

SONY

VIDEO COMMUNICATION SYSTEM-TECHNICAL DOCUMENTATION

High Quality HD Image of the PCS-XG80S

IPELA™

PCS-XG80S Ver1.0

Introduction

As a standard feature, the PCS-XG80S Sony HD Visual Communication System supports the input and output of 1080i (1080/60i or 1080/50i) video signal, which has become the HD standard format for many imaging devices in recent years. Moreover, to transmit this 1080i video without degrading the quality, the system uses a High Profile video codec that complies with ITU-T (International Telecommunication Union Telecommunication Standardization Sector) recommendation H.264.

The video codec of PCS-XG80S also supports 720p (720/60p or 720/50p) as well as 1080i, which are both known as the de facto global standard in the field of broadcasting.

What is 1080i?

The 1080i format, along with 720p, is a high-quality video format called High Definition (HD). While 720p consists of a 1280 x 720 pixel screen resolution, 1080i consists of 1920 x 1080 pixels (Figure 1), which is more than double the resolution of 720p in terms of the number of pixels on the screen. This image uses the interlace format to refresh at a speed of 60 fields (or 50 fields) per second, reproducing smooth motion in extremely high definition (Figure 2).

Fig.1: Comparison of Resolutions



Fig.2: Comparison of 720/30p, 720/60p and 1080/60i

Other Companies' terminal PCS-XG80S

<p>720/30p</p> <p>1st frame 1280 720</p> <p>2nd frame 1280 720</p> <p>3rd frame 1280 720</p> <p>30th frame 1280 720</p>	●	●
<p>720/60p</p> <p>1st frame 1280 720</p> <p>2nd frame 1280 720</p> <p>3rd frame 1280 720</p> <p>4th frame 1280 720</p> <p>5th frame 1280 720</p> <p>6th frame 1280 720</p> <p>59th frame 1280 720</p> <p>60th frame 1280 720</p>	×	●
<p>1080/60i</p> <p>1st field 1920 540</p> <p>2nd field 1920 540</p> <p>3rd field 1920 540</p> <p>4th field 1920 540</p> <p>5th field 1920 540</p> <p>6th field 1920 540</p> <p>59th field (Odd) 1920 540</p> <p>60th field (Even) 1920 540</p> <p>1 frame consists of 2 field</p> <p>1 sec</p>	×	●

● : Supported × : Not supported (as of June, 2008)

What is High Profile?

ITU-T H.264 includes a variety of image coding tools and features (Table 1), but in actual use some profiles that define combinations of these tools and features are used for different purposes and applications. Conventional videoconferencing systems generally use the Baseline Profile, and they typically perform interlace/progressive conversion and reduce image resolution to 720/30p for transmission, even when the original format is 1080i. However, the PCS-XG80S supports High Profile, and it can directly encode 1080/60i and 1080/50i interlaced signal. The sender side judges in macroblocks whether to encode the odd and even fields separately or to encode the two fields as a single frame, and it performs the optimum encoding. The receiver side can reconstruct the original video format. Because no format conversion is performed, the system maintains the image quality of the 1080/60i or 1080/50i video from the PCSA-CXG80 standard camera for PCS-XG80S or other imaging device connected to the external input terminal, and smooth, high-quality video can be displayed on the far-end monitor in the original 1080/60i or 1080/50i format (Figure 3).

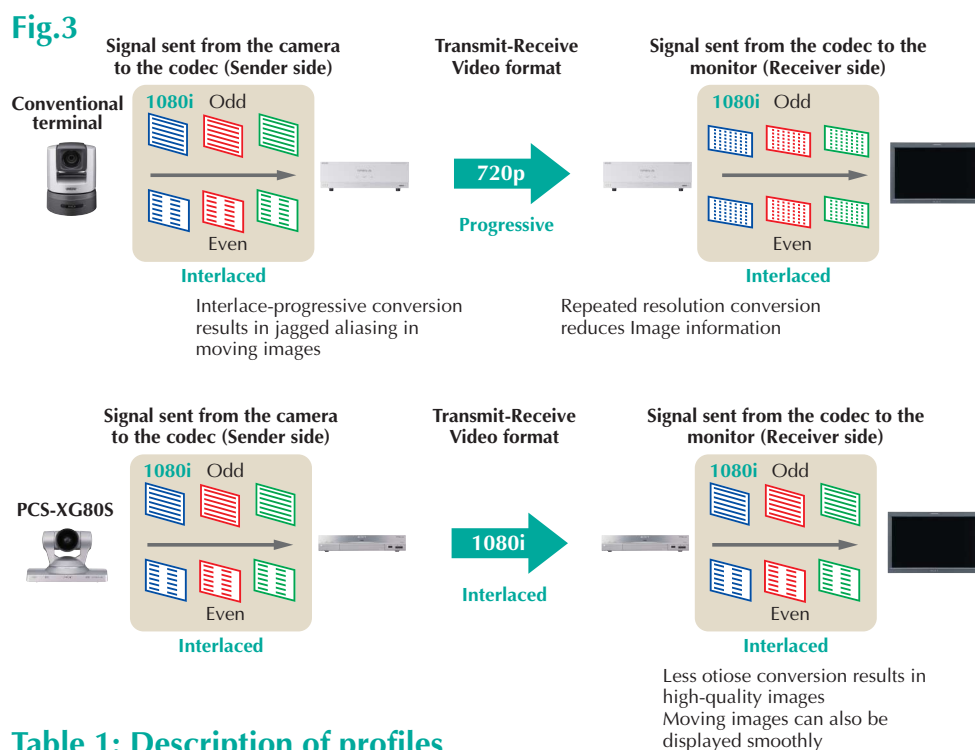


Table 1: Description of profiles

Name	Main encoding tool	Envisioned applications
Baseline Profile	Basic tool + Error-resilience tool (ASO, FMO, RS) *1	Mobile phone, simple broadcasting
High profile	Basic tool + High-efficiency encoding tool (CABAC, frame/field macroblock, weighted prediction) + Tool for high definition image (8x8 integer DCT, quantization matrix)	HD image

*1 The PCS-XG80S does not support the error resilience tool.

Use of the 1080i video signal format enables the delivery of smooth, clear and realistic 1920 x 1080 pixel video, which is useful in conventional forms of visual communication such as videoconferencing or distance education, as well in telepresence or in fields that demand extremely high-definition video, such as broadcasting and medical training.

In this way, the PCS-XG80S maintains an extremely compact size while transmitting images with the 1080/60i (1080/50i) and 720/60p (720/50p) formats, which are recognized for their quality as the de facto global standard. With a higher definition and smoother image than the 720/30p format widely used by other companies, these formats are more ideally suited for visual communications.

Video codecs supported by PCS-XG80S

Video codecs supported by PCS-XG80S

Name	Resolution (H x V)	Aspect ratio	Video codec	Scan mode	Maximum frame rate*2	Recommended bandwidth*2*5	Profile
1080i*3	1920 x 1080	16:9	H.264	Interlaced	60 (50)*4	3Mbps and above	High profile
720p	1280 x 720	16:9	H.264	Progressive	60 (50)	4Mbps and above	Baseline Profile
					30 (25)	1536kbps and above	
w4CIF/w576p	1024 x 576	16:9	H.264	Progressive	30 (25)	1Mbps and above	
w432p	768 x 432	16:9	H.264	Progressive	30 (25)	768kbps and above	
wCIF/w288p	512 x 288	16:9	H.264	Progressive	30 (25)	512kbps and above	
4CIF	704 x 576	4:3	H.264/H.263	Progressive	30 (25)	512kbps and above	
CIF	352 x 288	4:3	H.264/H.263/H.261	Progressive	30 (25)	256kbps and above	
QCIF	176 x 144	4:3	H.263/H.261	Progressive	30 (25)	128kbps and above	

*2 In H.264

*3 Able to connect only to a counterpart that can communicate using 1080i video format.

*4 The unit in the 1080i mode is "field per sec".

*5 Includes video and audio transfer rates.

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