SONY

EVI-370 series

Command List

(Ver. 1.3) ——English——

# Table of Contents

VISCA™/RS-232C CONTROL PROTOCOL

■ Scope

This control specification is applied to EVI series camera manufactured by Sony Corp.

NOTE : **The interface board IF-51 is different in details.**

The following specification covers overall control protocol for camera category. For detailed supported commands for each camera, refer to the command list of the each model.
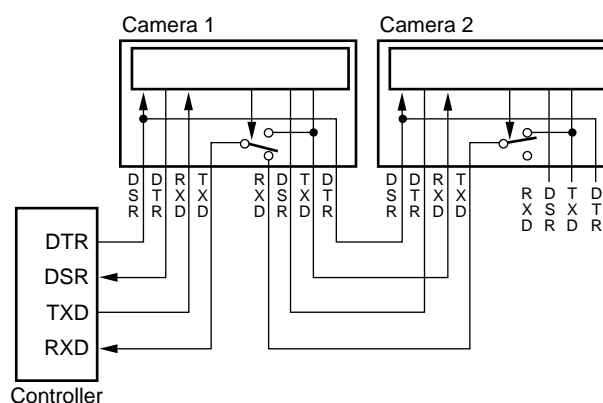
■ Connection

Camera may be controlled by PCs (personal computers) or workstations by connecting as shown in **Fig. 1** or **Fig. 2**. **Fig. 1** shows one by one control using serial interface port of the PCs or workstations. By this connection, the address of the camera can be identified by the port number or the address assignable to the each camera.
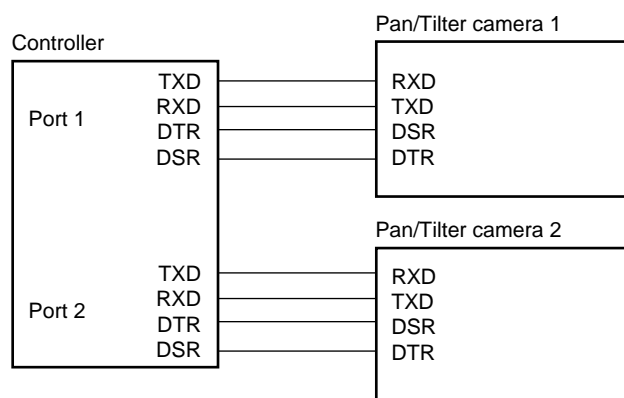
Fig. 1

Fig. 2 shows schematically connections of camera when daisy chained. For actual connection, refer to information supplied by each model. In this instance, the maximum sets on one network is seven and the address can be assigned automatically by the controller. The address of the controller is set to 0 and the camera address will be assigned from 1 to 7 (nearer, the younger address).

The interface to the controller is RS-232C, 9600 bps, 8 bits data, 1 start bit, 1 stop bit and non parity.

Fig. 2 Daisy chain connection

* "VISCA™" is a trademark of Sony Corporation.

━━━ **VISCA™/RS-232C CONTROL PROTOCOL** ━━━

■ Definition of Terms

● ACK message

Signal from camera to the controller which returns acknowledge command execution, information for inquiry or error message etc..

● Address

Address assigned automatically by address set command. Camera will be assigned from 1 to 7. The address of the controller is fixed to 0.

● Packet

Fundamental Unit of the communication between controller and cameras. Comprised by Header (1 byte), Message (max. 14 bytes) and Terminator (1 byte; fixed FFH).

● Socket

Command buffer memories prepared by camera to accept more than one commands. The number of the sockets are two.

━━━ **VISCA™/RS-232C CONTROL PROTOCOL** ━━━

■ Communication Specifications

◇ Communication specification (RS-232C)

- Communication speed: 9600 bps
- Start bit   : 1
- Stop bit   : 1
- Data bits   : 8
- Parity   : None
- MSB first

◇ Communication protocol

● Communication from the controller

Communication is started by header which comprises sender's address and receiver's address followed by message and ended by terminator. The message part comprises communication mode (2 bytes), category code (2 bytes) and parameters. The maximum length of the message is 14 bytes. The terminator is fixed to FFH and the controller should check the value to terminate communication. The bit 15 should be 0 in the message part.
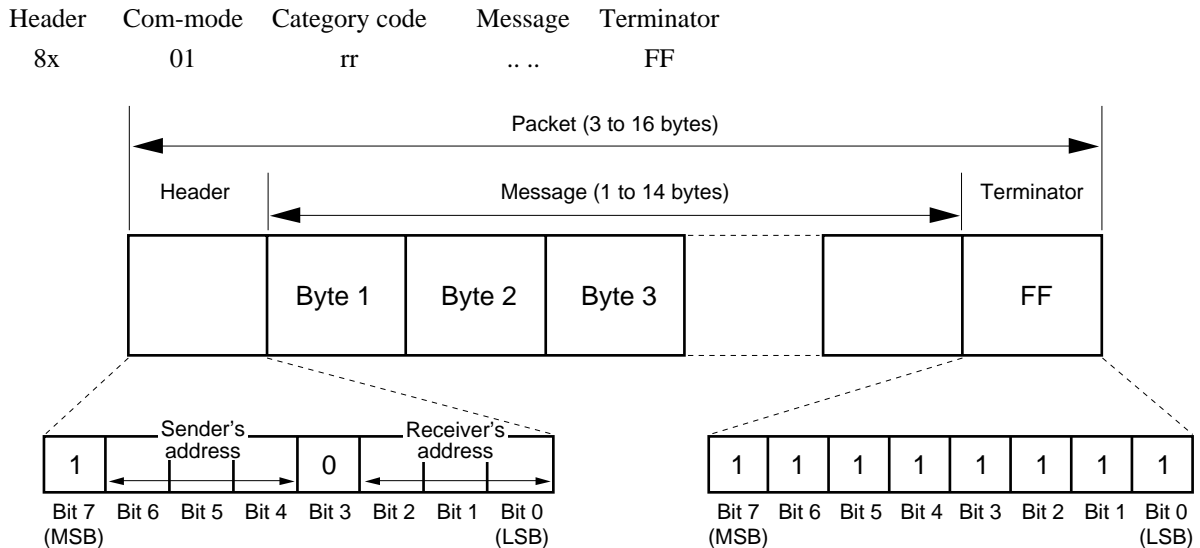
Header	Com-mode	Category code	Message	Terminator
8x	01	rr	.. ..	FF

Fig. 3

Header	: Signifies the start of the communication and comprises the sender's address and receiver's address.
	Since the address of the controller is fixed to 0, header is 8x in which x is the receiver's address. (The value of x should be from 1 to 7) In case of broad cast, the header should be 88H.
Com-mode	: Code which specifies the category of command.
Control command	: 01H
Information request command	: 09H
Net-keeping command	: 00H
Category	: Code which roughly specifies the category the command is applicable.
Main message	: Part between header and terminator. 14 bytes maximum.
	Comprises command and parameter if any.
Terminator	: Code which signifies the end of communication. Fixed to FFH.

VISCA™/RS-232C CONTROL PROTOCOL

● Commands

A command which is sent from the controller to the camera is comprised in the message part of the send data. The commands are roughly classified into several functions such as to control camera, to inquire the information of the camera and the ones for various purposes. The controller commands may comprise some parameters as needed.

● ACK message

The ACK message is returned to the controller from the camera to acknowledge the command. ACK message comprises the address of the camera (expressed by z and z = address + 8), socket number (y) and terminator. Socket is the memory buffer reserved in the camera and used to store commands. Having this feature enables the camera to execute new commands during former commands being under execution.

In case of inquiry commands, the information is returned between the third byte and the terminator.

If the commands are inquiry, the camera returns information message immediately, but for the commands, the camera returns ACK message immediately and returns the command completion message when the command is actually executed.

ACK	z0 4y FF
Command completion	z0 5y FF
Information return	z0 50 .... FF

Following message is sent from the camera to the host when power ON.

Address set	z0 38 FF

● Error messages

If the command is not executable or failed to execute, the camera returns error message instead of the acknowledge message. The error message is expressed by the following codes.

syntax error	z0 60 02 FF
command buffer full	z0 60 03 FF
command cancel	z0 60 04 FF
No sockets	z0 60 05 FF
Command not executable	z0 60 41 FF

● Broadcast

Used to command all the set regardless the individual address.

In this mode of transmission, the header code is set to 88H.

● Auto address assignment

This command is only valid when the camera is connected as shown in **Fig. 2**. When the camera receives the address assignment command (88 30 01 FF), the first camera sets parameter 01 as the self address and hands over to the next camera by incrementing this parameter.

The controller can recognize how many camera cameras are connected on the network by the returned parameter.

VISCA™/RS-232C CONTROL PROTOCOL

◇ Flow of information transmission

The flow of information transmission between the controller and the camera should be one of the following examples.

● Inquiry is executed immediately
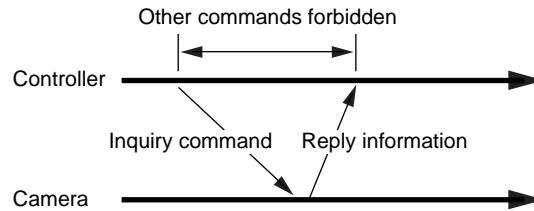

Fig. 4

● Command is stored in a socket and executed later
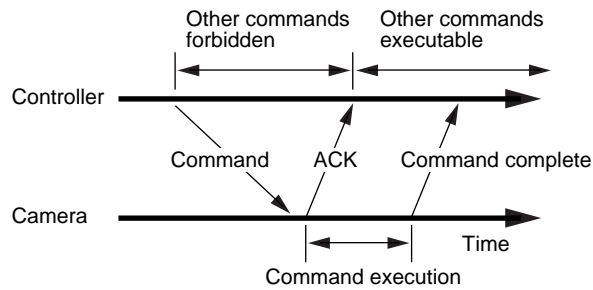
Fig. 5

● Return of error message (1)
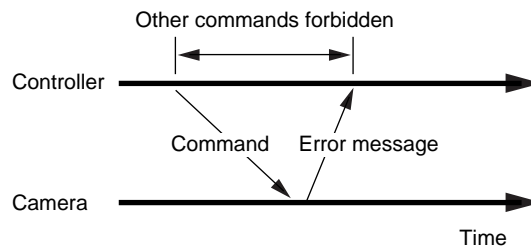
Fig. 6

VISCA™/RS-232C CONTROL PROTOCOL

● Return of error message (2)
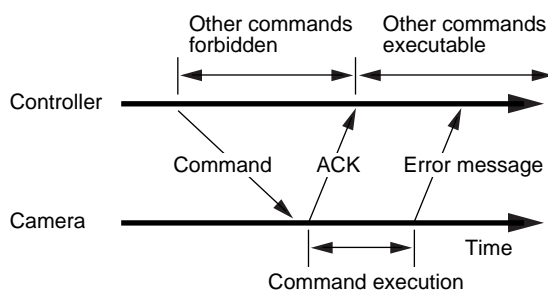
Fig. 7

● Execution of more than one commands

Fig. 8 shows the case when two commands are executed.
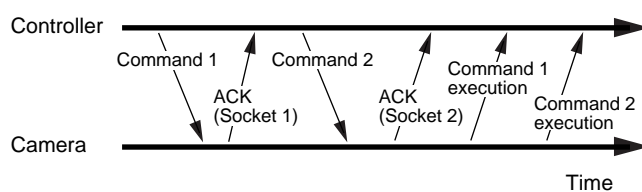
Fig. 8

● Cancel of commands (1)
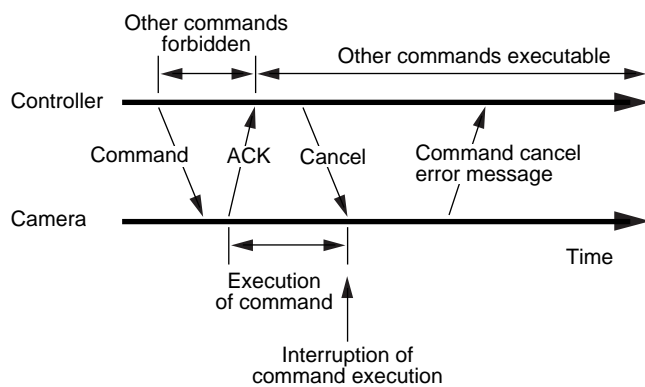
Fig. 9

VISCA™/RS-232C CONTROL PROTOCOL

● Cancel of commands (2)

Cancel is sent before command completion message is received, but the command is already executed. In this case, no socket error message is returned since the socket of the camera is cleared.

Fig. 10

● Continuous information transmission, Cancel of continuous information transmission.

Fig. 11

══ COMMAND LIST ══

■ EVI-370 Series Command List (1/2)

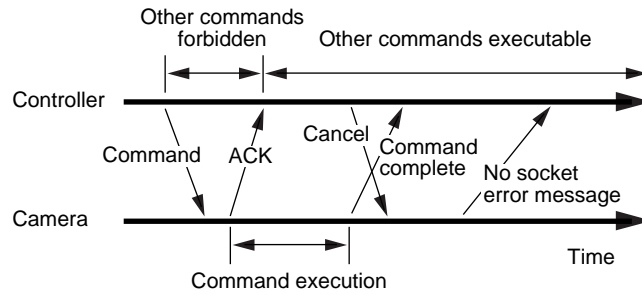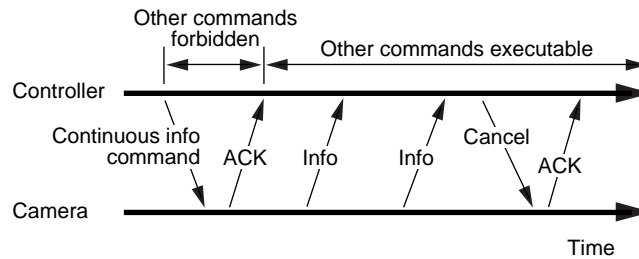| Command Set	Command	VISCA™ Packet	Comments
AddressSet	broadcast	88 30 01 FF	Send IF_clear command and Address_set command before
IF_Clear	broadcast	88 01 00 01 FF	starting communication.
CommandCancel		8x 2Z FF	Z is a socket number. 0 or 1
CAM_Power	On	8x 01 04 00 02 FF	When Camera main power is on, camera can be changed to
	Off	8x 01 04 00 03 FF	Power Save Mode.
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele (Standard)	8x 01 04 07 02 FF	
	Wide (Standard)	8x 01 04 07 03 FF	
	Tele (Variable)	8x 01 04 07 2Z FF	Z: Speed Parameter, 2 (Low) to 7 (High)
	Wide (Variable)	8x 01 04 07 3Z FF	
	D-Zoom On	8x 01 04 06 02 FF	Digital Zoom ON/OFF
	D-Zoom Off	8x 01 04 06 03 FF	
	Direct	8x 01 04 47 0Z 0Z 0Z 0Z FF	ZZZZ: Zoom Data, 0000 (Wide) to 03FF (Tele)
	D-Zoom Direct	8x 01 04 46 0Z 0Z 0Z 0Z FF	ZZZZ = 0000 (x1) to 00FF (x2)
CAM_Focus	Stop	8x 01 04 08 00 FF	Focus control.
	Far	8x 01 04 08 02 FF	When adjust the focus, change the mode to Manual the send
	Near	8x 01 04 08 03 FF	Far/Near or Direct command.
	Far (Variable)	8x 01 04 08 2Z FF	Z: Speed Parameter, 2 (Low) to 7 (High)
	Near (Variable)	8x 01 04 08 3Z FF	
	Auto focus on	8x 01 04 38 02 FF	
	Manual focus on	8x 01 04 38 03 FF	
	Auto/Manual	8x 01 04 38 10 FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Data. Infinity = 1000, close = 9FFF
CAM_WB	Auto	8x 01 04 35 00 FF	White Balance Setting.
	Indoor mode	8x 01 04 35 01 FF	Auto: Trace the light source automatically.
	Outdoor mode	8x 01 04 35 02 FF	Indoor/Outdoor: Fixed at Factory.
	OnePush mode	8x 01 04 35 03 FF	Pull-in to White with a Trigger then hold the data until next
	OnePush trigger	8x 01 04 10 05 FF	Trigger coming
CAM_AE	Full Auto	8x 01 04 39 00 FF	Auto Exposure Mode
	Manual	8x 01 04 39 03 FF	Iris, Shutter and Gain can be set individually.
	Shutter priority	8x 01 04 39 0A FF	Shutter fixed Auto Exposure Mode. Shutter speed can be selected.
	Iris priority	8x 01 04 39 0B FF	Iris fixed Auto Exposure Mode. Iris can be selected.
	Bright mode	8x 01 04 39 0D FF	Fixed Exposure Mode. When turning on to Bright Mode, Iris,
CAM_Bright	Reset	8x 01 04 0D 00 FF	Gain and Shutter at the time then increase or decrease 3 dB/
	Up	8x 01 04 0D 02 FF	step using UP/DOWN command.
	Down	8x 01 04 0D 03 FF	
CAM_ExpCmpnst	Reset	8x 01 04 0E 00 FF	Adjust brighter or darker in Auto Mode.
	On	8x 01 04 3E 02 FF	1 step = 0.5 EV.
	Off	8x 01 04 3E 03 FF	
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 0Z 0Z 0Z 0Z FF	ZZZZ = FFF9 to 0007, +/– 7 steps
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Electronic Shutter Setting.
	Up	8x 01 04 0A 02 FF	Enable on AE_Manual, Shutter_Priority
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 0Z 0Z 0Z 0Z FF	ZZZZ = 0000 (NTSC1/60/PAL1/50) to 001B (1/10000 sec.)

━━ **COMMAND LIST** ━━━━━━━━━

■ EVI-370 Series Command List (2/2)

Command Set	Command	VISCA™ Packet	Comments
CAM_Iris	Reset	8x 01 04 0B 00 FF	Iris Setting. Enable on AE_Manual or Iris_Priority
	Up	8x 01 04 0B 02 FF	
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 0Z 0Z 0Z 0Z FF	ZZZZ = 0000 (CLOSE) to 0011 = F1.8, 17 steps
CAM_Gain	Reset	8x 01 04 0C 00 FF	Gain Setting. Enable on AE_Manual only
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 4C 0Z 0Z 0Z 0Z FF	ZZZZ = 0001 (0 dB) to 0007 (+18 dB), 7 steps
CAM_Memory	Reset	8x 01 04 3F 00 0Z FF	Preset memory for memorize camera condition.
	Set	8x 01 04 3F 01 0Z FF	Z = 0 to 5, 6 positions
	Recall	8x 01 04 3F 02 0Z FF	
CAM_KeyLock	Off	8x 01 04 17 00 FF	Enable/Disable RS-232C and key control.
	On	8x 01 04 17 02 FF	
CAM_IDWrite	On	8x 01 04 22 0Z 0Z 0Z 0Z FF	ZZZZ = 0000 to 00FF
CAM_Date/TimeSet	Set	8x 01 07 29 0p 0p 0q 0q 0r 0r 0s 0s 0t 0t FF	pp = year (19pp, 20pp), qq = month, rr = day, ss = hour, tt = minute
CAM_DateDisplay	On	8x 01 07 2a 02 FF	Date display
	Off	8x 01 07 2a 03 FF	
CAM_TimeDisplay	On	8x 01 07 2b 02 FF	Time display
	Off	8x 01 07 2b 03 FF	

COMMAND LIST

◇ Command for EVI-370DG/371DG

Command Set	Command	VISCA™ Packet	Comments
CAM_ID Write	Write	8x 01 04 22 0Z 0Z 0Z 0Z FF	ZZZZ = 0000 to 00FF
GenLockMode	Auto	8x 01 07 30 00 FF	
	Internal	8x 01 07 30 01 FF	
	Auto/Internal	8x 01 07 30 10 FF	
H-PhaseSet	Stop	8x 01 07 31 00 FF	
	Up	8x 01 07 31 02 FF	
	Down	8x 01 07 31 03 FF	
	Up (step)	8x 01 07 31 2Z FF	z = step (1-7)
	Down (step)	8x 01 07 31 3Z FF	
H-PhaseDirectSet	Direct	8x 01 07 32 00 0W 0Z 0Z FF	W = 0: +, 1: − ZZ = H-Phase (0-99)
SubCarrierPhaseSet	0 degree	8x 01 07 33 00 FF	
	180 degree	8x 01 07 33 01 FF	
	0/180 degree	8x 01 07 33 10 FF	
SubCarrierPhaseFineSet	Stop	8x 01 07 34 00 FF	
	Up	8x 01 07 34 02 FF	
	Down	8x 01 07 34 03 FF	
	Up (step)	8x 01 07 34 2Z FF	z = step (1-7)
	Down (step)	8x 01 07 34 3Z FF	
SubCarrierPhaseDirectSet	Direct	8x 01 07 35 00 0W 0Z 0Z FF	W = 0: +, 1: − ZZ = SC-Phase (0-99)
GenLockDataReset	Reset	8x 01 07 37 FF	Reset the data of H phase and SC phase to original setting.
GenLockDataWrite	Write	8x 01 07 38 FF	Memory H phase and SC phase to EEPROM.
CameraIDDisplay	Off	8x 01 07 39 00 FF	ID display ON / OFF Display position set.
	On (LeftUp)	8x 01 07 39 01 FF	
	On (RightUp)	8x 01 07 39 02 FF	
	On (LeftDown)	8x 01 07 39 03 FF	
	On (RightDown)	8x 01 07 39 04 FF	

— COMMAND LIST —

■ Inquiry Command

Inquiry	Packet Inq	Packet Reply	Description
CAM_PowerInq	8x 09 04 00 FF	Y0 50 02 FF	On
		Y0 50 03 FF	Off
CAM_ZoomPosInq	8x 09 04 47 FF	Y0 50 0p 0q 0r 0s FF	pqrs: position
CAM_D-ZoomPosInq	8x 09 04 46 FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ: position
CAM_FocusModeInq	8x 09 04 38 FF	Y0 50 02 FF	Auto
		Y0 50 03 FF	Manual
CAM_FocusPosInq	8x 09 04 48 FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ: position
CAM_WBModeInq	8x 09 04 35 FF	Y0 50 00 FF	Auto
		Y0 50 01 FF	Indoor mode
		Y0 50 02 FF	Outdoor mode
		Y0 50 03 FF	OnePush mode
CAM_AEModeInq	8x 09 04 39 FF	Y0 50 00 FF	Full Auto
		Y0 50 03 FF	Manual
		Y0 50 0A FF	Shutter priority
		Y0 50 0B FF	Iris priority
		Y0 50 0D FF	Bright mode
CAM_ECModeInq	8x 09 04 33 FF	Y0 50 02 FF	On
		Y0 50 03 FF	Off
CAM_ShutterPosInq	8x 09 04 4A FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ: position
CAM_IrisPosInq	8x 09 04 4B FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ: position
CAM_GainPosInq	8x 09 04 4C FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ: position
CAM_MemoryInq	8x 09 04 3F FF	Y0 50 0Z FF	Z: 0 to 5
CAM_KeyLockInq	8x 09 04 17 FF	Y0 50 00 FF	Off
		Y0 50 02 FF	On
CAM_IDInq	8x 09 04 22 FF	Y0 50 0Z 0Z FF	ZZ = Camera ID
CAM_VersionInq	8x 09 00 02 FF	Y0 50 00 01 HH HH JJ JJ KK FF	
		HHHH = Model EVI-370/371: 0404, EVI-370D/371D: 0405, EVI-370DG/371DG: 0407, JJJJ = ROM Revision, KK: Socket No.	

◇ Continues Position Reply

Inquiry/Command	Packet Inq			Packet Reply/Description
Zoom/Focus	8x 01 7D 02 00 02 FF		On	Y0 07 7D 02 00 0T 0T 0Z 0Z 0Z 0W 0W 0W 0W FF
	8x 01 7D 02 00 03 FF		Off	TT = D-Zoom, ZZZ = Zoom, WWWW = Focus
D-Zoom/ Shutter	8x 01 7D 02 01 02 FF		On	Y0 07 7D 02 01 0U 0U 0V 0V 0W 0W FF
Iris/Gain	8x 01 7D 02 01 03 FF		Off	UU = Shutter, VV = Iris, WW = Gain
Interval Time Set	8x 01 7D 02 7F 0Z 0Z FF			ZZ = time (20 to FF)

COMMAND LIST

◇ Command for EVI-370DG/371DG

Inquiry	Packet Inq	Packet Reply	Description
VideoSystemInq	8x 09 06 23 FF	Y0 50 00 FF	NTSC
		Y0 50 01 FF	PAL
Auto/InternalModeInq	8x 09 07 30 FF	Y0 50 00 FF	Auto
		Y0 50 01 FF	Internal
H-PhaseInq	8x 09 07 32 FF	Y0 50 00 0W 0Z 0Z FF	W = 0: +, 1: –
			ZZ = H-phase (00-99 (Deg))
SubCarrierPhaseInq	8x 09 07 35 FF	Y0 50 0V 0W 0Z 0Z FF	V = 0: 0˚, 1: 180˚
			W = 0: +, 1: –
			ZZ = H-phase (00-99 (Deg))
CameraIDDisplayInq	8x 09 07 39 FF	Y0 50 00 FF	Display Off
		Y0 50 01 FF	Display On (Pos. Left-Up)
		Y0 50 02 FF	Display On (Pos. Right-Up)
		Y0 50 03 FF	Display On (Pos. Left-Down)
		Y0 50 04 FF	Display On (Pos. Right-Down)

COMMAND LIST

■ Code List for Shutter, Iris and Gain

Code	Shutter (1/X sec.)	Iris	Gain (dB)
0	60 (371:50)	CLOSE	−3
1	60	F28	0
2	75	F22	3
3	90	F19	6
4	100	F16	9
5	125 (371:120)	F14	12
6	150	F11	15
7	180	F9.6	18
8	215	F8	
9	250	F6.8	
A	300	F5.6	
B	350	F4.8	
C	425	F4	
D	500	F3.4	
E	600	F2.8	
F	725	F2.4	
10	850	F2	
11	1000	F1.8	
12	1250		
13	1500		
14	1750		
15	2000		
16	2500		
17	3000		
18	3500		
19	4000		
1A	6000		
1B	10000		

─ **COMMAND LIST** ══════════════

■ EVI-370 Series RS-232C Connection

● EVI-370 series　CN204

RS-232C interface pin assignment

1	TXD IN	Transmit Data	
2	DTR IN	Data Transmission Ready	Connect to Controller
3	DSR IN	Data Set Ready	
4	RXD IN	Receive Data	
5	TXD OUT	Transmit Data	
6	DTR OUT	Data Transmission Ready	Connect to next Camera
7	DSR OUT	Data Set Ready	
8	RXD OUT	Receive Data	
9	GND	Ground	
10	NC		

● Controller

Windows D-sub 9P		EVI-370 series CN204		Next EVI-370 series CN204	
CD	1	1	TXD IN	1	TXD IN
RXD	2	2	DTR IN	2	DTR IN
TXD	3	3	DSR IN	3	DSR IN
DTR	4	4	RXD IN	4	RXD IN
GND	5	5	TXD OUT	5	TXD OUT
DSR	6	6	DTR OUT	6	DTR OUT
RTS	7	7	DSR OUT	7	DSR OUT
CTS	8	8	RXD OUT	8	RXD OUT
RI	9	9	GND	9	GND
		10	NC	10	NC

● Macintosh　　EVI-370 series CN204

Macintosh		EVI-370 series CN204	
DTR	1	1	TXD IN
DSR	2	2	DTR IN
TXD	3	3	DSR IN
GND	4	4	RXD IN
RXD	5	5	TXD OUT
GND	6	6	DTR OUT
OPEN	7	7	DSR OUT
OPEN	8	8	RXD OUT
		9	GND
		10	NC

MEMO

MEMO

Sales Office :

Japan

Image Sensing Products Sales Department
Broadcasting & Professional Systems Company
Sony Corporation
　　4-16-1, Okata, Atsugi-shi, Kanagawa-ken, 243-0021 Japan
　　Tel: +81-462-27-2345　　　Fax: +81-462-27-2347

USA　　　　　　　　　　　　http://www.sony.com/professional

Sony Electronics Inc.
　　HQ
　　1 Sony Drive Park Ridge, NJ 07656
　　Tel: +1-800-686-7669

Canada

Sony of Canada Ltd.
　　115 Gordon Baker Rd, Toronto, Ontario M2H 3R6
　　Tel: +1-416-499-1414　　　Fax: +1-416-497-1774

Europe　　　　　　　　　http://www.bpe.sony-europe.com

Sony Broadcast & Professional
　　HQ
　　15, rue Floreal 75831 Paris Cedex 17, France
　　Tel: +33-1-40-87-35-11　　　Fax: +33-1-40-87-35-17

　　Germany
　　Hugo-Eckener-Str. 20, 50829 Koln
　　Tel: +49-221-5966-322　　　Fax: +49-221-5966-491

　　France
　　15, rue Floreal 75831 Paris Cedex 17
　　Tel: +33-1-49-45-41-62　　　Fax: +33-1-47-31-13-57

　　UK
　　The Heights, Brooklands, Weybridge, Surrey KT13 0XW
　　Tel: +44-990-331122　　　Fax: +44-1932-817011

　　Nordic
　　Per Albin Hanssons vag 20 S-214 32 Malmo Sweden
　　Tel: +46-40-190-800　　　Fax: +46-40-190-450

　　Italy
　　Via Galileo Galilei 40 I-20092 Cinisello Balsamo, Milano
　　Tel: +39-2-618-38-431　　　Fax: +39-2-618-38-402

Sony on line

http://www.sony.co.jp/ISP/

99B