OVERVIEW

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Device class
The Cisco SX 80 is a full HD capable system for large conference rooms. It is mainly intended to be built into a rack. The Cisco SX80 belongs to the highest performance class and offers a lot of ports for the integration into the existing media technology.

The device supports up to three full HD video outputs (2xHDMI, 1xDVI-I) and eight audio outputs (6x Line/Euroblock, 2x HDMI). There are four full HD video inputs (3x HDMI, 1x DVI-I), a composite video input and fifteen audio inputs (8x Mic/Euroblock, 4x Line/Euroblock, 3x HDMI) available. All microphone inputs contain a separate echo canceller. The Cisco SX80 can be controlled by a provided touchscreen display or by a connected media control system.

Scope of Delivery
The scope of delivery includes a codec, the speaker track system with two Precision 60 cameras, a Cisco TelePresence Precision MIC 20, a Cisco TelePresence Touch 10 with PoE injector and all necessary cables. The used cameras are 1080p60 PTZ cameras with ten times optical zoom.

The, at the testing device, installed options were Encryption and MultiSite.

**Protocols and bandwidths**

The device enables calls via H.323 and SIP with a bandwidth up to 6 Mbps. At multi-point conferences is a total bandwidth of 10 Mbps available. The video resolution of 720p30 requires at least a bandwidth up to 768 kbps and full HD with 1080p30 requires at least 1472 kbps. The data transmission is realised by H.239 or BFCP.

The videocodec H.265 will be only supported at SIP calls.

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**INSTALLATION**

Setting up the whole system is more comprehensive as usual. While the microphone, the touchpanel (incl. PoE injector) and all the other cables like electricity, ethernet, the monitor and the data presentation cable were connected very fast with the appropriate terminals to the codec, the speaker track system has to be assembled first. This includes the installation of the two cameras in the housing of the speaker track system, the connection of the cameras with the electricity and ethernet to the speaker track codec and the attachment of the microphone arrays to the speaker track system. The microphone array will be also connected with two cables to the speaker track codec. The speaker track system will be connected with codec of the Cisco SX80 via the ethernet and two HDMI cables (cameras).

For the simultaneous use of SpeakerTrack and PresenterTrack a third Precision 60 camera will be needed, this makes the usage of a switch necessary, because there are not enough ethernet connections at the codec of the Cisco SX80. During the testing period there was no third Precision 60 camera available.

The attached manual is pretty good understandable and especially for the configuration and connection of the speaker track system absolutely necessary.

The first configuration steps, especially a first network configuration, will be adjusted at the beginning via the touchpanel. At a stand alone usage without any Cisco infrastructure (for example within the service DFN VideoConference) there have to be done more settings, which can not be adjusted directly at the device. They have to be configured by web access at a clear and self-explanatory surface.
Operation
The device can only be operated by a touch screen. Smartphone trained fingers feel immediately comfortable. Because of the size of the touchpanel and the intuitive, clear menu navigation is a remote control not to miss. All necessary functions to implement a video conference are included. Furthermore warning notices will be given if a problem was detected.

SpeakerTrack and PresenterTrack
The functionality of the SpeakerTrack requires the speaker track system with two built in Precision 60 cameras and a microphone array for the localization of the noise sources. With activated speaker tracking the speaking person or the speaking persons will be tracked by the currently not for the video conference used camera, showed in a corresponding image section and as video transmitted. Thus, the other camera is inactive. As soon as a other person begins to speak, the image section will be readjusted with the same mechanism, thereby the roles of the two cameras are changing constantly. At the time when no person is speaking, a total picture of the room will be transmitted.

At the speaker tracking, the number of people in the room will be constantly determined. The current number can be found at the web interface under "setup", "status", "room analytics". During the testing, the speaker tracking convinced completely, in each case the current speaker was recognized and accordingly displayed.

The functionality of the PresenterTrack requires a separate Precision 60 camera. This camera controls a selected area (for example the podium), where the presenter stays during the speech. As soon as the presenter enters the area and a face will be recognized, this camera will be used for the video transmission and the presenter tracking follows the presenting person. This provides the presenter a greater freedom of movement. As soon as the presenter leaves the controlled area, the original video transmission of an other camera will be used. (For example the transmission of the conference desk)

The tracking of the presenter takes not place by moving the camera, but by using a constantly changing part of the total picture. This provides considerably better an exact image. Also the presenter tracking could convince during the testing and works reliable.

Because there was no third Precision 60 available, the SpeakerTrack and the PresenterTrack could not be tested simultaneous. But it is possible to switch on the touch panel pretty fast, so that a camera of the SpeakerTrack-System can be used as PresenterTrack if necessary. The activation of the SpeakerTrack and the PresenterTrack is also possible at the web surface (under "Call Control" or "Setup", "Presenter Tracking").

Other settings can be done at the web interface. These are located under "Setup", "Configuration", "Cameras", "PresenterTrack" or "SpeakerTrack". The to be used cameras and the availability of both functions can be set up there.

The controlled area for the PresenterTrack is also adjustable by a camera position in PTZ coordinates. This can be also set up more easily through a graphic tool under "Setup", "PresenterTracking".

At the SpeakerTrack it is also possible to prevent the zoom-in to individual persons ("CloseUp"), to make the switching mode between the speakers smoother ("TrackingMode") and to recognize a existing WhiteBoard and to transmit it. ("WhiteBoard Mode").

Transmission quality
During the testing, the audio- and videoquality could be rated as very good. The video compression was using the video codec H.264. At the data presentation, static content (slide presentation) and also moving content (sd- and hd movies) could be transmitted very good, provided that an appropriate powerful device was used on the opposite site.

Remote camera control
The Cisco SX80 could control the remote site as long as the technical requirements of the receiver were conform.

Service DFNVideoConference
The cooperation with the DFN-MCU works very good. H.264 was utilised as video codec.
Gatekeeper
The use of Gatekeeper GNU-GK did not cause any problems.

SIP-Dialing
Calls to the DFN-MCU are possible via SIP-dialing with the syntax "Konferenz-ID@vc.dfn.de". In this case, the transmission of a data presentation can be done in a second channel via BFCP.

Encryption
All connections were realised with a H.235 with AES-128 media encryption.

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CONCLUSION

The Cisco SX80 convinces with a very good audio- and videoquality, with a lot of connection possibilities and with the related good integration possibilities to existing media technology. The pin-sharp camera image of the Precision 60 camera is an additional benefit. The one-off expenses for the installation is acceptable. SpeakerTrack and PresenterTrack are at appropriately usage considerations very good usable. Overall, the Cisco SX80 is one of the leading players of all currently available video conference devices. Thus, the usage of the system can be recommended, even if there are devices with a better price-service-ratio on the market.

Documentation
Manufacturer: Cisco, Datasheet 2017

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<td>G.711, G.722, G.722.1, G.728, G729AB, MPEG4-AAC-LD, Opus</td>
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<tr>
<td>Video Compression</td>
<td>H.265 (only at SIP), H.264, H263+, H263, H.261</td>
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<td>Resolution</td>
<td>Video up to 1080p with 60 fps, data presentation up to 1080p with 30fps</td>
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