GENERAL

Period
September 2016

SW-Version
4.25

Device Class
The Panasonic KX-VC 1600 is a settop-system, that enables videoconferences in high definition. It is one of the companies most powerfull devices.

The system can be used in combination with one of three different cameras (GP-VD151; GP-VD131; AW-VC2) and with one of two microphones (KC-VXA001; KC-VXA002). The cams differ in the optical zoom (none, 3times oder 10times); the microphones in there range (2-4m), the covered radius (300-360°) and the possibility of connection in series (0-4).

Up to three monitors can be connected over HDMI and configured in multiple ways to suit personal needs.

Scope of Delivery
Panasonic delivers the system with codec, the chosen microphone and camera, the remote controll Panasonic HD-VC and all necessary cables for basic use. For the Test the camera GP-VD131 and the microphon KC-VXA001 have been used.

Protocols and Bandwidths
The system permits calls with H.323 and SIP using a bandwith of 4 Mbps up to 18 Mbps when using the integrated MCU. Data is transmitted with H.239 or BFCP.
INSTALLATION

Although a documentation is missing, the installation of the device is quick and easy. However at least at this point the user requires to make use of the manual, because a variety of setups, options and menus can not be caught intuitively.

The manual has 196 pages and provides detailed descriptions for all menus and setups. Who spends time in studying the manual, is rewarded by a lot of detailed options that are otherwise not noticed. The device Panasonic KX-VC 1600 is worth a second look.

The security configuration is preadjusted in a defensive way. Therefore the system can only be operated at the place or by using the webinterface. A simultaneous configuration is not possible. To activate the webinterface a so-called admin-password is required. After that the device can only be operated by the webinterface. To enter the webinterface another different login is necessary. Within the webinterface the simultaneous use of direct and remote operation can be enabled.

TEST

Start up / Energy consumption
The Panasonic KX-VC 1600 requires 50 seconds from activation till finishing the startup. Reaktivation from standby takes seven seconds. Typical energy consumption lies at ca. 135 kWh for the codec and ca. 24 kWh per year for the camera.

**Control**

The userinterface requires some training concerning ergonomic layout as well as navigation through a large variety of options. In general the menu is divided in two sections - one for the user and one for the administrator.

The sections are quite flexible. The administrator can often change settings (for example to change the encryption on a running connection) or grant access for the user, so the user himself can change the option. All possibilities are well documented in the manual.

The colored buttons on the remote control are contextsensitive. Their meaning is displayed in the menu.

There are solutions to simplify the work for the user. For example it is possible to:
- enter all participant-numbers and selecting them with one click when using the intern MCU.
- or the layout on the monitors can be changed during the conference.

**Audio**

The audioquality is over all rated as "very good", in some cases the connection to older devices is just "good".

For transmission the codecs **G.722**, **G.722.1** and **G.722.1C** have been used in the test.

**Video**

The videoquality is in general rated as "very good" as well, except for the connection to LifeSize Team 220. The video was not better than "good" in that case.

The broadcast has been established with 720p or **1080p** with **H.264**. The selected bandwith has always been between 4 to 6 **Mbps**. A continuous 25 **fps** have been used. Even 50 **fps** when connected to **Polycom Real Presence Group 500**.

**Datapresentation**

Datapresentation made a good impression on the Panasonic KX-VC 1600. **WXGA** or **720p** have been used on older systems, modern devices have been connected with **1080p**. Videocodec was **H.264**.

Static content was always of "very good" quality.

Practical use of SD videos was given in 2/3 of all tests. Sending and Receiving HD-videos has been rated as applicable only in a few tests. Often a low negotiated framerate prevented a better evaluation.

The videorate for the Datapresentation between Polycom Debut and the KX-VC 1600 has been reduced from **1080p** to **720p** in the first channel.

For further information open the **compatibility matrix**.

**Camera remote control**

The camera remote control works depending on the remote stations hardware.

**DFN Video Conference 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 **G.722.1C**. For datapresentation **H.264** with **720p** was used.

**Gatekeeper**

The use of Gatekeeper GNU-GK did not cause any problems.

**SIP**

Calling the DFN-MCU by SIP-Dialing was not possible. The manufacturer is informed and works on a solution.

**URI-Dialing**

URI-Dialing with **H.323 Version 5** (formerly known as H.323 Annex O) by using the Syntax "194.95.240.35%conferenceID" can be used without limitations. It does not matter, whether the device ist registered at the gatekeeper or not.
Within all connections a H.235 media encryption has been conducted. The device supports Firewall-Traversal with H.460.18 and H.460.19.

**Other**

By using a commercial USB Stick new software updates can be implemented. The USB stick can also be used to save and recover important user data like profiles and phonebooks.

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## CONCLUSION

The Panasonic KX-VC 1600 system is a high performance device with a good price-performance ratio. When connected to modern systems a convincing connection quality in all channels could be achieved. Combined with the flexible configuration of the user interface it should be possible to use this system in a large variety of scenarios.

**Dokumentation**

Sincere thanks are given to Mr. Salac from the company Panasonic for providing the test equipment.

Manufacturer: Panasonic

Contact: Herr Hilmar Salac

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<tr>
<th>Supported general standards</th>
<th>H.323, SIP, H.239, BFCP</th>
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<tr>
<td>Videocompression</td>
<td>H.261, H.263, H.263+, H.263++, H.264, H.264 high profile, H.264 baseline profile</td>
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<tr>
<td>Resolution</td>
<td>up to 1080p with 60 fps in video and datan presentation</td>
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<tr>
<td>Bandwidth</td>
<td>up to 6 Mbps (point-to-point) and 18 Mbps (own multipoint conference)</td>
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