

## H.239

PCS-1/1P	Ver2.20 or later
PCS-11/11P	Ver2.20 or later
PCS-G50/G50P	All
PCS-G70/G70P	All
PCS-TL33/TL30	All
PCS-TL50	All
PCS-XG55S	All
PCS-XG80S	All

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\* In the following text, "PCS-1", "PCS-11", "PCS-G50" and "PCS-G70" refer to both NTSC and PAL models (i.e. PCS-1/1P, PCS-11/11P, PCS-G50/G50P, PCS-G70/G70P).

## Introduction

H.239 is the international standard that was ratified by the ITU-T in 2003 to enable videoconference users to deal with one or more appended video data, in addition to ordinary video.

The Sony Visual Communication System (hereafter referred to as the PCS series) conforms to the H.239 standard, and thereby promotes the interoperability of videoconferencing endpoints from other manufacturers.

H.239 stipulates how to control and manage one or more additional media channels, in addition to the main media channel.

The PCS series uses the additional media channels via two functions: the Presentation function and the Dual Video function.

The Presentation function and the Dual Video function that the PCS series provides can also be used in H.235 encrypted communication for when secure videoconferencing is required.

This documentation describes the H.239 technology supported by the PCS series.

## 1. H.239 Supported By The PCS Series

The PCS series can support the following three functions which conform to H.239. The H.239 Presentation role of two Dual Video functions has newly been introduced to the PCS-G70/G50 Ver.2.5 in order to compatible with a dual video signal supported by other company's end point.

- **Presentation function\*<sup>1</sup> (Presentation role in H.239)**

(For the PCS-XG55S/XG80S)

Transmits H.264 SXGA/XGA/SVGA/VGA or H.263 XGA/SVGA/VGA video signals through the additional media channel. When transmitting H.264 XGA video signals, the maximum frame rate is 30fps.

To use this function, the optional HD Data Solution Software PCSA-DSG80 is separately required.

(For the PCS-1/11/G50/G70/TL30/TL33/TL50)

Transmits H.263 XGA/SVGA/VGA video signals through the additional media channel using the optional Data Solution Box (PCSA-DSB1/DSB1S)\*<sup>2</sup> \*<sup>3</sup>.

This function supports videoconferencing over both IP (H.323 protocol) and ISDN (H.320 protocol) or a combination of the two.

- **Dual Video function\*<sup>1</sup> (Live role in H.239)**

(For the PCS-G70 of all versions)

Transmits and receives H.264, H.263, and H.261 video signals with CIF resolution through the two streams of the additional media channel.

(For the PCS-G50 of Ver.2.3 and later)

**Only receives** H.264, H.263, and H.261 video signals with CIF resolution through the two streams of the additional media channel. (PCS-G50 of up to Ver.2.2 cannot receive or send a dual video signal.)

This function supports videoconferencing over both IP (H.323 protocol) and ISDN (H.320 protocol) or a combination of the two.

- **Dual Video function\*<sup>1</sup> (Presentation role in H.239)**

(For the PCS-G70 of V2.5 and later)

Transmits and receives H.264, H.263, and H.261 video signals with CIF resolution through the two streams of the additional media channel.

(For the PCS-G50 of V2.5 and later)

**Only receives** H.264, H.263, and H.261 video signals with CIF resolution through the two streams of the additional media channel.

This function supports videoconferencing over IP (H.323 protocol) only.

### Difference by version of PCS-G70/G50\*<sup>4</sup>

	Up to Ver.2.4		Ver.2.5 and later	
	H.239 Presentation	H.239 Live	H.239 Presentation	H.239 Live
<b>Presentation function</b>	Computer image	–	Computer image	–
<b>Dual Video function</b>	Not supported	CIF (exchangeable between only PCS-G70/G50 units)	<b>CIF (exchangeable with other company's end point)</b>	CIF (exchangeable between only PCS-G70/G50 units)

## 2. Presentation Function

This function conforms to the "Presentation role" described in ITU-T Recommendation H.239.

### 2-1. PCS-XG55S/XG80S

The PCS-XG55S/XG80S can send computer images and camera images simultaneously with the optional HD data solution software installed. The recipient of the data can view the computer images, even if no data solution software is installed into the receiver terminal.

In addition, the receiver terminal can only receive video signals with CIF resolution sent by the PCS-G70/G50 or other company's endpoint through the second stream.

Using the H.239 standard, the sender terminal firstly exchanges the capacity of all the terminals participating in the conference. Presentation data that conforms to the H.239 standard and camera images can be transmitted at the same time via the Presentation function when the sender terminal determines that the additional media channel has sufficient capacity for H.264 video signals with SXGA/XGA/SVGA/VGA or H.263 video signals with XGA/SVGA/VGA resolution.

If the sender terminal can not determine whether the H.239 presentation data can be transmitted, the computer image is transmitted automatically through the single stream\*<sup>5</sup>.

#### Transmitting computer images using the Presentation function

There are two ways to send computer images using the Presentation function:

- Select "Execute" for the "Presentation" from the Tools menu.
- Press the Presentation button on the remote commander PCS-RF1

##### Note

When presentation data is being sent, the transmission operation will not be available for use by other PCS terminals.

Only one terminal participating in the conference can send presentation data at any one time.

(This operation is supported at Ver.2.0 or later.)

#### Transmission speed of Presentation data

The transmission speed is determined by the capacity of the H.239 additional media channels of remote terminals. The maximum transmission speed of the additional media channel, however, is limited to 4Mbps.\*<sup>6</sup>

For the PCS-XG80S, the maximum transmission speed of the main media channel is 10 Mbps. If "2/3" is selected under the "H.239 Ratio" in the menus for system administrators, the additional media channel exceeds its maximum transmission speed limit (4Mbps).

In this instance, a transmission band faster than 4 Mbps is assigned to the main media channel. However, for the terminal that receives the presentation data, the transmission speed of the main media channel does not change (unless it is part of a multi-point connection).

## 2-2. PCS-1/11/G50/G70/TL30/TL33/TL50

The PCS-1/11/G50/G70/TL30/TL33/TL50 can send computer images via the optional data solution box.<sup>\*2\*3</sup> The recipient of the data can view the computer images, even if they do not have a data solution box or are using the PCS-11.

Using the H.239 standard, the sender terminal firstly exchanges the capacity of all the terminals participating in the conference. Presentation data that conforms to the H.239 standard can be transmitted via the Presentation function when the sender terminal determines that the additional media channel has sufficient capacity for H.263 video signals with XGA/SVGA/VGA resolution. If the sender terminal can not determine whether the H.239 presentation data can be transmitted, the computer image is transmitted automatically as sequential still images with 4CIF resolution.<sup>\*7</sup>

### Transmitting computer images using the Presentation function

There are three ways to send computer images using the Presentation function:

- Press the Send button on the data solution box.
- Select the Presentation option from the communication submenu.
- Press the Presentation button on the new remote commander PCSA-RG1.  
(This operation is supported for PCS-G70 Ver.2.3 later or PCS-G50 Ver.2.3 later.)

#### Note

When presentation data is being sent, the transmission operation will not be available for use by other PCS terminals.

Only one terminal participating in the conference can send presentation data at any one time.

### Transmission speed of Presentation data

The transmission speed is determined by the capacity of the H.239 additional media channels of remote terminals.

The maximum transmission speed of the additional media channel, however, is limited to 2Mbps.<sup>\*6</sup>

For the PCS-G70/G50, the maximum transmission speed of the main media channel is 4 Mbps. If "2/3" is selected under the "H.239 Ratio" in the menus for system administrators, the additional media channel exceeds its maximum transmission speed limit (2Mbps).

In this instance, a transmission band faster than 2 Mbps is assigned to the main media channel. However, for the terminal that receives the presentation data, the transmission speed of the main media channel does not change (unless it is part of a multi-point connection).

### Multi-point connection specifications

The following specifications apply to a multi-point connection (in which up to ten sites can be connected using a cascading connection) when optional MCU software is installed in the PCS series:

- The Presentation function is available for use in H.320 multi-point connections, H.323 multi-point connections, and mixed multi-point connections with both H.323 and H.320 connections.
- The transmission speed of the main media channel of all terminals in a multi-point conference will decrease while presentation data is being sent.
- (PCS-G70/G50 only)  
In a multi-point connection where the H.323 and H.320 connections are mixed, the PCS-G70/G50 can divide the transmission speed of the main media channel into H.323 and H.320 groups. With this function, it is possible to avoid lowering the speed of the H.323 connection to match the H.320 connection. If Presentation data is sent at this time, the transmission speed of the additional media channel becomes the same for all the terminals. Only the transmission speed of the main media channel has different speeds for each group.
- A broadcaster switching function is available that can automatically switch the video signal sent to all terminals through the main media channel according to the speaker. This function and the Presentation function work independently from each other. This means that presentation data can still be transmitted either from the speaker's terminal or from another terminal, and that there is no restriction on the broadcaster switching function while presentation data is being transmitted.

### 3. Dual Video Function (Available for the PCS-G70/G50)

The PCS-G70/G50<sup>\*4</sup> of Ver.2.5 and later support the Dual Video function which conforms to both the "Live role" and "Presentation role" described in ITU-T Recommendation H.239. The difference between the H.239 Live role and H.239 Presentation role is described below.

Use of the H.239 Live is very effective when a dual video signal is exchanged among only PCS-G70/G50 units. This provides more flexible use, such as DSB data transmission while transmitting dual video or H.320 support than use of H.239 Presentation does.

The recommended bottom line is that the H.239 Live should be used for an ordinary use while the H.239 Presentation should be used only when a dual video signal needs to be exchanged between the PCS-G70/G50 and other company's endpoint.

	H.239 Live	H.239 Presentation
Compatibility with other company's endpoint	Not supported	○
Automatic transmission at the start of a videoconference	○	Not supported
Two-way simultaneous communication	○	Not supported
Automatic switching or automatic recovery of DSB transmissions while transmitting dual video	○	Not supported
Selecting dual video transmission sources with MCU during a multipoint connection	○	Not supported
Line interface (point-to-point) available	H.323/H.320	H.323
Line interface (multipoint) available	H.323/H.320	H.323

#### Video sources available for Dual Video function

The PCS-G70 can handle up to six video inputs. Two video sources can be selected at any one time: a main media channel from the Main camera, Aux1, or IR1 (object), and an additional media channel from the Sub camera, Aux2, or IR2 (object).

#### 3-1. H.239 Live

This function conforms to the "Live role" described in ITU-T Recommendation H.239.

H.264, H.263, and H.261 video signals with CIF resolution are transmitted through the additional media channel. With the Dual Video function, it is possible to transmit/receive two video sources through the two streams of the main media channel and an additional media channel.

The PCS-G70/G50<sup>\*4</sup> supports the Dual Video function conforming to the Live role in H.239 during H.323 or H.320 point-to-point connection, H.323-only multi-point connection or H.320-only multi-point connection as shown in the following table.

	H.323 only	H.320 only	H.323 & H.320
Point-to-point connection	○	○	–
Multi-point connection	○	○	Not supported
Cascade connection	Not supported	Not supported	Not supported

The Dual Video function conforming to the Live role in H.239 can be used in one of the above conference formats when the PCS-G70 determines that all the terminals participating in the conference have the capacity to exchange dual video data conforming to the Live role in H.239, or if all the terminals participating in the conference are the PCS-G70/G50\*4. It does this by checking if the additional media channel has enough capacity for H.264, H.263, or H.261 video signals with CIF resolution.

(H.323 only)

When the PCS-G70 cannot determine that all the terminals have the capacity to exchange dual video data conforming to the Live role in H.239, it next judges whether or not dual video data conforming to the Presentation role in H.239 can be exchanged.

When a PCS-G50 (Ver.2.3 or later) without transmission function which is conducted as a main terminal during a multi-point videoconferencing receives dual video data conforming to the Live role in H.239 sent from the connected PCS-G70;

The dual video data received by the PCS-G50 is forwarded to other connected terminal (PCS-G70, PCS-G50 of Ver.2.3 later or any other terminal having the capacity to exchange the dual video data conforming to the Live role).

### 3-2. H.239 Presentation (for the PCS-G70/G50 of Ver.2.5 and later)

This function conforms to the "Presentation role" described in ITU-T Recommendation H.239.

H.264, H.263, and H.261 video signals with CIF resolution are transmitted through the additional media channel. With the Dual Video function, it is possible to transmit/receive two video sources through the two streams of the main media channel and an additional media channel.

The PCS-G70/G50\*4 supports the Dual Video function conforming to the Presentation role in H.239 during H.323 point-to-point or H.323-only multi-point connection, as shown in the following table. This function enables you to exchange dual video data with other company's endpoint which supports the Dual Video function conforming to the Presentation role in H.239.

Note that, however, the H.239 Live role has a priority when communication is established between all PCS-G70/G50 units.

	H.323 only	H.320 only	H.323 & H.320
<b>Point-to-point connection</b>	○	Not supported	–
<b>Multi-point connection</b>	○	Not supported	Not supported
<b>Cascade connection</b>	Not supported	Not supported	Not supported

When a PCS-G50 (Ver.2.5 or later) without transmission function which is conducted as a main terminal during a multi-point videoconferencing receives dual video data conforming to the Presentation role in H.239 sent from the connected PCS-G70;

The dual video data received by the PCS-G50 is forwarded to other connected terminal (PCS-G70 of Ver.2.5 later, PCS-G50 of Ver.2.5 later or any other terminal having the capacity to exchange the dual video data conforming to the Presentation role).

### 3-3. Precautions For Use Of Dual Video Functions

#### During point-to-point connection

(H.239 Live)

In a point-to-point connection, one terminal can send dual video and the other can receive it, or two dual video signals can be exchanged between the two.

(H.239 Presentation)

In a point-to-point connection, one terminal can send dual video and the other can receive it.

Two dual video signals, however, cannot be exchanged between the two at the same time. While you are receiving dual video, another dual video also cannot be transmitted to any other terminal.

#### • Dual video transmission method

There are two ways to transmit dual video:

1. From the communication submenu during a videoconference
2. Automatically upon conference connection (only for the dual video data conforming to Live role in H.239)

#### • Dual video transmission speed

In the case of a point-to-point connection between PCS series terminals, the transmission speed of the main media channel before sending dual video is split between the main media channel and the additional media channel.

#### • Dual video transmission resolution and video mode

When dual video is transmitted with the resolution for the main media channel set to anything other than CIF (e.g., H.263 4CIF), the resolutions for the main media channel and the additional media channel become both CIF. When dual video transmission is canceled, the pre-transmission video mode and resolution will be restored.

#### During multi-point connection

##### • Dual video transmission method

(H.239 Live)

The transmission method during a multi-point connection is the same as during a point-to-point connection. In addition, dual video can be transmitted from multiple terminals during a multi-point connection. However, only dual video from one terminal can be transmitted to all the terminals participating in the conference.

The main terminal can determine and specify which terminal transmits dual video to all the participating terminals in the conference.

A broadcaster switching function is available that can automatically switch the video signal sent to all terminals through the main media channel according to the speaker. This function and the Dual Video function work independently from each other. This means that dual video can still be transmitted either from the speaker's terminal or from another terminal, and that there is no restriction on the broadcaster switching function while dual video is being transmitted.

(H.239 Presentation)

Dual video cannot be transmitted from multiple terminals during a multi-point connection. While you are receiving dual video, another dual video also cannot be transmitted to any other terminal. Only dual video from one terminal can be transmitted to all the terminals participating in the conference.

The main terminal cannot determine and specify which terminal transmits dual video to all the participating terminals in the conference.

- **Dual video transmission speed**

As with a point-to-point connection, the transmission speed of the sending terminal is split between the main media channel and the additional media channel.

Moreover, in a multi-point connection, the transmission speed of the main media channel from the terminal that received (but did not transmit) the dual video also halves.

- **Dual video transmission resolution and video mode**

Same as the point-to-point connection.

## 4. QoS (Quality of Service) Support

The relationship between the Quality of Service that the PCS series delivers and the Presentation function and Dual Video function is shown in the following table.

### PCS-1/11/G50/G70/TL30/TL33/TL50

	Audio	Video	Presentation	Dual Video
<b>FEC Forward Error Correction</b>	Not supported	○	Not supported	○
<b>ARQ Automatic Repeat reQuest</b>	○	○	○	○
<b>ARC Adaptive Rate Control</b>	–	○	○	○

### PCS-XG55S/XG80S

	Audio	Video	Presentation	Dual Video
<b>FEC Forward Error Correction</b>	Not supported	○	○	–
<b>ARQ Automatic Repeat reQuest</b>	○	○	○	–
<b>ARC Adaptive Rate Control</b>	–	○	○	–

\*1: The Presentation and Dual Video functions cannot be used simultaneously.

\*2: No optional data solution box is available for the PCS-11, however it only can receive the H.263 XGA/SVGA/VGA video signals as standard.

\*3: The PCS-TL30/TL33 substitutes the data solution module (PCSA-DSM1) for the data solution box.

\*4: The PCS-G50 only supports dual video reception as follows:

Live role: Ver.2.3 and later

Presentation role: Ver.2.5 and later

\*5: The computer image is transmitted using one of the screen display patterns (Full, PandP and Side by Side) selected under "Presentation Screen" in the menus for system administrators.

\*6: You can select how much of the total bandwidth to use for the additional media channel from 2/3, 1/2, or 1/3 under "H.239 Ratio" in the menus for system administrators.

(For the PCS-G70/G50/XG55S/XG80S only, Factory-set value: 2/3)

\*7: When the video mode of the main media channel is H.264, 4CIF image data cannot be transmitted. In this instance, you should change to another video mode.

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