Instructions for using HoloLens with VimedixAR™

CAE Vimedix Augmented Reality Comes Alive

Freed from its two-dimensional environment inside a monitor, our VimedixAR™ ultrasound simulator leaps to life, displaying anatomy you can enlarge, turn, rotate or command to return into its manikin body so you can view the interrelatedness of its structures. Witness in real time how the ultrasound beam cuts through the human anatomy.
Helpful Links:

- Fitting your HoloLens: https://support.microsoft.com/en-us/help/12632
- Turning your HoloLens on or off: https://support.microsoft.com/en-us/help/12642
- HoloLens lights: https://support.microsoft.com/en-us/help/28982
- Using gestures: https://support.microsoft.com/en-us/help/12644
- Start menu and finding your apps: https://support.microsoft.com/en-us/help/12638
- Spaces on HoloLens: https://support.microsoft.com/en-us/help/13760/hololens-spaces-on-hololens
- Additional instructions and references: https://support.microsoft.com/en-us/products/hololens
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Connecting and Starting the HoloLens

Connecting and starting the HoloLens is a four (4) step process that MUST be completed in the following sequence. Beginning with the router, computer, and HoloLens powered off:

1. Turn on the router

*Power on the Router*

2. Connect the network cable between the bottom port of the computer and any of the blue ports on the router

*The Ethernet Ports*

3. Turn on the computer and wait for it to boot
4. Turn on the HoloLens (the HoloLens is pre-configured to connect to the router)

*Turn on the HoloLens*
Verify the connectivity of your HoloLens to the Vimedix WIFI network by following the steps below:

1. Bloom to view the Start menu
2. Select the Settings icon in the Start menu

   ![Settings Icon]

3. Air tap the **Settings** window to anchor it in place
4. Select the **Network & Internet** icon

   ![Settings Window - Network & Internet Icon]

5. Verify that the HoloLens are connected to the Vimedix WIFI network
Environmental Anchoring

The stability of the anchoring is highly impacted by the knowledge the HoloLens has of its environment. It is important to scan your surroundings when using the HoloLens in a new room. This prevents the hologram from drifting causing the device to lose its tracking.

Prior to launching VimedixAR, walk around with the HoloLens on your head so it can map the surroundings. Microsoft suggests doing this for between 5 and 10 minutes, to look at the ceiling, the floor and other objects from all sides. This step is important so the holograms stay grounded in the world preventing the device from "getting lost". One trick is to finger tap in the air while looking around. This directs the device to return visual feedback on its spatial mapping, drawing green triangles on the surfaces it knows about.

Note: The HoloLens continuously tracks its surroundings to maintain its position in the World. Here are examples of things that can confuse the device. None of them is critical by itself but combined they can create a bad experience where the device may lose its tracking ability.

1. Windows, mirrors
2. White empty walls (posters help)
3. No furniture
4. Looking at a display monitor (ex: having a large TV in the field of view when looking at the Manikin)

Note: You may see a warning icon with the text "Poor environment for tracking! Holograms may shift in position" at the top left corner of your field of view during a VimedixAR simulation. Ensure that you are taking the environment considerations above into consideration and scan your environment with the HoloLens until the warning disappears from your field of view.
Starting a VimedixAR Simulation with Microsoft HoloLens

To start a VimedixAR simulation with the HoloLens:

1. Select the VimedixAR app in the Start menu

2. Move the VimedixAR Startup window with your gaze and air tap to anchor it in place
3. Adjust your HoloLens so that all four corners of the **FitBox** are visible

![VimedixAR Start Simulation FitBox](image)

4. Begin the simulation by air tapping or using the voice command "**Vimedix, Start Simulation**"
Ending a VimedixAR Simulation with Microsoft HoloLens

To end a VimedixAR simulation with the HoloLens:

1. Bloom to return to the Start menu
2. Select the Remove icon in the upper right corner of the VimedixAR Startup window to exit the VimedixAR simulation

Note: Air tapping the VimedixAR Startup window instead of selecting the Remove icon will resume the simulation.
VimedixAR User Interface

The VimedixAR user interface is divided into three main sections:

- Interactive Panel
- Ultrasound Panel
- Hologram Controls

Interactive Panel

The Interactive Panel is controlled by the following tabs along its left side:

- Information
- Multi-user
- Calibration
- Exercises
- Settings
- Help
Information Tab

The Interactive Panel displays the Loaded Pathology (e.g. E-FAST_Template or Normal Patient 3) and the Shared Experience Mode (e.g. Individual, Instructor or Student) when the Information tab is selected and there are no warnings to be displayed.

Note: Refer to the Warnings section of the user guide to understand and manage the warnings that can be displayed on the Interactive Panel when the Information tab is selected.
The **Interactive Panel** is displayed in all three Shared Experience Mode options when the **Multi-user** tab is selected:

- Individual
- Instructor
- Student

Please refer to the Shared Experience Modes section of the user guide for more information about each Shared Experience Mode in VimedixAR.

If your Shared Experience Mode is Individual, you can gain control over the other HoloLenses by selecting the Instructor option.

If your Shared Experience Mode is Instructor, you can release control over the other HoloLenses by selecting the Individual option.

It is not possible for a user to select the Student option. When a user becomes the Instructor, all other users will become Students in which case the Student option will automatically be selected for them and the other Shared Experience Mode options will be disabled.
Calibration Tab

The Interactive Panel displays the Status of calibration (e.g. Not Calibrated or Calibrated) and an overview of the Calibration procedure steps when the Calibration tab is selected.

The Status of calibration will be Not Calibrated during the Calibration process and Calibrated at all other times.

The Interactive Panel also provides you with the option to calibrate the position of the Hologram Manikin relative to the Physical Manikin by tag or by gaze.

Calibration by tag is started by selecting the Use Tag button at the bottom of the Interactive Panel.

Calibration by gaze is started by selecting the Use Gaze button at the bottom of the Interactive Panel.

Whether you are calibrating by tag or gaze, select the End button at the bottom of the Interactive Panel to end the calibration.

Please refer to the Calibration Procedure section of the user guide for more information about the Calibration process in VimedixAR.
Exercises Tab

The **Interactive Panel** displays two exercises when the **Exercises** tab is selected: Region Scan and Find Fluids.

![Exercises Tab - Interactive Panel](image)

If your Shared Experience Mode is Instructor, you will only have access to the Region Scan and Find Fluids exercises. To begin the setup that is required prior to starting the Region Scan or Find Fluids exercise, select the **Start** button that is directly below the description of the respective exercise in the **Interactive Panel**.

**Note:** The **Start** buttons of both exercises are disabled if your Shared Experience Mode is Individual or Student. The message "*Requires Instructor Mode*" will be visible below each button.

Please refer to the Exercises section of the user guide for more information about the exercises in VimedixAR.
Settings Tab

The **Interactive Panel** displays three options when the **Settings** tab is selected:
- IPD (interpupillary distance) Calibration to improve your visuals
- Shared Demo
- Local Demo

To calibrate your IPD, select the **Configure** button on the **Interactive Panel** and follow Cortana’s instructions. You can end the IPD Calibration prematurely with the bloom gesture, in which case your IPD will not be updated.

To start the Shared Demo, select the **Shared Demo** button on the **Interactive Panel**.

**Note:** The **Shared Demo** button is only enabled when your Shared Experience Mode is **Instructor**.

To start the Local Demo, select the **Local Demo** button on the **Interactive Panel**.

**Note:** The **Local Demo** button will only be enabled if your Shared Experience Mode is **Individual**.

Please refer to the Demo Modes section of the user guide for more information about the demo options in VimedixAR.
Help Tab

The Interactive Panel displays the most useful voice commands that are compatible with VimedixAR when the Help tab is selected.

Select the Help tab using the voice command "Vimedix, Help" or with the gaze and air tap gestures. Please refer to the Voice Commands section of the user guide for more information about when the "Vimedix, Help" voice command can be executed and by whom.

Note: All voice commands can be found in the Voice Commands section of the user guide.

Ultrasound Panel

The Ultrasound Panel displays the real-time ultrasound image.
Hologram Controls

The Hologram Controls include the following buttons along the right side of the UI:

The **Adjust Menu** button unpins the UI so that it can be dragged to another location. Once you select the **Adjust Menu** button, you are prompted to tap and hold the UI to drag it to your desired location.

**Note:** The UI will be boxed in orange when it is in your grasp and boxed in blue when it is not.

The **Adjust Menu** icon is an open lock when the UI is unpinned.

**UI Unpinned Adjust Icon**

Anchor the UI in place by air tapping the UI or selecting the **Adjust Menu** button with the gaze and air tap gestures.

The **Adjust Menu** icon will return to its closed lock configuration when the UI is anchored in place.

**UI Anchored Adjust Icon**
The **Left Cross Section** button displays a cross-sectional view of the hologram anatomy based on the position of the ultrasound beam cut plane.

The **Right Cross Section** button displays a cross-sectional view of the hologram anatomy based on the position of the ultrasound beam cut plane.

**Note:** The cross-sectional view that is displayed with the Left Cross Section button and the cross-sectional view displayed with the Right Cross Section button are on opposite sides of the probe.

The **No Cross Section** button removes the cross-sectional view of the hologram anatomy.

The **Show Layers** button* expands the different anatomical systems into layers above the Physical Manikin.

The **Raise Anatomy** button* raises the anatomy that is selected in the Structures Visibility menu on the Vimedix system above the Physical Manikin such that the anatomy is 10 cm below eye level. The **Raise Anatomy** button also unlocks the zoom and rotation voice commands and gestures.

The **Normal** button* displays the anatomy that is selected in the Structures Visibility menu on the Vimedix system at the current Calibration position of the Hologram Manikin relative to the Physical Manikin.

The **Normal** button is selected by default when your Shared Experience Mode is Student.

The **Probe Visible** button* displays/hides the virtual probe.

The **Pause Probe** button* freezes the AR and Ultrasound displays on the last scanned cycle and loops the cycle on the displays. The **Pause Probe** button is useful for analyzing cut planes.

* Button is disabled if your Shared Experience Mode is Student
Shared Experience Modes

VimedixAR supports the following three Shared Experience Modes:

- **Individual:**
  Users whose Shared Experience Mode is *Individual* can interact with the simulator independently from other *Individual* users. The Shared Demo option as well as both the Region Scan and Find Fluids exercises are disabled for *Individual* users, however the Local Demo option will be enabled.

  An *Individual* user can become an *Instructor* by selecting the Instructor option on the **Interactive Panel** under the **Multi-user** tab.

- **Instructor:**
  A user whose Shared Experience Mode is *Instructor* controls the simulation experience of the *Student(s)*. The *Instructor* can demonstrate the Region Scan and Find Fluids exercises to the *Student(s)* as well as perform a Shared Demo for them. The Local Demo option is disabled for the *Instructor*.

  An *Instructor* can become an *Individual* user by selecting the Individual option on the **Interactive Panel** under the **Multi-user** tab.

  **Note:** Only one user can be the *Instructor* at a time.

- **Student:**
  When a user becomes the *Instructor*, all other users automatically become *Students*.

  Users whose Shared Experience Mode is *Student* have limited access to the user interface of VimedixAR. For example, some of the **Hologram Controls**, both the Region Scan and Find Fluids exercises as well as both the Local and Shared Demo options will be disabled. Please refer to the Hologram Controls section of the user guide to learn which **Hologram Controls** are disabled for *Students*. However, *Students* can watch the *Instructor* perform the Region Scan and Find Fluids exercises. *Students* can also watch the *Instructor* perform a Shared Demo.

  *Students* automatically become *Individual* users when the *Instructor* becomes an *Individual* user.
Calibration Procedure

VimedixAR supports the following two methods to calibrate the position of the Hologram Manikin relative to the Physical Manikin:

- calibration by tag
- calibration by gaze

Note: Calibration by tag or gaze can always be repeated if the Physical Manikin is moved.

Regardless of your Shared Experience Mode and whether you are calibrating by tag or gaze, you have access to the Information, Calibration and Help tabs as well as the Adjust Menu button at any point during calibration; all other tabs and Hologram Controls are disabled.

Calibration by Tag

Calibration by tag is started by selecting the Use Tag button at the bottom of the Interactive Panel after selecting the Calibration tab.

Once the Use Tag button is selected, a small target sign appears at the top left corner of your field of view with the text "Place the hologram using the tag". You must then place the provided "T" tag on the table, below the right ear of the Physical Manikin with the arrow facing the head. When the HoloLens recognizes the tag, it places a holographic image of the tag on top of it, with the Hologram Manikin not far. You must then move the tag to change the position of the Hologram Manikin to match the Physical Manikin. Please refer to the Fine-Tuning Your Calibration subsection of the user guide to learn how to fine-tune your calibration.

Select the End button at the bottom of the Interactive Panel to end the calibration by tag.

Calibration by Gaze

Calibration by gaze is started by selecting the Use Gaze button at the bottom of the Interactive Panel after selecting the Calibration tab.

Once the Use Gaze button is selected, a small target sign appears at the top left corner of your field of view with the text "Air Tap to place the hologram". You must then move the Hologram Manikin with your gaze to match the position of the Physical Manikin and air tap the Hologram Manikin to anchor it in place. Please refer to the Fine-Tuning Your Calibration subsection of the user guide to learn how to fine-tune your calibration.

Select the End button at the bottom of the Interactive Panel to end the calibration by gaze.
Fine-Tuning Your Calibration

Whether you are calibrating by tag or gaze, the following voice commands will allow you to fine-tune the calibration:

<table>
<thead>
<tr>
<th>Voice Command</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vimedix, Move Lateral Left</td>
<td>Moves the Hologram Manikin one centimeter on its left</td>
</tr>
<tr>
<td>Vimedix, Move Lateral Right</td>
<td>Moves the Hologram Manikin one centimeter on its right</td>
</tr>
<tr>
<td>Vimedix, Move Anterior</td>
<td>Moves the Hologram Manikin one centimeter upward</td>
</tr>
<tr>
<td>Vimedix, Move Posterior</td>
<td>Moves the Hologram Manikin one centimeter downward</td>
</tr>
<tr>
<td>Vimedix, Move Cranial</td>
<td>Moves the Hologram Manikin one centimeter in the direction of its head</td>
</tr>
<tr>
<td>Vimedix, Move Caudal</td>
<td>Moves the Hologram Manikin one centimeter in the direction of its feet</td>
</tr>
<tr>
<td>Vimedix, Apply Stand</td>
<td>Inclines the Hologram Manikin at a 45° angle on its left side to match the inclination of the Physical Manikin when it is configured with both stands</td>
</tr>
<tr>
<td>Vimedix, Remove Stand</td>
<td>Removes the 45° inclination of the Hologram Manikin</td>
</tr>
</tbody>
</table>

You can also fine-tune the calibration with the **3D Calibration Widget**.

A small target sign appears at this point at the top left corner of your field of view with the text "Air Tap on arrow to adjust placement" if you are calibrating by gaze.

Use the gaze and air tap gestures to select the arrow controls of the **3D Calibration Widget** to move the Hologram Manikin 1 cm left, right, up, down, in the direction of its head, or in the direction of its feet.
Use the gaze and air tap gestures to select the stand control of the **3D Calibration Widget** to incline the Hologram Manikin at a 45° angle on its left side to match the inclination of the Physical Manikin when it is configured with both stands. You can remove the 45° inclination of the Hologram Manikin by selecting the **stand** icon again.
Exercises

VimedixAR supports the following two exercises:
- Region Scan
- Find Fluids

Regardless of whether you are the Instructor or a Student, you have access to the Adjust Menu, Left Cross Section, Right Cross Section, No Cross Section, Probe Visibility and Pause Probe buttons at any point during the Region Scan or Find Fluids exercise; all other tabs and Hologram Controls are disabled.

Region Scan Exercise

The objective of the Region Scan exercise is to allow a user to perform a thorough FAST (Focused Assessment with Sonography for Trauma) ultrasound examination in the shortest time possible.

The Region Scan exercise is only performed by the Instructor, and is observed by the Student(s).

Region Scan Exercise, Instructor

In the Region Scan exercise, you are expected to:
1. select the FAST protocol region(s) to be scanned
2. scan the selected region(s) with or without visual aids representing the selected region(s)
3. review the metrics and visual feedback that will be displayed in simulation once you have completed the Region Scan exercise

To begin the setup that is required prior to starting the Region Scan exercise, select the Start button that is directly below the description of the Region Scan exercise in the Interactive Panel.
The **Interactive Panel** displays the Region Scan Parameters, which include the following FAST protocol regions:

- Right Upper Quadrant
- Left Upper Quadrant
- Pelvic
- Pericardial
- Right Pleural
- Left Pleural

**Regional Scan Parameters – Interactive Panel (Instructor)**

Select one or more regions to scan. To scan all regions, select the All option above the Right Upper Quadrant option. The Region Scan Parameters also include the option to enable visual aids representing the selected region(s). Select the Show Regions option at the bottom of the **Interactive Panel** to enable these visual aids.

Select the Back button at the bottom left of the **Interactive Panel** to change exercise.

Select the Start button at the bottom right of the **Interactive Panel** when you are ready to begin, the Region Scan exercise.
The timer starts when the Region Scan exercise is started; the timer is visible in the middle of the Interactive Panel.

When you finish scanning the selected region(s), select the **Done** button at the bottom of the Interactive Panel with the gaze and air tap gestures.

The Interactive Panel then displays the Region Scan Results, which include:

- total time
- total distance traveled (cm)
- total angular movement (deg.)
- percent scanned (%)

As per the instructions near the bottom of the Interactive Panel, the Region Scan Results also include the cloud of points on the Hologram Manikin representing the percentage of a region that was successfully scanned.
Note: Green points indicate scanned areas and red points indicate non-scanned areas.

The visual aids representing the selected FAST protocol regions will also appear at this point regardless of whether you enabled them or not during the setup of the Region Scan exercise. Use your gaze to select a region to view its name and the percent scanned (%).

Select the **Dismiss** button at the bottom of the Interactive Panel to exit the Region Scan exercise.

**Note:** You can access the Region Scan Results once you have exited the Region Scan exercise.
Region Scan Exercise, Student

During the Region Scan exercise, you see the same Holograms as the Instructor, but the display on the Interactive Panel is different.

You will see the Exercise Status at the top of the Interactive Panel. The Exercise Status is based on the Instructor’s exercise progression. For example, the Exercise Status will be:

- **Setting Up** when the Instructor is setting up the Region Scan Parameters
- **In Progress** when the Instructor starts the Region Scan exercise and the latter is now in progress
- **Completed** when the Instructor completes the Region Scan exercise and he/she is now reviewing the Region Scan Results

If the Instructor enabled the visual aids representing the FAST protocol regions they selected prior to starting the exercise, you will see them on the Hologram Manikin when the Exercise Status is **In Progress**.

When the Exercise Status is **Completed**, the Interactive Panel displays the Instructor’s Region Scan Results, namely:

- total distance traveled (cm)
- total angular movement (deg.)
- percent scanned (%)

![Exercise Status Complete - Interactive Panel (Student)](image)

As per the instructions near the bottom of the Interactive Panel, the Instructor’s Region Scan Results also include the cloud of points on the Hologram Manikin representing the percentage of a region that was successfully scanned by the Instructor.

The visual aids representing the selected FAST protocol regions are visible at this point regardless of whether the Instructor enabled them or not during the setup of the Region Scan exercise. Use your gaze to select a region to view its name and the percent scanned (%).

**Note:** Green points indicate scanned areas and red points indicate non-scanned areas.
Find Fluids Exercise

The objective of the Find Fluids exercise is to allow a user to perform a FAST (Focused Assessment with Sonography for Trauma) ultrasound examination to locate free fluid in the shortest time possible.

The Find Fluids exercise is only performed by the Instructor, and is observed by the Student(s).

Find Fluids Exercise, Instructor

In the Find Fluids exercise, you are expected to:
1. select the free fluid location(s) that you would like to scan
2. scan to locate the free fluid(s) with or without visual aids representing the free fluid(s)
3. input the region(s) where you believe that free fluid is located
4. review the metrics and visual feedback that will be displayed in simulation once you have completed the Free Fluids exercise

To begin the setup that is required prior to starting the Find Fluids exercise, select the Start button that is directly below the description of the Find Fluids exercise in the Interactive Panel.

The Interactive Panel then displays the Find Fluids Parameters, which include the following free fluid locations:
- Douglas' Pouch
- Morrison's Pouch
- Pericardial Effusion
- Pleural Effusion
- Splenal Renal

The Random option at the top of the Interactive Panel is selected by default. In which case the simulator randomly selects none, one or several free fluid location(s). You can also select the Custom option.

Selecting the Custom option allows you to select one or several free fluid locations. To scan all free fluid locations, select the All option above the Douglas' Pouch option.

**Note:** Selecting none the free fluid locations is also an option.
The Find Fluids Parameters also include the option to enable visual aids representing the free fluid at the location(s) you selected. Select the Show Fluids option at the bottom of the **Interactive Panel** to enable these visual aids.

Select the **Back** button at the bottom left of the **Interactive Panel** to change exercise.

To begin the Find Fluids exercise, select the **Start** button at the bottom right of the **Interactive Panel** with the gaze and air tap gestures.

The timer starts when the Find Fluids exercise is started; the timer is visible at the top of the **Interactive Panel**.

When you finish locating the free fluid(s), select one or several of the following region(s) in which you believe free fluid is located:

- Right Upper Quadrant
- Left Upper Quadrant
- Pelvic
- Pericardial
- Pleural

Not selecting any of the regions is also an option.

Select the **Done** button at the bottom of the **Interactive Panel** with the gaze and air tap gestures to complete the Free Fluids exercise.

The **Interactive Panel** then displays the Find Fluids Results, which include:

- Total time
- Total distance traveled (cm)
- Total angular movement (deg)
A green check mark represents a correct answer and a red X represents an incorrect answer.

As per the instructions near the bottom of the Interactive Panel, the Find Fluids Results also include the cloud of points on the Hologram Manikin representing the percentage of a region that was successfully scanned.

**Note:** Green points indicate scanned areas and red points indicate non-scanned areas.

The visual aids representing the free fluid at the locations you selected also appear regardless of whether you enabled them or not during the setup of the Find Fluids exercise.

Select the **Dismiss** button at the bottom of the Interactive Panel to exit the Find Fluids exercise.

**Note:** You will not be able to access the Find Fluids Results once you have exited the Find Fluids exercise.
Find Fluids Exercise, Student

During the Find Fluids exercise, you see the same Holograms as the Instructor. However, the display on the Interactive Panel is different.

You will see the Exercise Status at the top of the Interactive Panel. The Exercise Status is based on the Instructor’s exercise progression. For example, the Exercise Status will be:

- **Setting Up** when the Instructor is setting up the Find Fluids Parameters
- **In Progress** when the Instructor starts the Find Fluids exercise and the latter is now in progress
- **Completed** when the Instructor completes the Find Fluids exercise and he/she is now reviewing the Find Fluids Results

If the Instructor enabled the visual aids representing the free fluid in the regions they selected prior to starting the exercise, you will see them on the Hologram Manikin when the Exercise Status is *In Progress*.

When the Exercise Status is *Completed*, the Interactive Panel displays the Instructor’s Find Fluids Results, namely:

- Total distance traveled (cm)
- Total angular movement (deg.)
- Affected region(s)

![Region Scan Exercise](image)

**Exercise Status is Completed – Interactive Panel (Student)**

As per the instructions near the bottom of the Interactive Panel, the Instructor’s Find Fluids Results also include the cloud of points on the Hologram Manikin representing the percentage of a region that was successfully scanned by the Instructor.

**Note:** Green points indicate scanned areas and red points indicate non-scanned areas.

The visual aids representing the free fluid in the selected regions are visible regardless of whether the Instructor enabled them or not during the setup of the Find Fluids exercise.
Demo Modes

VimedixAR supports the following two Demo Modes:

- Shared Demo
- Local Demo

Regardless of whether you are the Instructor or the Student, all tabs and Hologram Controls are disabled during both the Shared Demo and Local Demo.

Shared Demo

The Shared Demo option is only enabled if a user’s Shared Experience Mode is Instructor and they are connected to Vimedix.

The Shared Demo gives the Instructor the opportunity to demo the features of VimedixAR.

To start a Shared Demo, the Instructor must select the Shared Demo button on the Interactive Panel under the Settings tab.

Once a Shared Demo is started, a FitBox appears in the field of view of the Instructor and the Student(s). It is important that the HoloLens are adjusted so that each user sees the four corners of the FitBox.

The FitBox disappears from each user’s field of view when the Instructor selects any of the Shared Demo options below excluding the FitBox option.
The following demo items will appear on the **Interactive Panel** during the Shared Demo:

<table>
<thead>
<tr>
<th>Demo Item</th>
<th>Voice Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FitBox</td>
<td>Vimedix, Step 1</td>
<td>Displays the FitBox in the field of view of the Instructor and Student(s).</td>
</tr>
<tr>
<td>Anatomy</td>
<td>Vimedix, Step 2</td>
<td>Displays the anatomy that is selected in the Structures Visibility menu on the Vimedix system; the anatomy will be located at the Calibration position of the Hologram Manikin relative to the Physical Manikin.</td>
</tr>
<tr>
<td>Show layers</td>
<td>Vimedix, Step 3</td>
<td>Expands the different anatomical systems into layers above the Physical Manikin.</td>
</tr>
<tr>
<td>Isolate heart</td>
<td>Vimedix, Step 4</td>
<td>Raises the heart and the circulatory system above the Physical Manikin if they are selected in the Structures Visibility menu on the Vimedix system. The Isolate heart option also unlocks the zoom and rotation gestures for the Instructor.</td>
</tr>
<tr>
<td>Cut Plane</td>
<td>Vimedix, Step 5</td>
<td>Displays a cross-sectional view of the anatomy based on the position of the ultrasound beam cut plane. The ultrasound image is not displayed on the ultrasound beam cut plane; only the Ultrasound Panel displays the ultrasound image. <strong>Note:</strong> Only the anatomy that is selected in the Structures Visibility menu on the Vimedix system is visible when the Cut Plane option is selected.</td>
</tr>
<tr>
<td>Cut Plane Ultrasound</td>
<td>Vimedix, Step 6</td>
<td>Displays a cross-sectional view of the anatomy based on the position of the ultrasound beam cut plane. Both the Ultrasound Panel and the ultrasound beam cut plane will display the ultrasound image. <strong>Note:</strong> Only the anatomy that is selected in the Structures Visibility menu on the Vimedix system is visible when the Cut Plane Ultrasound option is selected.</td>
</tr>
</tbody>
</table>
| Region Highlight | Vimedix, Step 7 | Displays a hologram of each of the following FAST protocol regions regardless of the anatomy that is selected in the Structures Visibility menu on the Vimedix system:  
  - Right Upper Quadrant  
  - Left Upper Quadrant  
  - Pelvic  
  - Pericardial  
  - Right Pleural  
  - Left Pleural  |
| Fluids Highlight | Vimedix, Step 8 | Displays a hologram of the free fluid in each the following free fluid locations regardless of the anatomy that is selected in the Structures Visibility menu on the Vimedix system:  
  - Douglas’ Pouch  
  - Morrison’s Pouch  
  - Pericardial Effusion  
  - Pleural Effusion  
  - Splenal Renal  |
| Show Menu     | Vimedix, Step 9 | Displays the UI in the field of view of the Student(s).                                                                                                                                                    |
Note: Only the Instructor can select each item with the gaze and air tap gestures or with the voice commands listed in the table above.

The Instructor selects the Exit button at the bottom of the Interactive Panel to exit the Shared Demo.
Local Demo

The Local Demo option is only enabled for users whose Shared Experience Mode is *Individual* and who may or may not be connected to Vimedix. The Local Demo gives *Individual* users the opportunity to become acquainted with some of the features of VimedixAR even when they are not connected to Vimedix.

**Note:** Before starting a Local Demo, make sure that your Shared Experience Mode is *Individual*.

To start a Local Demo, select the **Local Demo** button on the **Interactive Panel** under the **Settings** tab.

Once a Local Demo is started, a FitBox appears in your field of view; this is the same FitBox that appears in a Shared Demo. It is important that the HoloLens are adjusted so that you can see the four corners of the FitBox. The FitBox disappears from your field of view when you select any of the Local Demo options below excluding the **FitBox** demo item. The following demo items appear on your **Interactive Panel** during a Local Demo.

**Note:** The anatomy in the Local Demo is preloaded. This means that you cannot change the visibility of the different anatomical structures using the Structures Visibility menu in Vimedix even if you are connected to Vimedix.

<table>
<thead>
<tr>
<th>Demo Item</th>
<th>Voice Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FitBox</td>
<td>Vimedix, Step 1</td>
<td>Displays the FitBox in your field of view.</td>
</tr>
<tr>
<td>Anatomy</td>
<td>Vimedix, Step 2</td>
<td>Displays the preloaded anatomy at the Calibration position of the Hologram Manikin relative to the Physical Manikin.</td>
</tr>
<tr>
<td>Show layers</td>
<td>Vimedix, Step 3</td>
<td>Expands the different anatomical systems into layers above the Physical Manikin.</td>
</tr>
<tr>
<td>Isolate heart</td>
<td>Vimedix, Step 4</td>
<td>Raises the heart and the circulatory system above the Physical Manikin. The <strong>Isolate heart</strong> option also unlocks the zoom and rotation gestures.</td>
</tr>
<tr>
<td>Cut Plane</td>
<td>Vimedix, Step 5</td>
<td>Displays the cross-sectional view of the preloaded anatomy based on the position of the ultrasound beam cut plane along its preloaded trajectory; note that this is an animation. Both the <strong>Ultrasound Panel</strong> and the ultrasound beam cut plane will display the ultrasound image.</td>
</tr>
</tbody>
</table>
| Ultrasound     |               | Displays a hologram of each of the following FAST protocol regions throughout the preloaded anatomy:  
• Right Upper Quadrant  
• Left Upper Quadrant  
• Pelvic  
• Pericardial  
• Right Pleural  
• Left Pleural |
| Region Highlight| Vimedix, Step 6 | Displays a hologram of the free fluid in each the following free fluid locations throughout the preloaded anatomy:  
• Douglas' Pouch  
• Morrison's Pouch  
• Pericardial Effusion  
• Pleural Effusion  
• Splenal Renal |
Demo items are selected with the gaze and air tap gestures or with the voice commands listed in the table above. To exit the Local Demo, select the **Exit** button at the bottom of the **Interactive Panel**.
Instructions for using HoloLens with VimedixAR™

Zoom and Rotation Gestures

For all zoom and rotation gestures below, ensure that your index and thumb are visible by the HoloLens camera. 

**Note:** The tap and hold gesture is described at the following link: [https://support.microsoft.com/en-ca/help/12644/hololens-use-gestures](https://support.microsoft.com/en-ca/help/12644/hololens-use-gestures)

Zoom Gestures:
- **Zoom IN:** Tap and hold, then slowly move your hand towards you
- **Zoom OUT:** Tap and hold, then slowly move your hand away from you

Rotation Gestures:
- **Rotate CLOCKWISE:** Tap and hold, then slowly move your hand towards the left
- **Rotate COUNTERCLOCKWISE:** Tap and hold, then slowly move your hand towards the right

Please refer to the Hologram Controls, Shared Demo and Local Demo subsections of the user guide to learn when these zoom and rotation gestures are unlocked during a VimedixAR simulation.

Voice Commands

Each voice command begins by summoning *Vimedix*, then listening for a beep. For example, the command “Start Simulation” would be issued by summoning “Vimedix” listening for the beep then requesting “Start Simulation”. If a command is not issued within five (5) seconds a second beep is heard indicating that the HoloLens has exited Voice Command Mode. To issue a voice command the user must re-summon Vimedix.

The following is a comprehensive list of when each voice command can be executed and by whom.

**Note:** Each voice command can be executed by all users regardless of their Shared Experience Mode unless stated otherwise.
Instructions for using HoloLens with VimedixAR™

**FitBox (prior to starting VimedixAR simulation)**
- Start Simulation

**Simulation**
- Activate Cross Section
- Remove Cross Section
- Invert Cross Section
- Show Menu
- Hide Menu
- Face Me
- Help

**Individual / Instructor only:**
- Show Probe
- Hide Probe
- Probe Pause
- Probe Play
- Expand Layers
- Collapse Layers
- Raise Anatomy
- Reset Anatomy
- Rotate Clockwise*
- Rotate Counterclockwise*
- Increase Zoom*
- Decrease Zoom*

*voice command can only be executed when the anatomy is raised

**Calibration**
- Move Lateral Left
- Move Lateral Right
- Move Anterior
- Move Posterior
- Move Cranial
- Move Caudal
- Apply Stand
- Remove Stand
- Show Menu
- Hide Menu
- Face Me
- Help

**Region Scan or Find Fluids Exercise**
- Activate Cross Section
- Remove Cross Section
- Invert Cross Section
- Show Menu
- Hide Menu
- Face Me

**Instructor only:**
- Show Probe
- Hide Probe
- Probe Play
- Probe Pause

**Shared Demo**

*Instructor only:*
- Step (1, 2, 3, 4, ... 9)
- Show Menu
- Hide Menu
- Face Me

**Local Demo**

*Individual only:*
- Step (1, 2, 3, 4, ... 7)
- Show Menu
- Hide Menu
- Face Me
Refer to the table below for a description of each voice command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>Options</th>
<th>Command Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Simulation</td>
<td>Initiates a VimedixAR Simulation.</td>
<td></td>
<td>Start Simulation</td>
</tr>
<tr>
<td>Face Me</td>
<td>Moves the UI such that it is in your field of vision. The warning message &quot;Menu is far away! Say Vimedix: Face me to center menu&quot; will appear in the top left corner of your field of view if you are far from the UI.</td>
<td></td>
<td>Menu Configuration</td>
</tr>
<tr>
<td>Hide Menu</td>
<td>Hides the UI.</td>
<td></td>
<td>Menu Configuration</td>
</tr>
<tr>
<td>Show Menu</td>
<td>Displays the UI. Note that this voice command will only take effect if the &quot;Vimedix, Hide Menu&quot; voice command was used beforehand; it should not be confused with the &quot;Vimedix, Face Me&quot; voice command.</td>
<td></td>
<td>Menu Configuration</td>
</tr>
<tr>
<td>Help</td>
<td>Configures the Interactive Panel to display the contents of the Help tab.</td>
<td></td>
<td>Menu Configuration</td>
</tr>
<tr>
<td>Move Lateral Left</td>
<td>Moves the Hologram Manikin laterally 1 cm to the left relative to the Physical Manikin.</td>
<td></td>
<td>Calibration</td>
</tr>
<tr>
<td>Move Lateral Right</td>
<td>Moves the Hologram Manikin laterally 1 cm to the right relative to the Physical Manikin.</td>
<td></td>
<td>Calibration</td>
</tr>
<tr>
<td>Move Anterior</td>
<td>Moves the Hologram Manikin 1 cm upward relative to the Physical Manikin.</td>
<td></td>
<td>Calibration</td>
</tr>
<tr>
<td>Move Posterior</td>
<td>Moves the Hologram Manikin 1 cm downward relative to the Physical Manikin.</td>
<td></td>
<td>Calibration</td>
</tr>
<tr>
<td>Move Cranial</td>
<td>Moves the Hologram Manikin 1 cm in the direction of the head relative to the Physical Manikin.</td>
<td></td>
<td>Calibration</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
<td>Options</td>
<td>Command Type</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Move Caudal</td>
<td>Moves the Hologram Manikin 1cm in the direction of the feet relative to the Physical Manikin.</td>
<td></td>
<td>Calibration</td>
</tr>
<tr>
<td>Apply Stand</td>
<td>Inclines the Hologram Manikin at a 45° angle on its left side to match the inclination of the Physical Manikin when it is configured with both stands.</td>
<td></td>
<td>Calibration</td>
</tr>
<tr>
<td>Remove Stand</td>
<td>Removes the 45° inclination of the Hologram Manikin.</td>
<td></td>
<td>Calibration</td>
</tr>
<tr>
<td>Activate Cross Section</td>
<td>Displays a cross-sectional view of the hologram anatomy based on the position of the ultrasound beam cut plane.</td>
<td></td>
<td>Probe / Beam Configuration</td>
</tr>
<tr>
<td>Invert Cross Section</td>
<td>Inverts the cross-sectional view of the hologram anatomy based on the position of the ultrasound beam cut plane.</td>
<td></td>
<td>Probe / Beam Configuration</td>
</tr>
<tr>
<td>Remove Cross Section</td>
<td>Removes the cross-sectional view of the hologram anatomy.</td>
<td></td>
<td>Probe / Beam Configuration</td>
</tr>
<tr>
<td>Probe Pause</td>
<td>Freezes the AR and Ultrasound displays on the last scanned cycle and loops the cycle on the displays. This is useful for analyzing cut planes.</td>
<td></td>
<td>Probe / Beam Configuration</td>
</tr>
<tr>
<td>Probe Play</td>
<td>Unfreezes the AR and Ultrasound displays.</td>
<td></td>
<td>Probe / Beam Configuration</td>
</tr>
<tr>
<td>Show Probe</td>
<td>Displays the virtual probe.</td>
<td></td>
<td>Probe Configuration</td>
</tr>
<tr>
<td>Hide Probe</td>
<td>Hides the virtual probe.</td>
<td></td>
<td>Probe Configuration</td>
</tr>
<tr>
<td>Raise Anatomy</td>
<td>Raises the currently visible anatomy above the Physical Manikin and enables view adjustments. Visible anatomy can be specified using the structures visibility menu on the Vimedix system.</td>
<td>Rotate Clockwise Rotate Counterclockwise Increase Zoom Decrease Zoom</td>
<td>Anatomy Configuration</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
<td>Options</td>
<td>Command Type</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Reset Anatomy</td>
<td>Resets the currently raised anatomy layer to the current Calibration position of the Hologram Manikin relative to the Physical Manikin.</td>
<td></td>
<td>Anatomy Configuration</td>
</tr>
<tr>
<td>Expand Layers</td>
<td>Expands the different anatomical systems into layers above the Physical Manikin.</td>
<td></td>
<td>Anatomy Configuration</td>
</tr>
<tr>
<td>Collapse Layers</td>
<td>Collapses the layers of the different anatomical systems, but configures the collapsed anatomy based on your settings in the Structures Visibility menu in Vimedix.</td>
<td></td>
<td>Anatomy Configuration</td>
</tr>
<tr>
<td>Step (1, 2, 3, 4, ... 9)</td>
<td>Selects a demo item to be executed during a Shared Demo or Local Demo. Please refer to the table in the Shared Demo and Local Demo sections of the user guide for more information.</td>
<td></td>
<td>Demo Configuration</td>
</tr>
</tbody>
</table>
Warnings

Warnings are displayed on the Interactive Panel under the Information tab.

If the Information tab is not selected when a warning is being displayed, a warning icon appears to the left of the Information tab to prompt you to select the latter and view the warning.

![Warning Icon]

If the UI is not in your field of view when a warning is being displayed, the warning icon appears at the top left corner of your field of view with the text "Warning! See more menu for more info".

You may encounter the following warnings in a VimedixAR simulation:

<table>
<thead>
<tr>
<th>Warning</th>
<th>Resolution</th>
</tr>
</thead>
</table>
| Could not connect to Vimedix | Potential problems and their solution:  
  - Vimedix is not connected to the router via the network cable or the connection was not done correctly. Refer to the Connecting and Starting the Microsoft HoloLens section of the user guide for more information on how to connect Vimedix to the router via the network cable.  
  - The HoloLens are not connected to the Vimedix WIFI network. Refer to the Connecting and Starting the Microsoft HoloLens section of the user guide for more information on how to verify this connection.  
  - Your current version of Vimedix is not compatible with your current version of VimedixAR. Validate that both Vimedix and VimedixAR are up to date.  
  - The Augmented Reality Module is not installed in Vimedix. Check to see if this is indeed the case by following the steps below:  
    1. Select the Help icon in Vimedix  
    2. Select the Access tab  
    3. Look for the Augmented Reality Module under the Feature Subscription section. If you see the Augmented Reality Module, then it is installed in Vimedix. If you do not see the Augmented Reality Module, contact Customer Service. |
| Pathology in Vimedix is not supported by VimedixAR | The pathology that is currently loaded in Vimedix is not supported by VimedixAR. Load one of the following pathologies that are supported by VimedixAR in Vimedix:  
  - Normal Patient 3  
  - E-FAST_Template  
If these pathologies are not available in Vimedix, contact Customer Service. |
| Pathology is loading ... | Pathology is loading in Vimedix. Note that the loading process may take a few seconds. |
| No pathology loaded | This warning message will appear when Vimedix is turning ON or OFF. When Vimedix is running, make sure to load one of the following pathologies that are supported by VimedixAR in Vimedix:
  • Normal Patient 3
  • E-FAST_Template
If these pathologies are not available in Vimedix, contact Customer Service. |
Microsoft HoloLens Account

At the time of its manufacture, the HoloLens is bound to a Microsoft account. The format of the email account address is: “vmdx####@outlook.com” where “####” is the serial number of the VimedixAR unit. The password for the account is: “CAEadmin” and SHOULD NOT be changed.

Should the HoloLens require validation it is this account information that will be used.

Software Updates

Whenever a software update for VimedixAR is released during the warrantee period you will be notified via email, phone, or standard mail. It is important to note that the VimedixAR application does not update automatically. Please follow the steps below to update the VimedixAR application. Before checking for VimedixAR updates, ensure that you are connected to a WIFI network with internet capabilities.

Updating VimedixAR

The VimedixAR application does not update automatically. Please follow the steps below to update the VimedixAR application.

Before checking for VimedixAR updates, ensure that you are connected to a WIFI network with internet capabilities.
Establishing a Network Connection

1. Bloom to show the Start menu
2. Select the Settings icon

3. Air tap the Settings window to anchor it in place
4. Select the Network & Internet icon

5. Connect to a WIFI network with internet capabilities. If required, enter the password for the network.
   **Note:** Use care when selecting characters on the virtual keyboard.

Once the connection is made, proceed with checking for VimedixAR updates.
Checking for VimedixAR Updates

1. Bloom to show the Start menu
2. Select the Store icon

![Store Icon]

3. Air tap the Store window to anchor it in place
4. Select the User icon to the left of the search bar

![User Icon]

1. Select the Downloads and updates option
2. Select the Check for updates button
   
   **Note:** it may take a few minutes for the available updates to be displayed.

![Check for Updates]

If the VimedixAR application is in the Available updates section, an update is available for your application and you can proceed with the update.
Updating VimedixAR

1. Select the VimedixAR application in the Available updates section
2. Select the Update button
   
   Note: The update may take a few minutes to complete.

Caution: You may be presented with many applications available for installation. CAE recommends updating any available Vimedix, Microsoft Store and Windows updates. Do Not select any other updates or install new Apps without first consulting CAE Customer Service to verify that these will not interfere with VimedixAR functionality.

Reestablish Vimedix Network

1. Close all open windows by air tapping on the Remove icon.
2. Bloom to show the Start menu
3. Select the Settings icon
4. Air tap the Settings window to anchor it in place
5. Select the Network & Internet icon
6. Locate and connect to your Vimedix by air tapping on its name and then select Continue

   Note: You may be required, enter a password for the network. Use care when selecting characters on the virtual keyboard. The Vimedix network password is "caeadmin".
7. Air tap on the Remove icon to close all open windows

The update is complete.

To launch the updated version of VimedixAR, Bloom to show the Start menu then select the CAE Vimedix icon.
For more information about CAE Healthcare products, contact your regional sales manager or the CAE Healthcare distributor in your country, or visit caehealthcare.com. Tel +1 941-377-5562 or 866-233-6384

For customer service, please contact CAE Healthcare.

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