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Polycom Realpresence Group 500 - evaluation results main document

EagleEye Acoustic Camera

EagleEye III Camera

CODEC Front view

CODEC Rear view

Remote Control

Microphone Array Pod

Manufacturer: Polycom
Model: RealPresence Group 500
Software Version: 4.1.1
Optional Features and Modifications: Advanced Video 1080p Multipoint MCU
Date of Test: 24 - 31 October 2013

The Executive summary is available at this link [1]

SETUP PROCEDURE

Setting up the RealPresence Group 500 system was straightforward. The compact CODEC can be mounted below or behind the picture monitor/s and the Eagle Eye III pan and tilt camera positioned above the monitor/s. The infrared remote control and an external power supply completed the package.

The connections for basic operation were clearly illustrated on the quick installation card and in the documentation and involved:

- Mounting the camera adjacent to the monitor(s)
- Connecting the camera cable between the camera and the CODEC
- Connecting the supplied HDMI-HDMI cables between the CODEC and the monitor/s

- Establishing an Ethernet IP network connection through the RJ45-RJ45 cable
- Connecting the external power unit to the CODEC

System set up was conveniently configured through the “on-screen” menus via the hand held remote control. IP address, IP Gateway, Subnet mask and Gatekeeper address were all entered through these menus. Additional advanced setup options are only available via the web interface.

Approximate set-up time: 15 minutes

Documentation quality: The User and Admin guides cover all the RealPresence Series systems so care must be taken to ensure the section is relevant to the particular hardware.

Hardware Description

General

This compact CODEC may either be mounted within a monitor cabinet or adjacent to the monitor/s. Provided with one auto switching 10/100/1000 Ethernet connection and capable of conferencing up to a bandwidth of 6 Mbit/s, the system can display a maximum image resolution of 1080p@50 frames/second. The RealPresence Group 500 CODEC includes a cooling fan which generates some background noise.

The infra-red remote control includes a rechargeable battery; the battery is charged by removing it from the remote and plugging it into one of the USB ports on the rear of the CODEC.

Multiple options are available including:

- Advanced Video 1080p
- Polycom EagleEye Acoustic Camera
- Multipoint MCU

The systems supplied for evaluation included one Polycom EagleEye III Pan and Tilt Camera and one Polycom EagleEye Acoustic Camera, Advanced Video 1080p and MCU options. The EagleEye Acoustic Camera restricted the frame rate in one direction to 25fps.

The monitor outputs auto;select resolution and aspect ratio, these may also be set manually from the web interface.

The main HDMI video output connection carries the digital audio but a separate 3.5mm analogue audio output connection is also provided. Auxiliary audio input is facilitated by a 3.5mm stereo jack connector.

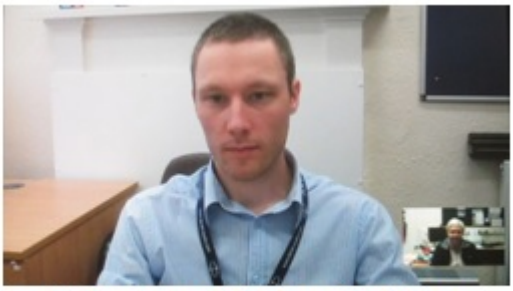
The RealPresence Group 500 system supports seven video resolutions including:

- The basic CIF format resolution of 352 x 288 pixels.

- wCIF (512 x 288).
- w480p (848 x 480).
- High definition w720p (1280 x 720)
- High definition w1080p (1920 x 1080)*

*Requires Advanced Video 1080p option

In addition to the traditional Picture in Picture (PIP) display format, the CODEC also supports Picture outside Picture (POP). This allows both near and far end images to be displayed simultaneously on a single picture monitor.

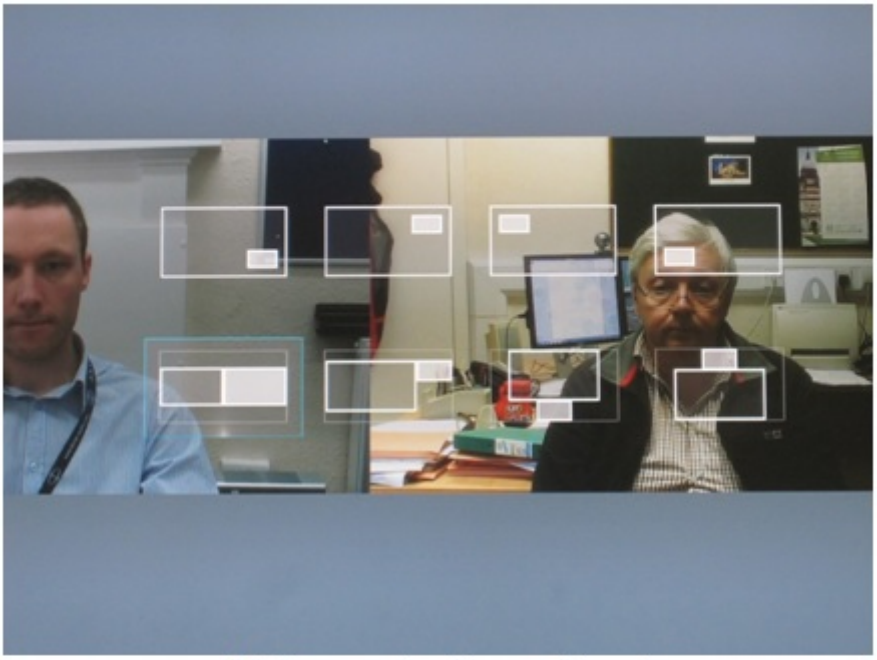


Full screen of the Far- End image
Self View Picture in Picture (PIP)

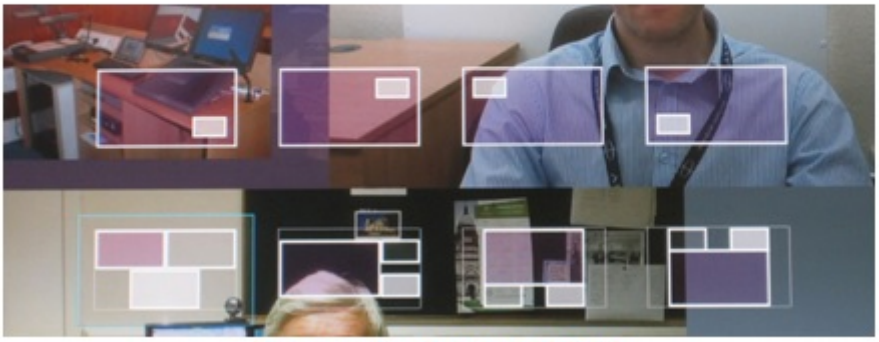
Far-End Image and Self View
Picture outside Picture (POP)

Single Monitor Mode

A number of PIP and POP image layouts are available for user selection via the graphic interface, for example:



No Presentation Content Shared



Presentation Content Shared

In addition to the layout options, two selections for “Self View” are also available: “Show” and “Auto”

“Self View” set to “Show” with no shared presentation content

- Four PIP Options
- Four POP Options

“Self View” set to “Auto” with no shared presentation content

- Far End Image Full Screen
- Four PIP Options
- Four POP Options

When the Far End Image Full Screen layout is selected and the camera pan tilt or zoom is adjusted a self view image PIP is displayed; once the camera adjustment is complete the PIP image disappears.

“Self View” set to “Show” with shared presentation content

- Four PIP Options: Presentation Content Full Screen, Self View PIP

- Four POP Options: Presentation Content, Self View, Far End

Presentation content full screen only is not available with Self View set to Show.

“Self View” set to “Auto” with shared presentation content

With Self View set to Auto and presentation content shared, the layout selection differs when transmitting or receiving presentation content.

Transmitting Presentation Content

- Presentation Content Full Screen
- Presentation Content Full Screen plus Four Far End Image PIP Options
- Four POP Options: Presentation Content, Self View, Far End

With Presentation Content Full Screen or any of the PIP options selected, when the camera pan tilt or zoom is adjusted a self view image PIP is displayed; once the camera adjustment is complete the PIP image disappears after an additional 25 seconds.

Receiving Presentation Content

- Presentation Content Full Screen
- Presentation Content Full Screen plus Four Far End Image PIP Options
- Four POP Options: Presentation Content and Far End

In this case it is not possible to select a POP option displaying all three images:

Presentation Content, Self View and Far End

With Presentation Content Full Screen or any of the PIP options selected, the system behaves in the same way as presentation content being transmitted: when the camera pan tilt or zoom is adjusted a self view image PIP is displayed; once the camera adjustment is complete the self view PIP image disappears after an additional 25 seconds.

When the POP options are selected and the camera is adjusted, the image changes to Full Screen Presentation Content plus Self View PIP. Once the camera adjustment is complete the image returns to the original selected POP layout after an additional 25 seconds.

This inconsistency in operation between transmitted and received presentation content could be confusing for the occasional user.

Dual Monitor Mode

In dual monitor mode the following images are displayed:

	Main Monitor	**Second Monitor**
Not in a call	Near image + menu	Graphic Background

In a call with no presentation material	Far image + menu	Near image
In a call with presentation material transmitted or received	Full Screen Far image Four Near and Far image PIP Layouts Four Near and Far image POP Layouts	Presentation materia

On some HDMI input monitors, the menu and presentation information at the edge of the screen may be “cropped”. There is no facility within the CODEC to adjust the size of the menu information or presentation content to alleviate this cropping. If the Monitor includes a DVI input this could be used via an HDMI-DVI cable to ensure that all on screen menu information and PC desktop images are fully visible.

The 1080p native resolution Polycom EagleEye III Pan and Tilt Camera includes a 12x Optical Zoom with a horizontal viewing angle of 72 degrees.

Far end camera control (FECC) is supported.

The CODEC includes three video inputs: the HD camera, HDMI and VGA for the connection of a PC or auxiliary video inputs. The HDMI and VGA inputs are an “either/or” input which requires to be set as People to be transmitted on the main channel, or Content and then transmitted on the presentation H.239 channel. People + Content IP a network connection may also be used to share presentation material from a PC with the CODEC.

Dual video coding H.239 is supported, providing a second unidirectional video channel using either People+Content - a physical connection to the CODEC or alternatively People+Content IP - a network connection. Thus a camera image and presentation material from a PC could be transmitted simultaneously and displayed on two monitors at the remote site. People+Content IP is a windows only software application that is installed on a PC. This allows the PC to share the screen image with the RealPresence Group 500 system across the network; the CODEC may then share this image via the H.239 videoconference connection.

During the evaluation when two RealPresence Group 500 systems conferenced together over a 6 Mbit/s connection, while 1080p @50fps was observed on the main channel, with the second input set to Sharpness, 1080p @25fps was observed; with the second channel input set to Motion, 720p @50fps was observed. At no point was 1080p @50 observed on the second content channel. Information on the Polycom website appears inconsistent: the Group 500 Data Sheet indicates that “1080p60 video and content collaboration heightens realism and speeds adoption”. However, summary information for the RealPresence Group states “Simultaneous dual-stream 1080p60 people and content (Group 700) or dual-stream 1080p60 / 1080p30 people and content (Group 300 and 500), helping to eliminate compromises when sharing across distances)”. This sentence implies that simultaneous 1080p60 is only available on the Group 700 system.

Several audio formats are supported by the RealPresence Group 500 CODEC. In calls between RealPresence Group 500, systems Polycom Siren 22 audio protocol was negotiated providing 22 KHz analogue audio bandwidth utilising 64 Kbit/s of connection bandwidth.

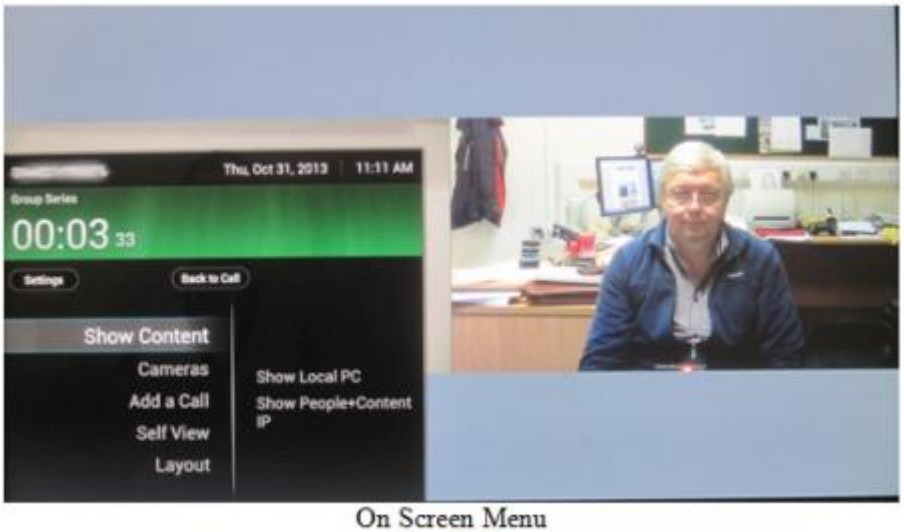
The main HDMI output carries the digital stereo output together with an additional 3.5mm mini jack audio output. Auxiliary audio i/p is provided via a 3.5mm jack connection.

Encryption is provided at all connection speeds through Advanced Encryption Standard (AES) with a 128 bit session key.

SYSTEM OPERATION

The system may be operated locally from the infra-red remote control or integrated with a room control system via Telnet or RS232. The on-screen menus are logical and easy to follow. The system may also be configured and controlled via a web browser interface from a network connected PC. For security this remote web connection is password protected.

On Screen Menu
Not in a Call

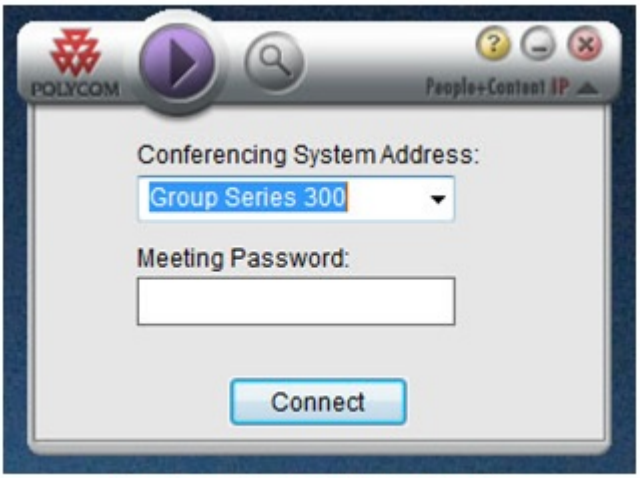


On Screen Menu
In a Call

Remote Control

The remote control includes a limited selection of single operation control buttons: Volume, Zoom, Call, End Call, Mic Mute. The majority of menu selection is achieved using the navigation buttons and the graphic interface icons: Menu, Place a Call, Show Content, System and Settings.

An H.239 connection is initiated and terminated on the remote control via the graphic interface by selecting “Show Content”. Before content can be shared by People and Content IP a connection must be established between the PC and the Codec. This is done by entering the IP address of the codec in the PC application together with a meeting password if required and pressing connect. Once the link is established, content may be shared by pressing the play icon on the PC application or selecting “Show Content” on the CODEC graphic interface.



People + Content IP Application

The camera occupies one channel and the source is connected using People+Content or People+Content IP; the second channel is normally a PC or Laptop. At the remote site these two images may either be viewed on two separate monitors or using POP displayed on a single screen.

The RealPresence Group 300 system uses the RealPresence Group Microphone Array, in larger installations two microphones may be daisy-chain connected.

The system takes a significant period to boot up from cold (~2 Minutes). When not in a call the system automatically goes into sleep mode after a user-definable period of time. An incoming call or a remote control button press will return the system to active mode.

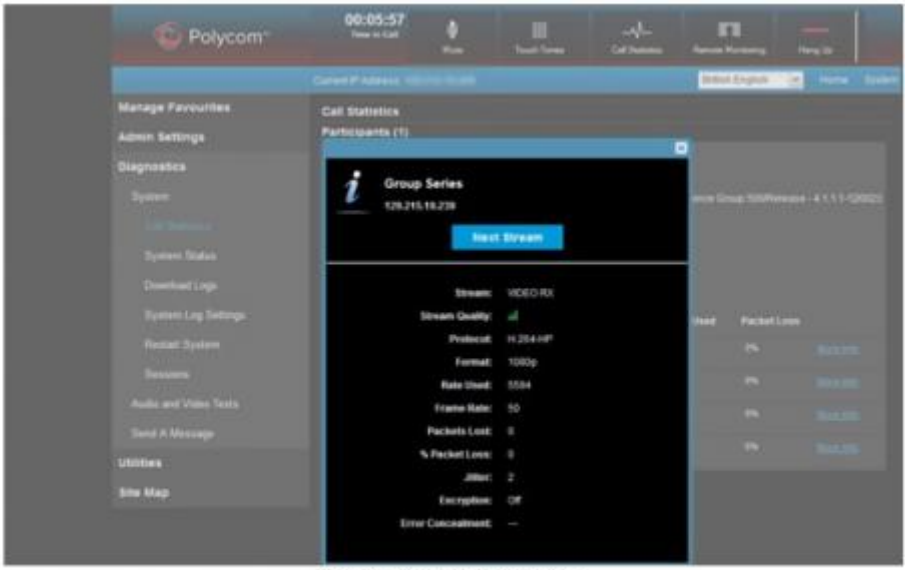
The Stats menu is accessed via the “System Information” icon on the graphic interface; it displays call status data including connection speed, compression protocols, packet loss and frame rate. Extensive diagnostics are also available including Colour Bars, Speaker Test, Audio Level Metering, Loop Test and System Reset.

The system may also be configured, controlled and monitored via a password protected web interface from a network connected PC. This facility provides configuration, control and monitoring facilities, including Snapshots of the CODEC main video input and output.

Web Interface Menu

Remote Monitoring and Control

Call Statistics



Detailed Call Statistics

MCU Operation

The RealPresence Group 500 systems include an optional continuous presence Multipoint MCU which connects up to 4 sites in High Definition or 6 sites in Standard Definition.

In single monitor mode where up to four sites are connected - the host RealPresence Group 500 and three remote sites - a number of layouts are available including a quad split of all four connected sites. When presentation material is transmitted or received, the maximum number of images displayed is three: the presentation material and two of the remote sites, the remote site images voice switch to the current speaker.

Four Site MCU Call no Presentation Material

Four Site MCU Call with Presentation Material

In dual monitor mode a number of layouts are available on the main monitor while a voice switched full screen single image of the current speaker remote site is displayed on the second monitor.

When presentation material is transmitted or received it occupies the second monitor full screen.

In an MCU call while the RealPresence Group 500 system transmits 720p to the remote sites, it negotiates lower resolutions received from the remote sites. For example: 640 x 368, wCIF or CIF; while these low resolution images look fine when constructed into a multi-image tile, in dual monitor mode the voice switched single image on the second monitor looks soft as it is displaying a standard definition image.

VIDEO TESTS SUMMARY

The video quality experienced between RealPresence Group 500 systems at 1080p @50fps at higher bandwidths up to 6Mbit/s was excellent; at standard videoconference bandwidths of 2Mbit/s it was very good. The ability to transmit two simultaneous channels of 1080p video

and presentation images is a welcome provision, however, with moving image presentation material, the image whilst appearing to have an overall high frame rate motion appeared at times to “stutter”, particularly when set to Sharpness delivering 1080p@25fps. A more acceptable performance of moving image presentation material was achieved by setting the input to Motion delivering 720p@50fps. This effect was observed even at the highest connection speed of 6Mbit/s where the bandwidth was evenly split between the main and presentation channels.

AUDIO TESTS SUMMARY

Setup The echo canceller is fully automatic in operation. The quality of echo cancellation and doubletalk from the system was excellent.

	Room
Audio levels adequate? (Yes/no)	Yes
Audio quality acceptable? (Yes/no)	Yes
Echo cancellation acceptable? (Yes/no)	Yes
Quality of double talk	Excellent

INTEROPERABILITY

There were no problems connecting between the Polycom RealPresence Group 300 units.

Time to Connect

All speeds: 9 seconds

Connectivity with Other Machines (models listed with comments)

Successful connections were made in each direction with the following CODECs, where the systems supported H.239 presentation material was also shared.

CODEC	Call Bandwidth	Resolution Transmitted by The Polycom RealPresence Group 500	Resolution Received by The Polycom RealPresence Group 500

Connectivity with the Janet Videoconferencing Service			
Tandberg 6000 MXP **H.323** S/W F9.0 PAL	4 Mbit/s	1024x576 @ 12	w720p @ 30
Cisco SX20 S/W TC6.0.0	6 Mbit/s	w720p @ 25	w720p @ 30
Procedure for making a call Cisco C40 S/W TC6.0.1 (No Premium Res)	6 Mbit/s	w720p @ 25	w720p @ 30
Cisco C60 (Prem Res) S/W TC4.2.1	6 Mbit/s	w1080p @ 25	w720p @ 60
Cisco C90 (Prem Res) S/W TC4.2.1	6 Mbit/s	w1080p @ 25	W1080p @ 25
Lifesize Express 220 S/W 4.9.00	4 Mbit/s	w720p @ 25	w720p @ 30
Lifesize Room 200 S/W 4.7.10	6 Mbit/s	w720p @ 25	w720p @ 30

The Polycom RealPresence Group 500 connected successfully to the Janet VC Codian MCU; 720p H.264 video, G722.1c audio was transmitted to the MCU and Siren 14 audio was received from the MCU.

H.239 also interoperated correctly. The received audio level was measured as peaking around -10dBm which is slightly low. There is no microphone level adjustment.

1. Press the “Call” button on the remote control
2. Input IP address
3. Press the “Call” button

Or you can use the local contacts directory available from the user interface Contacts or the Recent Calls lists.

Source URL: https://community-stg.jisc.ac.uk/library/advisory-services/polycom-realpresence-group-500-evaluation-results-main-document

Links

[1] https://community.ja.net/library/advisory-services/executive-summary-polycom-realpresence-group-500