Cisco telepresence SX80

Evaluation document

Contents

Manufacturer: Cisco

Model: TelePresence SX80

Software Version: TC7.3.3

Optional Features and   Premium Resolution
Modifications:

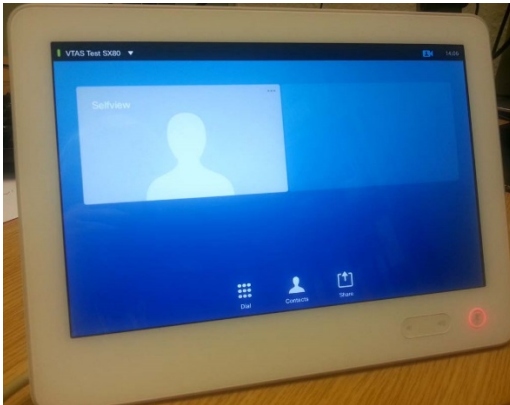**Date of Test:**   3rd – 7th August 2015

HD Camera

CODEC front view

CODEC Rear view

Touch 10 Control Panel

Desk Microphone

A: EXECUTIVE SUMMARY

The TelePresence SX80 high definition conferencing system is at the top of the range of Cisco SX conferencing solutions. The SX80 is a high spec solution with multiple input and output connections to serve the most complex videoconferencing installations.

The system supports a maximum transmitted and received image resolution of 1920x1080p @ 60fps on the main video channel; presentation material is transmitted and received up to 1920x1080p @ 30fps. The integrator system includes a high definition (HD) camera, a table microphone pod and a Touch 10 control panel. An optional embedded MCU is also available.

The maximum point to point connection speed is 6 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.

Pros:
- Video Quality
- Number of audio and video I/P and O/P Connections
- Proximity Application Sharing

Cons:
- Lacks SDI Camera Inputs on and Installation CODEC

Feature Summary:

Video standards	H.261, H.263, H.263+, H.264, H.265 (SIP Only)
Supported video resolutions include	320 x 240 (QCIF) 352 x 240 (SIF) 352 x 288 (CIF) 640 x 480 (VGA) 704 x 480 (4SIF) 704 x 576 (4CIF) 1280 x 720 (HD720p) 1920 x 1080 (HD1080p)
Communications	H.323 and SIP, 64Kbps ~ 6 Mbps
Audio standards	G.711, G.722, G.722.1, G.728, G.729, AAC-LD,OPUS
Camera	10x optical zoom camera, PTZ function, 80° Horizontal field of view.
Video inputs	Three HDMI, one DVI-I and one Composite/S-Video
Video outputs	Two HDMI and one DVI-D
Audio inputs	Eight Microphone/Balanced Line Level, Four Balanced Line Level, Three HDMI
Audio outputs	Six Balanced Line Level and Two HDMI
Auxiliary features	H.239 second video channel up to 1080p resolution @30fps. Far-end camera control. Optional Embedded MCU Proximity content sharing to mobile applications

Encryption	AES Encryption

B: SETUP PROCEDURE

Setting up the SX80 system was straightforward. The CODEC can be mounted below the picture monitor/s and the HD camera positioned above the monitor/s; alternatively a rack mounting kit is available for larger installations. A desk microphone and Touch 10 control panel completed the package. External power supplies are required for the Camera and also for the Touch 10 control panel if Power over Ethernet (PoE) is not available.

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 HDMI cable between the camera and the CODEC
- Connecting the Ethernet control cable between the camera and the CODEC
- Connecting the external power unit to the Camera
- Connecting the supplied HDMI-HDMI cables between the CODEC and the monitor/s.
- Cabling the microphone/s to the CODEC Phoenix Connector Inputs
- Connecting the Touch 10 control panel via a PoE Injector to a CODEC network point.
- Establish an Ethernet IP network connection through the RJ45-RJ45 cable

System set up was conveniently configured through the "on-screen" menus via the Touch 10 control panel and the Web Interface. IP address, IP Gateway, Subnet mask and Gatekeeper address were all entered through these menus.

Approximate set-up time: 30 minutes

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

C: Hardware Description

General

This comprehensive fully featured CODEC system may be mounted within a monitor cabinet or adjacent to the monitor/s; alternatively a rack mount kit is available. Provided with one auto switching 10/100/1000 Ethernet connection, two additional Ethernet connections for Cisco peripherals and capable of conferencing up to a bandwidth of 6 Mbit/s the system can transmit and receive a maximum image resolution of 1080p @ 60 frames/second on the main video channel. The SX80 was silent in operation.

The main HDMI video output connection carries the digital audio, six separate balanced analogue output connections are supported via Phoenix connectors.

In addition to the traditional Picture in Picture (PIP) display format, the CODEC also supports Picture outside Picture (POP) when presentation material is shared. Self-view may only be displayed full screen or as a PIP image.

The layout is controlled via the Touch 10 control panel which allows the position of the Self-view PIP to be moved and the Layout adjusted.
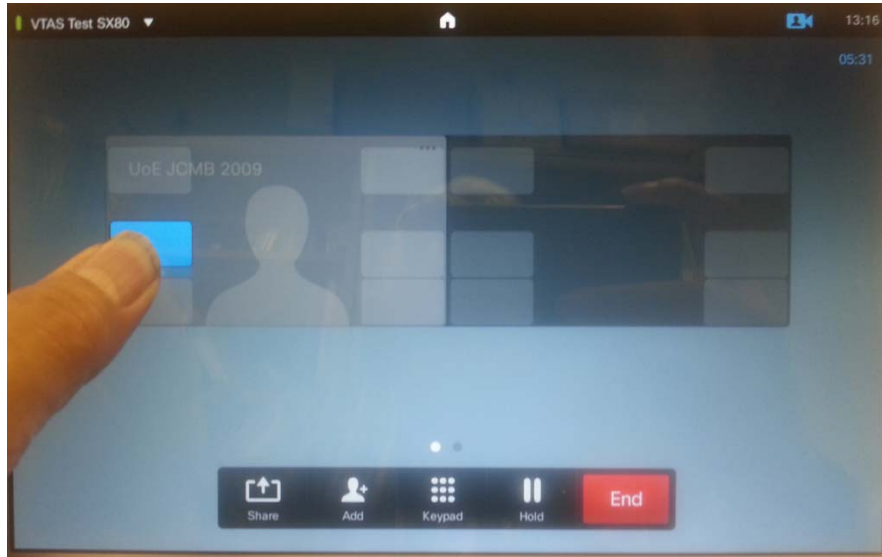
Picture in Picture (PIP) position adjustment

Single Monitor Mode

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

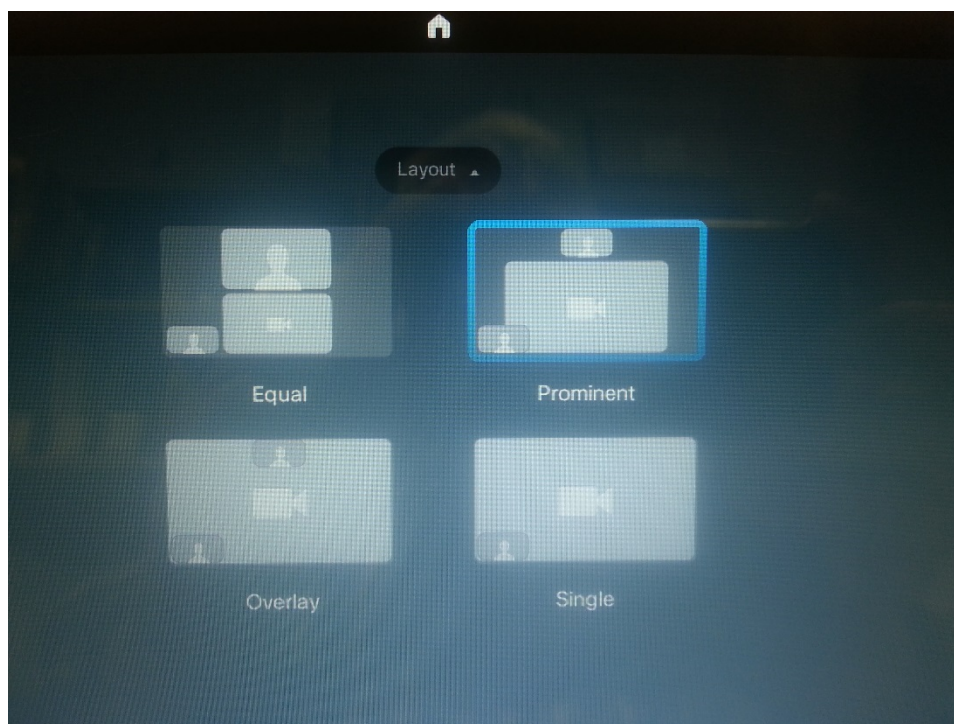|	No presentation material connected	Presentation material connected
Monitor 1	Near Image PIP + Clock	Presentation Full Screen Near Image PIP

In single monitor mode in a call the monitor displays the following layouts:

- Far image full screen, small near image PIP
- Near image self-view full screen

Presentation Inputs may be previewed with the following layouts:

- Single: Full screen of the presentation image and near image PIP
- Overlay: Full screen of the presentation image and near and far image PIP
- Equal: Presentation and far end images side by side POP, near image PIP
- Prominent: Large presentation image, small far image POP, and near image PIP

The Presentation Layouts are reflected on the Touch 10 Menu Screen

Presentation Layout Selection

When multiple presentation inputs are connected, up to two presentation inputs may be simultaneously previewed in Picture outside Picture (POP) prior to selection and sharing.
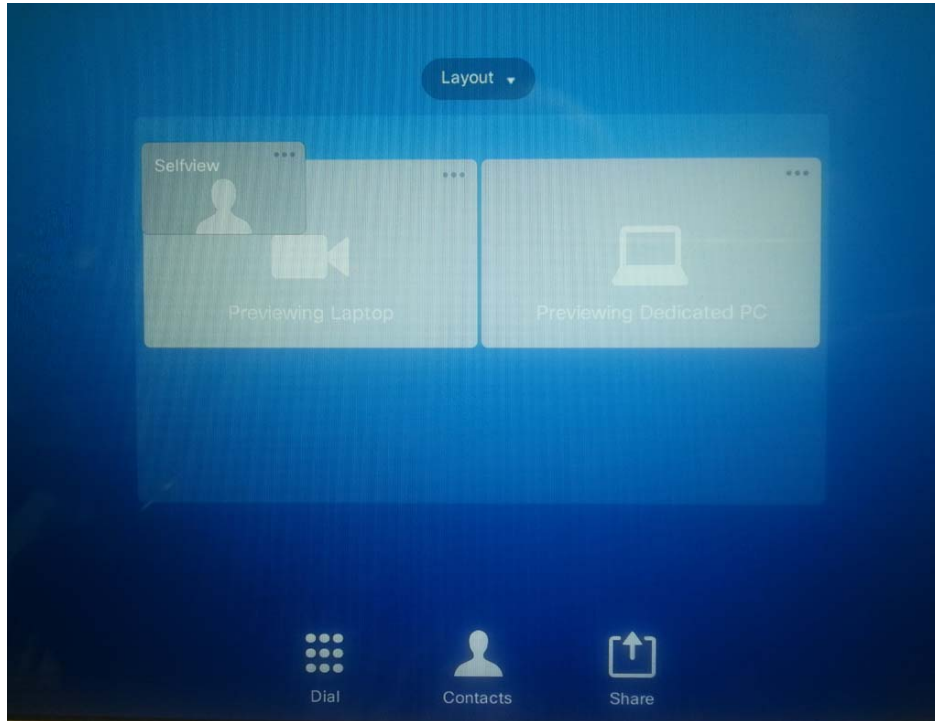
Presentation Preview

In single monitor mode in a call when H.329 presentation material is either transmitted or received the monitor displays the same layout selections as in Preview

Note: In single monitor mode it is not possible to display the three images simultaneously as POP: Near image is always a PIP or full screen.

Dual Monitor Mode

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

	No presentation material selected
Monitor 1	Clock
Monitor 2	Blank

The Self-view PIP may be displayed and switched to full screen on either monitor.

When presentation material is connected and previewed the following layouts are available:

Monitor 1	Clock	Presentation
Monitor 2	Presentation	Presentation

The Self-view PIP may be displayed and switched to full screen on either monitor.

In Dual Monitor mode in a call, the monitors display:

	No presentation material selected
Monitor 1	Far Image
Monitor 2	Near Image Selfview

When presentation material is connected, previewed and shared, the following layouts are available:

Monitor 1	Far Image plus Near Image PIP
Monitor 2	Presentation

The Near Image Pip may be switched to full screen and moved to either monitor by the user.
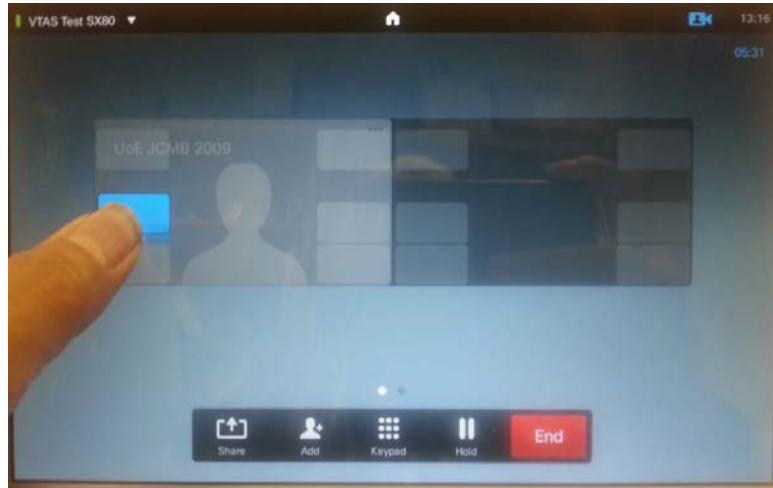
Picture in Picture (PIP) position adjustment

Three monitor outputs are available to support larger more complex installations; Room Type Templates may also be constructed by a system administrator. A Room Type template includes custom video layouts and customized system behaviour.

Cisco TC Console software is a visual editor that enables the system administrator to customise sections of the SX80 CODEC configuration, including audio and display layouts.

Room Type Template Selection

The PTZ (Pan Tilt and Zoom) HD camera includes a 10x Optical Zoom and a 2x Digital Zoom and an exceptionally wide horizontal viewing angle of 80 degrees and supports Preset Positions. The image quality from the camera was exceptional, with levels of detail visible in dark areas of the image being superior to other vendor's cameras.

Far end camera control (FECC) is also supported.

The CODEC includes an extensive number of video inputs including three HDMI, one DVI-D and one Composite/S-Video. The HDMI and DVI-D inputs support Extended Display Identification Data (EDID).

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 conferenced together over a 6 Mbit/s connection, it was possible to transmit two simultaneous high resolution images - the main camera 1080p @60fps and the presentation channel at 1080p @30fps. 720p @60fps is an alternative for the presentation channel if motion rendition is more important.

Several audio formats are supported by the SX80. AAC-LD is supported providing 20 KHz analogue audio frequency response.

The SX80 system provides comprehensive audio facilities via Phoenix connectors:

Eight switchable microphone/balance line level inputs, four balanced line level inputs, three HDMI inputs. Audio outputs include six balanced line level outputs and two HDMI outputs.

Encryption is provided at all connection speeds through Advanced Encryption Standard (AES).

MCU

Optional embedded MCU Licenses are available, this feature was not available with the test unit.

D: SYSTEM OPERATION

The system may be operated locally from the Touch 10 control panel with its on-screen graphic interface or integrated with a room control system. The Touch 10 menus are logical and easy to follow and supports the use of the system when not in a call for local presentation display from any of the presentation inputs.
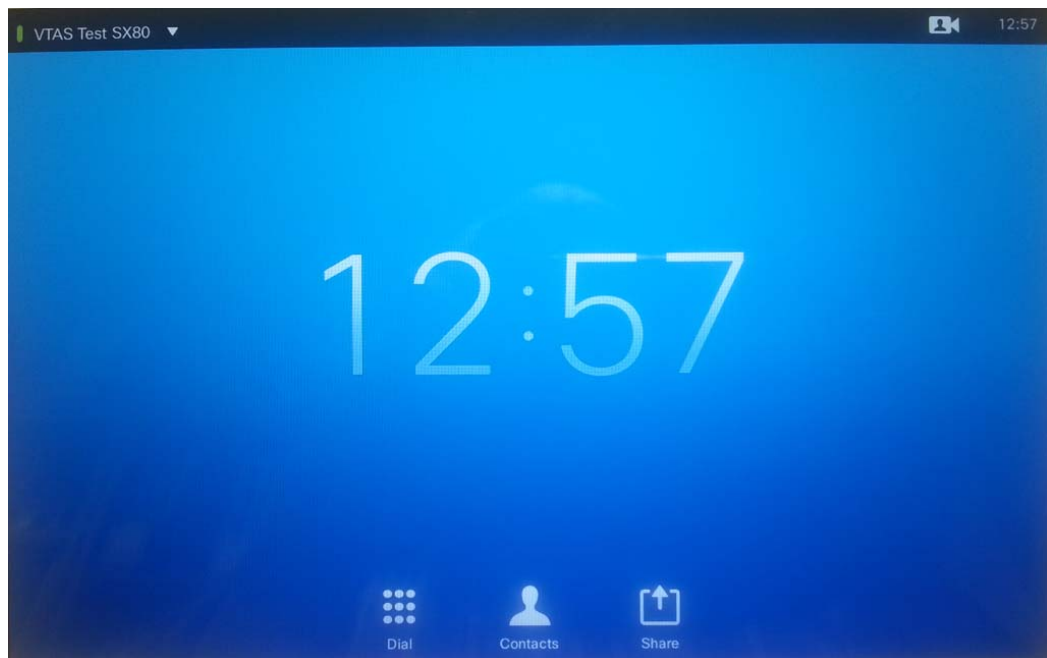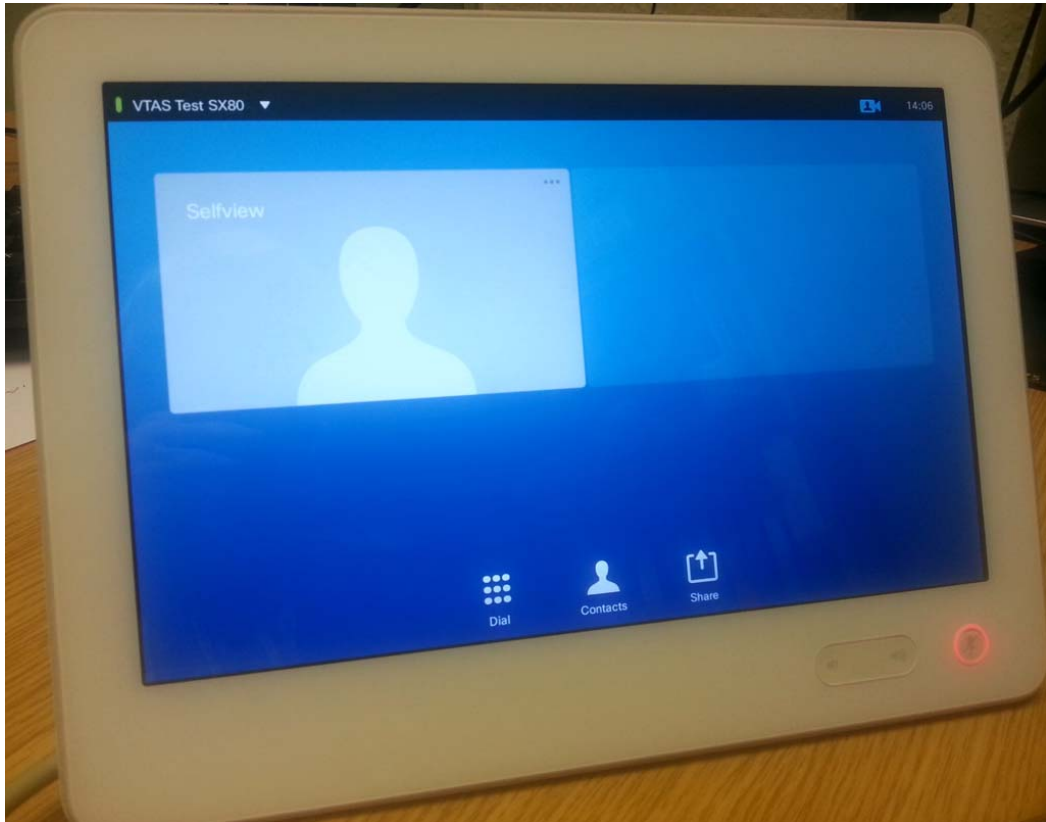

On-Screen Main Menu
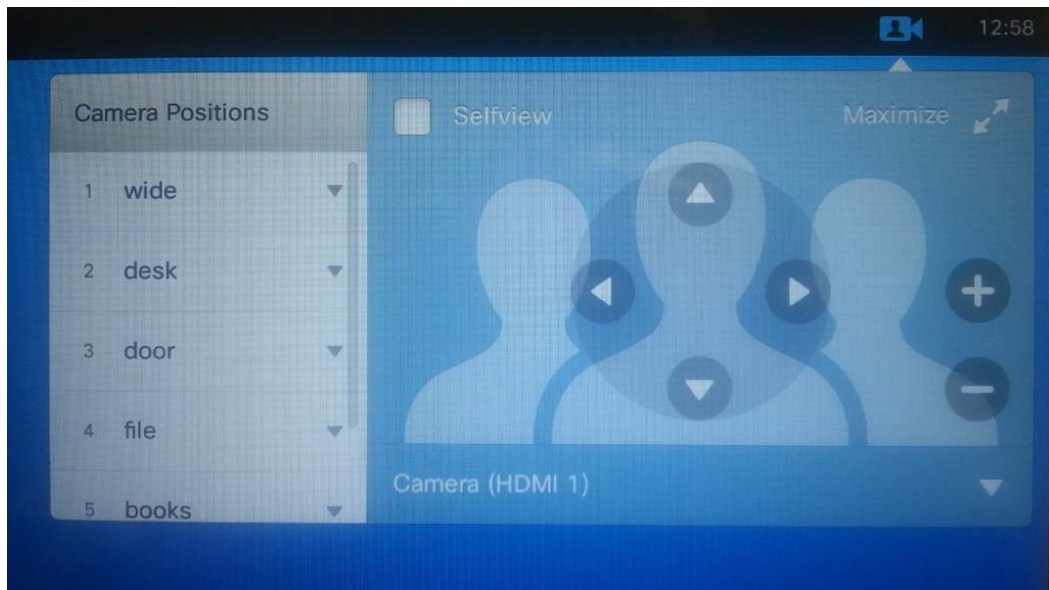
Camera Selection and Control

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.

Touch 10 Control Panel

The Touch 10 control panel includes five main menu options:

- Dial
- Contacts, including access to Favourites, the Directory and a list of Recent Calls.
- Share, including preview of the presentation inputs
- Camera, including Camera Selection, Pan Tilt Zoom Control and Preset Position Selection
- System Settings

An H.239 connection is initiated and terminated on the Touch 10 control panel:

- Pressing the Share button displays the available presentation sources on the control panel; the source may be previewed prior to sharing or immediately shared
- Pressing the Stop Sharing button again for a short period closes the H.239   connection
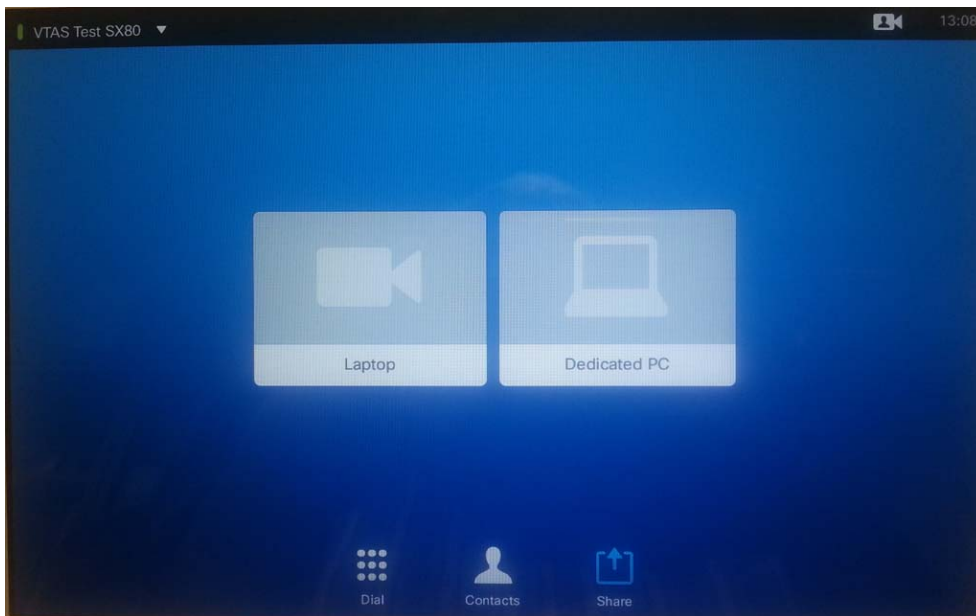
Presentation Source Selection
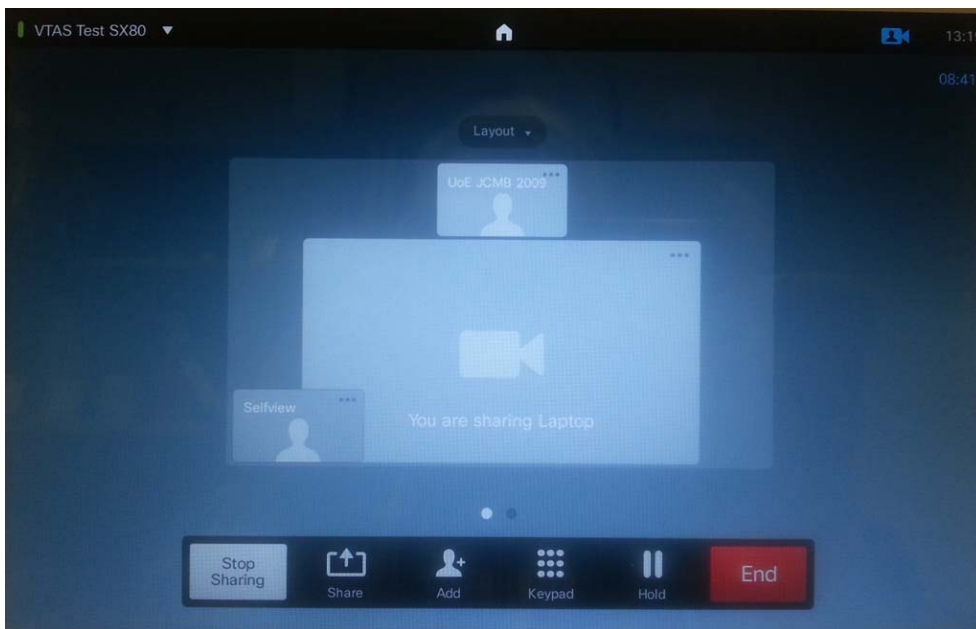
Presentation Being Shared (Single Monitor)

The camera occupies one channel. Any other source - normally a PC, Laptop or Document Camera – occupies the second channel. At the remote site these two images may either be viewed on two separate monitors or when using POP, displayed on a single screen.

The system takes a significant period to boot up from cold (~60 seconds). 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 Call Status menu accessed via the "Settings" button on the Touch 10 control panel displays call status data, including connection speed, compression protocols, packet loss and frame rate.

Cisco Intelligent Proximity

The Cisco Intelligent Proximity feature activates when mobile devices are close to an SX80 endpoint. When the Proximity App is launched, an Ultrasound connection between the endpoint and the mobile device facilitates pairing between the systems over the wireless network. Using an audio connection for pairing ensures the mobile device can only connect to the CODEC within the room.

Once connected, the Proximity App allows simple control of the Codec and displays any content shared across the videoconference link on the mobile device. The App captures a still image every time the presentation changes and allows the user to scroll back through the presentation to earlier slides. If video material is shared, one still image is captured approximately every second. Snapshots of slides may also be captured and stored on the mobile device.
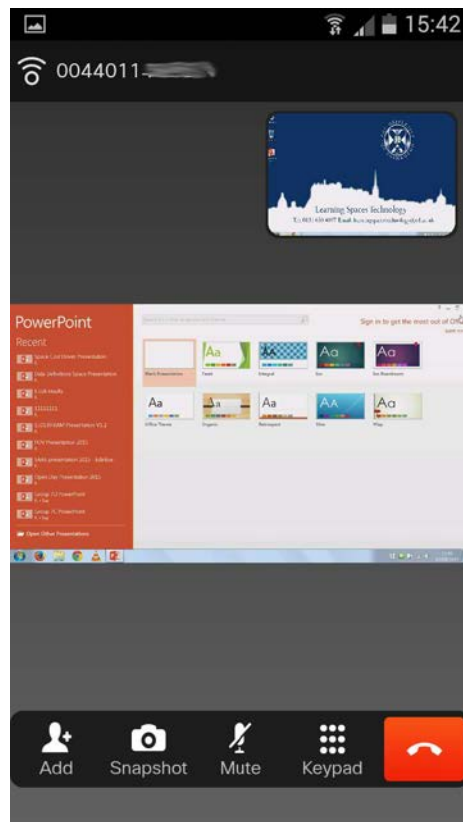
System Detection
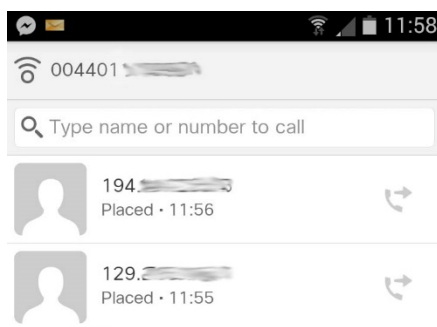
Call Menu
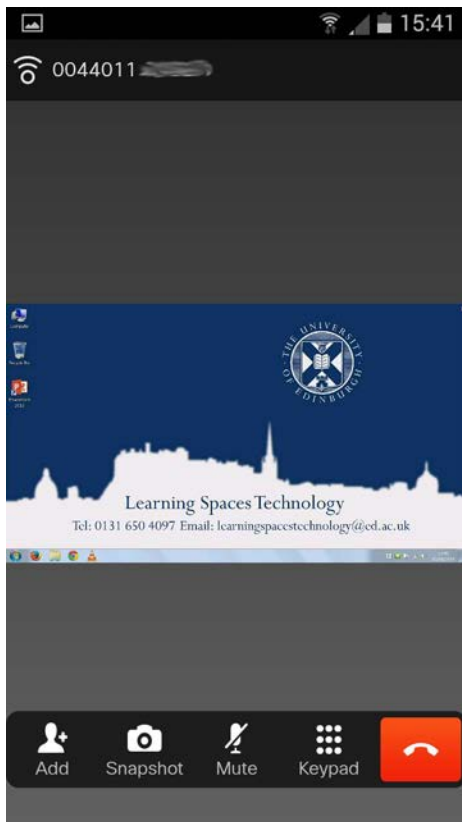
Current Slide   Previous Slide with Current Slide Insert

The system may also be configured, controlled and monitored via a password protected web browser from a network connected PC. This facility provides configuration, control and monitoring facilities; video images may only be viewed if an option key is applied to protect conference privacy.
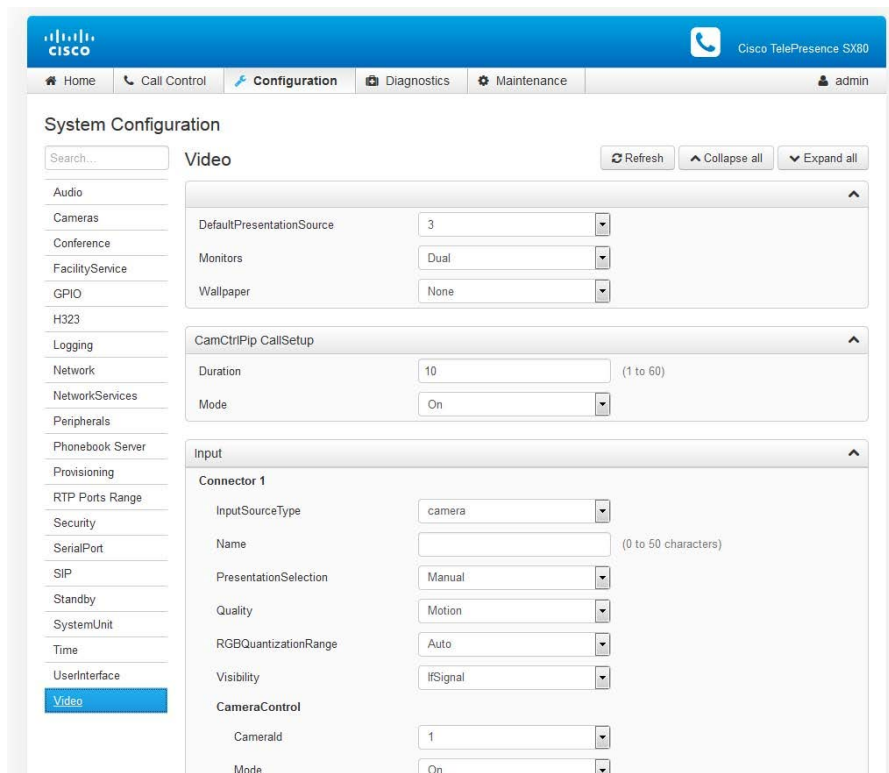
Web Interface Configuration Menu
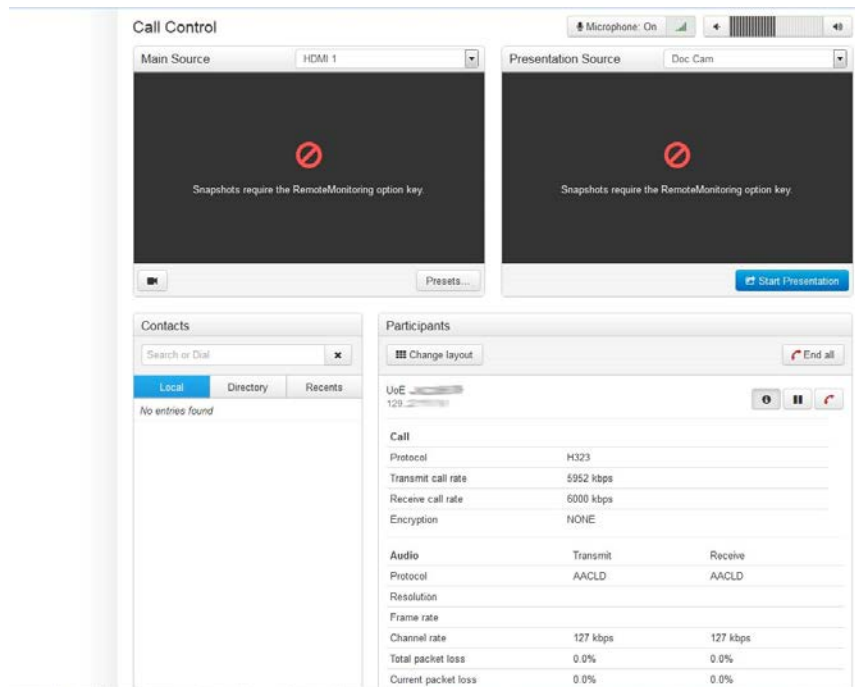
Web Interface Call Statistics Menu

The SX80 system includes a desktop microphone pod with an in built mute button; the LED indicator is illuminated red when muted. The system facilitates connection of up to eight microphones.

Desk Microphone

E: VIDEO TESTS SUMMARY

The overall video quality experienced from the SX80 system was excellent; the high resolution images and the superb motion rendition at 1080p 60fps were impressive. The 10x camera video quality when viewed as self-view and transmitted via the videoconference link, was exceptional with levels of detail visible in dark areas of the image being superior to other vendors' cameras. For connections at the maximum 6Mbit/s, the video was of a high quality. Even fast moving movie trailer material that challenges conference links to the limit was almost artefact free.

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

F: AUDIO TESTS SUMMARY

Setup   The echo canceller is fully automatic in operation. The quality of echo cancellation was acceptable however 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

G: INTEROPERABILITY

There were no problems connecting from the SX80.

Time to Connect with encryption On

All speeds: 3 seconds

Connectivity with Other Machines (models listed with comments)

Successful connections were made in each direction with the following CODECs, with the exception of the Lifesize Room. Where the systems supported H.239, presentation material was also shared.

CODEC	Call Bandwidth	Resolution Transmitted by The SX 80	Resolution Received by The SX80	
Tandberg 6000 MXP S/W F9.0 PAL	2 Mbit/s	720p @ 30	720p @ 25	** In connections with a Lifesize Room 200 no video or presentation material was received by the SX80
Cisco SX20 S/W TC7.1.1	6 Mbit/s	720p @ 30	720p @ 30	
Cisco C40 S/W TC7.2.0 (No Premium Res)	6 Mbit/s	720p @ 30	720p @ 30	
Cisco C90 (Prem Res) S/W TC7.02	6 Mbit/s	720p @ 30	1080p @ 25	**Connectivity with the Jisc**
Lifesize Express 220 S/W 4.9.00	4 Mbit/s	720p @ 60	720p @ 30	
Lifesize Room 200** S/W 4.7.22	6 Mbit/s	720p @ 30	No Video	

Videoconferencing Service - Vscene

H.323

The SX80 connected successfully to the Vscene Codian MCU at high definition using H.264 video, 720p resolution and AAC-LD audio with video and audio in both directions. The received audio level was measured as peaking to -4dBm.

H.239 also interoperated correctly.

Procedure for making a call

1.   Press the "Dial" button on the Touch 10 control panel
2.   Input IP or E164 address and select the Call rate
3.   Press the "Call" button

Or use the local contacts Directory, Favourites, or the Recent Calls lists.