GENERAL

Period
March 2016

SW-Version
1.20.20

Device Class
The Sony PCX-XC1 is the mobile model of the PCS-Series from Sony. It is compact and barely larger than similar SRG-cameras. The Sony SRG-120 DH serves as integrated camera. This system is meant to be used as Settop-System. connection-ports are reduced to an absolute Minimum compared to the Sony PCS-XG100, therefor only one monitor can be connected for example. Advanced mobility can be realised by an WLAN-Modul, which is included by optional PCSA-WXC1 Wireless Software. Due this WLAN-Modul and the mentioned Option videoconferences can also be executed via WLAN.

Scope of Delivery
The Sony PCS-XC1 is delivered with codec, integrated camera, desctopmicrophone Sony PCS-A1, the remote-control Sony PCS-RF1 and all necessary cables for operation. Optional devices like WLAN-modul IFU-WLM3 and an USB Stick for recording directly at the device have also been tested. Further more the options Presentation, PCSA-RXC1 HD upgrade and PCSA-WXC1 wireless software had been installed. These allow to transfer datapresentations, as well as video- and presentationresolutions up to 1080p and the use of WLAN for videoconferences. The option presentation is always available. Also the PCSA-SAG1 can be purchased, which enables videoconferences with mobiledevices via Ipela Communication App.

Protocols and Bandwidths
The system permits calls with H.323 and SIP using a bandwidth up to 4 Mbps.

Other
The remotecontrol works with radiotransmission and does therefore not require a visual connection.
INSTALLATION

Setting the device up and connecting all components is a easy task using enclosed documentation. Even without the documentation, installation is easy and fast to do thanks to clearly arranged connection ports. Positiv to mention is that there has not been made use of proprietary connectionports. For operation necessary properties involve specifications about the IP-network and gatekeeper. Furthermore bandwith should be adapted and encryption activated. To conduct all adjustments at the device, advanced properties need to be displayed by pressing the F4-button in the konfiguration menue.

The Sony PCS-XC1 only possesses one HDMI-output, which is to be used for audiooutput necessarily. The second HDMI-connectionport is the input, that can be either used for an other videoinput or an datapresentation. No audio can be inducted at this HDMI-input. Further more HDCP as well as HDMI CEC are not supported at both HDMI-ports. Microfoninput is realised over 3,5 mm jack-connector. All in all 3 USB-ports are available, while one of them is a mini-USB-port for external control and service. The other USB-Connectors on both, the front as well as the backside are meant to be used for recording on to USB-sticks or by WLAN-modul. In case of using the WLAN-modul the USB-port at the devices frontside is not to be used. The RJ4S-port is an Gigabit-Ethernet-connection. Other connectionports are for powersupply and optional Kensington-securitylock.
Start up / Energyconsumption
The Sony PCS-XC1 requires 55 seconds for startup. To reach readymode from stand-by it takes 15 seconds. Typical energyconsumption lies at 81 kWh per year.

Control
The interface is both intuitiv and user-friendly. The, from further versions, well-known remote controll enables comfortable control of the device. When ever needed advices are faded up, that show which color activates which function. This explanation is needed due to contextsensitive function or abbreviated instruction, which are explained by the menue. The Sony PCS-XC1 Mainmenue is for the most part customisable and there for adaptable for most user needs. For example the user-interface can be run in a kind of Kiosk-mode (one has access only by quick dialing and the phonebook) or by displaying further menueoptions. Also while videoconferences are running, most necessary functions can be activated by remote control.

Due the fact that only one monitorconnection is installed, the available monitor-layouts for simultaneous presentation from video and presentation are needed and usefull. It can be chosen between full-screen, same size images and image with different size of each image as well as image in image. Further accessoptions are maintained over the webinterface and via Telnet/SSH

Audio
The Sony PCS-XC1 audioquality has been rated very good in 2/3 of the tests. Although the system is capable of modern audiocodecs, in ca. 1/4 of the tests the oldest of the ITU standardised basiccodecs G.711 is made use of. It's sensation is almost equal to an ISDN phoneconnection, therefore the audioquality is just evaluated as "good". At this part the producer could improve the connectionalgorithm, so modern audiocodecs are used more often.

The Sony PCS-XC1 works with an acoustic echo cancellation (AEC), automatic gain control (AGC) and automatic noise supression. Never the less echo problems and interruptions happend with simultaneous presentation in conection with Sony PCS-XG80 there for the audio is only rated as "good".

More severe problems due audiointerruption could just be noticed while receiving in connection with the Polycom RealPresence Desktop (Windows) and the Polycom RealPresence Mobile App installed on the iPad. The audioquality has been rated OK.
The codecs **G.711**, **G.722** and **AAC-LC Mono** have been used in the test. **G.722** was used with "mode 1", this is not to be mistaken for **G.722.1**.

**Video**

The video quality could be rated as "very good" at almost all tests in both directions. However, the connection to the Polycom RealPresence Mobile App could only be rated as "good" or "okay" as result of bandwidth conditions. Throughout the test the videocodec **H.264** has been used. A minimum resolution of **720p** was used consistently, on third of the tests could even be performed at **1080p**. As well as in the audiotests, the connection with the Polycom RealPresence Mobile App, used on the iPad, could only be conducted with lower resolution (512x288, 480x272, 240x136).

**Datapresentation**

The topic datapresentation could be performed with good up to very good results at the Sony PCS-XC1. Resolutions with a minimum of **720p** at **H.264** as videocodec have been reached within the datachannel, however improvement is possible for transmission of HD-videos.

While transmitting static presentersheets, limitations have only been noticed in connection with the LifeSize Team 220, in general the sheet transmission could be rated "very good". Linked with the LifeSize Team 220 very long swichtimes as well as incorrect transmission could be seen.

The practicable use of SD Videos was given in 2/3 of the tests. The reason for weak performance could be trekked back to an too low framerate sent by connected vc-system.

Using HD-Videos was practicable within 1/3 of all tests. In general a better rating was averted by framerates, blocking artefacts respectively focussing.

In connection with Cisco C40, the **Polycom RealPresence Group 500** and the **Sony PCS-XG80** the videoresolution was reduced from **1080p** to **720p** respectively the videoframerate from 60fps to 30fps due presentation.

Detailed findings can be found in the **compatibility matrix**.

**Camera remote control**

The camera remote control works with one exception constantly with apropriate technical reqierements of the connected vc-station. In connection with the Cisco C40, the C40 was not able to direct the Sony PCX-XC1s camera.

**DFNVideoConference service**

Linking with the DFN-MCU works without any problems. The audio and video quality was very good. As videocodec **H.264** was used, with **720p@30** in transmitter direction and **1080p@25** in receiver direction. The used audiocodec was **AAC-LC Mono**. For datapresentation **H.264** with **720p** was used.

**Gatekeeper**

The collaboration with the Gatekeeper GNU-GK worked without any problems.

**SIP**

Calls to DFN-MCU are possible by SIP-Dialing with the syntax "Konferenz-ID@vc.dfn.de". A transmission of an presentation within the second channel by use of BFCP can not be made. A SIP-Call from DFN-MCU to Sony PCS-XC1 was not possible.

**URI-Dialing**

With the Sony PCS-XC1 URI-Dialing with **H.323 Annex O** with the Syntax "vc.dfn.de#Konferenz-ID" is possible without any restrictions. It does not matter whether the system is registered at the Gatekeeper or not.

**Encryption and Firewall-Traversal**

Within all connections a media encryption with H.235 Version 3 has been made. Besides the device supports Firewall-Traversal with H.460.18 and H.460.19.

**WLAN**

In order to increase mobility, the WLAN-Modul IFU-WLM3 can be purchased, it is included in the option PCSA-WXC1 Wireless Software. The WLAN-Modul needs to be connected on the backside of the device. A Plug&Play is not possible, the WLAN-Modul needs to be connected while the device is turned off, otherwise it will not be recognised correctly. As well LAN und WLAN can not be used at the Sony PCS-XC1 simultaneously, an adjustment can be made in the configuration menu.
When switched to WLAN a new menu option "Wireless security" can be seen in the configuration menu. A connection can be established via a list of available WLAN networks. Except unprotected connections only WPA1/WPA2-connections with password are supported, therefore eduroam for example cannot be used.

A bandwidth of 2 Mbps could be achieved with no problems, at 4 Mbps packet loss happened. Also the WLAN-Module requires direct visual connection to the Accesspoint, otherwise further packet losses are to be expected.

The WLAN-Module works with the standard IEEE802.11b/g/n and requires a connection speed of 4 Mbps.

Others

An optional USB-Stick can be used for recording video conferences and Photo/Snapshots, for installing of software updates and for saving setups as well as saving phonebooks. A 32 GB USB-Stick can store up to 4 hours with 1 Mbps.

The Sony PCS-XC1 supports Streaming with Unicast and Multicast (up to 10 receivers).

Update 08/2016: Due to the discontinuation of QuickTime for Windows streaming is no longer possible.

CONCLUSION

The Sony PCS-XC1 is mobile due to the compact construction and flexible in use by reason of the WLAN-support. It also is easy to transport. That only one monitor can be connected needs to be mentioned. The familiar usability at the Sony PCS-devices is continued at the PCS-XC1. It also can persuade in video and data transmission. In the case of audio transmission the co-operative algorithm should be improved, so the use of G.711 is an absolute exception.

Documentation

Our thanks go to Mr. Herter from MaxxVision for providing the tested device.

Manufacturer: Sony
Contact person: Mr. R. Herter

<table>
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<tr>
<th>supported gen. standards</th>
<th>H.323, SIP, H.239</th>
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<tr>
<td>audiocoding</td>
<td>G.711, G.722, G.728, MPEG-4 AAC-LC Mono</td>
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<tr>
<td>videocompression</td>
<td>H.263, H.263+, H.263++, H.264, H.264 High Profile, MPEG-4 Simple Profile</td>
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<tr>
<td>resolution</td>
<td>up to 1080p with 60 fps video and 1080p with 30 fps while simultaneously using video und daten presentation (not achieved within the test)</td>
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<tr>
<td>bandwidth</td>
<td>up to 4 Mbps</td>
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