Command List

VISCA/RS-232C Commands

This Manual outlines an RS-232C control protocol and command list for certain Sony cameras from which control software can be developed.
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Overview of VISCA

In VISCA, the device outputting commands, for example, a computer, is called the controller. The device receiving the commands, an FCB camera is called the peripheral device. In VISCA, up to seven peripheral devices like the FCB camera can be connected to one controller using communication conforming to the RS-232C standard. The parameters of RS-232C are as follows.

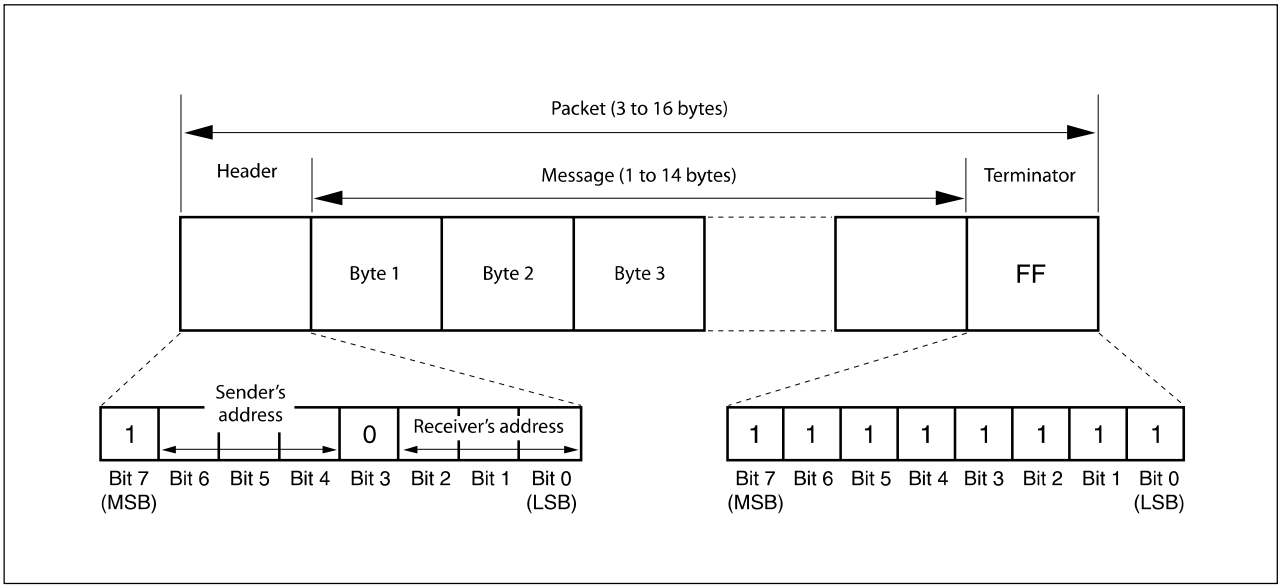
- Communication speed: 9.6 kbps/19.2 kbps/ 38.4 kbps/115.2 kbps
- Data bits : 8
- Start bit : 1
- Stop bit : 1
- Non parity

Flow control using XON/XOFF and RTS/CTS, etc., is not supported.

VISCA Communication Specifications

VISCA packet structure

The basic unit of VISCA communication is called a packet. The first byte of the packet is called the header and comprises the sender's and receiver's addresses. For example, the header of the packet sent to the FCB camera assigned address 1 from the controller (address 0) is hexadecimal 81h. The packet sent to the camera assigned address 2 is 82h. In the command list, as the header is 8X, input the address of the camera at X. The header of the reply packet from the camera assigned address 1 is 90h. The packet from the camera assigned address 2 is A0h.
Some of the commands for setting cameras can be sent to all devices at one time (broadcast). In the case of broadcast, the header should be hexadecimal 88h. When the terminator is FFh, it signifies the end of the packet.



Command and inquiry

- **Command**
  Sends operational commands to the FCB camera.
- **Inquiry**
  Used for inquiring about the current state of the FCB camera.

	Command Packet	Note
Inquiry	8X QQ RR ... FF	QQ[1] = Command/Inquiry, RR[2] = category code

[1] QQ = 01 (Command), 09 (Inquiry)
[2] RR = 00 (Interface), 04 (camera 1), 06 (Pan/Tilt), 07 (camera 2)

X = 1 to 7: FCB camera address

Responses for commands and inquiries

- **Acknowledge message**
  Returned by the FCB camera when it receives a command. No Acknowledge message is returned for inquiries.

- **Completion message**
  Returned by the FCB camera when execution of commands or inquiries is completed. In the case of inquiry commands, it will contain reply data for the inquiry after the 3rd byte of the packet. If the Acknowledge message is omitted, the socket number will contain 0.

	Reply Packet	Note
Acknowledge	X0 4Y FF	Y = socket number
Completion (Commands)	X0 5Y FF	Y = socket number
Completion (Inquiries)	X0 5Y ... FF	Y = socket number

X = 9 to F: FCB camera address + 8

- **Error message**
  When a command could not be executed or failed, an error message is returned instead of the Acknowledge message. After an Acknowledge message, an error message may be returned if the process of some command (zoom, etc.) has not been completed.
  When a inquiry command could not be executed or failed, an error message is returned instead of the completion message.

Error Packet	Description
X0 6Y 01 FF	Message length error (>14 bytes)
X0 6Y 02 FF	Syntax Error
X0 6Y 03 FF	Command buffer full
X0 6Y 04 FF	Command cancelled
X0 6Y 05 FF	No socket (to be cancelled)
X0 6Y 41 FF	Command not executable

X = 9 to F: FCB camera address + 8, Y = socket number

Socket number

When command messages are sent to the FCB camera, send the next command message after waiting for the completion message or error message to return. However to deal with advanced uses, the FCB camera has two buffers (memories) for commands, so that up to two commands including the commands currently being executed can be received. When the FCB camera receives commands, it notifies the sender which command buffer was used using the socket number of the Acknowledge message. As the completion message or error message also has a socket number, it indicates which command has ended. Even when two command buffers are being used at any one time, an FCB camera management command and some inquiry messages can be executed.

The Acknowledge message is not returned for these commands and inquiries, and only the completion message of socket number 0 is returned.

Command execution cancel

To cancel a command which has already been sent, send the Cancel command as the next command. To cancel one of any two commands which have been sent, use the cancel message.

	Cancel Packet	Note
Cancel	8X 2Y FF	Y = socket number

X = 1 to 7: FCB camera address, Y = socket number

An error message will be returned for this command, but this is not a fault. It indicates that the command has been canceled.

VISCA Device Setting Command

Before starting control of the FCB camera, be sure to send the Address command and the IF_Clear command using the broadcast function.

For VISCA network administration

- **Address**
  Sets an address of a peripheral device. Use when initializing the network, and receiving the following network change message.

- **Network Change**
  Sent from the peripheral device to the controller when a device is removed from or added to the network. The address must be re-set when this message is received.

	Packet	Note
Address	88 30 01 FF	Always broadcasted.
Network Change	X0 38 FF	

X = 9 to F: FCB camera address + 8

Note

Please start the camera and start sending the VISCA command after receiving the Network Change.

VISCA interface command

- **IF_Clear**
  Clears the command buffers in the FCB camera and cancels the command currently being executed.

	Command Packet	Reply Packet	Note
IF_Clear	8X 01 00 01 FF	X0 50 FF	
IF_Clear (broadcast)	88 01 00 01 FF	88 01 00 01 FF	

X = 1 to 7: FCB camera board address (For inquiry packet)
X = 9 to F: FCB camera board address +8 (For reply packet)

VISCA interface and inquiry

- **CAM_VersionInq**
  Returns information on the VISCA interface.

Inquiry	Inquiry Packet	Reply Packet	Description
CAM_VersionInq	8X 09 00 02 FF	Y0 50 GG GG HH HH JJ JJ KK FF	GGGG = Vender ID (0020: Sony) HHHH = Model ID 0640: FCB-EV7520A 0641: FCB-CV7520A JJJJ = ROM revision KK = Maximum socket #(02)

X = 1 to 7: FCB camera address (For inquiry packet)
X = 9 to F: FCB camera address +8 (For reply packet)

VISCA Command/Acknowledge Protocol

Command	Command Message	Reply Message	Comments
General Command	81 01 04 38 02 FF (Example)	90 41 FF (Acknowledge) +90 51 FF (Completion) 90 42 FF 90 52 FF	Returns Acknowledge when a command has been accepted, and Completion when a command has been executed.
	81 01 04 38 FF (Example)	90 60 02 FF (Syntax Error)	Accepted a command which is not supported or a command lacking parameters.
	81 01 04 38 02 FF (Example)	90 60 03 FF (Command Buffer Full)	There are two commands currently being executed, and the command could not be accepted.
	81 01 04 08 02 FF (Example)	90 61 41 FF (Command Not Executable) 90 62 41 FF	Could not execute the command in the current mode.
Inquiry Command	81 09 04 38 FF (Example)	90 50 02 FF (Completion)	Acknowledge is not returned for the inquiry command.
	81 09 05 38 FF (Example)	90 60 02 FF (Syntax Error)	Accepted an incompatible command.
Address Set	88 30 01 FF	88 30 02 FF	Returned the device address to +1.
IF_Clear(Broadcast)	88 01 00 01 FF	88 01 00 01 FF	Returned the same command.
IF_Clear (For x)	8x 01 00 01 FF	z0 50 FF (Completion)	Acknowledge is not returned for this command.
Command Cancel	8x 2y FF	z0 6y 04 FF (Command Canceled)	Returned when the command of the socket specified is canceled. Completion for the command canceled is not returned.
		z0 6y 05 FF (No Socket)	Returned when the command of the specified socket has already been completed or when the socket number specified is wrong.

VISCA Camera-Issued Messages

Acknowledge/Completion Messages

	Command Messages	Comments
Acknowledge	z0 4y FF (y:Socket No.)	Returned when the command is accepted.
Completion	z0 5y FF (y:Socket No.)	Returned when the command has been executed.

z = Device address + 8

Error Messages

	Command Messages	Comments
Syntax Error	z0 60 02 FF	Returned when the command format is different or when a command with illegal command parameters is accepted.
Command Buffer Full	z0 60 03 FF	Indicates that two sockets are already being used (executing two commands) and the command could not be accepted when received.
Command Canceled	z0 6y 04 FF (y:Socket No.)	Returned when a command which is being executed in a socket specified by the cancel command is canceled. The completion message for the command is not returned.
No Socket	z0 6y 05 FF (y:Socket No.)	Returned when no command is executed in a socket specified by the cancel command, or when an invalid socket number is specified.
Command Not Executable	z0 6y 41 FF (y:Socket No.)	Returned when a command cannot be executed due to current conditions. For example, when commands controlling the focus manually are received during auto focus.

Network Change Message

	Command Message	Comments
Network Change	z0 38 FF	Issued when power is being routed.

FCB Camera Commands

Command List (1/6)

Command Set	Command	Command Packet	Comments
AddressSet	Broadcast	88 30 01 FF	Address Setting
IF_Clear	—	8x 01 00 01 FF	I/F Clear
	Broadcast	88 01 00 01 FF	
CommandCancel	—	8x 2p FF	p: Socket No. (=1 or 2)
CAM_Power	On	8x 01 04 00 02 FF	Power On/Off
	Off (Standby)	8x 01 04 00 03 FF	
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 2p FF	p=0 (Low) to 7 (High)
	Wide (Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_DZoom	On	8x 01 04 06 02 FF	Digital Zoom On/Off
	Off	8x 01 04 06 03 FF	
	Combine Mode	8x 01 04 36 00 FF	Optical/Digital Zoom Combined
	Separate Mode	8x 01 04 36 01 FF	Optical/Digital Zoom Separate
	Stop	8x 01 04 06 00 FF	—
	Tele (Variable)	8x 01 04 06 2p FF	p=0 (Low) to 7 (High) * Enabled during Separate Mode
	Wide (Variable)	8x 01 04 06 3p FF	
	Direct	8x 01 04 46 00 00 0p 0q FF	pq: D-Zoom Position * Enabled during Separate Mode
CAM_Focus	Stop	8x 01 04 08 00 FF	—
	Far (Standard)	8x 01 04 08 02 FF	
	Near (Standard)	8x 01 04 08 03 FF	
	Far (Variable)	8x 01 04 08 2p FF	p=0 (Low) to 7 (High)
	Near (Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Position
	Auto Focus	8x 01 04 38 02 FF	AF On/Off
	Manual Focus	8x 01 04 38 03 FF	
	Auto/Manual	8x 01 04 38 10 FF	
	One Push Trigger	8x 01 04 18 01 FF	One Push AF Trigger
	Full Scan One Push Trigger	8x 01 04 18 03 FF	Full Scan One Push AF Trigger
	Near Limit	8x 01 04 28 0p 0q 0r 0s FF	pqrs: Focus Near Limit Position
CAM_AFSensitivity	Normal	8x 01 04 58 02 FF	AF Sensitivity High/Low
	Low	8x 01 04 58 03 FF	
CAM_AFMode	Normal AF	8x 01 04 57 00 FF	AF Movement Mode
	Interval AF	8x 01 04 57 01 FF	
	Zoom Trigger AF	8x 01 04 57 02 FF	
	Active/Interval Time	8x 01 04 27 0p 0q 0r 0s FF	pq: Movement Time, rs: Interval
CAM_IRCorrection	Standard	8x 01 04 11 00 FF	Focus IR compensation data switching
	IR Light	8x 01 04 11 01 FF	
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position tuvw: Focus Position
CAM_Initialize	Lens	8x 01 04 19 01 FF	Lens Initialization Start
	Camera	8x 01 04 19 03 FF	Camera reset

Command List (2/6)

Command Set	Command	Command Packet	Comments
CAM_WB	Auto	8x 01 04 35 00 FF	Normal Auto
	Indoor	8x 01 04 35 01 FF	Indoor mode
	Outdoor	8x 01 04 35 02 FF	Outdoor mode
	One Push WB	8x 01 04 35 03 FF	One Push WB mode
	ATW	8x 01 04 35 04 FF	Auto Tracing White Balance
	Manual	8x 01 04 35 05 FF	Manual Control mode
	One Push Trigger	8x 01 04 10 05 FF	One Push WB Trigger
	Outdoor Auto	8x 01 04 35 06 FF	Outdoor auto
	Sodium Lamp Auto	8x 01 04 35 07 FF	Auto including sodium lamp source
	Sodium Lamp	8x 01 04 35 08 FF	Sodium lamp source fixed mode
	Sodium Lamp Outdoor Auto	8x 01 04 35 09 FF	Outdoor auto including sodium lamp source
CAM_RGain	Reset	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq: R Gain
CAM_BGain	Reset	8x 01 04 04 00 FF	Manual Control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	pq: B Gain
CAM_AE	Full Auto	8x 01 04 39 00 FF	Auto Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Shutter Priority	8x 01 04 39 0A FF	Shutter Priority Auto Exposure mode
	Iris Priority	8x 01 04 39 0B FF	Iris Priority Auto Exposure mode
CAM_AutoSlowShutter	On	8x 01 04 5A 02 FF	Auto Slow Shutter On/Off
	Off	8x 01 04 5A 03 FF	
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Shutter Setting
	Up	8x 01 04 0A 02 FF	
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 00 00 0p 0q FF	pq: Shutter Position
CAM_Iris	Reset	8x 01 04 0B 00 FF	Iris Setting
	Up	8x 01 04 0B 02 FF	
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 00 00 0p 0q FF	pq: Iris Position
CAM_Gain	Reset	8x 01 04 0C 00 FF	Gain Setting
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 4C 00 00 0p 0q FF	pq: Gain Position
	Gain Limit	8x 01 04 2C 0p FF	p: Gain Position

Command List (3/6)

Command Set	Command	Command Packet	Comments
CAM_ExpComp	On	8x 01 04 3E 02 FF	Exposure Compensation On/Off
	Off	8x 01 04 3E 03 FF	
	Reset	8x 01 04 0E 00 FF	Exposure Compensation Amount Setting
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 00 00 0p 0q FF	pq: ExpComp Position
CAM_BackLight	On	8x 01 04 33 02 FF	Back Light Compensation On/Off
	Off	8x 01 04 33 03 FF	
CAM_SpotAE	On	8x 01 04 59 02 FF	Spot Auto Exposure Setting
	Off	8x 01 04 59 03 FF	
	Position	8x 01 04 29 0p 0q 0r 0s FF	pq: X (0h to 10h), rs: Y (0h to Eh)
CAM_AE_Response	Direct	8x 01 04 5D pp FF	pp: Auto Exposure Response Setting (01h to 30h), initial setting: 01h
CAM_VE	Off	8x 01 04 3D 03 FF	Off
	VE On	8x 01 04 3D 06 FF	VE On
	Set Parameter	8x 01 04 2D 00 0q 0r 0s 00 00 00 00 FF	q: Display brightness level (0: Dark to 6: Bright) r: Brightness compensation selection (0: Very dark, 1: Dark, 2: Standard, 3: Bright) s: Compensation level (0: Low, 1: Mid, 2: High)
CAM_WD	On	8x 01 04 3D 02 FF	Wide-D On
	Off	8x 01 04 3D 03 FF	Wide-D and VE Off
	VE On	8x 01 04 3D 06 FF	VE On
	Set Parameter	8x 01 04 2D 00 0q 0r 0s 00 00 00 00 FF	q: Display brightness level (0: Dark to 6: Bright) r: Brightness compensation selection (0: Very dark, 1: Dark, 2: Standard, 3: Bright) s: Compensation level (0: Low, 1: Mid, 2: High)
CAM_Defog	On	8x 01 04 37 02 0p FF	Defog On/Off p: Defog level (1: low, 2: mid, 3: high)
	Off	8x 01 04 37 03 00 FF	
CAM_Aperture	Reset	8x 01 04 02 00 FF	Aperture Control
	Up	8x 01 04 02 02 FF	
	Down	8x 01 04 02 03 FF	
	Direct	8x 01 04 42 00 00 0p 0q FF	pq: Aperture Gain
CAM_NR	Noise Reduction	8x 01 04 53 pq FF	pq: NR setting (00: Off, 01 to 05: level 1 to 5, 7F: 2D/3D NR independent setting available)
	2D/3D NR independent setting	8x 01 05 53 0p 0q FF	p: 2DNR level (0: OFF, 1 to 5: level 1 to 5) q: 3DNR level (0: OFF, 1 to 5: level 1 to 5)
CAM_Gamma	—	8x 01 04 5B 0p FF	p: Gamma Setting (0: Standard, 1: Straight)
CAM_HighSensitivity	On	8x 01 04 5E 02 FF	High Sensitivity mode On/Off
	Off	8x 01 04 5E 03 FF	
CAM_LR_Reverse	On	8x 01 04 61 02 FF	LR Reverse On/Off
	Off	8x 01 04 61 03 FF	
CAM_Freeze	On	8x 01 04 62 02 FF	Freeze On/Off
	Off	8x 01 04 62 03 FF	
CAM_PictureEffect	Off	8x 01 04 63 00 FF	Picture Effect Setting
	Black & White	8x 01 04 63 04 FF	

Command List (4/6)

Command Set	Command	Command Packet	Comments
CAM_MinShutter	On	8x 01 04 12 02 FF	pq: Minimum Shutter Position (05h to 14h)
	Off	8x 01 04 12 03 FF	
	Limit	8x 01 04 13 00 00 0p 0q FF	
CAM_PictureFlip	On	8x 01 04 66 02 FF	E-Flip On/Off
	Off	8x 01 04 66 03 FF	
CAM_ICR	On	8x 01 04 01 02 FF	ICR Mode On/Off
	Off	8x 01 04 01 03 FF	
CAM_AutoICR	On	8x 01 04 51 02 FF	Auto ICR Mode On/Off
	Off	8x 01 04 51 03 FF	
	Threshold	8x 01 04 21 00 00 0p 0q FF	pq: ICR On → Off Threshold Level
CAM _AutoICRAlarmReply	On	8x 01 04 31 02 FF	Auto ICR switching Alarm On/Off
	Off	8x 01 04 31 03 FF	
	(Reply)	y0 07 04 31 02 FF	ICR Off → On
		y0 07 04 31 03 FF	ICR On → Off
CAM_Stabilizer	On	8x 01 04 34 02 FF	Stabilizer On/Off/HOLD
	Off	8x 01 04 34 03 FF	
	Hold	8x 01 04 34 00 FF	
CAM_Memory	Reset	8x 01 04 3F 00 0p FF	p: Memory Number (=0h to Fh)
	Set	8x 01 04 3F 01 0p FF	
	Recall	8x 01 04 3F 02 0p FF	
CAM_Custom	Reset	8x 01 04 3F 00 7F FF	Starts up in this mode when the power is turned on.
	Set	8x 01 04 3F 01 7F FF	
	Recall	8x 01 04 3F 02 7F FF	
CAM_MemSave	Write	8x 01 04 23 0X 0p 0q 0r 0s FF	X: 00h to 07h (Address), total 16 byte pqrs: 0000h to FFFFh (Data)
CAM_Display	On	8x 01 04 15 02 FF (8x 01 06 06 02 FF)	Display On/Off
	Off	8x 01 04 15 03 FF (8x 01 06 06 03 FF)	
	On/Off	8x 01 04 15 10 FF (8x 01 06 06 10 FF)	
CAM_MultiLineTitle	Title Set1	8x 01 04 73 1L 00 nn pp qq 00 00 00 00 00 00 FF	L: Line Number, nn: H-position pp: Color, qq: Blink
	Title Set2	8x 01 04 73 2L mm nn pp qq rr ss tt uu vv ww FF	L: Line Number, mnpqrstuvw: Setting of characters (1 to 10)
	Title Set3	8x 01 04 73 3L mm nn pp qq rr ss tt uu vv ww FF	L: Line Number, mnpqrstuvw: Setting of characters (11 to 20)
	Title Clear	8x 01 04 74 1p FF	Title Setting clear (p: 0h to Ah, F= all lines)
	On	8x 01 04 74 2p FF	Title display On/Off (p: 0h to Ah, F= all lines)
	Off	8x 01 04 74 3p FF	
CAM_Mute	On	8x 01 04 75 02 FF	Muting On/Off
	Off	8x 01 04 75 03 FF	
	On/Off	8x 01 04 75 10 FF	
CAM_PrivacyZone	SetMask	8x 01 04 76 mm nn 0r 0r 0s 0s FF	mm: Mask Settings nn 00: Modify, 01: New rr: W, ss: H
	Display	8x 01 04 77 pp pp pp pp FF	Mask Display On/Off pp pp pp pp: Mask Settings (0: Off, 1: On)
	SetMaskColor	8x 01 04 78 pp pp pp pp qq rr FF	pp pp pp pp: Mask Color Settings qq: Color Setting when 0 is selected rr: Color Setting when 1 is selected
	SetPanTiltAngle	8x 01 04 79 0p 0p 0p 0q 0q 0q FF	Pan/Tilt Angle Settings ppp: Pan, qqq: Tilt
	SetPTZMask	8x 01 04 7B mm 0p 0p 0p 0q 0q 0q 0r 0r 0r 0r FF	Pan/Tilt/Zoom Settings for Mask ppp: Pan, qqq: Tilt, rrrr: Zoom, mm: Mask Settings

Command List (5/6)

Command Set	Command	Command Packet	Comments
CAM_PrivacyZone	Non_InterlockMask	8x 01 04 6F mm 0p 0p 0q 0q 0r 0r 0s 0s FF	mm: Non_Interlock Mask Settings pp: X, qq: Y, rr: W, ss: H
	CenterLineOff	8x 01 04 7C 03 FF	Center Line Display Off
	CenterLineOn	8x 01 04 7C 04 FF	Center Line Display On
CAM_IDWrite	—	8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (=0000h to FFFFh)
CAM_MD	On	8x 01 04 1B 02 FF	Motion Detection On/Off
	Off	8x 01 04 1B 03 FF	
	Function Set	8x 01 04 1C 0m 0n 0p 0q 0r 0s FF	m: Display mode n: Detection Frame Set (00h to 0Fh) pq: Threshold Level (00h to FFh) rs: Interval Time set (00h to FFh)
	Window Set	8x 01 04 1D 0m pp 0q rr 0s FF	m: Select Detection Frame (0, 1, 2, 3) pp: Start Horizontal Position (00h to 10h) q: Start Vertical Position (00h to 0Eh) rr: Stop Horizontal Position (01h to 11h) s: Stop Vertical Position (01h to 0Fh)
	Alarm (Reply)	y0 07 04 1B 0p FF	p: Detection Frame Number
CAM_Continuous ZoomPosReply	On	8x 01 04 69 02 FF	Zoom Position data Continuous Output On/Off
	Off	8x 01 04 69 03 FF	
	(Reply)	y0 07 04 69 0p 0p 0q 0q 0q 0q FF	pp: D-Zoom Position * 00: When Zoom Mode is Combine qqqq: Zoom Position
CAM_ZoomPos ReplyIntervalTimeSet	—	8x 01 04 6A 00 00 0p 0p FF	pp: Interval Time [V cycle]
CAM_Continuous FocusPosReply	On	8x 01 04 16 02 FF	Focus Position data Continuous Output On/Off
	Off	8x 01 04 16 03 FF	
	(Reply)	y0 07 04 16 00 00 0p 0p 0p 0p FF	pppp: Focus Position
CAM_FocusPosReply IntervalTimeSet	—	8x 01 04 1A 00 00 0p 0p FF	pp: Interval Time [V cycle]
CAM_RegisterValue	—	8x 01 04 24 mm 0p 0p FF	mm: Register No. (=00h to 7Fh) pp: Register Value (=00h to FFh)
CAM_ChromaSuppress	—	8x 01 04 5F pp FF	pp: Chroma Suppress setting level 00: Off 01h to 03h: On (3 levels). Effect increases as the level number increases.
CAM_ColorGain	Direct	8x 01 04 49 00 00 00 0p FF	p: Color Gain Setting 0h to Eh
CAM_ColorHue	Direct	8x 01 04 4F 00 00 00 0p FF	p: Color Hue Setting 0h to Eh
CAM_GammaOffset	Direct	8x 01 04 1E 00 00 00 0s 0t 0u FF	s: Polarity offset (0 is plus, 1 is minus) tu: Offset s=0 (00h to 40h) Offset s=1 (00h to 40h)

Command List (6/6)

Command Set	Command	Command Packet	Comments
CAM_ContrastAdjLevel	Direct	8x 01 05 5D 01 0p 0q FF	pq: 00h to FFh 00h to 7Fh: The smaller the value is, the lower the contrast becomes. 80h (Initial setting): No contrast adjustment 81h to FFh: The larger the value is, the higher the contrast becomes.
CAM_ExExpComp	Reset	8x 01 04 1F 0E 00 00 FF	Exposure compensation reset
	Up	8x 01 04 1F 0E 02 pp FF	Exposure compensation up pp: Step number pp=00h to 7Fh (However, 00h is the same operation as 01h.)
	Down	8x 01 04 1F 0E 03 pp FF	Exposure compensation down pp: Step number pp=00h to 7Fh (However, 00h is the same operation as 01h.)
	Direct	8x 01 04 1F 4E 00 00 0p 0q FF	Set the exposure compensation to the specified level pq: Level pq=00h to FFh
CAM_ExAperture	Reset	8x 01 04 1F 02 00 00 FF	Aperture control reset
	Up	8x 01 04 1F 02 02 pp FF	Aperture control up pp: Step number pp=00h to 7Fh (However, 00h is the same operation as 01h.)
	Down	8x 01 04 1F 02 03 pp FF	Aperture control down pp: Step number pp=00h to 7Fh (However, 00h is the same operation as 01h.)
	Direct	8x 01 04 1F 42 00 00 0p 0q FF	Set the aperture control to the specified level pq: Level pq=00h to FFh
CAM_ExAutoICR	Threshold (On→Off)	8x 01 04 1F 21 00 00 0p 0q FF	pq: ICR On→Off threshold level when Auto ICR pq=00h to FFh
	On Level	8x 01 04 1F 21 01 00 0r 0s FF	pq: ICR Off→On threshold level when Auto ICR pq=00h to 1Ch
CAM_ExColorGain	Direct	8x 01 04 1F 49 00 00 0p 0q FF	Color Gain Setting pq: Gain setting level pq=00h to FFh
CAM_ExColorHue	Direct	8x 01 04 1F 4F 00 00 0p 0q FF	Color Hue Setting pq: Phase setting level pq=00h to FFh
CAM_HLC	Parameter Set	8x 01 04 14 0p 0q FF	p: HLC level (0: Off, 1: Low, 2: Mid, 3: High) q: HLC mask level (0: Off, 1: Low, 2: Mid, 3: High)
CAM_FlickerReduction	ON	8x 01 04 32 02 FF	Flicker reduction ON/OFF
	OFF	8x 01 04 32 03 FF	

Inquiry Command List (1/4)

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off (Standby)
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_DZoomModeInq	8x 09 04 06 FF	y0 50 02 FF	D-Zoom On
		y0 50 03 FF	D-Zoom Off
CAM_DZoomC/SModeInq	8x 09 04 36 FF	y0 50 00 FF	Combine Mode
		y0 50 01 FF	Separate Mode
CAM_DZoomPosInq	8x 09 04 46 FF	y0 50 00 00 0p 0q FF	pq: D-Zoom Position
CAM_FocusModeInq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_FocusNearLimitInq	8x 09 04 28 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Near Limit Position
CAM_AFSensitivityInq	8x 09 04 58 FF	y0 50 02 FF	AF Sensitivity Normal
		y0 50 03 FF	AF Sensitivity Low
CAM_AFModeInq	8x 09 04 57 FF	y0 50 00 FF	Normal AF
		y0 50 01 FF	Interval AF
		y0 50 02 FF	Zoom Trigger AF
CAM_AFTimeSettingInq	8x 09 04 27 FF	y0 50 0p 0q 0r 0s FF	pq: Movement Time, rs: Interval
CAM_IRCorrectionInq	8x 09 04 11 FF	y0 50 00 FF	Standard
		y0 50 01 FF	IR Light
CAM_WBModeInq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	Indoor
		y0 50 02 FF	Outdoor
		y0 50 03 FF	One Push WB
		y0 50 04 FF	ATW
		y0 50 05 FF	Manual
		y0 50 06 FF	Outdoor Auto
		y0 50 07 FF	Sodium Lamp Auto
		y0 50 08 FF	Sodium Lamp
		y0 50 09 FF	Sodium Lamp Outdoor Auto
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
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
CAM_AutoSlowShutterInq	8x 09 04 5A FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ShutterPosInq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position
CAM_GainPosInq	8x 09 04 4C FF	y0 50 00 00 0p 0q FF	pq: Gain Position
CAM_GainLimitInq	8x 09 04 2C FF	y0 50 0q FF	p: Gain Limit
CAM_ExpCompModeInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position
CAM_BackLightModeInq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off

Inquiry Command List (2/4)

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_SpotAEModeInq	8x 09 04 59 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_SpotAEPosInq	8x 09 04 29 FF	y0 50 0p 0q 0r 0s FF	pq: X Position, rs: Y Position
CAM_VEModeInq	8x 09 04 3D FF	y0 50 03 FF	Off
		y0 50 06 FF	VE On
CAM_VEParameterInq	8x 09 04 2D FF	y0 50 00 0q 0r 0s 0t 0u 00 00 FF	q: Display brightness level (0: Dark to 6: Bright) r: Brightness compensation selection (0: Very dark, 1: Dark, 2: Standard, 3: Bright) s: Compensation level (00h: Low, 01h: Mid, 02h: High) tu: Always 0
CAM_WDModeInq	8x 09 04 3D FF	y0 50 02 FF	Wide-D On
		y0 50 03 FF	Wide-D and VE Off
		y0 50 06 FF	VE On
CAM_WDParameterInq	8x 09 04 2D FF	y0 50 00 0q 0r 0s 0t 0u 00 00 FF	q: Display brightness level (0: Dark to 6: Bright) r: Brightness compensation selection (0: Very dark, 1: Dark, 2: Standard, 3: Bright) s: Compensation level (00h: Low, 01h: Mid, 02h: High) tu: Always 0
CAM_AEResponseInq	8x 09 04 5D FF	y0 50 pp FF	pp: 01h to 30h
CAM_DefogInq	8x 09 04 37 FF	y0 50 02 0p FF	p: Defog level (1: low, 2: mid, 3: high)
		y0 50 03 00 FF	Defog Off
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_NRInq	8x 09 04 53 FF	y0 50 pq FF	pq: NR level (00: Off, 01 to 05: level 1 to 5, 7F: 2D/3D NR independent setting available)
CAM_NR2D3Dinq	8x 09 05 53 FF	y0 50 0p 0q FF	p: 2D NR level (0: Off, 01 to 05: level 1 to 5) q: 3D NR level (0: Off, 01 to 05: level 1 to 5)
CAM_GammaInq	8x 09 04 5B FF	y0 50 0p FF	Gamma p: 00h, 01h
CAM_HighSensitivityInq	8x 09 04 5E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_LR_ReverseModeInq	8x 09 04 61 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_FreezeModeInq	8x 09 04 62 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_PictureEffectModeInq	8x 09 04 63 FF	y0 50 00 FF	Off
		y0 50 04 FF	Black & White
CAM_PictureFlipModeInq	8x 09 04 66 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ICRModeInq	8x 09 04 01 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_AutoICRModeInq	8x 09 04 51 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_AutoICRThresholdInq	8x 09 04 21 FF	y0 50 00 00 0p 0q FF	pq: ICR On → Off Threshold Level
CAM_AutoICRAlarmReplyInq	8x 09 04 31 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_MemoryInq	8x 09 04 3F FF	y0 50 pp FF	pp: Memory number recalled last
CAM_MemSaveInq	8x 09 04 23 0X FF	y0 50 0p 0q 0r 0s FF	X: 00h to 07h (Address) pqrs: 0000h to FFFFh (Data)

Inquiry Command List (3/4)

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_DisplayModeInq	8x 09 04 15 FF (8x 09 06 06 FF)	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_StabilizerModeInq	8x 09 04 34 FF	y0 05 02 FF	On
		y0 05 03 FF	Off
		y0 05 00 FF	Hold
CAM_MuteModeInq	8x 09 04 75 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_PrivacyDisplayInq	8x 09 04 77 FF	y0 50 pp pp pp pp FF	pp pp pp pp: Mask Display (0: Off, 1: On)
CAM_PrivacyPanTiltInq	8x 09 04 79 FF	y0 50 0p 0p 0p 0q 0q 0q FF	ppp: Pan qqq: Tilt
CAM_PrivacyPTZInq	8x 09 04 7B mm FF	y0 50 0p 0p 0p 0q 0q 0q 0r 0r 0r 0r FF	mm: Mask Settings ppp: Pan qqq: Tilt rrrr: Zoom
CAM_PrivacyMonitorInq	8x 09 04 6F FF	y0 50 pp pp pp pp FF	pp pp pp pp: Mask is displayed now.
CAM_IDInq	8x 09 04 22 FF	y0 50 0p 0q 0r 0s FF	pqrs: Camera ID
CAM_VersionInq	8x 09 00 02 FF	y0 50 00 20 mn pq rs tu vw FF	mnpq: Model Code (06xx) rstu: ROM version vw: Socket Number (=02)
CAM_MDModeInq	8x 09 04 1B FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_MDFunctionInq	8x 09 04 1C FF	y0 50 0m 0n 0p 0q 0r 0s FF	m: Display mode n: Detection Frame Set (00h to 0Fh) pq: Threshold Level (00h to FFh) rs: Interval Time set (00h to FFh)
CAM_MDWindowInq	8x 09 04 1D 0m FF	y0 50 pp 0q rr 0s FF	m: Select Detection Frame (0, 1, 2, 3) pp: Start Horizontal Position (00h to 10h) q: Start Vertical Position (00h to 0Eh) rr: Stop Horizontal Position (01h to 11h) s: Stop Vertical Position (01h to 0Fh)
CAM_ContinuousZoomPos ReplyModeInq	8x 09 04 69 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ZoomPosReply IntervalTimeInq	8x 09 04 6A FF	y0 50 00 00 0p 0p FF	pp: Interval Time
CAM_Continuous FocusPosReplyModeInq	8x 09 04 16 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_FocusReply IntervalTimeInq	8x 09 04 1A FF	y0 50 00 00 0p 0p FF	pp: Interval Time
CAM_RegisterValueInq	8x 09 04 24 mm FF	y0 50 0p 0p FF	mm: Register No. (=00h to 7Fh) pp: Register Value (=00h to FFh)
CAM_ChromaSuppressInq	8x 09 04 5F FF	y0 50 pp FF	pp: Chroma Suppress setting level
CAM_ColorGainInq	8x 09 04 49 FF	y0 50 00 00 00 0p FF	p: Color Gain Setting 0h to Eh
CAM_ColorHueInq	8x 09 04 4F FF	y0 50 00 00 00 0p FF	p: Color Hue Setting 0h to Eh
CAM_TempInq	8x 09 04 68 FF	Y0 50 00 00 0p 0q FF	pq: Lens Temperature
CAM_GammaOffsetInq	8x 09 04 1E FF	y0 50 00 00 00 0s 0t 0u FF	s: Polarity offset (0 is plus, 1 is minus) tu: Offset s=0 (00h to 40h) Offset s=1 (00h to 40h)
CAM_ContrastAdjLevelInq	8x 09 05 5D FF	y0 50 0p 0q FF	pq: Contrast adjustment value (low) 00h to 80h (no adjustment) to FFh (high)
CAM_ExExpCompPosInq	8x 09 04 1F 4E FF	y0 50 00 00 0p 0q FF	pq: Exposure compensation level pq = 00h to FFh

Inquiry Command List (4/4)

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_ExApertureInq	8x 09 04 1F 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture control level pq=00h to FFh
CAM_ExColorGainInq	8x 09 04 1F 49 00 FF	y0 50 0p 0q FF	pq: Gain setting level pq=00h to FFh
CAM_ExColorHueInq	8x 09 04 1F 4F 00 FF	y0 50 0p 0q FF	pq: Phase setting level pq=00h to FFh
CAM_ExAutoICRThresholdInq	8x 09 04 1F 21 00 FF	y0 50 00 00 0p 0q FF	pq: ICR On→Off threshold level when Auto ICR pq=00h to FFh
CAM_ExAutoICROnLevelInq	8x 09 04 1F 21 01 FF	y0 50 00 00 0p 0q FF	pq: ICR Off→On threshold level when Auto ICR pq=00h to 1Ch
CAM_MinShutterInq	8x 09 04 12 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_MinShutterLimitInq	8x 09 04 13 FF	y0 50 00 00 0p 0q FF	pq: MinShutter Position
CAM_HLCInq	8x 09 04 14 FF	y0 50 0p 0q FF	p: HLC level (0: OFF, 1: Low, 2: Mid, 3: High) q: HLC mask level (0: OFF, 1: Low, 2: Mid, 3: High)
CAM_FlickerReductionInq	8x 09 04 32 FF	y0 50 02 FF	ON
		y0 50 03 FF	OFF

Block Inquiry Command List

Lens Control System Inquiry Commands ..... Command Packet 8x 09 7E 7E 00 FF

Byte	Bit	Comments
0	7	Destination Address
	6	
	5	
	4	
	3	Source Address
	2	
	1	
	0	
1	7	0 Completion Message (50h)
	6	1
	5	0
	4	1
	3	0
	2	0
	1	0
	0	0
2	7	0
	6	0
	5	0
	4	0
	3	Zoom Position (HH)
	2	
	1	
	0	
3	7	0
	6	0
	5	0
	4	0
	3	Zoom Position (HL)
	2	
	1	
	0	
4	7	0
	6	0
	5	0
	4	0
	3	Zoom Position (LH)
	2	
	1	
	0	
5	7	0
	6	0
	5	0
	4	0
	3	Zoom Position (LL)
	2	
	1	
	0	

Byte	Bit	Comments
6	7	0
	6	0
	5	0
	4	0
	3	Focus Near Limit (H)
	2	
	1	
	0	
7	7	0
	6	0
	5	0
	4	0
	3	Focus Near Limit (L)
	2	
	1	
	0	
8	7	0
	6	0
	5	0
	4	0
	3	Focus Position (HH)
	2	
	1	
	0	
9	7	0
	6	0
	5	0
	4	0
	3	Focus Position (HL)
	2	
	1	
	0	
10	7	0
	6	0
	5	0
	4	0
	3	Focus Position (LH)
	2	
	1	
	0	
11	7	0
	6	0
	5	0
	4	0
	3	Focus Position (LL)
	2	
	1	
	0	

Byte	Bit	Comments
12	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
13	7	0
	6	0
	5	DZoomMode 0: Combine 1: Separate
	4 3	0: Normal 1: Interval 2: Zoom Trigger
	2	AF Sensitivity 0: Low 1: Normal
	1	Digital Zoom 1: On 0: Off
	0	Focus Mode 1: Auto 0: Manual
14	7	0
	6	0
	5	0
	4	0
	3	0
	2	Camera Memory Recall 1: Executing 0: Stopped
	1	Focus Command 1: Executing 0: Stopped
	0	Zoom Command 1: Executing 0: Stopped
15	7	1 Terminator (FFh)
	6	1
	5	1
	4	1
	3	1
	2	1
	1	1
	0	1

Camera Control System Inquiry Commands .....Command Packet 8x 09 7E 7E 01 FF

Byte	Bit	Comments
0	7	Destination Address
	6	
	5	
	4	
	3	Source Address
	2	
	1	
	0	
1	7	0 Completion Message (50h)
	6	1
	5	0
	4	1
	3	0
	2	0
	1	0
	0	0
2	7	0
	6	0
	5	0
	4	0
	3	R Gain (H)
	2	
	1	
	0	
3	7	0
	6	0
	5	0
	4	0
	3	R Gain (L)
	2	
	1	
	0	
4	7	0
	6	0
	5	0
	4	0
	3	B Gain (H)
	2	
	1	
	0	
5	7	0
	6	0
	5	0
	4	0
	3	B Gain (L)
	2	
	1	
	0	

Byte	Bit	Comments
6	7	0
	6	0
	5	0
	4	0
	3	WB Mode
	2	
	1	
	0	
7	7	0
	6	0
	5	0
	4	0
	3	Aperture Gain
	2	
	1	
	0	
8	7	0
	6	0
	5	0
	4	Exposure Mode
	3	
	2	
	1	
	0	
9	7	0
	6	0
	5	0
	4	VE 1: On 0: Off Wide-D (1: Other than Off, 0: Off)
	3	Spot AE 1: On 0: Off
	2	Back Light 1: On 0: Off
	1	Exposure Comp. 1: On 0: Off
	0	Slow Shutter 1: On 0: Off
10	7	0
	6	0
	5	0
	4	Shutter Position
	3	
	2	
	1	
	0	

Byte	Bit	Comments
11	7	0
	6	0
	5	0
	4	Iris Position
	3	
	2	
	1	
	0	
12	7	0
	6	0
	5	0
	4	0
	3	Gain Position
	2	
	1	
	0	
13	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
14	7	0
	6	0
	5	0
	4	0
	3	Exposure Comp. Position
	2	
	1	
	0	
15	7	1 Terminator (FFh)
	6	1
	5	1
	4	1
	3	1
	2	1
	1	1
	0	1

Other Inquiry Commands .....Command Packet 8x 09 7E 7E 02 FF

Byte	Bit	Comments
0	7	Destination Address
	6	
	5	
	4	
	3	Source Address
	2	
	1	
	0	
1	7	0 Completion Message (50h)
	6	1
	5	0
	4	1
	3	0
	2	0
	1	0
	0	0
2	7	0
	6	0
	5	0
	4	0
	3	Auto ICR Alarm (1: On, 0: Off)
	2	Auto ICR 1: On 0: Off
	1	0
	0	Power 1: On 0: Off
3	7	0
	6	Stabilizer 1: On 0: Off
	5	Stabilizer Hold 1: Hold 0: Off
	4	ICR 1: On 0: Off
	3	Freeze 1: On 0: Off
	2	LR Reverse 1: On 0: Off
	1	0
	0	0
4	7	0
	6	0
	5	Privacy Zone 1: On 0: Off
	4	Mute 1: On 0: Off
	3	Title Display 1: On 0: Off
	2	Display 1: On 0: Off
	1	0
	0	0
5	7	0
	6	0
	5	0
	4	0
	3	Picture Effect Mode
	2	
	1	
	0	

Byte	Bit	Comments
6	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
7	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
8	7	0
	6	0
	5	0
	4	0
	3	Camera ID (HH)
	2	
	1	
	0	
9	7	0
	6	0
	5	0
	4	0
	3	Camera ID (HL)
	2	
	1	
	0	
10	7	0
	6	0
	5	0
	4	0
	3	Camera ID (LH)
	2	
	1	
	0	
11	7	0
	6	0
	5	0
	4	0
	3	Camera ID (LL)
	2	
	1	
	0	

Byte	Bit	Comments
12	7	0
	6	0
	5	0
	4	Memory 1: Provided 0: Not provided
	3	0
	2	ICR 1: Provided 0: Not provided
	1	Stabilizer 1: Provided 0: Not provided
	0	System 1: 1/50, 1/25 0: 1/60, 1/30
13	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
14	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
15	7	1 Terminator (FFh)
	6	1
	5	1
	4	1
	3	1
	2	1
	1	1
	0	1

Extended Function1 Query Command .....Command Packet 8x 09 7E 7E 03 FF

Byte	Bit	Comments
0	7	Destination Address
	6	
	5	
	4	
	3	Source Address
	2	
	1	
	0	
1	7	0 Completion Message (50h)
	6	1
	5	0
	4	1
	3	0
	2	0
	1	0
	0	0
2	7	0
	6	0
	5	0
	4	0
	3	Digital Zoom Position (H)
	2	
	1	
	0	
3	7	0
	6	0
	5	0
	4	0
	3	Digital Zoom Position (L)
	2	
	1	
	0	
4	7	0
	6	0
	5	0
	4	0
	3	AF Activation Time (H)
	2	
	1	
	0	
5	7	0
	6	0
	5	0
	4	0
	3	AF Activation Time (L)
	2	
	1	
	0	

Byte	Bit	Comments
6	7	0
	6	0
	5	0
	4	0
	3	AF Interval Time (H)
	2	
	1	
	0	
7	7	0
	6	0
	5	0
	4	0
	3	AF Interval Time (L)
	2	
	1	
	0	
8	7	0
	6	0
	5	0
	4	SpotAE Position (X)
	3	
	2	
	1	
	0	
9	7	0
	6	0
	5	0
	4	0
	3	SpotAE Position (Y)
	2	
	1	
	0	
10	7	0
	6	0
	5	0
	4	0
	3	0
	2	MD (1: On, 0: Off)
	1	0
	0	E-Flip (1: On, 0: Off)

Byte	Bit	Comments
11	7	0
	6	Color Gain (0h to Eh)
	5	
	4	
	3	
	2	Advanced Privacy (1: Provided, 0: Not provided)
	1	Reserved
	0	E-Flip (1: Provided, 0: Not provided)
12	7	0
	6	0
	5	0
	4	AE Response
	3	
	2	
	1	
	0	
13	7	0
	6	Gamma
	5	
	4	
	3	0
	2	NR Level (The lower 3 bits of the CAM_NRInq return value pq are stored.)
	1	
	0	
14	7	0
	6	Chroma Suppress
	5	
	4	
	3	Gain Limit
	2	
	1	
	0	
15	7	1 Terminator (FFh)
	6	1
	5	1
	4	1
	3	1
	2	1
	1	1
	0	1

Extended Function2 Query Command .....Command Packet 8x 09 7E 7E 04 FF

Byte	Bit	Comments
0	7	Destination Address
	6	
	5	
	4	
	3	Source Address
	2	
	1	
	0	
1	7	0 Completion Message (50h)
	6	1
	5	0
	4	1
	3	0
	2	0
	1	0
	0	0
2	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	Wide-D
	0	0: Off 1: On 2: VE On
3	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
4	7	0
	6	0
	5	0
	4	0
	3	0
	2	Display brightness level setting
	1	0: Dark to 6: Bright
	0	
5	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	Brightness compensation selection
	0	0: Very dark 1: Dark 2: Standard 3: Bright

Byte	Bit	Comments
6	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	Compensation level
	0	0: Low 1: Mid 2: High
7	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	Defog 0: Off 1: On
8	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	Defog Level
	0	1: low 2: mid 3: high
9	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
10	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0

Byte	Bit	Comments
11	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
12	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
13	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
14	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
15	7	1 Terminator (FFh)
	6	1
	5	1
	4	1
	3	1
	2	1
	1	1
	0	1

Extended Function3 Query Command .....Command Packet 8x 09 7E 7E 05 FF

Byte	Bit	Comments
0	7	Destination Address
	6	
	5	
	4	
	3	Source Address
	2	
	1	
	0	
1	7	0 Completion Message (50h)
	6	1
	5	0
	4	1
	3	0
	2	0
	1	0
	0	0
2	7	0
	6	0
	5	0
	4	0
	3	Color Hue (0h to Eh)
	2	
	1	
	0	
3	7	0
	6	Reserved
	5	
	4	
	3	
	2	
	1	
	0	
4	7	0
	6	Reserved
	5	
	4	
	3	
	2	
	1	
	0	
5	7	0
	6	Reserved
	5	
	4	
	3	
	2	
	1	
	0	

Byte	Bit	Comments
6	7	0
	6	Reserved
	5	
	4	
	3	
	2	
	1	
	0	
7	7	0
	6	Reserved
	5	
	4	
	3	
	2	
	1	
	0	
8	7	0
	6	Reserved
	5	
	4	
	3	
	2	
	1	
	0	
9	7	0
	6	Reserved
	5	
	4	
	3	
	2	
	1	
	0	
10	7	0
	6	Reserved
	5	
	4	
	3	
	2	
	1	
	0	

Byte	Bit	Comments
11	7	0
	6	Reserved
	5	
	4	
	3	
	2	
	1	
	0	
12	7	0
	6	Reserved
	5	
	4	
	3	
	2	
	1	
	0	
13	7	0
	6	Reserved
	5	
	4	
	3	
	2	
	1	
	0	
14	7	0
	6	Reserved
	5	
	4	
	3	
	2	
	1	
	0	
15	7	1 Terminator (FFh)
	6	1
	5	1
	4	1
	3	1
	2	1
	1	1
	0	1

VISCA Command Setting Values

Exposure control (1/2)

		59.94/29.97 mode	50/25 mode
Shutter Speed	15	1/10000	1/10000
	14	1/6000	1/6000
	13	1/4000	1/3500
	12	1/3000	1/2500
	11	1/2000	1/1750
	10	1/1500	1/1250
	0F	1/1000	1/1000
	0E	1/725	1/600
	0D	1/500	1/425
	0C	1/350	1/300
	0B	1/250	1/215
	0A	1/180	1/150
	09	1/125	1/120
	08	1/100	1/100
	07	1/90	1/75
	06	1/60	1/50
	05	1/30	1/25
	04	1/15	1/12
	03	1/8	1/6
	02	1/4	1/3
	01	1/2	1/2
	00	1/1	1/1

Iris	11	F1.6
	10	F2
	0F	F2.4
	0E	F2.8
	0D	F3.4
	0C	F4
	0B	F4.8
	0A	F5.6
	09	F6.8
	08	F8
	07	F9.6
	06	F11
	05	F14
	00	CLOSE

Gain	0F	50.0 dB (28 step)
	0E	46.4 dB (26 step)
	0D	42.8 dB (24 step)
	0C	39.3 dB (22 step)
	0B	35.7 dB (20 step)
	0A	32.1 dB (18 step)
	09	28.6 dB (16 step)
	08	25.0 dB (14 step)
	07	21.4 dB (12 step)
	06	17.8 dB (10 step)
	05	14.3 dB (8 step)
	04	10.7 dB (6 step)
	03	7.1 dB (4 step)
	02	3.6 dB (2 step)
	01	0 dB (0 step)

Gain Limit	0F	50.0 dB (28 step)
	0E	46.4 dB (26 step)
	0D	42.8 dB (24 step)
	0C	39.3 dB (22 step)
	0B	35.7 dB (20 step)
	0A	32.1 dB (18 step)
	09	28.6 dB (16 step)
	08	25.0 dB (14 step)
	07	21.4 dB (12 step)
	06	17.8 dB (10 step)
	05	14.3 dB (8 step)
	04	10.7 dB (6 step)

Exposure control (2/2)

Exposure Comp.	0E	+7	+10.5 dB
	0D	+6	+9 dB
	0C	+5	+7.5 dB
	0B	+4	+6 dB
	0A	+3	+4.5 dB
	09	+2	+3 dB
	08	+1	+1.5 dB
	07	0	0 dB
	06	−1	−1.5 dB
	05	−2	−3 dB
	04	−3	−4.5 dB
	03	−4	−6 dB
	02	−5	−7.5 dB
	01	−6	−9 dB
	00	−7	−10.5 dB

Zoom Ratio and Zoom Position (for reference)

Optical Zoom Ratio	Optical Zoom Position Data
1×	0000
2×	16A1
3×	2063
4×	2628
5×	2A1D
6×	2D13
7×	2F6D
8×	3161
9×	330D
10×	3486
11×	35D7
12×	3709
13×	3820
14×	3920
15×	3AOA
16×	3ADD
17×	3B9C
18×	3C46
19×	3CDC
20×	3D60
21×	3DD4
22×	3E39
23×	3E90
24×	3EDC
25×	3F1E
26×	3F57
27×	3F8A
28×	3FB6
29×	3FDC
30×	4000

Digital Zoom Combine mode

Digital Zoom Ratio	Digital Zoom Position Data
1×	4000
2×	6000
3×	6A80
4×	7000
5×	7300
6×	7540
7×	76C0
8×	7800
9×	78C0
10×	7980
11×	7A00
12×	7AC0

Zoom Separate mode

Digital Zoom Ratio	Digital Zoom Position Data
1×	00
2×	80
3×	AA
4×	C0
5×	CC
6×	D5
7×	DB
8×	E0
9×	E3
10×	E6
11×	E8
12×	EB

Lens control

Zoom Position	0000 to 4000 to 7AC0 Wide end Optical Tele end Digital Tele end	
Focus Position	1000 to F000 Far end Near end	
Focus Near Limit	1000: Over Inf 2000: 20 m 3000: 10 m 4000: 6 m 5000: 4.2 m 6000: 3.1 m 7000: 2.5 m 8000: 2.0 m 9000: 1.65 m A000: 1.4 m B000: 1.2 m C000: 0.8 m D000: 30 cm (initial setting) E000: 11 cm F000: 1 cm	As the distance on the left will differ due to temperature characteristics, etc., use as approximate values. *The lower 1 byte is fixed at 00.

Wide/Tele Limit Setting

Wide/Tele Limit Setting Value	Wide Limit		Tele Limit	
Limit Setting Value	Zoom Position	Zoom Ratio	Zoom Position	Zoom Ratio
00	0000	1	4000	30
10	00C4	1.02	3F3B	25.5
20	0188	1.04	3E77	22.7
30	024C	1.06	3DB3	20.7
40	0310	1.08	3CEF	19.1
50	03D4	1.11	3C2B	17.8
60	0498	1.13	3B67	16.7
70	055C	1.15	3AA3	15.7
80	0620	1.18	39DF	14.8
90	06E4	1.2	391B	14
A0	07A8	1.23	3857	13.2
B0	086C	1.26	3793	12.5
C0	0930	1.28	36CF	11.8
D0	09F4	1.31	360B	11.2
E0	0AB8	1.34	3547	10.6
F0	0B7C	1.38	3483	10
FF	0C33	1.41	33CC	9.5

Temperature Reading Conversion Value (Reference Value)

Reading Value pq (hex)	Temperature Conversion Value (°C)
FB	−8 to −2
00	−3 to +3
0A	7 to 13
14	17 to 23
1E	27 to 33
28	37 to 43
32	47 to 53
3C	57 to 63

Register Setting

Register name	Register No.	Setting value		Setting value reflection timing*
VISCA Baud Rate	00	00 (Iinitial Setting)	9600 bps	Reflected after camera reset
		01	19200 bps	
		02	38400 bps	
		03	115200 bps	
Monitoring Mode	72	01 (Iinitial Setting)	1080i/59.94	Reflected after camera reset
		02	1080i/60	
		04	1080i/50	
		06	1080p/29.97	
		07	1080p/30	
		08	1080p/25	
		09	720p/59.94	
		0A	720p/60	
		0B	Reserved	
		0C	720p/50	
		0D	Reserved	
		0E	720p/29.97	
		0F	720p/30	
		10	Reserved	
		11	720p/25	
		12	Reserved	
		13	1080p/59.94	
		14	1080p/50	
		15	1080p/60	
LVDS Mode	74	00 (Iinitial Setting)	Single output	Reflected after camera reset
		01	Double output	
Zoom Limit	50	00-FF (Iinitial Setting: 00)	Wide Limit (0: Disabled)	Reflected after camera reset
	51	00-FF (Iinitial Setting: 00)	Tele Limit (0: Disabled)	
D-Zoom Max	52	00-EB (Iinitial Setting: EB)	Max. digital zoom ratio = 256 ÷ (256-Value)	Reflected after camera reset
"StableZoom"	53	00 (Iinitial Setting: 00)	Off	Immediate reflection
		01	On	

* Timing to reflect register setting value changes

- Reflect after camera reset: After the setting value is changed, changes are reflected following camera reset by "Camera reset command" or "Camera power supply turned OFF and then ON again".
- Reflect immediately: Changes are reflected immediately after the setting value is changed.

Register name	Register No.	Setting value		Setting value reflection timing*
FocusTrace @ZoomDirect	54	00	Off	Reflected after camera reset
		01 (Iinitial Setting: 01)	On	
FocusOffset @DomeCover	55	00-FF (Iinitial Setting: 00)	00: None to FF: Max.	Reflected after camera reset
AE Parameter Change During VE On, Defog On	58	00	OFF	Immediate reflection
		01 (Iinitial Setting)	ON	
Auto Slow Shutter Limit	59	01	1/30	Immediate reflection
		02	1/15	
		03	1/8	
		04 (Iinitial Setting)	1/4	
		05	1/2	
		06	1/1	
Extended Normal Shutter	5A	00 (Iinitial Setting)	OFF	Immediate reflection
		01	Allowed up to 1/30	
		02	Allowed up to 1/15	
		03	Allowed up to 1/8	
		04	Allowed up to 1/4	
		05	Allowed up to 1/2	
		06	Allowed up to 1/1	
Defog Limit	5B	00-FF (Iinitial Setting: FF)	Defog level Low Limit	Immediate reflection
	5C	00-FF (Iinitial Setting: FF)	Defog level Mid Limit	
	5D	00-FF (Iinitial Setting: FF)	Defog level High Limit	
Extended Mode	5F	00 (Iinitial Setting)	OFF	Immediate reflection
		bit: 0 Exposure compensation Extended 256 levels On/Off bit: 1 Aperture Extended 256 levels On/Off bit: 2 Color Gain/Hue Extended 256 levels On/Off bit: 3 Auto ICR Off → On setting enable On/Off * For all of bit, 1 is to activate, 0 is Off		

Others

AF Active Time[1)]	00	to	FF
AF Interval Time[1)]	00	to	FF
Spot AE X position	00	to	10
Spot AE Y position	00	to	0E
R Gain	00	to	FF
B Gain	00	to	FF
Aperture Control Level	00	to	0F
AE Response	01	to	30
AutoICR On → Off Threshold Level	00	to	1C
MD Threshold Level	00	to	FF
MD Interval Time[1)]	00	to	FF
MD Set Horizontal Position	00	to	11
MD Set Vertical Position	00	to	0F
Chroma Suppress setting level	00	to	03
Color Gain setting level	00	to	0E
Color Hue setting level	00	to	0E

[1)] Unit: One second