

SONY

VIDEO COMMUNICATION SYSTEM-TECHNICAL DOCUMENTATION

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-TL30	All
PCS-TL50	All

IPELA

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 data types, in addition to video.

The Sony Videoconferencing 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.

- Presentation function ^{*1} (Presentation role in H.239)
(Available for PCS-1/1P/11/11P/G50/G50P/G70/G70P/TL30/TL50)
Transmits H.263 VGA/SVGA/XGA video signals through the additional media channel using an optional Data Solution Box ^{*2}.
- Dual Video function ^{*1} (Live role in H.239)
(Available for the PCS-G70/G70P only)
Transmits H.264, H.263, and H.261 video signals with CIF resolution through the additional media channel.

^{*1}: Presentation and Dual Video functions cannot be used simultaneously.

^{*2}: No optional Data Solution Box is available for the PCS-11/11P, however it only can receive the H.263 VGA/SVGA/XGA video signals as standard.

The Presentation function and the Dual Video function support videoconferencing over both IP (H.323 protocol) and ISDN (H.320 protocol), or a combination of the two. Both functions can also be used in H.235 encrypted communication for when secure videoconferencing is required.

Presentation Function (Available for PCS-1/1P/11/11P/G50/G50P/G70/G70P/TL30/TL50)

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

The PCS series can send computer images via the optional Data Solution Box (PCSA-DSB1/ DSB1S). *3, *4 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-11/11P.

*3: PCS-TL30 substitutes the Data Solution Module (PCSA-DSM1) for the Data Solution Box.

*4: No optional Data Solution Box is available for the PCS-11/11P.

Using the H.239 standard, the PCS series 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 PCS series determines that the additional media channel has sufficient capacity for H.263 video signals with VGA/SVGA/XGA resolution.

If the PCS series 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*5.

*5: If 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.

Transmitting computer images using the Presentation function

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

1. Press the Send button on the Data Solution Box
2. Select the Presentation option from the sub menu during communication

Only one terminal participating in the conference can send Presentation data at any one time, i.e., when data is being sent, the transmission operation will not be available for use by other terminals.

Transmission speed of Presentation data

- **Between two PCS series terminals:**

Before Presentation data is sent, approximately two thirds of the transmission speed of the main media channel is assigned to the additional media channel (up to a maximum of 2 Mbps), while the rest is assigned to the video stream. For the PCS-G50/G50P/G70/G70P, the maximum transmission speed of the main media channel is 4 Mbps; two thirds of which is well in excess of 2 Mbps. 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).

- **Between PCS terminal and terminal other than the PCS series:**

The transmission speed will be determined by the capacity of the H.239 additional media channels of those terminals.

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-G50/G50P/G70/G70P only) In a multi-point connection where the H.323 and H.320 connections are mixed, the PCS-G50/G50P/G70/G70P 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.
- The PCS series has a broadcaster switching function 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.

Dual Video Function (Available for the PCS-G70/G70P only)

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 Dual Video function is supported by both H.323 and H.320 point-to-point and multi-point connections, as shown in the following table:

	H.323 only	H.320 only	H.323 & H.320
Point-to-point connection	●	●	—
Multi-point connection	●	●	N/A
Cascade connection	N/A	N/A	N/A

The Dual Video function conforming to the H.239 standard can be used in one of the above conference formats when the PCS series determines that all the terminals participating in the conference have the capacity to exchange Dual Video data, or if all the terminals participating in the conference are the PCS-G70/G70P. 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.

Video sources available for Dual Video function

The PCS-G70/G70P 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).

The differences between Dual Video function when used in different conference formats are described below.

During point-to-point connection

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.

Dual Video transmission method

There are two ways to transmit Dual Video:

1. Via a user command during a videoconference
2. Automatically upon conference connection

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

- 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.
- Dual Video that is to be sent to all the participating terminals in the conference is determined by the MCU terminal.
- 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.

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.

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.

ARQ (Automatic Repeat reQuest) and ARC (Adapted Rate Control) support both the Presentation function and Dual Video function. FEC (Forward error correction) supports the Dual Video function only.

	Audio	Video	Presentation	Dual Video
FEC Forward Error Correction	N/A	●	N/A	●
ARQ Automatic Repeat reQuest	●	●	●	●
ARC Adapted Rate Control	—	●	●	●

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