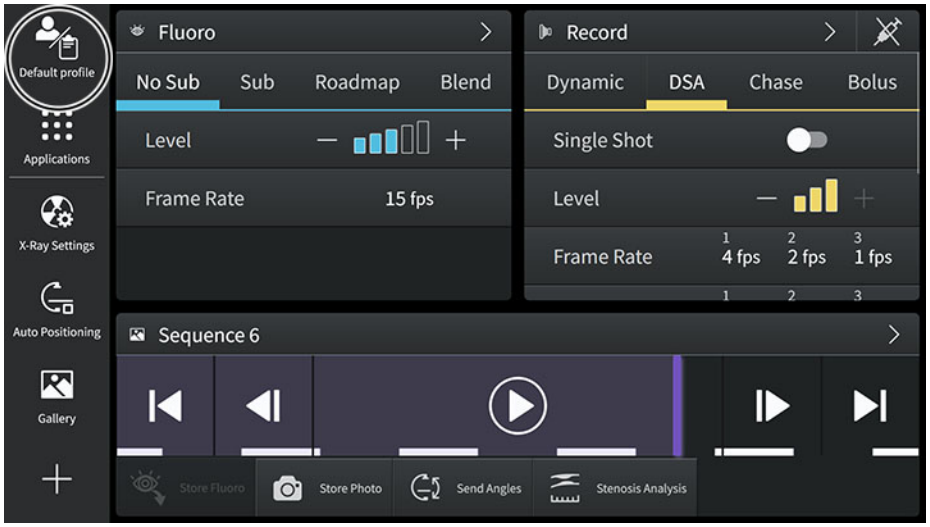
A profile can be removed, when:

- It is not the profile selected,
- There is at least another profile configured on the system.

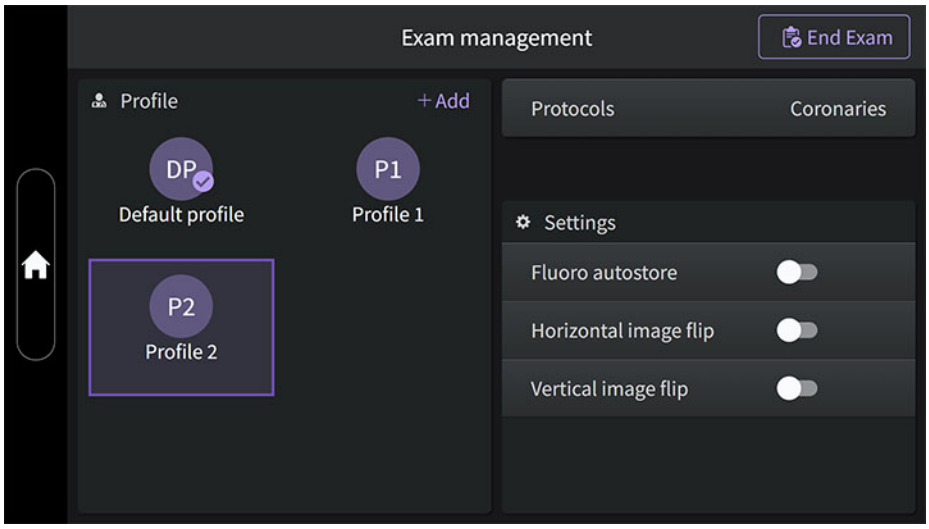
9.4 How to select a profile

From the Touch Panel

On the home screen, select the **user/exam** icon to go to the **Exam management** page.

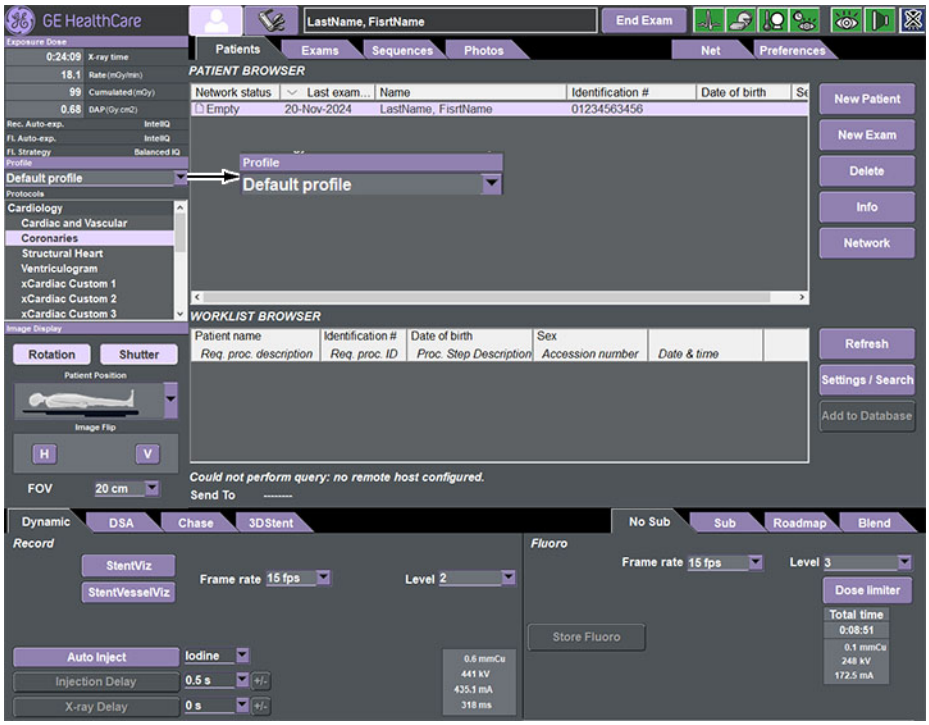


From the Profile pull down list, select the desired profile.



From the DL console

From the Profile pull down list, select the desired profile.



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10 Acquisition and Review

10.1 How to select an Acquisition Protocol

9.1.1

Figure 10-1 DL Screen

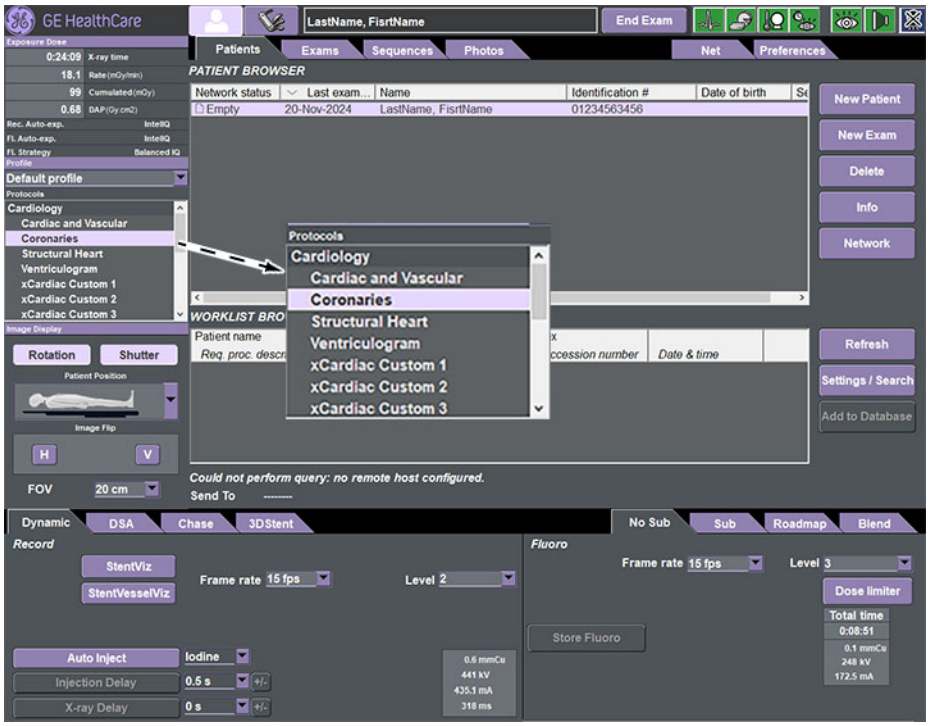


Figure 10-2 Touch Panel - Home page

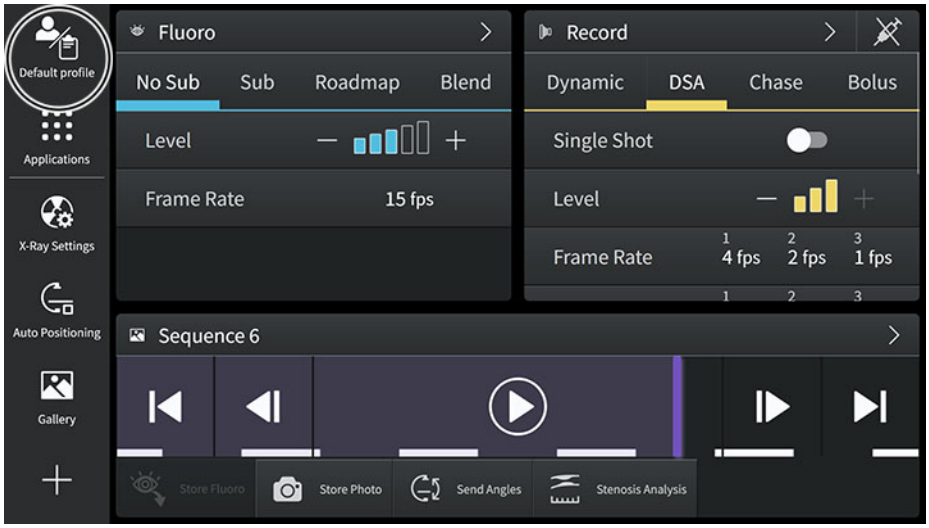
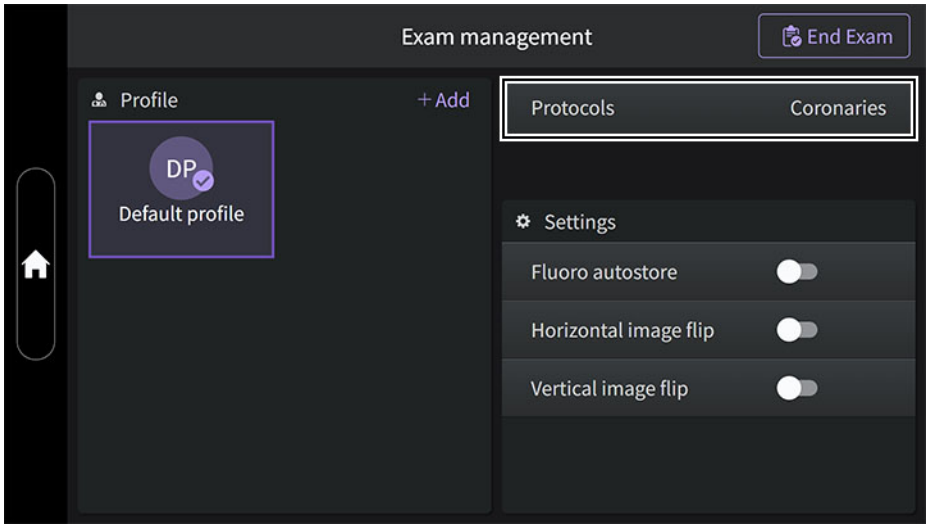


Figure 10-3 Touch Panel - Protocols



The protocols are classified inside categories. They are organized and displayed in a 2 level hierarchy list.

List of Protocols

Find below the list of default protocols available per categories:

Category	Protocol Name
Cardiology	Coronaries
	Cardiac and Vascular
	Structural Heart
	Ventriculogram
	xCardiac Custom 1
	xCardiac Custom 2
	xCardiac Custom 3
	xCardiac Custom 4
	xCardiac Custom 5
Electrophysiology	EP
	EP Mapping
	Device Implant
	xEP Custom 1
	xEP Custom 2
	xEP Custom 3
	xEP Custom 4
	xEP Custom 5
Interv Neuro	Cerebral
	Carotids
	xNeuro Custom 1
	xNeuro Custom 2
	xNeuro Custom 3

Category	Protocol Name
	xNeuro Custom 4
	xNeuro Custom 5
Needle	Needle Placement
	xNeedle Custom 1
	xNeedle Custom 2
Pediatrics	Pediatric Abdomen
	Pediatric Cardiac
	Pediatric Cardiac Neonate
	Pediatric Cerebral
	Pediatric Chest
	Pediatric Lower Limbs
	Pediatric Upper Limbs
Surgery (only with the surgical system configuration)	Endovascular
	xSurgery Custom 1
	xSurgery Custom 2
	xSurgery Custom 3
	xSurgery Custom 4
	xSurgery Custom 5
Vascular	Abdomen
	Lower Limbs
	Pelvis
	Upper Limbs
	xVascular Custom 1
	xVascular Custom 2
	xVascular Custom 3
	xVascular Custom 4
	xVascular Custom 5
	xVascular Custom 6
	xVascular Custom 7
X-Ray Quality Test	Quality Assessment

WARNING

USE THE "DEVICE IMPLANT" PROTOCOL LOCATED IN THE ELECTROPHYSIOLOGY CATEGORY OR ANY PROTOCOL UNDER THE "NEEDLE" CATEGORY, WHICH AUTOMATICALLY DISABLES THE INNOVASENSE PATIENT CONTOURING FUNCTION IN CASE OF PROCEDURE THAT INVOLVES THE USE OF SMALL INVASIVE OBJECTS/ DEVICES (I.E. BIOPSY OR OTHER NEEDLES) OR OBJECTS MADE OF NON-CONDUCTIVE MATERIALS (PLASTIC... I.E. OXYGEN MASK), WHICH PROJECT OUT FROM THE PATIENT SKIN SURFACE, THESE OBJECTS/DEVICES BEING TOO SMALL AND/OR NOT DETECTED BY THE CAPACITIVE SENSORS. FAILURE TO THIS MAY CAUSE SEVERE PATIENT INJURY IN CASE THE DETECTOR HITS THE INVASIVE OBJECT/DEVICE.

WARNING

DURING SURGERY, SELECTION OF ANY OF THE PROTOCOLS UNDER "SURGERY" CATEGORY WILL AUTOMATICALLY DISABLE THE INNOVASENSE PATIENT CONTOURING FUNCTION. CAPACITIVE SENSORS DOES NOT DETECT THE SURGICAL DEVICES THAT WOULD PROJECT OUT FROM THE PATIENT. FAILURE TO DO THIS MAY CAUSE SEVERE PATIENT INJURY IN CASE THE DETECTOR HITS THE INVASIVE OBJECT/DEVICE.

From the Protocols: select a protocol by clicking on the protocol name.

The selected protocol is then displayed in reverse video.

NOTE

In case a protocol is not available in the protocol list of the selected profile, a long press on **Protocols** button on the Touch Panel will open the profile edition interface.

NOTE

- The **X-Ray Quality Test** category is for Service usage only. It is recommended not to select the **Quality Assessment** protocol for clinical usage.
- In case a navigation system using electromagnetic waves is required during a cardiac procedure, it is recommended to select/use the **EP MAPPING** protocol which is set to reduce/optimize the image artefacts created by the navigation system.

CAUTION

Use this protocol only in case a navigation system using electromagnetic waves is required during a cardiac procedure. Otherwise Fluoro image quality might not be optimum.

Protocols whose names start with an "x" and contain "Custom" are dedicated to be customized for personal use.

Protocols from the Pediatrics category are made for pediatrics and all other protocols are made for adults.

To adjust the edge enhancement filter level used by default in a protocol, refer to 10.7.7.2 Edge Enhancement Filter Selection on page 308.

Protocol parameters tuning

The IGS system is delivered with default acquisition parameters to provide a standard image quality with the following settings in all categories (except Pediatrics, Electrophysiology and X-Ray Quality Test):

- Fluoroscopy: IntelIQ AutoExposure Level 3; 15 fps; Dose Limiter activated.
- Dynamic record: IntelIQ AutoExposure Level 2; 15 fps.
- DSA/Single Shot record: IntelIQ AutoExposure Level 3.
- InnovaBreeze™ Mode: IntelIQ AutoExposure Level 3.
- InnovaChase™ Mode: IntelIQ AutoExposure Level 2.
- 3D CT Mode: depending on the preset.
- 3DStent Mode: IntelIQ AutoExposure (only one dose level available within this mode).

All acquisition protocols are preloaded with dose-related and image processing parameters to deliver a standard image quality. It is always possible to modify the preloaded protocol parameters in order to customize/optimize either the dose settings or the image processing. The strength

of temporal and spatial denoising, the brightness, contrast and sharpness of the images can be fine-tuned according to individual preferences. Blended Roadmap also allows modifying the wire contrast over the vessel and the default vessel density. In the protocol, in the DSA acquisition mode, either DSA or Single Shot can be set as a default record mode. 3D acquisition default parameters are embedded in a 3D Preset, refer to 3D Presets on page 279. If needed, contact your GE HealthCare Representative for any acquisition protocol modification/optimization.

Any parameters, protocols and/or application changes to GE HealthCare Equipment shall be Customer's sole responsibility as well as any decision having regard to such clinical responsibilities and duty of care owed to patients. Accordingly, the Customer will be solely liable for the decision to modify the protocol and the consequences thereof. GE HealthCare shall in no event be held liable for any damages resulting directly or indirectly from such modification by the Customer of the protocol, as such modification will be made on Customer's instructions only.

For audit purpose, the date of the last change of protocols and identifier for the agent responsible for the change can be examined, if needed contact your service representative.

10.2 General acquisition and image display settings

10.2.1 Field of View (FOV)

There are four available Field of View (FOV or magnification) settings (see 5.3.6 Imaging on page 155).

The FOV can be changed on the DL Screen (see Figures below) or on the Control Panel.

Allia IGS 5

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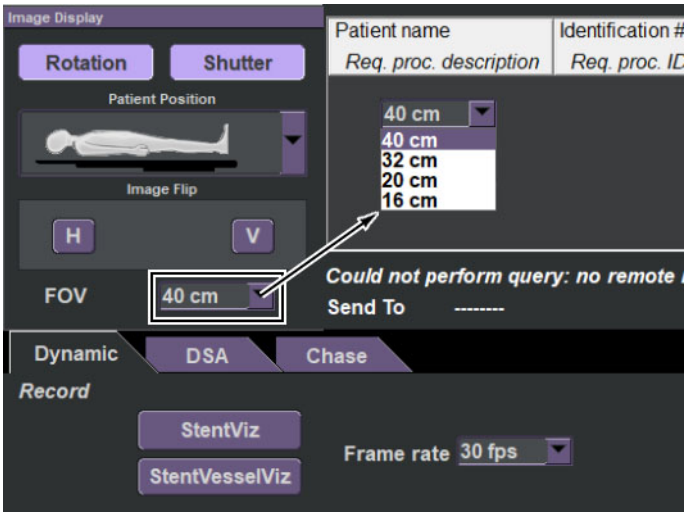
Allia IGS 7 OR

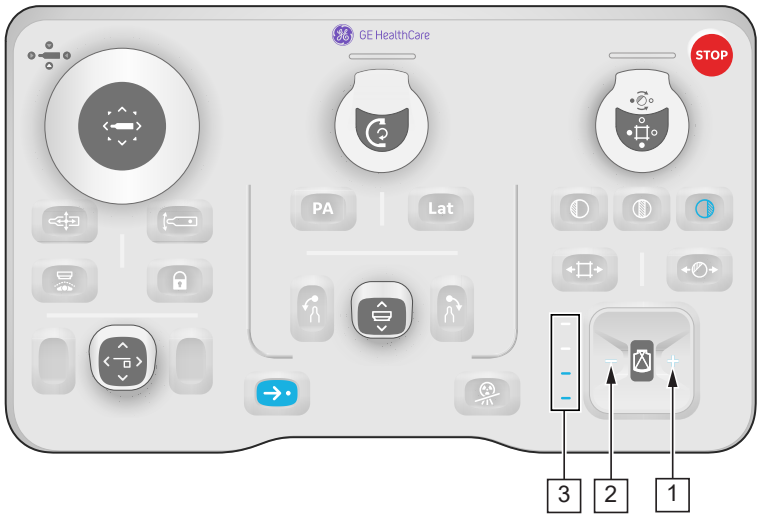
Figure 10-4 DL Console Screen with FOV selection context menu displayed



On the Control Panel, the **+** and **-** buttons selection increase and decrease the magnification (see **[1]** and **[2]**, Figure 10-5 FOV control on the Control Panel with magnification level indicator on page 224Figure 10-6 FOV control on the Control Panel with magnification level indicator on page 224).

Allia IGS 5

Figure 10-5 FOV control on the Control Panel with magnification level indicator



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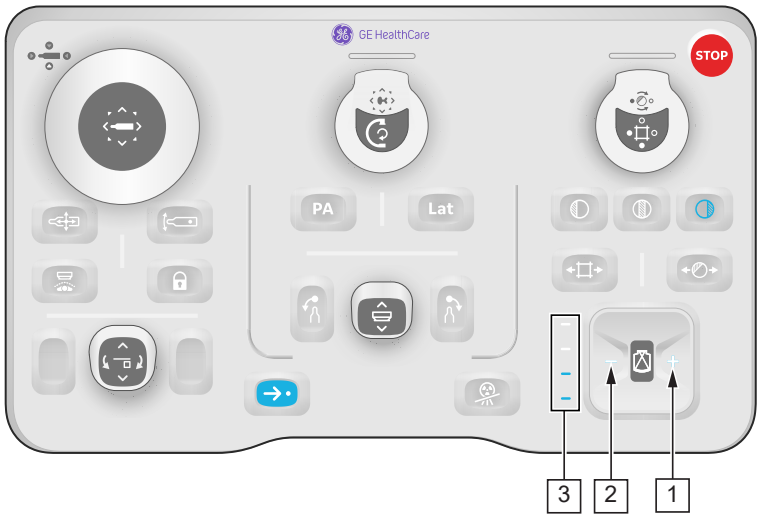
Allia IGS 7 OR

Figure 10-6 FOV control on the Control Panel with magnification level indicator



Item	Description
[1]	**+** button to increase the magnification
[2]	**-** button to decrease the magnification
[3]	Magnification level indicator

The FOV can be changed dynamically during fluoroscopy without releasing the pedal. The FOV default value depends on the selected protocol and record mode.

10.2.2 Digital Image Rotation

Use the **Rotation** button to control the rotation of the image.

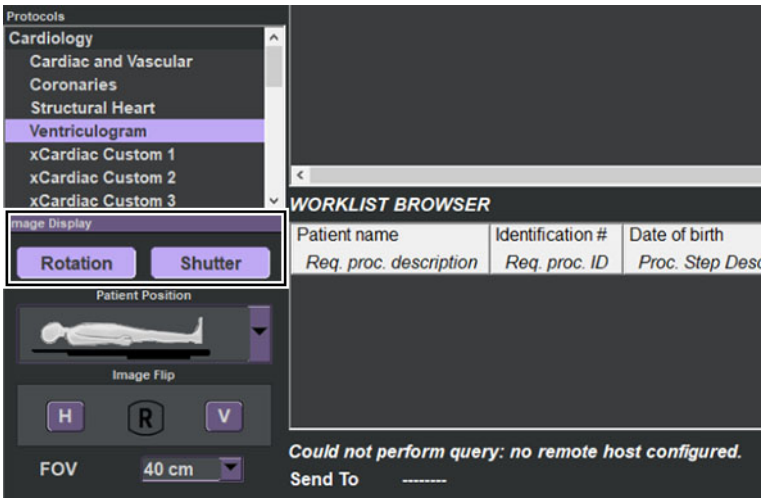
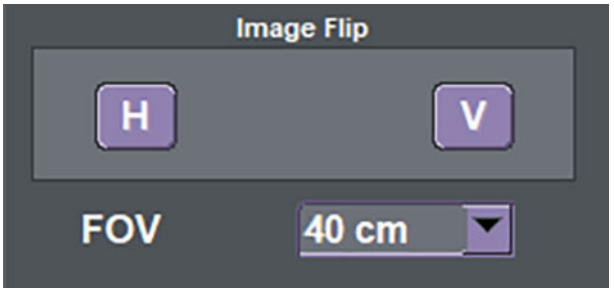


Image rotation

The image on the live display can rotate +90° or -90° according to the angulation of the (Frontal or Lateral) gantry axis (L, C and offset arms) in order to keep the "head up" display when the L-arm is positioned at 0° or 90°. A 90° image rotation is performed when the image rotates more than +/- 45°. The rotation is not updated while imaging is in progress. Hand/footswitches must be released first.

- Rotation Enabled: means that the system automatically performs a +/- 90° image rotation when the L-arm is positioned beyond +/- 45°. By default, rotation is enabled.
- Rotation Disabled: means that there is no image rotation performed by the system. In this case, the image will be displayed "head up" only when the L-arm will be at 0°.

For patient positioned feet first in the system, activate the vertical flip function in order to present image with the patient head towards the top of the live display. See details in 10.2.4 Image Flip on page 231.



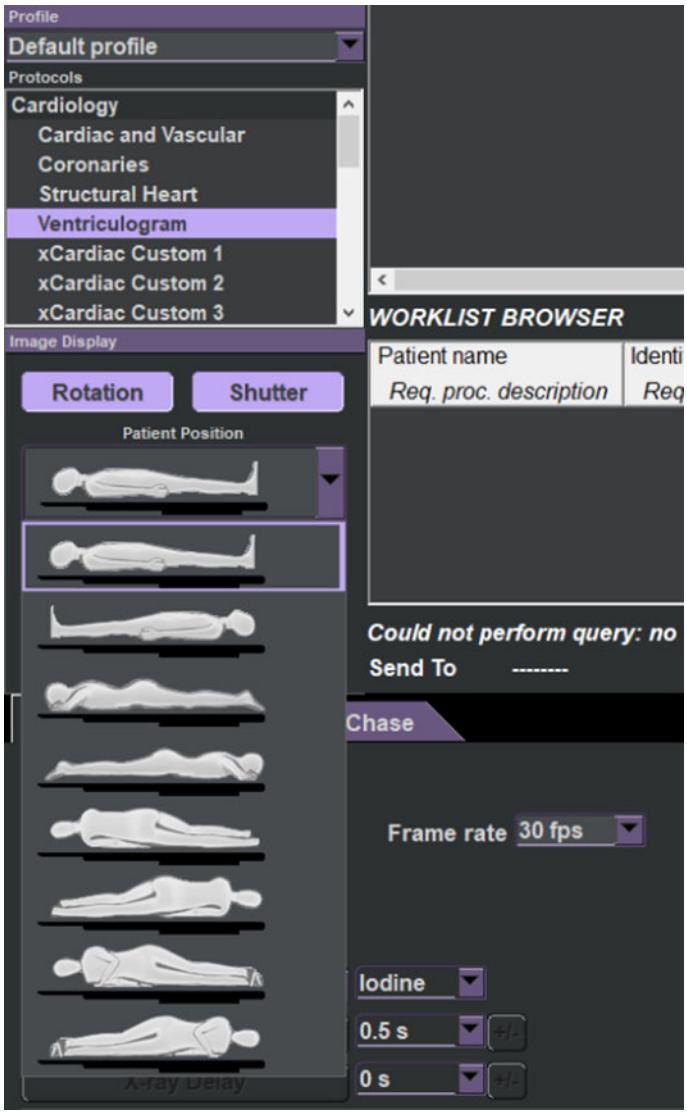
10.2.3 Patient Orientation

Patient Position on the DL

The Patient Position is the position of the patient on the table regardless of the imaging system. It is the responsibility of the operator to select the correct patient position prior to any acquisition.

From the **Patient Position** pull down list, select the correct patient icon to match the current patient position on the table.

This information is used by the system to correctly label patient orientation markers to avoid misinterpretation of the image displayed for diagnostic purposes. It is also used by the 3D reconstruction software to reconstruct the image in the correct orientation.

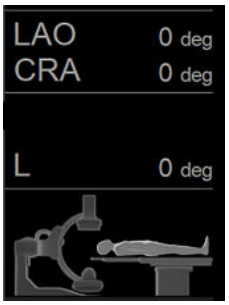


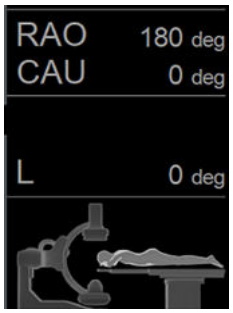
The Patient Position will automatically default to Head First Supine when **End Exam** is selected.

Patient Position in the exam room

The current selected Patient Position is displayed in the exam room on the live display.

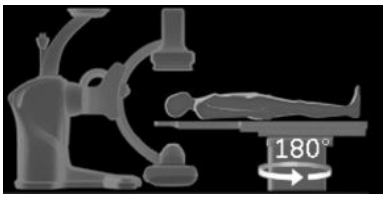
Figure 10-7 Patient is in Head First Supine **Figure 10-8 Patient is in Head First Prone**





If the displayed patient position on the live display does not match the actual patient position in the exam room, correct the patient position on the DL screen.

If the table is 180° rotated, an icon “180°” indicating the table rotation will appear on the live display.



The patient position relative to the table top does not change when the table is rotated so there is no need to reselect a patient position on the DL screen.

However, the patient position relative to the imaging system is the opposite of the display (patient position display shows his head under detector, while his feet are actually under the detector).

NOTE
The patient orientation markers (L, I, R) are described in Patient Orientation markers on page 227, below.

Patient Position at start exam

When clicking on **Start Exam**, a display of the current selected patient position on the DL screen will alternate with a question mark reminding the user to verify the correct patient position has been selected. This effect will stop upon selecting a patient position from the list or after 30 seconds.

Patient Orientation markers

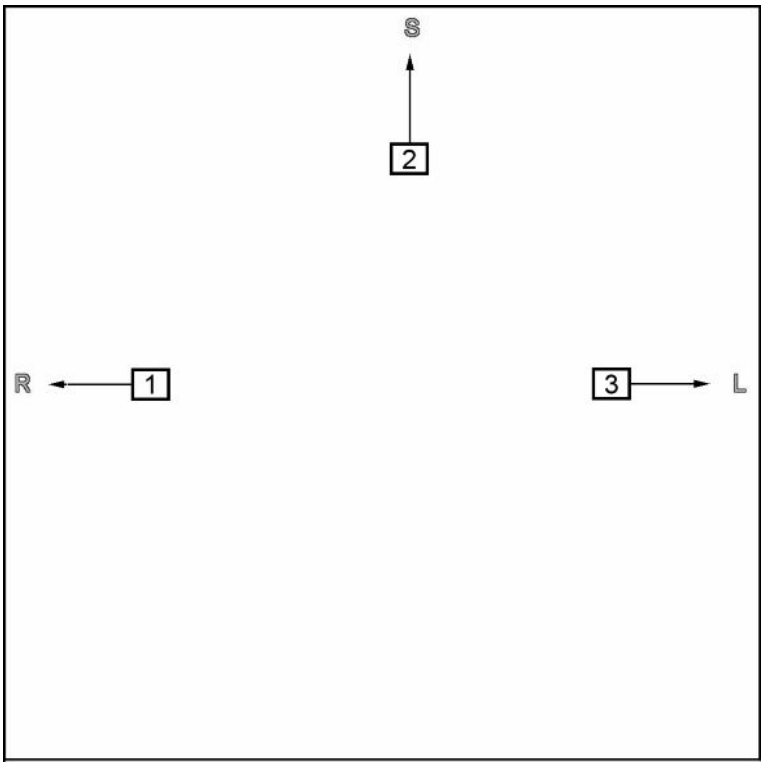
Patient orientation is the orientation of the patient in the X-Ray image.

The patient orientation is indicated by 1 to 3 direction letters located on the top, left and right edges of an X-Ray image in review or LIH: Right/Left, Superior/Inferior, Anterior/Posterior (R/L, S/I, A/P). It is not indicated on live images.

The patient orientation markers correspond to the patient orientation in the image. Their computation includes gantry and table angulations, patient position on the table, and image transformations such as flips and rotations.

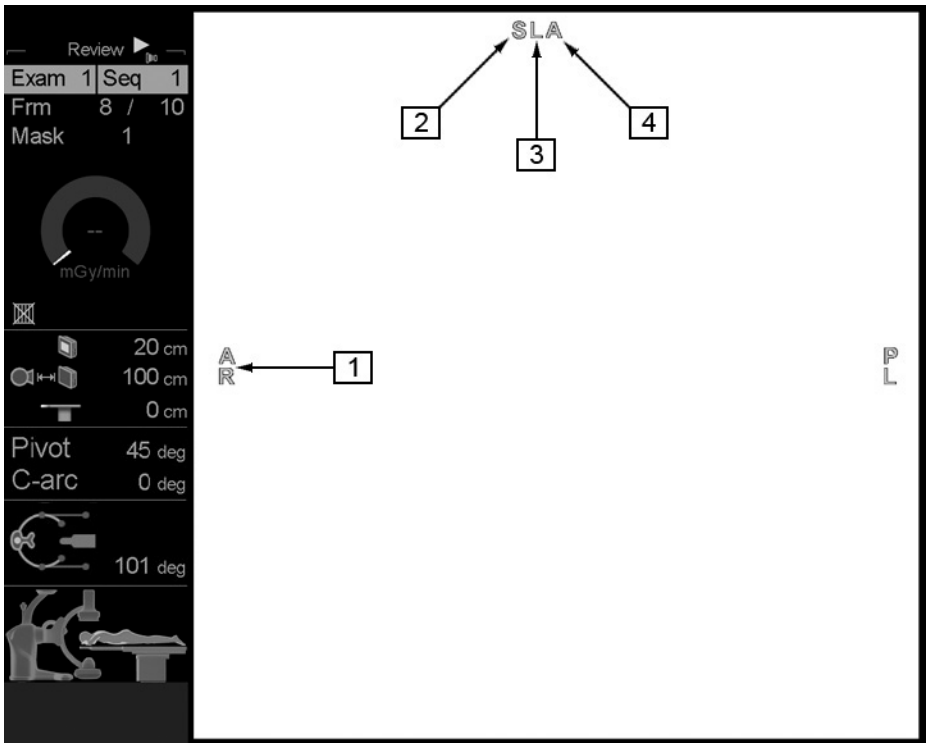
Patient orientation markers are part of the DICOM information and are transferred to a workstation which may have the ability to display them.

The following example is of a patient placed on the table supine, head first, gantry in the PA position and table position centered and not tilted.



Item	Description
[1]	Patient's right (R) is located on the left of the image
[2]	Patient's head (Superior) is located on the top of the image
[3]	Patient's left (L) is located on the right of the image

Additional patient directions appear when there are LAO/RAO and CRA/CAU angulations. The main direction of the patient is indicated by the first letter. The potential secondary direction is indicated by the second letter and the potential third direction, which is the least important, is indicated by the third letter.



Item	Description
[1]	Patient's anterior (A) is the dominant direction and the patient's right side (R) is also viewed
[2]	Patient's superior (S) is the dominant direction
[3]	Patient's left side (L) is the second dominant direction
[4]	Patient's anterior (A) direction is also viewed but it is the least important

Superior/Inferior or Head/Feet display

By default, the Superior/Inferior patient direction is indicated by letters “S” and “I”. However, there is a configuration to display this direction with the letters “H” (Head) and “F” (Feet) instead. Contact your GE HealthCare representative to change this setting.

Patient Orientation display/transfer option

In the **Preferences** Tab on the DL screen, **Patient Orientation Preferences** allows to display and transfer the patient orientation markers or not.

When the configuration is set to “Yes”, the patient orientation markers will be displayed and transferred to workstations.

When the configuration is set to “No”, they will not be displayed nor transferred. If the configuration is “No” and you need to retrieve the patient orientation of your acquired sequences, click on “Yes” and re-launch the sequence or photo review. The markers will appear. If the sequence or photo without patient orientation was already transferred to a workstation, it will need to be re-pushed.

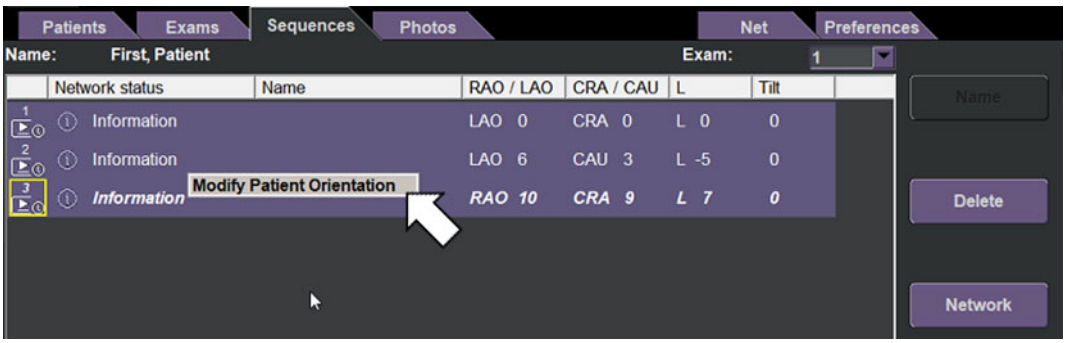
NOTE
The change of display preference will not affect the images that are in the queue for transfer.

Modification of Patient Orientation

If the patient position on the table was not selected properly, the patient orientation markers will be incorrect. In this case, it is possible to manually annotate the images through the **Modify Patient Orientation** interface.

Select the sequence or photo to modify. To select multiple sequences or photos, press and hold the shift key while selecting.

Right click on your selection then left click on the **Modify Patient Orientation** dialog box.



Right-click on multiple selection

The **Modify Patient Orientation** interface appears.

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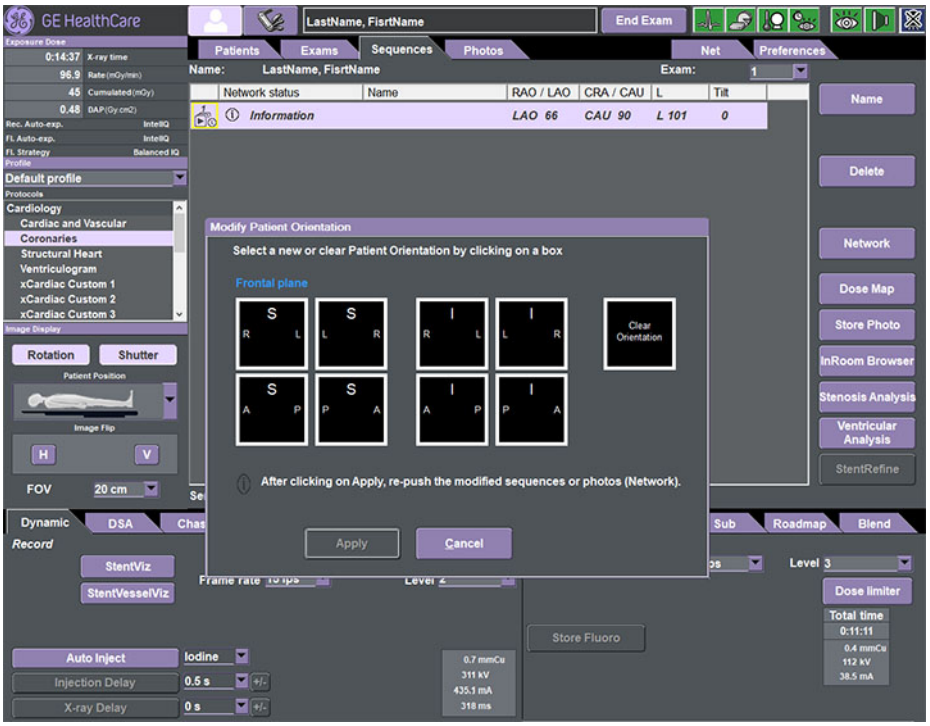

Click on the box that matches the correct patient orientation for the selected images or the **Clear Orientation** box. Click on **Apply**.

The change will apply to all frames in a sequence, even if the patient orientation changed during the acquisition.

Any sequence or photo that is in the queue for transfer cannot be modified.

If a sequence or photo containing incorrect patient orientation markers were already transferred, it will need to be re-pushed.

10.2.4 Image Flip

It is the responsibility of the Operator to correctly verify the patient orientation by confirming that it matches the information displayed on the live display.

The image can be flipped both horizontally and vertically using the H and/or V keys. A specific R icon will be displayed below the H and V keys to reflect the selection.

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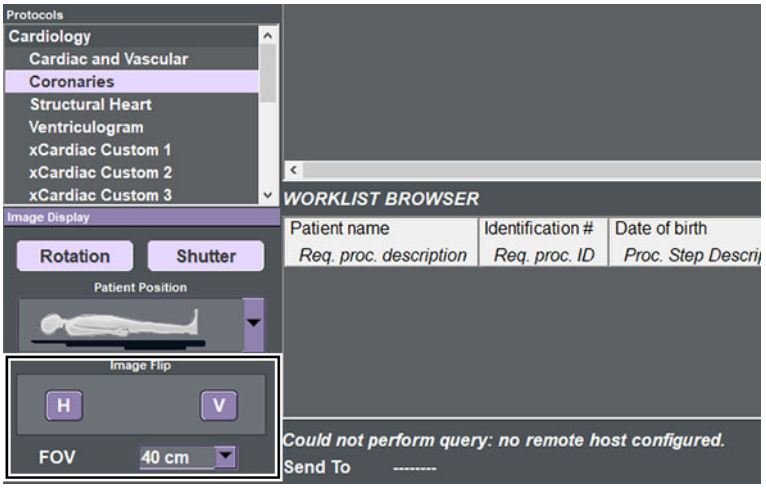
Allia IGS 7
Allia IGS 7 OR

Figure 10-9 Image Flip - DL Screen



Three choices are possible:

- H: flip the image horizontally: R icon displayed.
- V: flip the image vertically: icon displayed.
- H + V: flip the image horizontally and vertically: R icon displayed.

Image Flip can also be selected using the **Horizontal** and **Vertical** flip buttons of the Touch Panel on the ***Exam management*** page.

Figure 10-10 Image Flip - Touch Panel, Exam management page

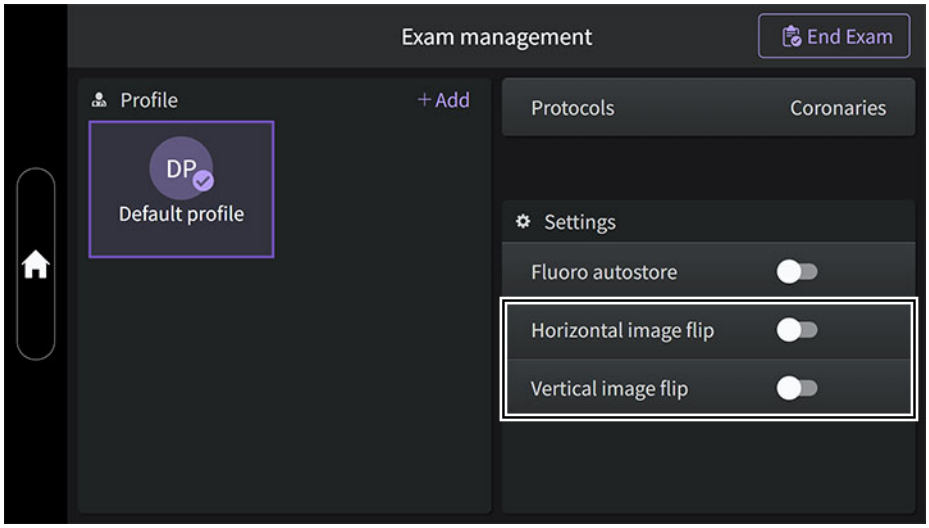
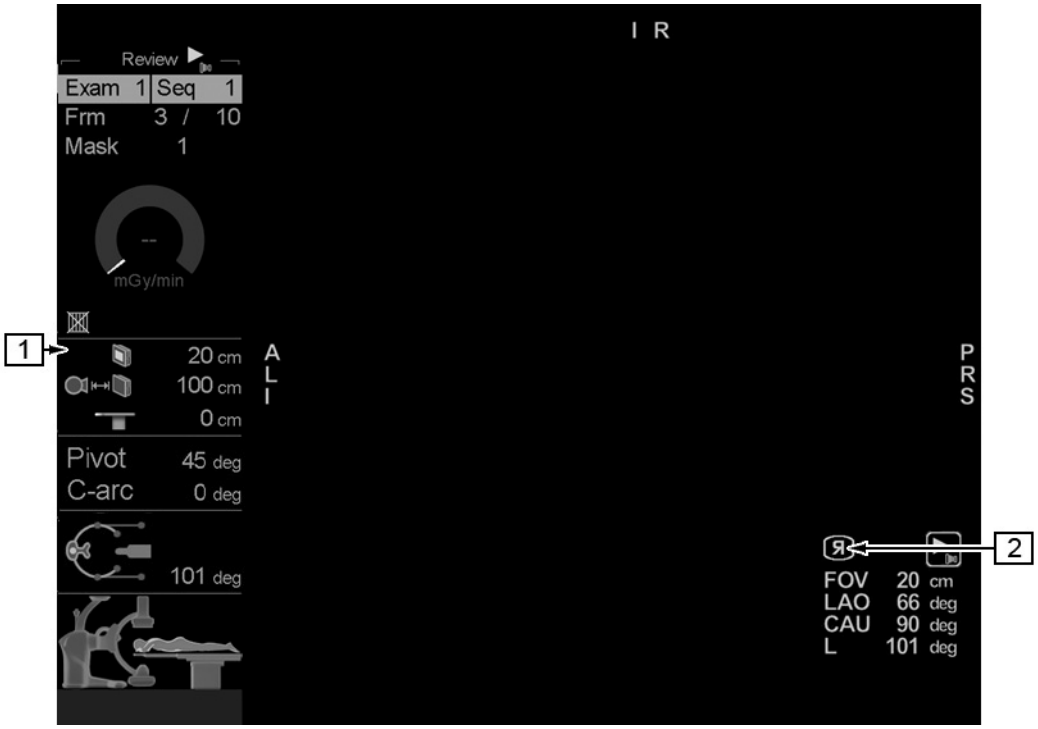


Image Flip will be automatically deselected at each Start Exam.

The (R) icon will be also displayed in the Geometry area **[1]** of each live display and over any image reviewed **[2]**.



10.2.5 Simultaneous Fluoro Sub / NoSub Display (Option)

Depending on system configuration, it is possible to display the subtracted and non subtracted fluoro images simultaneously.

If the exam room monitor is a large display monitor, first ensure that the current layout displays the live1 and live2 screens.

- On the DL screen by activating the **Sub NoSub** button located below the Landscape level selection in the **Roadmap** tab of the **Fluoro** window.

- On the X-Ray settings page of the Touch Panel by activating the **Simultaneous Display** button in the fluoro area.

Figure 10-11 DL Screen

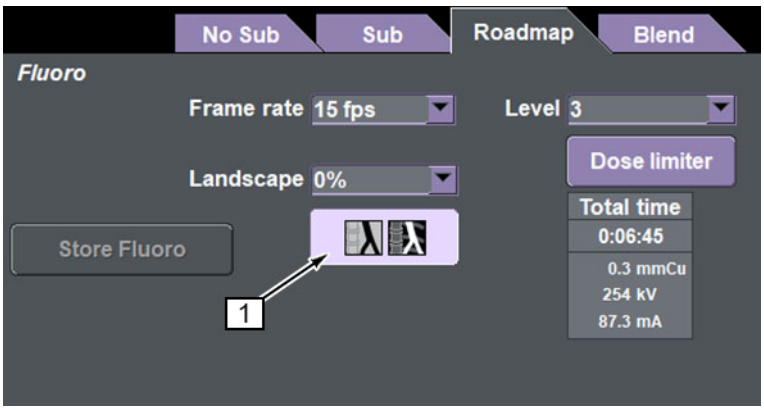
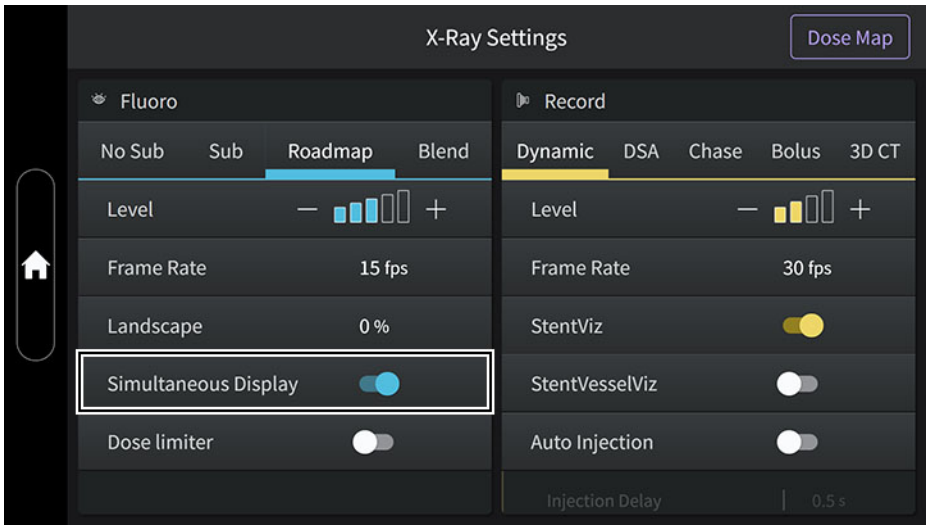


Figure 10-12 Simultaneous Fluoro Sub / NoSub Display – Touch Panel



10.2.6 Image look settings: how to select myIQ preset in Fluoro No Sub and Dynamic Record

Image processing parameters settings are predefined with myIQ preset selection in the Dynamic Record and in the Fluoro No Sub tabs from the Touch Panel, refer to X-Ray - Settings on page 205.

The IGS system is delivered with four myIQ presets that provide the user with the following image looks:

- **Balanced:** an image look with a good trade-off between contrast enhancement and noise reduction. This look is set as default.
- **Classic:** an image look with light processing, close to native X-ray image.
- **Smooth:** an image look with strong noise reduction and soft contrast.
- **Crisp:** an image look with fine details and extended contrast range (darker blacks and brighter whites).

It is always possible to change the selected myIQ preset prior to any acquisition to customize/ optimize image processing, the look will not be applied on already acquired images/sequences.

A custom preset can be activated through protocol modification. The custom preset allows to adjust parameters according to individual preference. If needed, contact your GE HealthCare Representative for any myIQ modification/optimization.

NOTE
The presets are available only for eligible protocols, from the following categories/ protocols name:

- Cardiology
- Electrophysiology
- Pediatric / Pediatric cardiac and Pediatric neonate cardiac
- X-ray Quality Test / Quality assessment

All eligible protocols are preloaded with Balanced as "Default" settings.

10.3 Fluoroscopy settings

10.3.1 How to select Fluoroscopy Mode

There are 4 modes of Fluoroscopy acquisition:

- Non-Subtracted (No Sub)
- Subtracted (Sub)
- Roadmap
- Blended Roadmap (Blend)

The selection is available on:

- The DL Screen by selecting the corresponding tab on the top of the **Fluoro** window.
- The Touch Panel by selecting the corresponding tab in the fluoro area (X-Ray settings page).

Allia IGS 5

Allia IGS 7
Allia IGS 7 OR

Figure 10-13 DL Screen

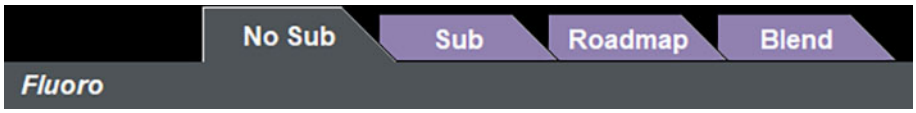
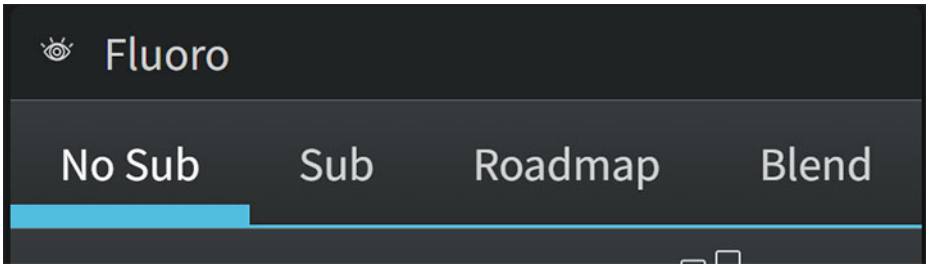


Figure 10-14 Touch Panel



All Fluoro parameters are automatically set and the system is ready to acquire using the selected mode.

10.3.2 Fluoro Level

There are up to five levels. The lowest level is designated “LOW” level and the highest “NORMAL” level producing different reference air kerma rates, such that the value for the low mode does not exceed 50 % of the value for the normal mode (in conditions defined in IEC60601-2-43).

The selection is available on:

- DL screen, where the selected level is represented by a number,
- Touch Panel, where a visual representation of the selected level and the range of available levels are displayed.

The number of levels depends on User preferences and Country regulation; the User preferences can be preset in protocol by Service or Application specialist.

Figure 10-15 Fluoro Level - DL Screen

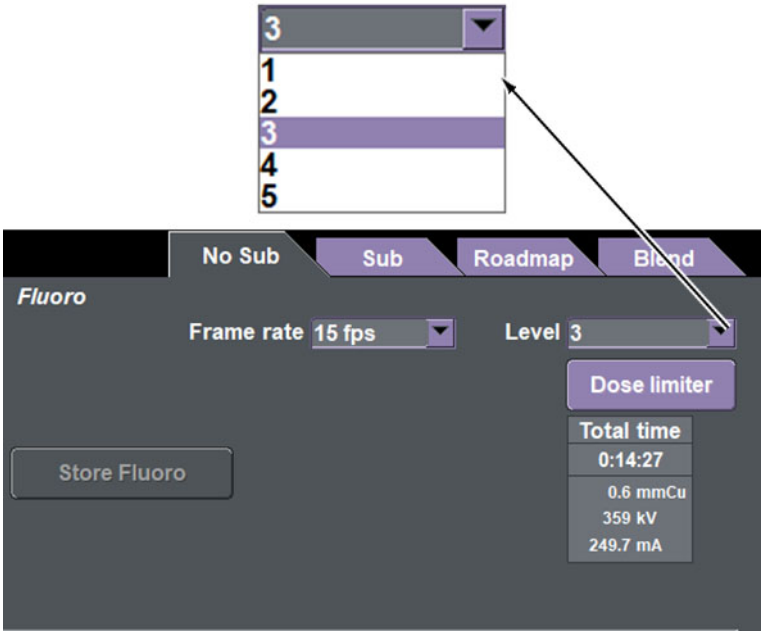
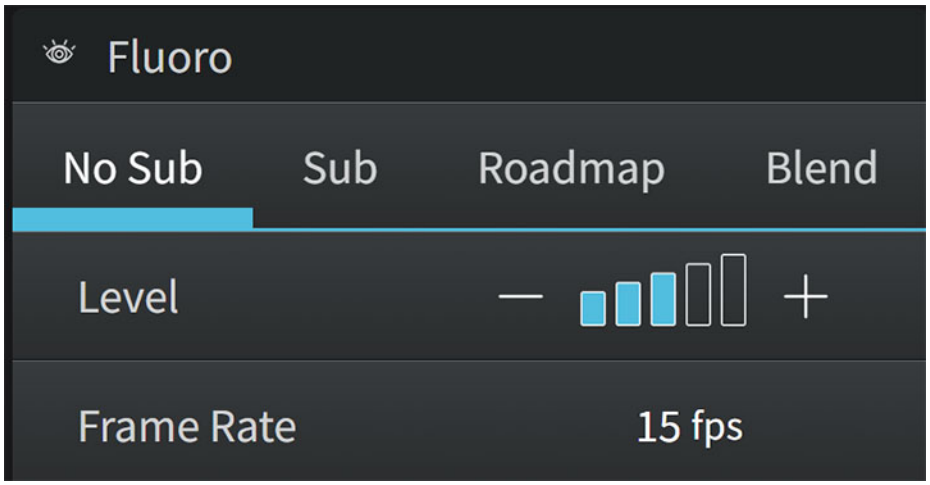


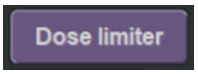
Figure 10-16 Fluoro Level - Touch Panel



The Fluoro Level selected is displayed with the Fluoro parameters on the reference display while in Exam.

10.3.3 Fluoro Dose Limiter

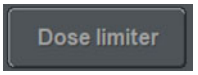
Fluoro dose rate can be limited at a lower level than the local regulatory limit from the DL screen or from the Touch Panel when the system is set with “IntelIQ” AutoExposure Preference.

- 

Unselected: means that the system maintained the Fluoro dose rate below a maximum authorized limit of 87.6 mGy/min (10 R/min) or at the level depending of local regulation (This AKR limit is defined in a plane representative of patient skin dose, and positioned 30 cm from the entrance of the Image Receptor cover). The Table 4-2 Dose Limiter on page 128 provides the air kerma rate value set when Dose limiter is activated.
- 

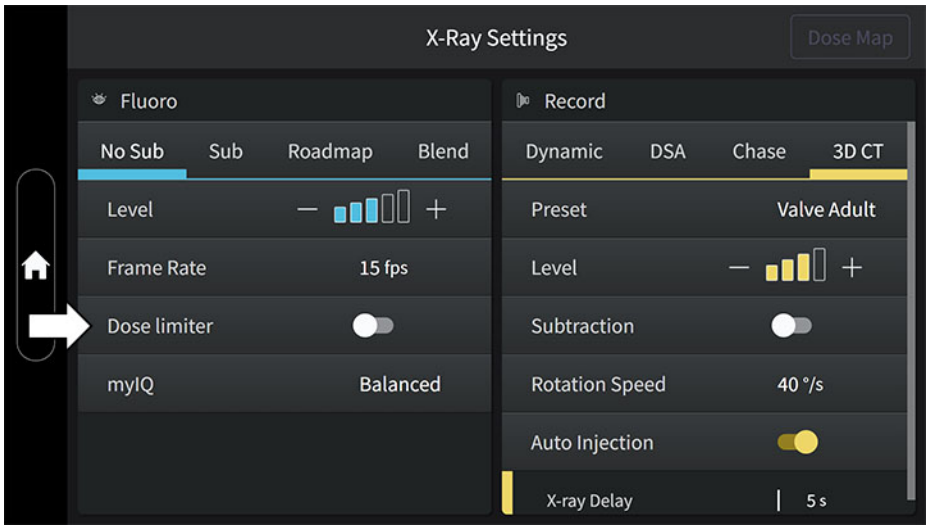
Selected: means that the system limits the Fluoro dose rate to at least half of the maximum authorized in Fluoro. Highest ref dose are given in Table 4-2 Dose Limiter on page 128.

  A specific icon 

is displayed on the left side of the live display when the dose limiter is activated, and the representation of limit value is displayed over the dose rate gauge meter.
- 

Dose Limiter is not **activable** when the button is greyed.

Figure 10-17 Fluoro Dose Limiter - Touch Panel



10.3.4 Fluoro Frame Rate

Frame rate can be selected either from the DL Screen or from the Touch Panel.

Fluoro can be performed at different frame rates:

- 30 fps, 15 fps, 7.5 fps or 3.75 fps for single plane fluoro. 3.75 fps is only available in non subtracted fluoro.

NOTE
Use low fluoro frame rate as often as possible to reduce patient skin dose.

Figure 10-18 Fluoro Frame Rate - DL Screen

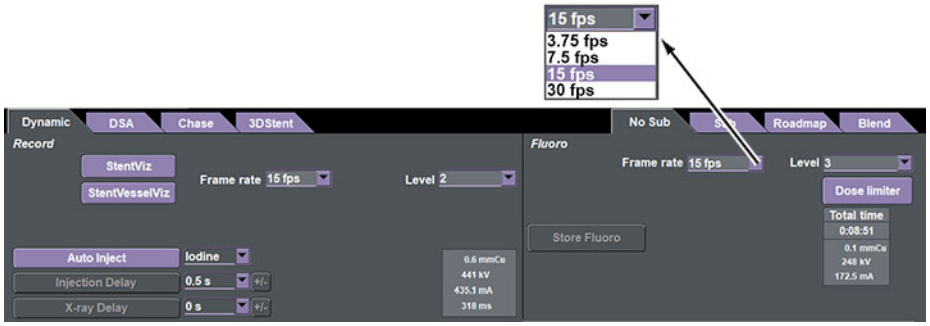
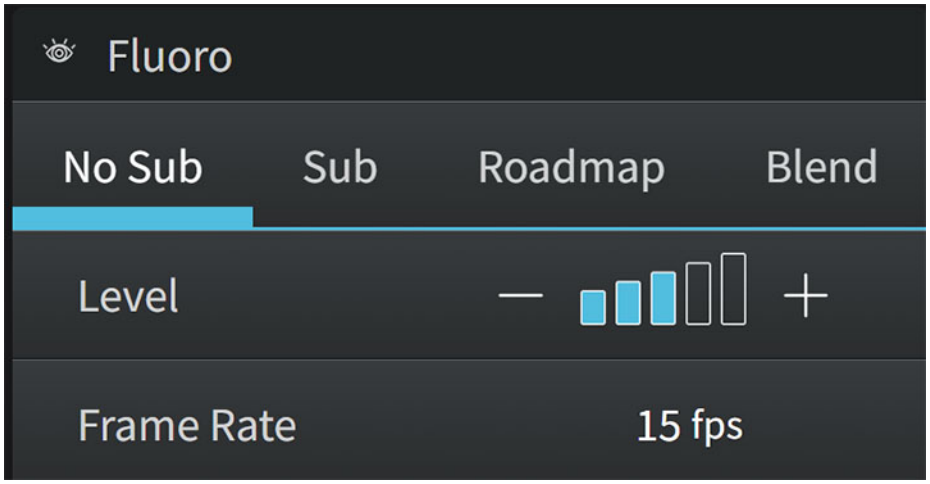


Figure 10-19 Fluoro Frame Rate - Touch Panel



10.3.5 Fluorostore

Fluorostore enables storage and looping display of the last 450 frames of the Fluoro just performed.

Depending on the Fluoro frame rate used, the Fluorostore function allows to store up to:

- 15 s of Fluoro when performed at 30 fps.
- 30 s of Fluoro when performed at 15 fps.
- 60 s of Fluoro when performed at 7.5 fps.
- 120 s of Fluoro when performed at 3.75 fps.
- The stored images are added into the DL database as a new Fluoro sequence.

There are two ways to use the Fluorostore function:

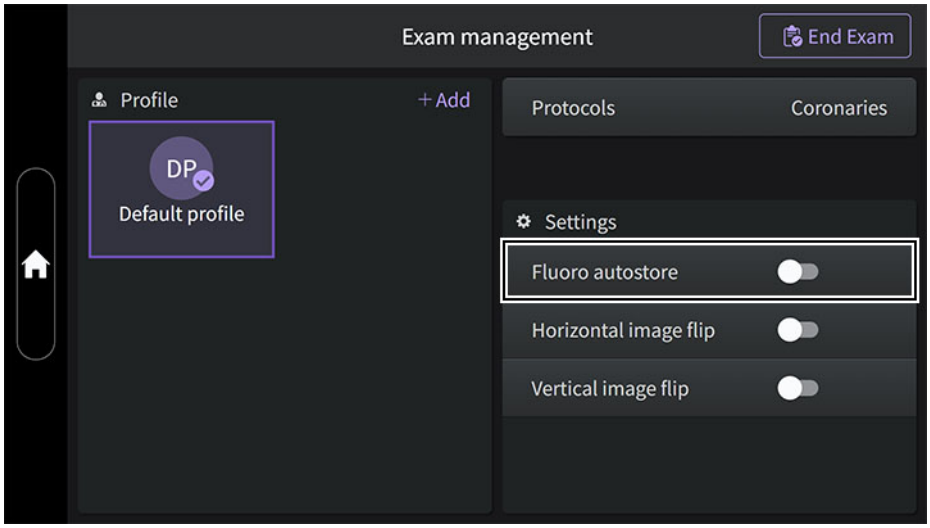
- Fluoro Autostore: when activating the Fluoro Autostore, each subsequent Fluoro performed will be automatically stored until deactivation of the feature.

NOTE

- A specific icon  is displayed on the left side of the live display during a Fluoro performed in Fluoro Autostore mode.
- Fluoro Autostore is turned off on End Exam.

The **Fluoro Autostore** button is located on the Touch Panel, in the ***Exam management*** page.

Figure 10-20 Fluoro Autostore - Touch Panel



- On request Fluorostore:

  After each Fluoro, the **Store Fluoro** button is available during 30 s:

  - It is blinking on the Touch Panel, in the home page and Sequence page.
  - It becomes available on the Console, in the Fluoro window.

  If blinking or available, press the Store Fluoro button to manually store the last 450 images of the Fluoro.

NOTE
The **Store Fluoro** button will be disabled and stop blinking in case:

- A new acquisition, Fluoro or Record is started.
- End Exam is selected.

Figure 10-21 FluoroStore Home Page - Touch Panel

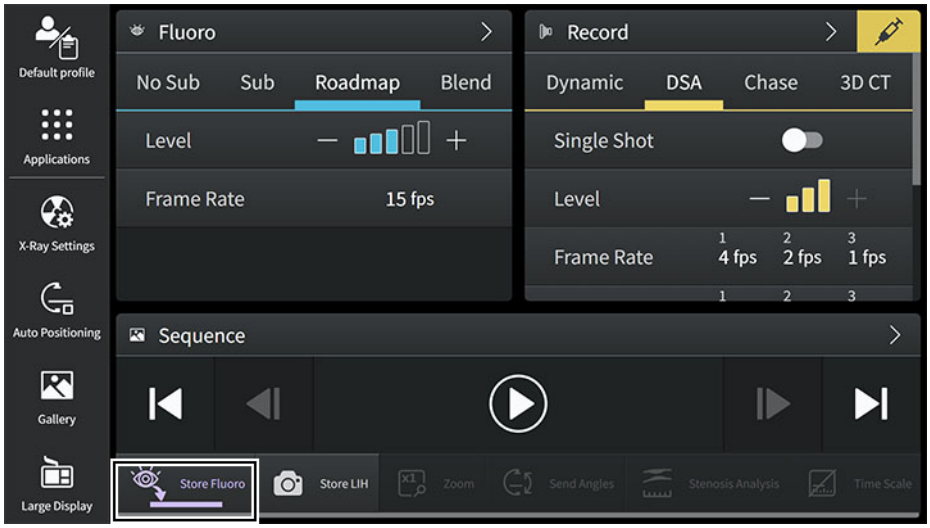


Figure 10-22 FluoroStore - Touch Panel

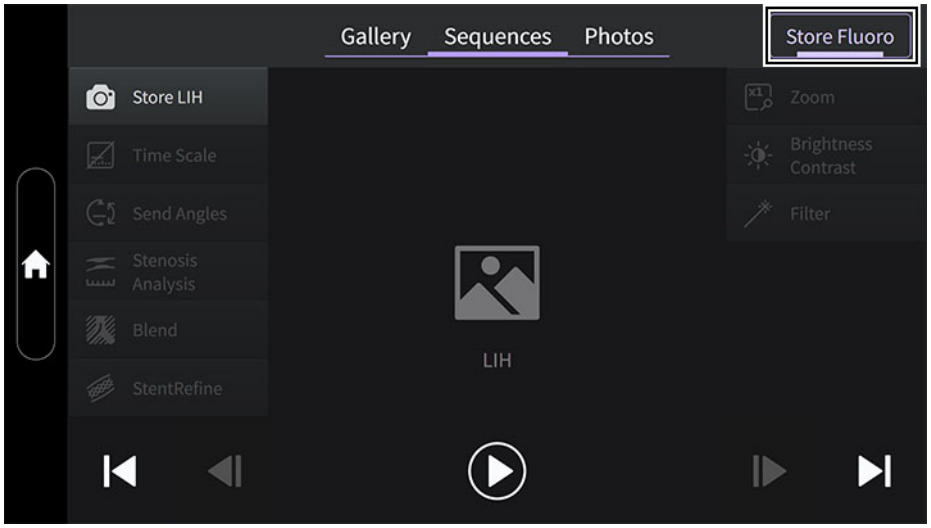
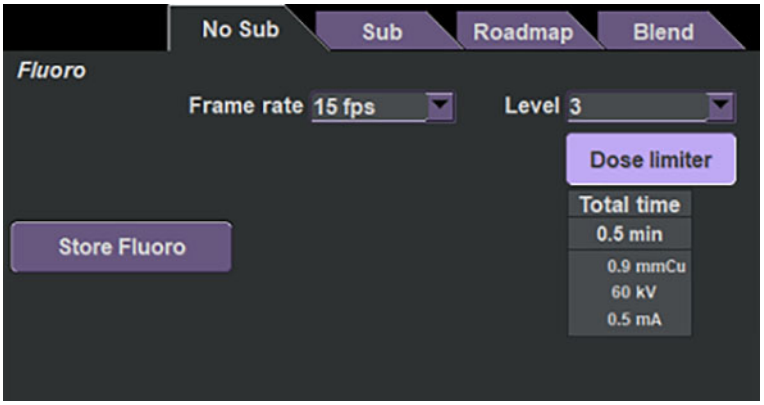


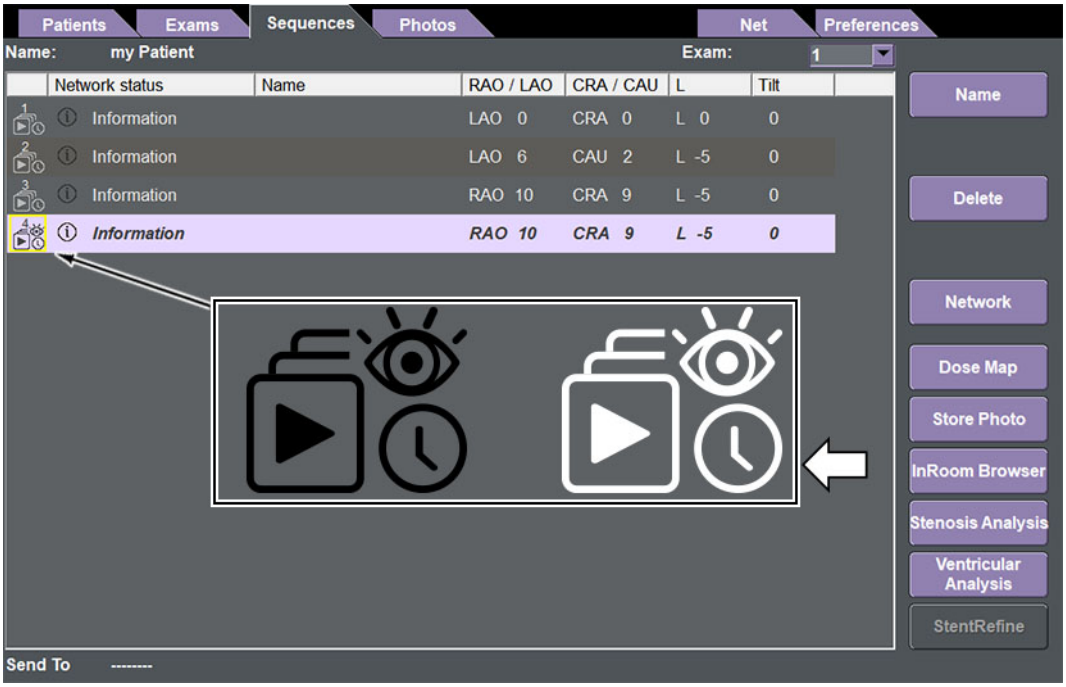
Figure 10-23 FluoroStore – DL Console



The review starts automatically after the sequence is stored.

The Fluoro sequence is shown in the sequence browser with a specific icon (see Figure 10-24 Fluoro Sequence icon on page 240). It has the same basic review capabilities (measurements and quantifications are not allowed).

Figure 10-24 Fluoro Sequence icon



While the Fluoro sequence is in review, a specific icon  is displayed at the bottom right of the live display.

NOTE
Optionally, selected protocols can be customized to extend storage to 900 frames. Contact your Service representative for assistance.

10.3.6 X-Ray Timer

X-Ray Timer Status

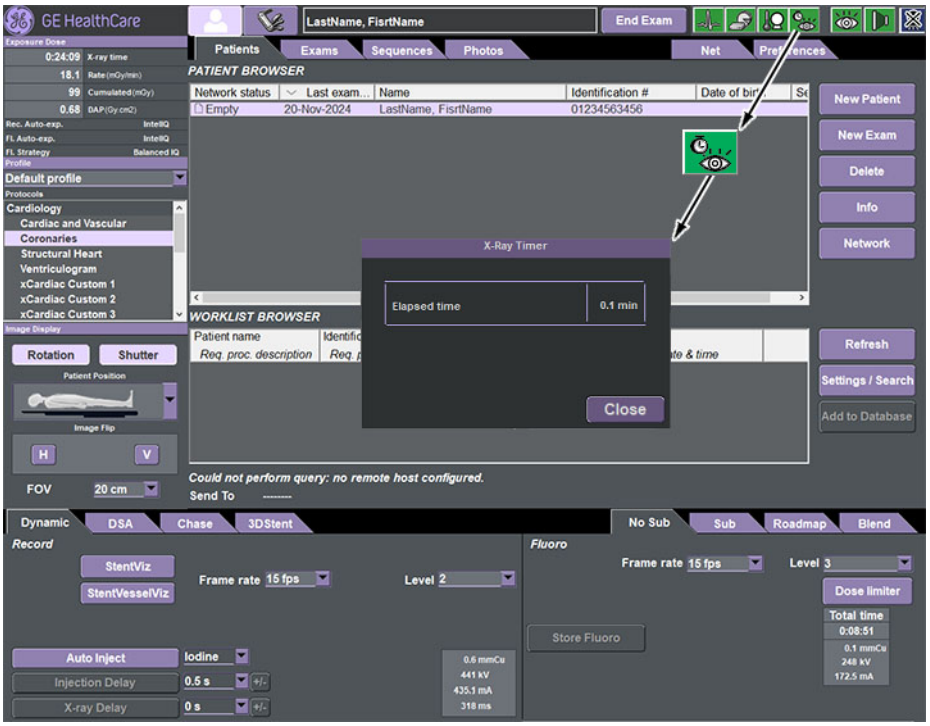
Click on the **X-Ray Timer Status** button on DL Screen to display the elapsed X-Ray time since last timer reset.

This timer counts the cumulated Fluoro time since last timer reset.

NOTE
(For US only (Compliance to 21 CFR 10.20.32)) this timer counts the total cumulated Fluoro and Record time, since last timer reset.

Allia IGS 5

Allia IGS 7
Allia IGS 7 OR



There are 2 thresholds defining 3 states (depending on country local regulation):

- From 0 to 5 minutes, warning level is GREEN.
- After 5 minutes, warning level is blinking YELLOW.
- After 10 minutes of cumulated X-Rays, warning level is ORANGE and X-Rays are disabled until the X-Ray timer is reset. This threshold is enabled only in Italy and Portugal.

  Maximum continuous acquisition: if a fluoro acquisition is maintained continuously without interruption, it will be terminated automatically after 10 min.

NOTE
The icon is still yellow after the 10 min continuous X-Rays in all countries but Italy and Portugal.

X-Ray Timer Reset

This timer counts the cumulated time while the Fluoro footswitch is depressed.

NOTE
(For US only (Compliance to 21 CFR 10.20.32)) , this timer counts the total cumulated Fluoro and Record time since last timer reset.

When the timer reaches 5 minutes, a warning tone is audible during Fluoro.

Figure 10-25 X-Ray Timer - Touch Panel

The **X-Ray Time Reset** screen is displayed on the Touch Panel (10.3.6 X-Ray Timer on page 240) and blinks. Press anywhere on the screen to reset the X-Ray timer after the elapsed duration.

The timer can be also reset with the **reset timer** button on the VCIM.

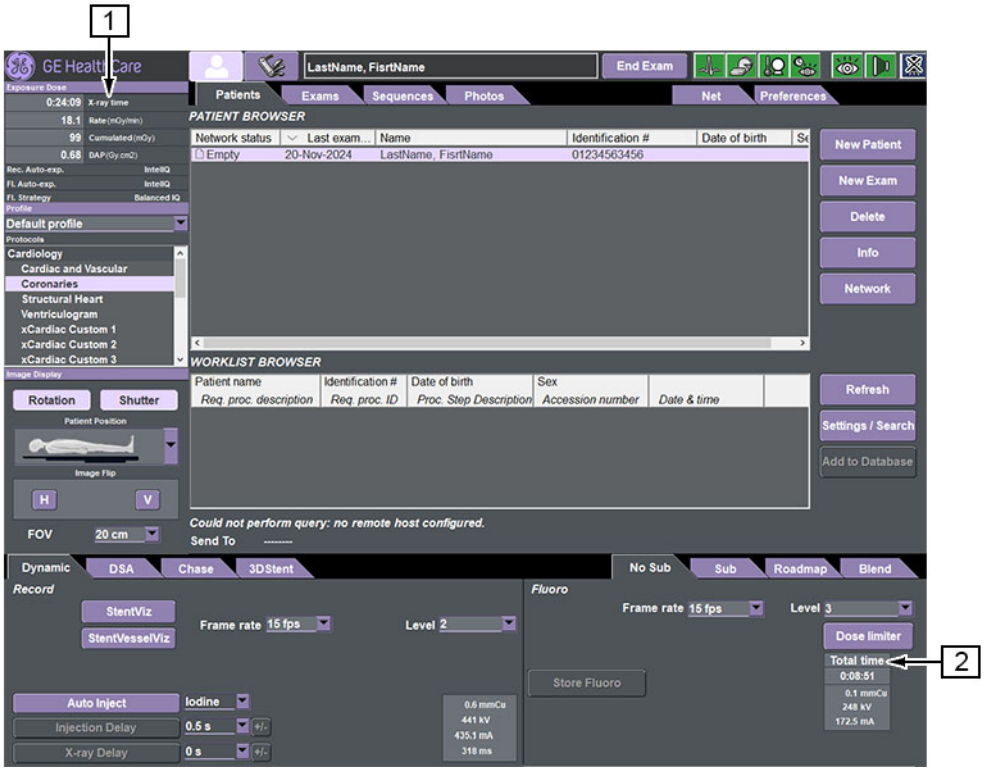
In some countries, depending on local regulation, the timer can also be reset before it elapses. To do so, press on the **reset timer** button on the VCIM.

In case of continuous fluoro without interruption, X-Ray will be terminated after 10 min and the error message `Fluoro interrupted: reset Fluoro timer to continue` will be displayed.

NOTE
In Italy and Portugal, after 10 min of cumulated X-Rays, X-Rays are disabled until the X-Ray timer is manually reset.

10.3.7 Cumulated X-Ray Time

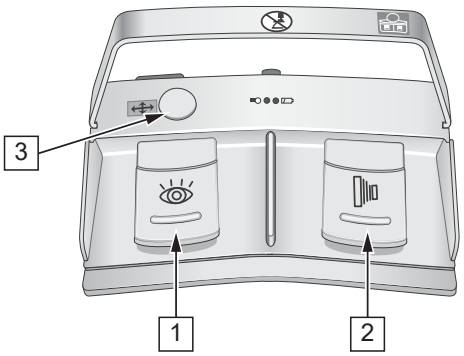
The system records both the total X-Ray time (Fluoro and Record) and the fluoro time within an exam. The values are reset to zero at end Exam. If the exam is resumed from an existing exam, they are reloaded with the values previously recorded in this exam.



Item	Description
[1]	Total X-Ray time (Fluoro and Record)
[2]	Total fluoro time

10.4 Fluoroscopy and Acquisition Footswitch

NOTE
For system behaviour in Standalone Mode with Magnus Maquet OR Table, refer to 12.1.1.4 Table Standalone Mode (only for IGS 7 OR) on page 395.

		Item	Description
Allia IGS 5  Allia IGS 7 Allia IGS 7 OR 	**Figure 10-26 Monoplane Footswitch** 	[1]	Fluoro
		[2]	Record
		[3]	Table Top Longitudinal and Lateral Brakes Release **(For System with InnovaIQ Table)** : The activation of the switch will only release the lateral table top brake when the table is tilted. **(For System with Magnus Maquet OR Table)** : Magnus Maquet OR Table has no floating mode.

Optionally, a second footswitch can be installed in the control room.

NOTE
Do not swap the foostwitches from the control room and exam room as the table brakes release is only available on the exam room footswitch.

10.5 How to perform Fluoroscopy Acquisition

10.5.1 No Sub Fluoroscopy Acquisition

Select non subtracted fluoroscopy (see 10.3.1 How to select Fluoroscopy Mode on page 234).

Start fluoroscopy acquisition by pressing the fluoro pedal .

The **Fluoro** icon  is displayed on the left side of the live display during Fluoro to show that the displayed image is a live fluoroscopic image.

 is displayed at the bottom of the DL screen to show that a fluoroscopic acquisition is in progress. After each Fluoro exposure, a Last Image Hold (LIH) is displayed on the live display.

10.5.2 How to perform a Roadmap Fluoroscopy Acquisition

Roadmap Fluoro is used to navigate devices under subtracted fluoroscopy, while having the vessel anatomy visible as an overlay.

Select roadmap fluoro (see 10.3.1 How to select Fluoroscopy Mode on page 234).

When Fluoro Roadmap is selected, the label **Fl. Roadmap** is displayed on the reference display.

Allia IGS 5

Allia IGS 7
Allia IGS 7 OR

Figure 10-27 Roadmap Fluoro - DL Screen

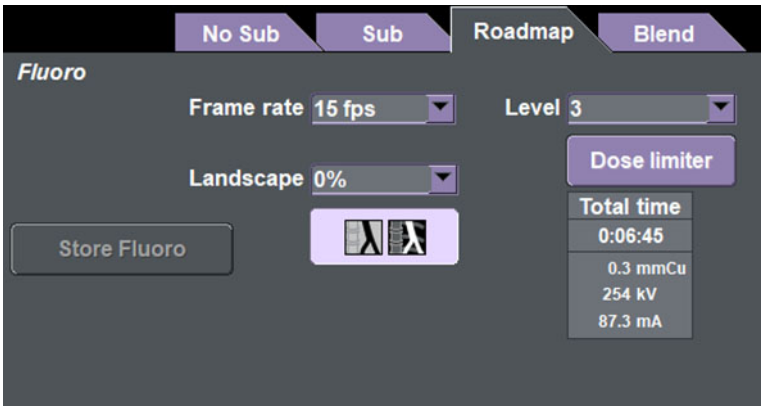
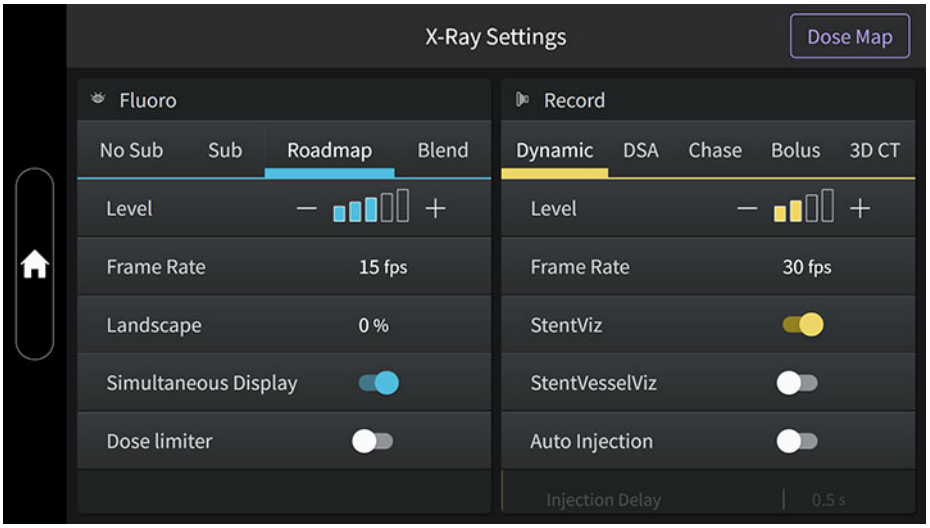


Figure 10-28 Roadmap Fluoro – Touch Panel X-Ray settings page



- Perform a fluoroscopy depressing the fluoro footswitch; this is the mask acquisition phase.

  The **Fluoro** icon  is displayed on the left side of the live display during Fluoro to show that the displayed image is a live fluoroscopic image.

  After a short time, "Inject" flashes on the live display.

- Inject manually the contrast media to perform a roadmap run.

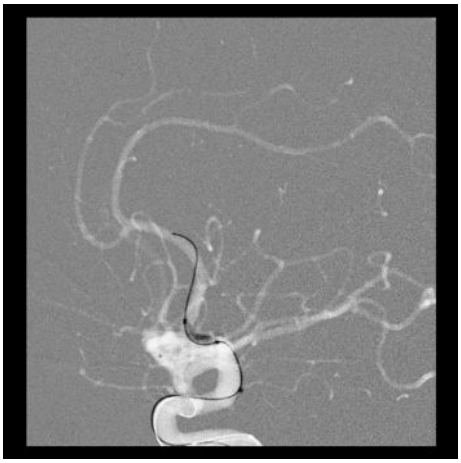
  NOTE
  In case the 7.5 fps fluoro is used, inject for at least 2 s to acquire enough frames. Doing so will optimize the peak opacification phase of the mask acquisition.

- Release the fluoro footswitch.

  A **Mask** icon  is displayed on the left side of the live display to show that the Fluoro mask was acquired.

- Depress again the fluoro footswitch. The displayed fluoro images are subtracted. The vessel roadmap should be visible in white color.

Figure 10-29 Sample fluoro roadmap result image



- The subtraction level can be adjusted using the LANDSCAPE function. Select an appropriate "Landscape" level in the Fluoro window.

CAUTION

The fluoro Landscape feature affects only the background visibility of the image. When using sub fluoro with Landscape, never move the table. If so, injected vessels will not match anymore with the anatomy.

The predefined LANDSCAPE values are: 0, 30, 50, 70 and 100%.

A **Landscape** icon  and the level value are displayed on the left side of the live display to show the selected level of landscape.

- At 100% landscape the fluoro images are not subtracted, vessel roadmap is not visible.
- 0% landscape = full subtraction imaging.

CAUTION

During the roadmap fluoroscopy, do not move the table top and / or the gantry nor change the Field of View, the fluoro level, the image flip settings, insert or remove contour filters. If done the image quality will be seriously degraded.

NOTE
The mask is lost when Roadmap mode is exited, or when "END EXAM" is activated or when another protocol is selected.

NOTE
When the roadmap fluoro is deselected, the landscape function is disabled.

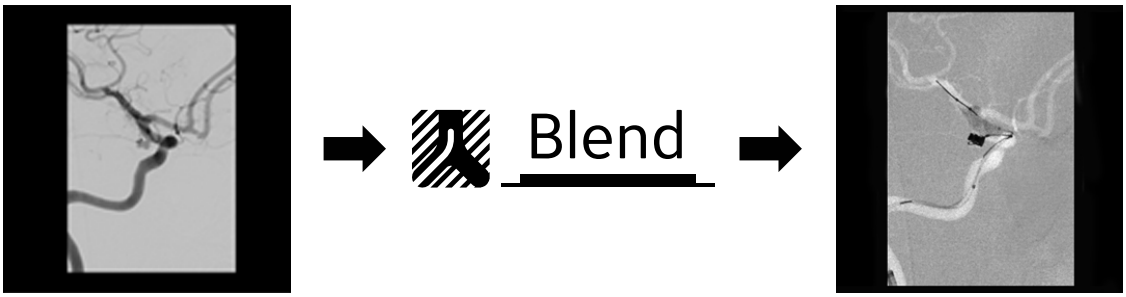
10.5.3 Blended Roadmap Fluoroscopy Acquisition (Option)

10.5.3.1 Overview

Fluoro roadmapping is used to navigate devices under subtracted fluoroscopy, while having the vessel anatomy visible as an overlay to help for device guidance. Blended Roadmap is a feature used for creating a roadmap of the vessel anatomy from a previously acquired acquisition (a DSA,

a Bolus or a 3DSub) avoiding the need to inject contrast during fluoro. The image containing the vessel anatomy is referred in this section by the vessel image.

Blended Roadmap is a 3-step guided workflow:



1) Select a vessel image

2) Enter Blended Roadmap

3) Perform Fluoro Acquisition

1) The first step is the vessel image selection. It consists in choosing a subtracted record image containing the vessels of interest for guidance.

2) Once selected, the second step is the selection of the Blended Roadmap mode. Note that if the current system geometry does not match the vessel image one, the system will suggest an automatic repositioning of the gantry and table positions to match with the one corresponding to the vessel image acquisition.

3) Then, the following fluoro acquisitions will be in Blended Roadmap mode, with the vessel image mask on.

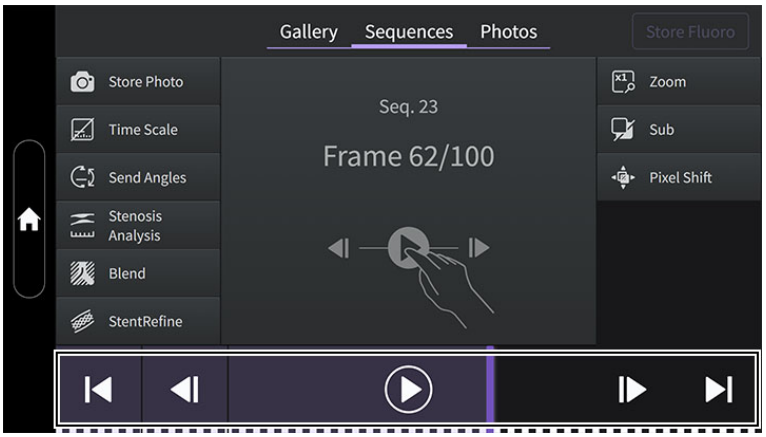
If the anatomy is subject to none or little organ or respiratory motion, and if the vessel image is acquired in DSA mode, an automatic registration will be applied between the vessel image and the fluoro acquisitions when starting the blended roadmap mode. It is important to check if the registration is appropriate after the first fluoro run.

While performing fluoro acquisitions, it is also possible to correct from small patient motion with an on-demand registration available through the Refresh button.

Also, the Blended Roadmap look can be finetuned using the two parameters: the vessel density level (referred as VESSELS) adjusting the opacification of the vessel overlay, and the landscape level (referred as LANDSCAPE) adjusting the transparency of the anatomy visible in the background of the image.

10.5.3.2 Detailed main workflow

Step 1. Select a vessel image

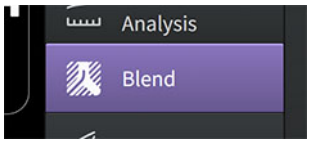


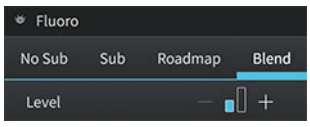
1. Review a subtracted record sequence. Eligible sequences are subtracted DSA, Bolus or subtracted 3D.
2. Pause on the relevant frame.

NOTE
The quality of the vessel information displayed in Blended Roadmap depends on the quality of the vessel image.

NOTE
Refer to 10.5.3.4 User Interfaces on page 254 for alternate ways to select a vessel image.

Step 2. Enter Blended Roadmap





When selected

Enter Blended Roadmap by touching the Blend icon (in the review page) or by selecting the Blended fluoro mode (from the touchscreen home page)

Alternative ways to enter Blended Roadmap are available and illustrated in Section Control panels.

NOTE
Before starting Blended Roadmap, ensure the vessel image and the fluoro settings are identical in terms of image flip, patient position and zoom.

NOTE
When trying to enter Blended Roadmap, an error message may pop up. Error messages are described in Section User messages below.

Optional Step 3. Reposition Gantry and Table - if requested by the system, refer to the last step of the workflow

Optional step. See last step of workflow.

Step 4. Perform Fluoro Acquisitions

Perform the first Blended Roadmap run.

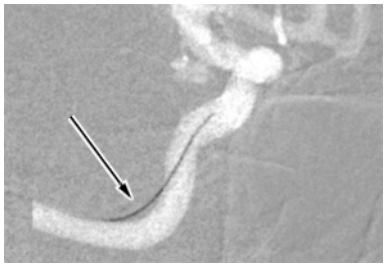
Blended Roadmap uses a fluoro mask to subtract anatomy background. The fluoro mask is acquired at the beginning of the first run.

During 1 or 2 seconds (depending on the fluoro frame rate) corresponding to the mask acquisition phase, images are displayed non-subtracted. Afterwards, the display automatically switches to Blended Roadmap. The fluoro mask is subtracted from the fluoro images to remove anatomy, and the vessel image is overlaid.

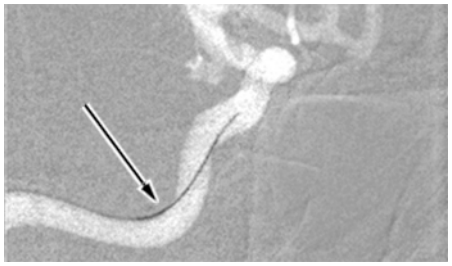
WARNING

IT IS THE USER'S RESPONSIBILITY TO CHECK THAT THE REGISTRATION ACCURACY IS ADEQUATE FOR THE CLINICAL NEED. TO DO SO, THE USER SHOULD USE THE POSITION AND BEHAVIOR OF THE DEVICES BEING NAVIGATED, RELATIVE TO THE WHITE VESSEL OVERLAY. OTHERWISE THE POSITION OF THE DEVICES MAY BE MISINTERPRETED.

Step 4. Perform Fluoro Acquisitions



Example of a fluoro and a DSA not registered (tool is outside the vessel).



Example of a good registration (tool stays in the vessel overlay).

APS button ON

APS button OFF

A Vessel icon is displayed to show that Blended Roadmap is active. The value of the level of vessel density (in percentage) is also displayed.

APS Refresh

The refresh button is available to correct for some small patient motion during fluoroscopic live acquisitions, introducing subtraction artifact when subtracted with fluoro mask. The computed correction is applied to next fluoro runs. More information on Auto Pixel-Shift function can be found in section Auto Pixel-Shift (APS) in Blended Roadmap on page 251.

For DSA, if automatic registration did not perform well, disable Auto Pixel-Shift, see Auto Pixel-Shift (APS) in Blended Roadmap on page 251 section. Use an alternate fluoro mode or exit and restart blended with another vessel image.

NOTE

It is the user's responsibility to check that registration accuracy is adequate for clinical need between fluoro live and fluoro mask, otherwise Blended Roadmap may display subtraction artifacts.

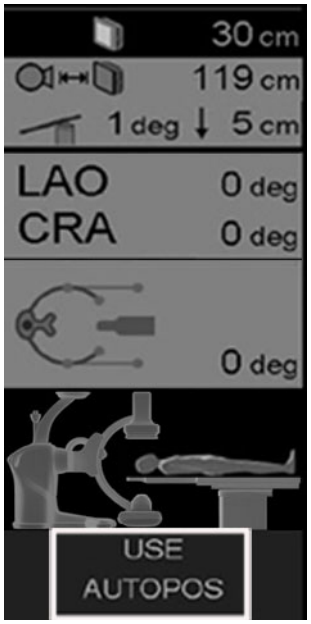
NOTE

During subtracted fluoroscopy, do not move the tabletop, the gantry, change the field of view, the fluoro level, the image flip settings, or insert or remove contour filters to avoid serious image quality degradation.

Step 5. Exit Blended Roadmap

Selecting any other Fluoro tab than Blended Roadmap or changing the protocol exits Blended Roadmap mode.

Detailed Optional Step 3. Reposition Gantry and table - if requested by the system

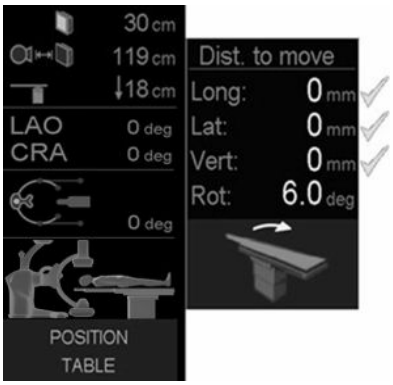


Need to reposition the system

The vessel information blended with the live fluoro acquisitions is relevant only if the live fluoro is taken from the same angulations as the vessel image. If the current system position is different from the vessel image position, the system needs to be repositioned back so that the live fluoro matches the vessel image.

- If the gantry position has changed, the system automatically triggers the Send Angle function. Press **Move** button on the Control Panel to drive the gantry back to where the vessel image was acquired.
- **(For InnovaIQ Table) (For Magnus Maquet OR Table with flat tabletop)** if the table position has changed, the system will display the activation of the Auto Positioner **Move** button to drive the table back to where the vessel image was acquired.

Move button blinking when repositioning is needed



- **(For Omega Table)** if the table position has changed, the system will automatically display the table repositioning tool. Manually adjust the axis of the table until a check mark is displayed next to all axis.

NOTE

A check mark is displayed when a range of 5 mm for longitudinal, lateral and vertical movement and 0.3 degrees for rotation is achieved. However, the closer the displayed distance to move is to 0, the more accurate the roadmap.

NOTE

For a better roadmap accuracy, preferably avoid moving the AGV.

NOTE

System repositioning for Blended Roadmap may fail, be cancelled, or induce an inaccurate roadmap, and an error message may pop up. Error messages are described in Section User messages.

10.5.3.3 Image Interpretation

Landscape and vessels level adjustment

The subtraction level can be adjusted using the **LANDSCAPE** function. Select an appropriate "Landscape" level as described in section 10.5.3.4 User Interfaces on page 254. The predefined **LANDSCAPE** values are: 0 (full subtraction), 30, 50, 70 and 100% (no subtraction).

The vessel density can be adjusted using the **VESSELS** function. Select an appropriate "Vessels" level as described in section 10.5.3.4 User Interfaces on page 254. The predefined **VESSELS** levels values are: 0 (no vessels), 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100%.

Landscape and vessel density can be changed out of fluoro. The display of percentages will be updated and will affect the next fluoro.

NOTE
During Fluoro, the landscape and vessels level can be adjusted from the Touch Panel only.

NOTE
At 100% landscape the fluoro images are not subtracted. In this case vessel image is not shown.

Auto Pixel-Shift (APS) in Blended Roadmap

The Auto Pixel-Shift (APS) function, allows reducing misregistration artifacts in Blended Roadmap mode.

APS performs a translational registration using anatomical landmarks. It is important to center bone structures in the center of the image. It is therefore recommended for Neuro and Peripherals anatomy only.

Figure 10-30 DSA acquired with centered bony structures.

APS functionality shall not be used in procedures with organ or respiratory motions as APS is not intended to correct for this type of motion. There is a risk to have remaining motion artifacts in the image. To overcome this risk, de-activate APS.

a. **APS at the start of Blended Roadmap:**

APS performs a registration between the fluoro mask and the anatomy of the vessel image when the vessel image is a DSA to avoid misregistration due to Gantry/Table repositioning inaccuracy, or to patient motion since the vessel image acquisition.

APS is applied automatically after the mask acquisition phase.

Based on the overlay of the tools and the vessels during the fluoroscopic acquisitions, if registration is not good enough, APS can be disabled using the APS button.

Figure 10-31 APS button on the DL console

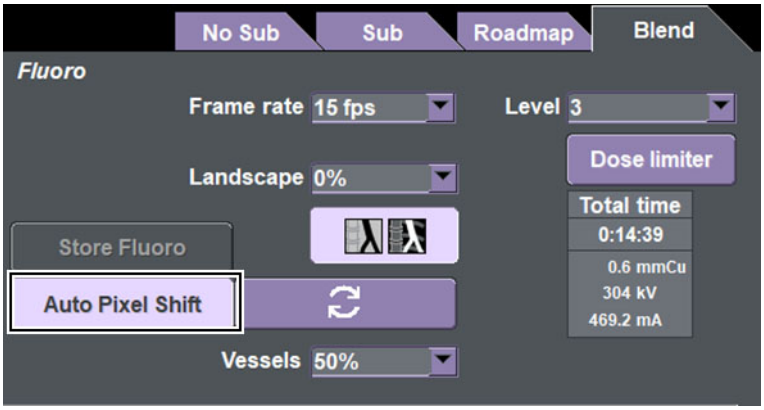
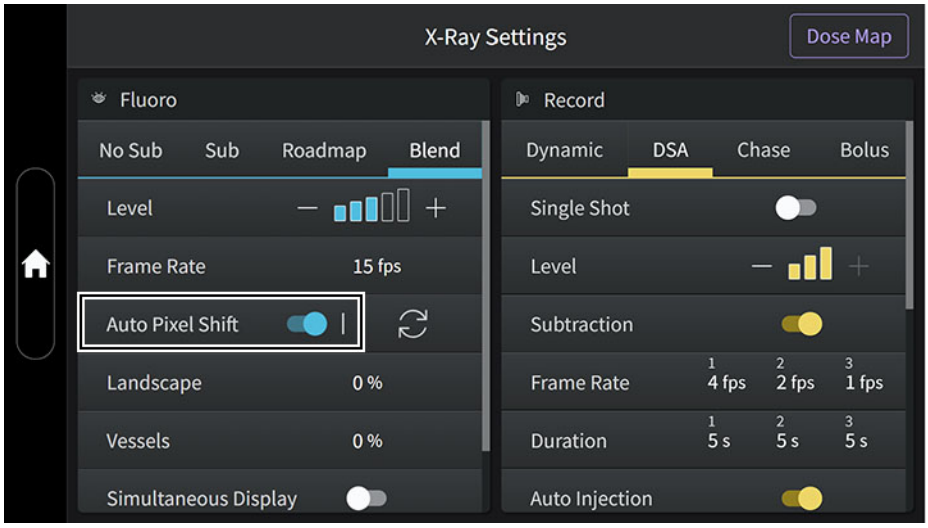


Figure 10-32 APS button on the Touch Panel

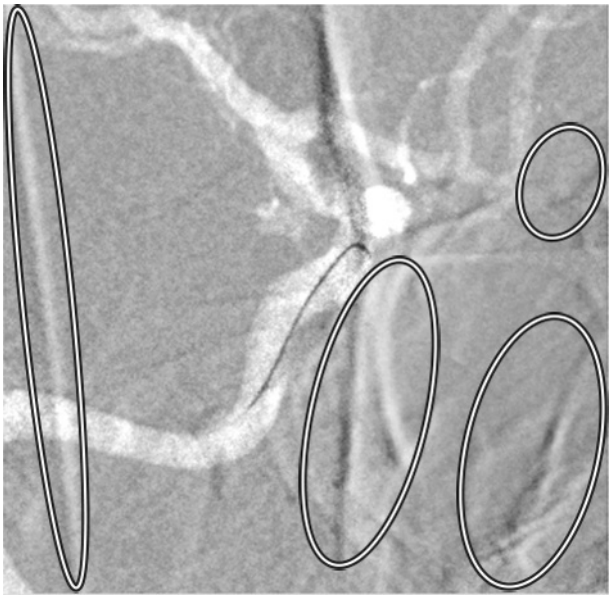


b. **APS during the fluoroscopic acquisitions in Blended Roadmap:**

APS performs an on-demand registration during fluoro acquisitions to correct potential misregistration due to patient motion since the mask creation. The registration is computed between the live fluoro and the mask fluoro.

The image below illustrates subtraction artifacts during fluoro acquisitions, which can be corrected by APS.

Figure 10-33 Subtraction artifacts due to motion during fluoro live acquisitions



APS correction works as described below:

- If APS button is selected, the computed shift will be applied to the next fluoro runs until the next refresh.
- with the APS button selected, press the Refresh APS button to compute a new shift. This updated shift will be applied to the next fluoro runs until the next refresh.

Figure 10-34 APS Refresh button on the DL console