APPENDIX 15/03

TEST RESULTS FOR AVER EVC130P

Manufacturer:	AVer
Model:	EVC130p
Software Version:	00.01.08.62
Optional Features and Modifications:	None
Date of Test:	20th – 24th October 2015

HD Camera

CODEC Front view

CODEC Rear view

Remote Control

Desk Microphone

C O N T E N T S

A: EXECUTIVE SUMMARY

The AVer EVC130p high definition conferencing system is a cost effective system designed to be installed either in a small to medium sized conference room, classroom or as part of a roll-about unit.

The system supports a maximum image resolution of 1920x1080p @ 30fps on the main video channel. However when presentation material is transmitted or received, the maximum resolution is reduced to 1280x720 pixels @ 30fps on the main video channel.   The system includes a high definition (HD) camera, a table microphone pod, an infra-red remote control, PC connectivity and conference recording in the package. One option is available: additional microphone pod.

The maximum point to point connection speed is 4 Mbit/s; compatibility with other H.323 CODECS is achieved across a range of resolutions from SIF (352x240) to 1080p (1920x1080) pixels. The quality of the conference is dependent upon the capability of the remote CODEC and the connection speed.

A three year warranty is included as standard.

   Pros:
   - Cost effective
   - Inclusive three year warranty
   - Very few interoperability issues

   Cons:
   - Lacks Digital Presentation Input
   - 7 Khz audio interoperability with Cisco Products

Feature Summary:

Video standards	H.261, H.263, H.263+, H.264,
Supported video resolutions	352 x 240 @ 25, 30 fps (SIF) 352 x 288 @ 25, 30 fps (CIF) 512 x 288 @ 25, 30 fps (wCIF) 704 x 480 @ 25, 30 fps (4SIF) 704 x 576 @ 25, 30 fps (4CIF) 848 x 480 @ 25, 30 fps (w480p) 1280 x 720 @ 25, 30 fps (HD720p) 1920 x 1080 @ 25, 30 fps (HD1080p)* *Not available when transmitting or receiving presentation material
Communications	H.323 and SIP, 128Kbps ~ 4Mbps
Audio standards	G.711, G.722, G.722.1, G.722.1c, G.728
Camera	6x optical zoom camera, PTZ function, 67° Horizontal field of view.
Video inputs	One Firewire (HD Camera) and one VGA
Video outputs	One HDMI and one VGA
Audio inputs	Desk microphone pod, 3.5mm mini-jack connection
Audio outputs	HDMI, 3.5mm mini-jack

Auxiliary features	H.239 second video channel up to 720p resolution @30fps. Far-end camera control.
Encryption	AES Encryption

B: SETUP PROCEDURE

Setting up the EVC130p system was straightforward. The compact CODEC can be mounted below the picture monitor/s and the HD camera positioned above the monitor/s. A system microphone, infrared remote control and an external power supply completed the package.

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

- Mounting the camera adjacent to the monitor(s)
- Connecting the firewire cable between the camera and the CODEC
- Connecting the supplied HDMI-HDMI and VGA-VGA cables between the CODEC and the monitor/s
- Cabling the microphone to the CODEC
- 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.

Approximate set-up time: 15 minutes

Documentation quality: The concise Quick Installation and User Guides were all easy to follow.

## C: HARDWARE DESCRIPTION

General

This compact CODEC may 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 4 Mbit/s, the system can display a maximum image resolution of 1080p at 30 frames/second on the main video channel. However, when presentation material is transmitted or received, the maximum resolution is reduced to 1280x720 pixels @ 30fps on the main video channel. The EVC130p CODEC was silent in operation.

The main HDMI video output connection carries the digital audio; separate 3.5mm analogue audio input and output connections are also provided.

The monitor outputs auto select resolution and aspect ratio; the VGA output can also be manually forced to 16:9 or 4:3 aspect ratio if required.

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.

The PIP image only appears on a limited number of layouts and disappears after five seconds. When any camera pan, tilt or zoom control is adjusted the PIP reappears.
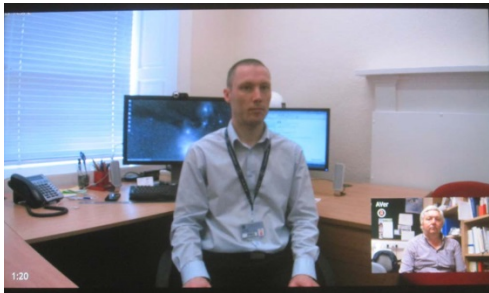
| Full screen of the Far- End image Near- Image Picture in Picture (PIP) | Large Near- Image, small Far- Image Picture outside Picture (POP) |

POP is particularly useful when a single large screen display device such as a plasma/LCD panel or video/data protector is used, as it permits greater flexibility in the choice of image layout.

Single Monitor Mode

In single monitor mode, when not in a call, the monitor displays:

		No presentation material connected	Presentation material connected
HDMI monitor		Near Image + Menu	Layout Selection + Menu

Layout Selection

- Presentation and near end images side by side POP
- Presentation image full screen
- Near image full screen

In single monitor mode in a call the monitor displays the following layout selections:

- Large far image, small near image POP
- Far and near end images side by side POP
- Large near image, small far image POP
- Full screen of the far image and near image PIP*

*The PIP disappears after five seconds, when any camera pan, tilt or zoom control is adjusted the PIP reappears.
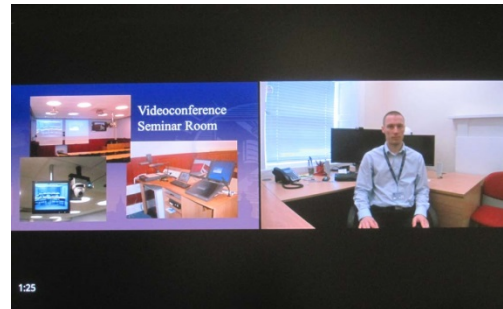
Far and Near Images Side by Side (POP)

In single monitor mode, in a call when H.329 presentation material is either transmitted or received, the monitor displays the following layout selections:

- Large presentation image, small near and far images POP
- Full screen of the presentation image and near image PIP*
- Presentation and far end images side by side POP and near image PIP*
- Large far image, small presentation and near images POP
- Large near image, small presentation and far images POP
- Full screen of the far image and near image PIP*

*The PIP disappears after five seconds; when any camera pan, tilt or zoom control is adjusted, the PIP reappears.

Large Presentation Image
Small Near and Far Images (POP)

Presentation and Far Image
Side by Side (POP)

Dual Monitor Mode

In Dual Monitor mode when not in a call the monitors display:

	No presentation material connected	Presentation material connected
HDMI monitor	Near Image + Menu	Layout Selection + Menu
VGA monitor	Near image	Presentation

Layout Selection

- Presentation and near end images side by side POP
- Presentation image full screen
- Near image full screen

In Dual Monitor mode in a call the monitors display:

	No presentation material transmitted or received	Presentation material transmitted or received
HDMI monitor	Layout Selection + Menu	Layout Selection + Menu
VGA monitor	Near image	Presentation

Layout Selection - no presentation material transmitted or received

- Large far end image, small near image POP
- Far and near end images side by side POP
- Large near end image, small far image POP
- Full screen of the far image

Layout Selection - presentation material transmitted or received

- Large presentation image, small near and far images POP
- Full screen of the presentation image and near image PIP*
- Presentation and far end images side by side POP and near image PIP*
- Large far image, small presentation and near images POP
- Large near image, small presentation and far images POP
- Full screen of the far image and near image PIP*

*The PIP disappears after five seconds; when any camera pan, tilt or zoom control is adjusted, the PIP reappears.

On some HDMI input monitors, the menu and presentation information at the edge of the screen may be "cropped". The CODEC includes a "TV Underscan" control to rectify this problem. Alternatively, the VGA output of the CODEC could be used or the DVI input of the monitor could be used via an HDMI-DVI cable, to ensure that all on screen menu information and PC desktop images are fully visible.

The PTZ (Pan Tilt and Zoom) 2-megapixel HD camera includes a 6x Optical Zoom and a wide horizontal viewing angle of 67 degrees.

Far end camera control (FECC) is supported.

CODEC inputs include the Firewire HD camera input and a separate VGA interface for PC connection; this input supports Extended Display Identification Data (EDID). The system does not include a digital video input for presentation material.

During the evaluation, inconsistencies were identified with the supported resolutions on the Data Sheet and those indicated by EDID with the supplied software Version 1.08.62. On completion of the evaluation the software was upgraded to Version 1.08.71 which resolved the issue.

Dual video coding H.239 is supported providing a second unidirectional video channel. Thus a camera image and presentation material from a PC could be transmitted simultaneously and displayed on two monitors at the remote site. When two systems were conferenced together over a 4 Mbit/s connection, it was possible to transmit two simultaneous high resolution images: the main camera and presentation channels both at 720p @30fps.

Several audio formats are supported by the EVC130p CODEC. In calls between EVC130p systems, G.722.1C audio protocol will be negotiated, providing 14 KHz analogue audio frequency response, utilising 48 Kbit/s of connection bandwidth.

PC audio input and stereo audio outputs are both available via industry standard 3.5mm mini jack connectors. The main HDMI output carries the digital stereo output. The 3.5mm mini jack audio input may be selected as an external microphone input; in this case the microphone pod is deselected. This input may alternatively be used for presentation audio from a PC or laptop enabling the audio to be transmitted to the remote site and heard locally.

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

D: SYSTEM OPERATION

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

On Screen Menu   Remote Control

The remote control includes a comprehensive selection of single operation control buttons. Two of the four colour coded buttons on the remote control are currently redundant on the EVC130p – AVer Point and Snapshot.

An H.239 connection is initiated and terminated on the remote control via a single presentation button:

- Pressing this button for a short period selects the PC presentation source and opens an H.239 connection
- Pressing the button again for a short period closes the H.239 connection

The camera occupies one channel and the source connected to the VGA input occupies the second channel, 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 system takes a significant period to boot up from cold (~80 seconds). When not in a call the system automatically goes into screen saver 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 system may also be set to auto power-off after a user-definable period of time. In this case the system may only be powered up from the remote control, CODEC or Wake Up on LAN.

The Stats menu accessed via the "Information" button on the remote control displays call status data, including connection speed, compression protocols, packet loss and frame rate.

The system may also be configured, controlled and monitored via a password protected WebTool within a web browser from a network connected PC. This facility provides configuration, control and monitoring facilities, including low resolution video of the layout selected on the CODEC main video output, together with call statistics. The WebTool menu structure is identical to that available on the CODEC which makes it intuitive to use.

WebTool Main Menu
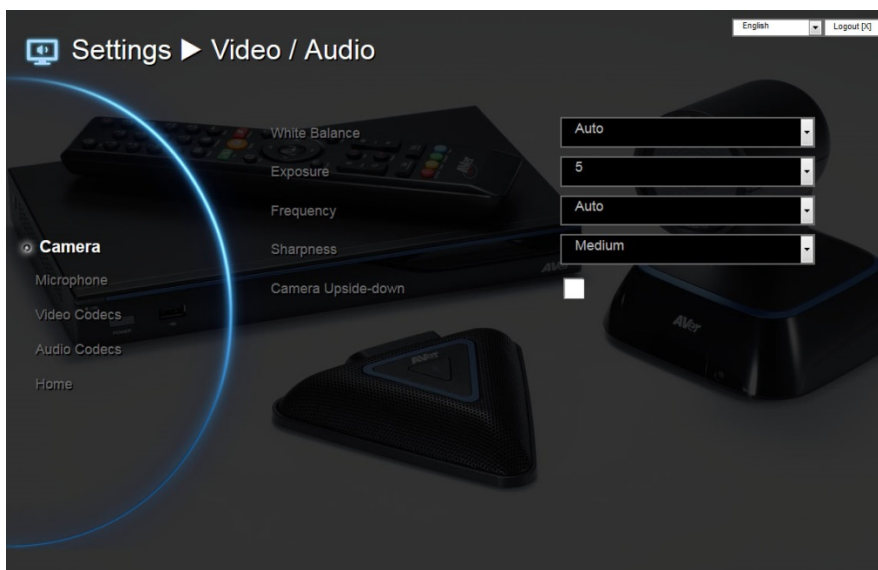
WebTool Camera Setup Menu

WebTool Dial Menu

WebTool including video snapshots of main monitor video output

WebTool including video snapshots of main monitor video and Virtual Remote

The EVC130p system includes a microphone pod with an in-built mute button; the button is illuminated red when muted. Multiple microphone pods may also be connected to the CODEC via a daisy chain connection to the first microphone pod.


AVer Desk Microphone

Conference recording

Conferences may be conveniently recorded to a USB memory stick connected to the CODEC front panel, recordings being initiated via the remote control. Recordings may be played back using the AVer VCplayer application installed on a PC.

The storage required for a recording is dependent on the call speed, for example a 2Mbit/s call will require around 2GB of storage for a conference lasting an hour. The quality replayed via the AVer VCplayer was very good. Within the PC application, full layout control is available during playback. The VCplayer also provides the facility to convert a choice of layouts into a Quicktime .mov file for editing and/or web distribution, but with the interactive layout selection facility removed.

The images below demonstrate the same conference recording being replayed with different screen layouts selected:

AVer VC Player Software
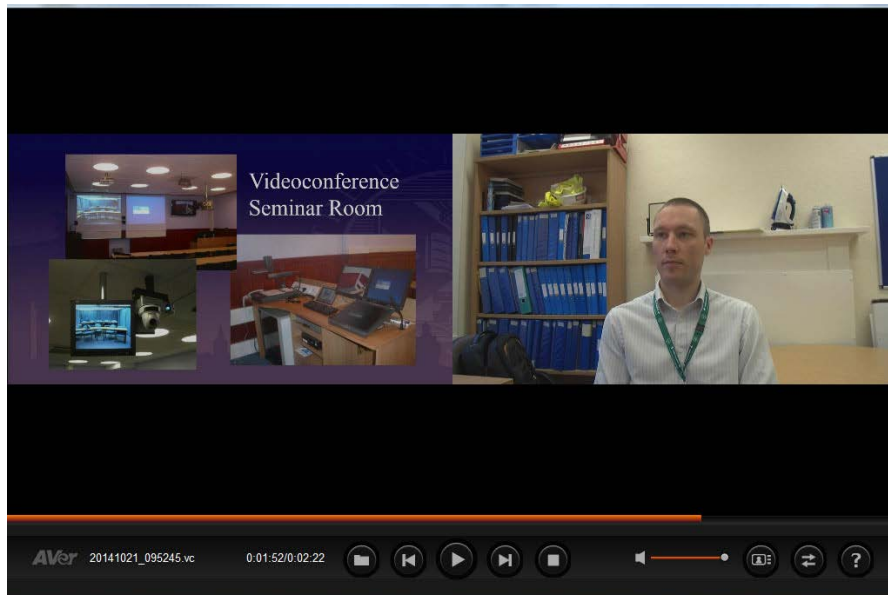
Combined Quicktime File Replay

E: VIDEO TESTS SUMMARY

The video quality experienced from the EVC130p system at 720p @ 30fps was very good; the ability to transmit two simultaneous channels of 720p resolution, high frame rate images on both the main video and presentation channels is a welcome provision. For connections at 4Mbit/s where the bandwidth was split between the main and presentation channels, movie trailer material that normally challenges conference links, was transmitted with few artefacts.

At lower connection speeds on standard VC material the video quality was good.

F: AUDIO TESTS SUMMARY

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

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

It was noted that the only wideband audio codec supported by the EVC130p is G.722.1c, the system does not support AAC-LD. Hence in calls to Cisco products which do not support G.722.1c, but support AAC-LD, the 7KHz frequency response G.722 protocol will be negotiated providing a lower quality audio experience.

G: INTEROPERABILITY

There were no problems connecting from the AVer EVC130p unit.

Time to Connect with encryption On

All speeds   4 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 AVer EVC130p	Resolution Received by The AVer EVC130p
Tandberg 6000 MXP S/W F9.0 PAL	2 Mbit/s	w480p @ 25	w448p @ 30
Cisco SX20 * S/W TC7.1.1	4 Mbit/s	720p @ 30	720p @ 30
Cisco C40* S/W TC7.2.0 (No Premium Res)	4 Mbit/s	720p @ 30	720p @ 30
Cisco C90 (Prem Res)* S/W TC7.02	4 Mbit/s	1080p @ 30	1080p @ 25
Lifesize Express 220 S/W 4.9.00	4 Mbit/s	720p @ 30	720p @ 30
Lifesize Room 200 S/W 4.7.22	4 Mbit/s	720p @ 30	720p @ 30

* In calls t

*In * In connections to Cisco products which do not support G.722.1c but support AAC-LD wideband audio, the G.722 protocol delivering a 7KHz frequency response was negotiated providing a lower quality audio experience.

Connectivity with the JANET Videoconferencing Service (v-scene)

H.323

The AVer EVC130p connected successfully to the v-scene Codian MCU at high definition using H.264 video, 720p resolution and G722.1c audio with video and audio in both directions.

H.239 also interoperated correctly. The received audio level was measured as peaking to -4dBm.

Procedure for making a call

1.   Press the "Call" button on the remote control
2.   Input IP address and select connection speed
3.   Press the "Call" button

Or use the local contacts directory available from the user interface Phone Book or the Recent Calls lists.