Equal-i DX Dual Camera Module and 2S Image Processor with Polycom Videoconferencing Codecs

Version 1.1
Created by Array Telepresence
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About this guide

The Partner Solutions Guide describes how a partner solution and Polycom combine to solve specific customer needs.

The Polycom Partner Solutions Guide for integration with Array Telepresence’s Equal-i Technology is for administrators who need to integrate Polycom videoconferencing end-points with Array Telepresence’s DX Dual Camera Module and 2S Image Processor to enable life size, immersive telepresence using dual screens.

Please read the Polycom and Array Telepresence documentation before installing or operate the system.
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Overview

High-quality, cost effective immersive telepresence

Array Telepresence’s Equal-i Technology enables immersive telepresence in standard conference rooms using Polycom videoconferencing codecs. The company’s revolutionary cameras and image processing system dramatically improves the scene before handing it to the codec. Farthest participants are brought “Up Close and Personal” with the ability to transmit dual screen immersive images using a single Group Series Codec. Equal-i Technology also creates an improved dual-screen view of the remote scene, allowing a single site technology upgrade to significantly enhance the experience of both sites. The solution makes it cost-effective to upgrade dozens, hundreds, or even thousands of videoconferencing rooms to immersive telepresence.

Creates an Equalization of Images

The biggest challenge of group videoconferencing systems – the elongated table – is remedied by Equal-i’s ability to bring the furthest participants up close and personal. Globally, there are two million video conferencing rooms that deal with this “bowling alley effect”. With Equal-i technology, executives at the head of the table are brought forward at life-size scale, with perfect vertical eye-line and enhanced resolution, in a format that feels as though the meeting were just across the table rather than at the far end of another room.

Operates on a Single Codec

Equal-i provides dual screen HD video capability operating over a single codec, creating a wide-format dual screen immersive view. Using a Polycom codec with a 1080p content channel (RealPresence Group 310, 500, or 700) the Array Image Processor can send its dual-screen immersive experience to virtually any dual screen equipped remote site using the data channel to send the 2nd screen of immersive video, allowing the experience on the remote site to be upgraded, at no cost to them, to an immersive experience.

Polycom Videoconferencing Codecs

The Array DX Camera Module and 2S Image Processor are well complemented by a number of Polycom videoconferencing codecs capable of 1080p which enables our Immersive Everywhere capability to send our dual screen immersive scene to other dual-screen systems with a 1080p data channel capability. Array’s Equal-I technology is compatible with the following Polycom Codecs:

- **RealPresence Group 310 Series codec** (with dual display and 1080p license)
- **RealPresence Group 500 Series codec** (with 1080p license)
- **RealPresence Group 700 Series codec**
Figure 1 – The Array DX Camera Module is concealed between dual-displays at perfect vertical eye-line while the Image Processor sits between the camera and the codec.

Figure 2 – The image improvement between Equal-i and a Pan-Tilt-Zoom camera. This is scene expected in Equal-i to Equal-i scenarios where we are sending both screens over the video channel in a single stream before breaking them out in the far side 2S Image Processor before sending to the displays and also the view received when using our Immersive Everywhere capability which sends the 2nd screen over the codec’s 1080p data channel to sites that don’t yet have Equal-i.
Figure 3 – **Video+Content** – In this operating mode we are sending a single-screen view to be able to share content and improve the experience when calling into MCUs, VMRs, or with desktop clients like RealPresence Desktop or Skype4Business.

Figure 4 – **Immersive PTZ** – This capability improves the scene coming from video systems using a Pan-Tilt-Zoom camera that don’t have Equal-i. Because the 2S Image Processor sits between the codec and the displays we can catch the incoming scene off the codec, apply image improvement and Equal-i-ization.
and scale the scene over dual displays, centering the scene (vs. looking left) and improving what is being received while simultaneously improving what is being sent.

**Equal-i System Implementation**

**Design Considerations**

When considering an installation of an Equal-i System into a videoconferencing environment, there are several considerations that should be taken into account:

- **Shape and size of the table**
  The length, width and shape of the table will be a determining factor in which Equalization Map is utilized with the Equal-i Image Processor. It will also be a determining factor in the qualification for utilization of Equal-i Technology. Check out Room and Table Layout Recommendations Here: [https://arraytelepresence.com/download/Array_Room_Layouts.pdf](https://arraytelepresence.com/download/Array_Room_Layouts.pdf)

- **Hardware or software codec implementation**
  The Equal-i System has been tested to work optimally with the Group 500 and 700 series codecs, however alternative codecs may be able to be used in their stead. Doing so may limit the functionality and framing mode capability of the Equal-i system.

- **Power**
  The Equal-i Image processor is powered by a 12V 5A power supply, connected to either 100-240V, 50-60Hz power. The camera module connects to the Image Processor and is able to draw power directly from it over the attached HDMI cable.

- **Communication**
  The Equal-i System is able to communicate over the network via an Ethernet cable. It utilized full-duplex 100Mbps communication over a Telnet or SSH connection. There are internal APIs that can be controlled through command-line or the utilization of Control apps (provided, Windows & Android) or control systems (ie. Crestron, AMX, etc). Find an overview on Control Here: [https://arraytelepresence.com/resources/control-applications/](https://arraytelepresence.com/resources/control-applications/)

- **HDMI Content Switching**
  It is recommended to have the ability to connect the Codec 2 port of the Image Processor to an HDMI switch that can also then have content input. This allows participants to easily switch between sending dual screen immersive or Equal-i’s single screen Video+Content to share data.
Installation

Initial Setup
Initial setup is defined as the setup of the Image Processor, connecting the Image Processor to the network, installation of the Equal-i Control App, mounting and alignment of the camera. Follow the steps below, in order, to complete initial setup. Note that not all steps are permanent for final integration, however are necessary for alignment of the fixed cameras.

Before Initial Setup begins, please send an email to support@arraytelepresence.com with the following specifications to ensure that your room environment will be compatible:

- Completed Installation Certification Site Survey (found in Appendix D) of the Installation Guide
  - Room dimensions
  - Table dimensions
  - Display size and height from floor
  - Distance from the displays to the edge of the table
  - Distance from the walls to the table

Equal-i 2S Image Processor

⚠️ WARNING: Be sure that the Image Processor is unplugged when connecting/disconnecting camera cables

1. Place the Image Processor in a location that is close to both a power receptacle and within range of the displays such that the high speed camera cables are able to reach.

   **Note:** A Wall Mount Bracket (P/N: AEXX-PWK1) is included with the Equal-i Image Processor to allow for mounting directly to the wall behind or next to the displays.

2. Attach one end of an Ethernet cable to the Image Processor. The other end should be connected to a Windows PC.

3. Connect the power cord/adapter to the Image Processor

4. After approximately 15 seconds the Image Processor should be connected to your PC. The default settings are:

   - Static IP: Enabled
   - IP Address: 192.168.1.234
   - Subnet Mask: 255.255.255.0
   - Default Gateway: 192.168.1.1
   - Device Name: ArrayEquali.

Windows Equal-i Control App

With the Windows Equal-i Control Application, Professional A/V integrators are able to set up the Image Processor for use on company networks as well as configure the camera settings.

The network settings include:

- Static IP – allows for the network to assign IP, Subnet and Gateway addresses
DHCP – allows for the manual assignment of IP, Subnet and Gateway addresses
Beacon Name – When discovering the Image Processor via the Conference Room selector within the Control Application, this is the name by which it can be found.
MAC Address – displays the mac address of the Ethernet chip

Each camera of the DX Dual Camera Module is controlled independently. These settings include:

- Color Saturation – allows for adjustment to the intensity of color displayed
- White Balance – adjusts the image for more natural colors
- Gain – works in tandem with Brightness Control to adjust the amount of light in the image
- Brightness – works in tandem with Gain to adjust the amount of light in the image
- Gamma – adjusts the gamma higher or lower based on the requirements of the room
- X/Y Axis Fine Adjustment – allows for slight horizontal and vertical adjustments to the image

User Interface
The User Interface is simple, in that the end user will only need to access the ON/OFF button, the Remote and Local Site Framing Options, and the Conference Room Selector. It is recommended that the system be deployed with a Control Panel. Array has modules for both Crestron and AMX available on their website, and publishes the API commands in the Installation Guide. Alternatively, end users may use a Windows or Android Equal-i Control application for device control.

Windows Equal-i Control App Download
Take the following steps to download the Equal-i Control App to your Windows 7 (or higher) PC:

1. Make sure your PC is connected to your Wi-Fi network
3. Launch the Equal-i Control App
   Once the app is launched, you will be on the Home screen. From here you can access the Conference Room selector at the top, the Main Menu in the top left, or the Sending/Receiving framing options at the bottom.

Connecting to the Equal-i Image Processor
Take the following steps to connect to the Image Processor in the room

1. Once the Equal-i Control App has been launched, click on the Conference Room selector at the top. All available Image Processors on the network will be found and selectable through this menu.
2. Select the Image Processor to which you would like to connect. The factory default name of the Image Processor is ArrayEquali.
   **Note:** If you are unable to detect the Image Processor in the list, ensure that it is connected to the network switch and powered on. In order for the Image Processor to be automatically displayed in the list, it MUST exist on the same network to which the Equal-i Control App is connected. If it is not on same network/subnetwork as the Windows PC, you can manually add the IP Address of the Image Processor. Alternatively, see Section 4.2.4 for manual network configuration.
3. Once selection is made, you will be taken back to the app Home screen.
Settings Menu
Take the following steps to access the Settings Menu of the Equal-i Control App:

1. Click on the **Menu** icon at the top left of the app home screen
2. Select **Settings**
3. Access the Settings screen by entering the password: **ATEQi2S!**
   **Note:** This password can be changed in the Admin menu.
4. The default tab within the Settings Menu is **LAN**. From here you can configure the Ethernet settings of the Image Processor.
5. Click the **Save** button once the network settings have been configured. In order to make the settings go into effect, the Image Processor must be rebooted. You can do this by clicking on the **Back** button in the top left of the screen, then choosing **Menu > Reboot**.
   **Note:** It will take approximately 10-15 seconds for the Image Processor to reboot.
6. If your network settings were adjusted, go into the **Conference Room** menu to re-select your Image Processor.

Manual Network Configuration
In the event that the **Equal-i Control App** is unable to connect to the Image Processor through the company network, you can connect directly to it with a laptop. Follow the below steps to connect with a Windows-based computer and alter the network settings:

1. Open the **Network and Sharing Center** from within Control Panel
2. Click on **Change Adapter Settings** in the top right of the Network and Sharing Center
3. Right-click on the Ethernet adapter and choose **Properties**
5. Configure with the following settings:
   - **IP Address:** 192.168.1.10
   - **Subnet Mask:** 255.255.255.0
   - **Default Gateway:** 192.168.1.1
   **Note:** DNS information is not required
6. Click **OK**
7. Launch a telnet client (i.e. Windows, PuTTY, TeraTerm, etc)
8. Configure the telnet client to connect with the following telnet IP & Port:
   - **IP:** 192.168.1.234
   - **Port:** 2000
9. Once connected, you will be prompted for a password. The factory default password is: **ATEquali**
   **Note:** For security purposes, the default password is able to be changed. Please refer to the Telnet Command Appendix for further information.
10. You can use the below commands to alter the network IP address of the Image Processor. When the session is complete, the telnet session can be closed – no further action is required.

- **:LANIPADDR=<IP address value>**
  This command sets the IP address of the wired Ethernet port on the Image Processor. The IP address must be an IPv4 address formatted in the xxx.xxx.xxx.xxx format. A valid IP address must be specified. The new IP address will not have any effect on the current session’s LAN configuration. In order for the change to take effect two things must occur: 1) the user LAN configuration must be saved with the :SAVELAN! command, and 2) the Image Processor must be rebooted manually or with the :RESET! command.

<table>
<thead>
<tr>
<th>IP Address Value</th>
<th>Must be specified in xxx.xxx.xxx.xxx format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read value</td>
<td>:LANIPADDR? &lt;cr&gt;</td>
</tr>
<tr>
<td>Write value</td>
<td>:LANIPADDR= &lt;new value&gt; &lt;cr&gt;</td>
</tr>
</tbody>
</table>

- **:LANIPMASK=<Subnet Mask Value>**
  This command sets the IP address mask of the wired Ethernet port on the Image Processor. The IP mask must be an IPv4 mask formatted in the xxx.xxx.xxx.xxx format. A valid IP mask must be specified. The new mask setting will not have any effect on the current session’s LAN configuration. In order for the change to take effect two things must occur: 1) the user LAN configuration must be saved with the :SAVELAN! command, and 2) the Image Processor must be rebooted manually or with the :RESET! command.

<table>
<thead>
<tr>
<th>IP Address Mask Value</th>
<th>Must be specified in xxx.xxx.xxx.xxx format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read value</td>
<td>:LANIPMASK? &lt;cr&gt;</td>
</tr>
<tr>
<td>Write value</td>
<td>:LANIPMASK= &lt;new value&gt; &lt;cr&gt;</td>
</tr>
</tbody>
</table>

- **:LANIPGATE=<Gateway Value>**
  This command sets the IP gateway address of the wired Ethernet port on the Image Processor. The gateway address must be an IPv4 address formatted in the xxx.xxx.xxx.xxx format. A valid IP address must be specified. The new gateway address setting will not have any effect on the current session’s LAN configuration. In order for the change to take effect two things must occur: 1) the user LAN configuration must be saved with the :SAVELAN! command, and 2) the Image Processor must be rebooted manually or with the :RESET! command.

<table>
<thead>
<tr>
<th>IP Gateway Address</th>
<th>Must be specified in xxx.xxx.xxx.xxx format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read value</td>
<td>:LANIPGATE? &lt;cr&gt;</td>
</tr>
<tr>
<td>Write value</td>
<td>:LANIPGATE= &lt;new value&gt; &lt;cr&gt;</td>
</tr>
</tbody>
</table>
• **:LANDHCP=<value>**
  This command enables or disables the use of DHCP for the Image Processor. When DHCP is enabled and the unit is connected to a network with a DHCP server, it will request an IP address from the DHCP server. When DHCP is disabled, the Image Processor unit will use its assigned static IP address. The DHCP setting will not have any effect on the current session's LAN configuration. In order for the change to take effect two things must occur: 1) the user LAN configuration must be saved with the :SAVELAN! command, and 2) the Image Processor must be rebooted manually or with the :RESET! command.

<table>
<thead>
<tr>
<th>DHCP value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>DHCP Disabled</td>
</tr>
<tr>
<td>1</td>
<td>DHCP Enabled</td>
</tr>
</tbody>
</table>

- **Read value**: :LANDHCP  <cr>
- **Write value**: :LANDHCP= <new value> <cr>

• **:SAVELAN!**
  This command saves IP address, IP mask, gateway address, and DHCP status for the LAN port on the Image Processor. Current values are written to non-volatile memory. They will take effect the next time the Image Processor is booted.

• **:RESET!**
  This command resets the Image Processor, which is similar to cycling power. All systems are re-initialized.

Once manual configuration is complete, connect the Image Processor to the company network and attempt to access it via the Conference Room selector. If the Windows PC and the Image Processor exist on separate subnets, you can manually add the IP address of the Image Processor within the Conference Room selector.

**DX Dual Camera Module**

Once the Equal-i Image Processor has been configured and accessible on the network, take the following steps to install the DX Dual Camera Module

⚠️ **WARNING**: Be sure that the Image Processor is unplugged when connecting/disconnecting camera cables.

1. Once the camera has been removed from the box, adjust the mounting arm so that each angle is roughly 30°/150°.
2. Tighten the lock screws so that the clamps will not pivot freely.
3. To maintain proper eye line with the remote party, the center of the camera should be 43% from the top of first pixel line of the display. Use the chart located in Appendix G to determine the location on the displays where the center of the camera will be located.
4. Place a piece of masking tape on the right-hand side of the left display to mark this location. Be sure to place the tape on the screen and not the bezel of the display.
5. If wall mounted, remove both displays from the wall so that the rear can be accessed. Brace the display so that it is safely vertical to the floor.

6. Hold the camera so that it is square to the display in a position such that the center of the two cameras are center to the tape on the display. Do not adhere the camera to the display.

7. Determine a flat location on the back of the display for the mounting plate. 
   **Note:** The arm mount can be rotated up or down to find the best location. Included with the camera is an optional alternate 4” mount in the event that the 7” mount is too long. Should there be no location on the rear of the current (left) display, consider using the other (right) display to mount the camera.

8. Using a pencil, mark an outline onto the back of the display where the mounting plate will be adhered.

9. Remove the film from the tape located on the back of the camera. 
   **Note:** Adhere it to the same display onto which the mounting plate will be located. Note that only one side of the tape should be removed. Do not adhere the camera to the bezel of both right and left display.
10. With the blade flush against the side of the display bezel, place the camera adhesive firmly against the front of the display, holding it in place for 30 seconds.

11. Remove the film from the back of the tape located on the back of the mounting plate.

12. Place the mounting plate firmly against the rear of the display on the pencil mark noted in Step 8, holding it in place for 30 seconds.

13. Tighten both clamps.

14. Return the display with the attached camera back to its permanent location.

15. Place the Image Processor in a location that is close to both a power receptacle and within range of the displays such that the high speed camera cables are able to reach. **Note:** The optional Wall Mount Bracket (P/N: AEXX-PWK1) is included with the Equal-i Image Processor to allow for mounting directly to the wall behind the display or to the display mount mechanicals.

16. Connect the provided High Speed Camera Cables to the CAM1 and CAM2 ports on the camera assembly and Image Processor.

17. Connect the Image Processor in loopback, to be used only for the duration of the camera alignment process:
   a. Connect an HDMI cable from the Transmit CODEC 1 port to the Receive CODEC 1 port on the Image Processor.
   b. Connect an HDMI cable from the Transmit CODEC 2 port to the Receive CODEC 2 port on the Image Processor.
   c. Connect and HDMI cable from the left display to the Display 1 port on the Image Processor.
   d. Connect and HDMI cable from the right display to the Display 2 port on the Image Processor.

18. Power on the display and Image Processor.

19. Using the Equal-i Control App, choose Equal-i Room, then Video+Content. This will put ensure that the two cameras are matched onto a single screen to begin alignment.

20. Perform rough camera alignment of the camera by turning the knurled adjustment rod to move the attached ball joints closer or further away – thus rotating the camera horizontally from left to right. Continue this until the rear center of the table is centered in the displays. **Tip:** Place an object at the end of the table, in the center, to which you can align the display(s).
21. Gently return the remaining display to its permanent location.
   **Tip:** Be sure the display rests against the camera blade to maintain minimum display separation.
22. Connect an HDMI cable from the **Transmit CODEC 2** port to the **Receive CODEC 2** port on the Image Processor.
23. Connect and HDMI cable from the right display to the **Display 2** port on the Image Processor.
24. Perform fine camera alignment using the alignment screws on the camera with the supplied hex wrench. This is done individually for each camera.
   **Note:** For optimal vertical alignment, align the cameras to the center top edge of the back of the table, farthest from the camera.
24. Perform digital camera alignment using the Android app or telnet API commands for the Immersive Mode and Immersive Everywhere Modes.
25. Once camera alignment is complete, **SAVE** settings.
27. Place the Camera Cover onto the camera unit.

**Note:** Once the Image Processor has been connected to the codec and powered back on, use the Equal-i Control App to perform digital alignment (if necessary) from the Settings menu. Reference section 7.3.2 in this Guide for further instruction. Be aware that the Horizontal and Vertical pan settings within the app will only apply to the current framing mode. Be sure to cycle through the different framing modes to ensure that alignment is properly set for each framing mode.
Final Configuration
Once initial setup is complete, the HDMI cables must be moved to their permanent location.

⚠️ WARNING: Be sure that the Image Processor is unplugged when connecting/disconnecting any cables

Polycom® RealPresence® Group 310/500 Wiring

1. Connect the supplied HDMI cable from the Transmit CAM 1 port to the Cam 1 port on the camera using supplied HDMI cables.
2. Connect the supplied HDMI cable from the Transmit CAM 2 port to the Cam 2 port on the camera using supplied HDMI cables.
3. Connect an HDMI cable from the Transmit CODEC 1 port to the HDMI port on a RealPresence Digital Breakout Box.
4. Connect a mini-HDCI cable from the RealPresence Digital Breakout Box to the HDCI port on the Group 500 codec.
5. Connect an HDMI cable from the Transmit CODEC 2 port to the data channel HDMI port the Group 500 codec.
6. Connect an HDMI cable from the Display 1 port to the Group 500 codec to the Receive CODEC 1 port on the Image Processor.
7. Connect an HDMI cable from the Display 2 port to the Group 500 codec to the Receive CODEC 2 port on the Image Processor.
8. Connect an HDMI cable from the Display 1 port on the Image Processor to the left display.
9. Connect an HDMI cable from the Display 2 port on the Image Processor to the left display.

Polycom® RealPresence® Group 700 Wiring

1. Connect the supplied HDMI cable from the Transmit CAM 1 port to the Cam 1 port on the camera using supplied HDMI cables.
2. Connect the supplied HDMI cable from the Transmit CAM 2 port to the Cam 2 port on the camera using supplied HDMI cables.
3. Connect an HDMI cable from the Transmit CODEC 1 port to the HDMI Camera 1 input on the Group 700 codec.
4. Connect an HDMI cable from the Transmit CODEC 2 port to the HDMI Data 3 input on the Group 700 codec.
5. Connect an HDMI cable from the Display 1 port to the Group 700 codec to the Receive CODEC 1 port on the Image Processor.
6. Connect an HDMI cable from the Display 2 port to the Group 700 codec to the Receive CODEC 2 port on the Image Processor.
7. Connect an HDMI cable from the Display 1 port on the Image Processor to the left display.
8. Connect an HDMI cable from the Display 2 port on the Image Processor to the left display.
Equal-i Connection Guide
Connections to codecs with 1080p 30/25 content channel

Equal-i DX Dual Camera Module and 2S Image Processor with Polycom Videoconferencing End-points
Polycom® HDX® 8000 Series Wiring

It should be noted that, due to limitations in the fps capability of the content channel in the HDX 8000 series, this series is incompatible with transmission of the “Immersive Everywhere” framing mode of the Equal-i Image Processor. All other framing modes operate normally.

1. Connect the supplied HDMI cable from the Transmit CAM 1 port to the Cam 1 port on the camera using supplied HDMI cables.
2. Connect the supplied HDMI cable from the Transmit CAM 2 port to the Cam 2 port on the camera using supplied HDMI cables.
3. Connect an HDMI cable from the Transmit CODEC 1 port to the HDMI port on a Sewell Direct SW-29390 HDMI to 15-pin Component (YPbPr) Converter.
4. Connect a Sound Control Technologies RC2-101 15-pin Component to HDCI adapter cable from the Sewell Direct SW-29390 to the Video 1 input of the HDX 8000 codec.
5. Connect an HDMI cable from the Display 1 port to the HDX 8000 codec to the Receive CODEC 1 port on the Image Processor.
6. Connect an HDMI cable from the Display 2 port to the HDX 8000 codec to the Receive CODEC 2 port on the Image Processor.
7. Connect an HDMI cable from the Display 1 port on the Image Processor to the left display.
8. Connect an HDMI cable from the Display 2 port on the Image Processor to the left display.
Equal-i Connection Guide
Connections to codecs without 1080p 30/25 content channel

Equal-i DX Dual Camera Module and 2S Image Processor with Polycom Videoconferencing End-points
For More Information

Product Information
For more information about Array Telepresence visit www.ArrayTelepresence.com.

For more information about the DX Camera Module visit:
http://arraytelepresence.com/products/dxdualcameramodule/

For more information about the Equal-i 2S Image Processor visit:
http://arraytelepresence.com/products/equal-i-2s/

Array Telepresence Support
Online support and by country support information is available at http://arraytelepresence.com/support/

For Array Telepresence support, please email support@arraytelepresence.com.

For Array Telepresence sales, please email sales@ArrayTelepresence.com.

By country sales contact information is available at: http://arraytelepresence.com/contact/

Polycom Support
For support or service of Polycom products, please contact your Polycom distributor or go to Polycom Support at http://www.polycom.com/support

For more information about Polycom Technology Partner Program and the Technology and Developer Partner solutions, visit http://www.polycom.com/partners
Test/Validation Annex

Polycom RealPresence Group 300/310 Testing
We have not yet tested a Polycom RealPresence Group 300/310 due to the functional comparability between it and the RealPresence Group 500. Our understanding is that if the customer were to add a dual-screen license and a 1080p license, then the unit has the same functional capability as the Group 500. For this reason, please see below for the results of the RealPresence Group 500 testing.

Polycom RealPresence Group 500 Testing
In December 2015, we tested a Polycom RealPresence Group 500 using the latest firmware available at the time – v5.0.1. Note that each mode was tested with the transmission of image at 720p and 1080p. License to transmit 1080p not required, however is encouraged. Tested were the following framing mode capabilities and their results:

Transmit

Immersive: This mode transmits two full compressed 1080p images to the receiving end using only the single video channel of a single codec. It requires an Equal-i System on the receiving end to decompress the image. This test passed.

Immersive Everywhere: This mode transmits two full 1080p images to the receiving end using both the video channel and the data channel of a single codec. It does not require an Equal-i System on the receiving end. This test passed.

Video+Content: This mode transmits a side-by-side letterbox capture of the entire scene over a single screen in 1080p using only the single video channel of a single codec. It does not require an Equal-i System on the receiving end. This test passed.

Receive

Immersive: This mode receives the transmitted single-channel compressed image from another Equal-i System, decompresses it, and outputs the image to both displays. This test passed.

Immersive PTZ: This mode receives an incoming PTZ image, vertically splits it in half, equalizes the image, then outputs the image to both displays. This test passed.

Passthrough: This mode does nothing with the incoming image. It simply passes it through without any interference or processing, and outputs the image to the display(s). This test passed.
Equal-i DX Dual Camera Module and 2S Image Processor with Polycom Videoconferencing End-points

**Polycom RealPresence Group 700 Testing**

In March 2016, we tested a Polycom RealPresence Group 700 using the latest firmware available at the time – v5.1.0. Tested were the following framing mode capabilities and their results:

**Transmit**

**Immersive:** This mode transmits two full compressed 1080p images to the receiving end using only the single video channel of a single codec. It requires an Equal-i System on the receiving end to decompress the image. This test passed.

**Immersive Everywhere:** This mode transmits two full 1080p images to the receiving end using both the video channel and the data channel of a single codec. It does not require an Equal-i System on the receiving end. This test passed.

**Video+Content:** This mode transmits a side-by-side letterbox capture of the entire scene over a single screen in 1080p using only the single video channel of a single codec. It does not require an Equal-i System on the receiving end. This test passed.

**Receive**

**Immersive:** This mode receives the transmitted single-channel compressed image from another Equal-i System, decompresses it, and outputs the image to both displays. This test passed.

**Immersive PTZ:** This mode receives an incoming PTZ image, vertically splits it in half, equalizes the image, then outputs the image to both displays. This test passed.

**Passthrough:** This mode does nothing with the incoming image. It simply passes it through without any interference or processing, and outputs the image to the display(s). This test passed.
Polycom HDX 8000 Testing
In late January 2016, we tested a Polycom HDX 8000 using the latest firmware available at the time – v3.1.9. Tested were the following framing mode capabilities and their results:

**Transmit**

**Immersive:** This mode transmits two full compressed 1080p images to the receiving end using only the single video channel of a single codec. It requires an Equal-i System on the receiving end to decompress the image. This test passed.

**Immersive Everywhere:** This mode transmits two full 1080p images to the receiving end using both the video channel and the data channel of a single codec. It does not require an Equal-i System on the receiving end. This test failed due to the low framerate capability of the codec.

**Video+Content:** This mode transmits a side-by-side letterbox capture of the entire scene over a single screen in 1080p using only the single video channel of a single codec. It does not require an Equal-i System on the receiving end. This test passed.

**Receive**

**Immersive:** This mode receives the transmitted single-channel compressed image from another Equal-i System, decompresses it, and outputs the image to both displays. This test passed.

**Immersive PTZ:** This mode receives an incoming PTZ image, vertically splits it in half, equalizes the image, then outputs the image to both displays. This test passed.

**Passthrough:** This mode does nothing with the incoming image. It simply passes it through without any interference or processing, and outputs the image to the display(s). This test passed.