5-066-065-**12** (1)

SONY

Color Video Camera

VISCA Command List
Software Version 2.0

BRC-AM7

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Use of control software based upon this command list may cause malfunction or damage to hardware and software. We are not liable for any such damage.

Overview

About This Document

This document describes the specifications of the VISCA command, CGI command, and RTSP streaming of the Sony BRC-AM7 color video camera. In this document, the products is referred to as the “camera.”

VISCA

VISCA[1)] is a protocol developed by Sony for controlling a consumer’s camcorder.

Overview of VISCA

In VISCA, the device outputting commands, such as a computer, is called the controller, and the device receiving the command, such as the BRC-AM7[2)], is called a peripheral device. In VISCA, up to seven peripheral devices including this using this camera can be connected to a single controller using communication conforming to the RS-422 standard. The parameters of RS-422 are as follows.

- Communication speed: 9600 bps/38400 bps
- Data bits: 8
- Start bit: 1
- Stop bit: 1
- Non parity

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

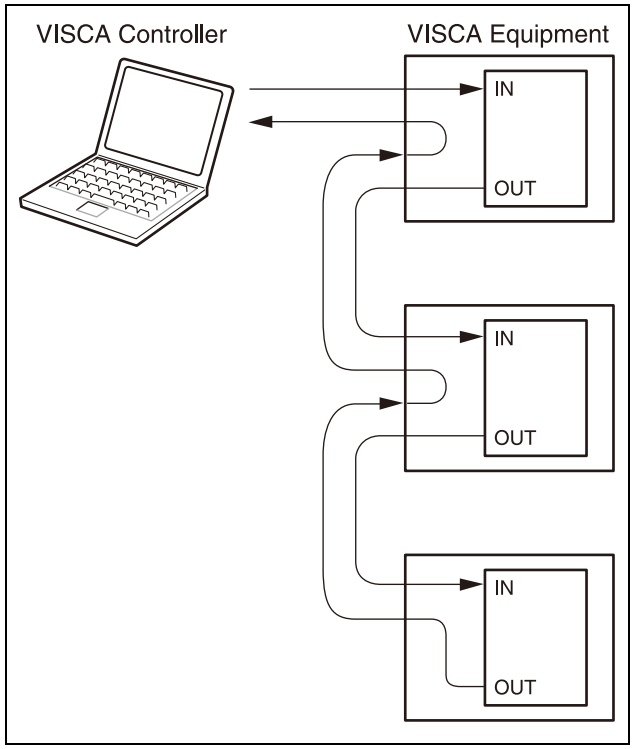
Peripheral devices are connected in a daisy chain. As shown in Fig. 1, the actual internal connection is a one-direction ring, so that messages return to the controller via the peripheral devices. The devices on the network are assigned addresses. The address of the controller is fixed at 0. The peripheral devices are assigned to the addresses, 1, 2, 3... in the connected order, starting from the one connected nearest to the controller. These addresses are set when the controller sends address commands during initialization of the network.

1) “VISCA” is a trademark of Sony Corporation.
2) The product name of this camera, “BRC-AM7 Color Video Camera” is referred to as “the camera” in this document.

Note

Each VISCA equipment has VISCA IN and VISCA OUT connectors.
Set the DTR input (the S output of the controller) of VISCA IN to H when controlling VISCA equipment from the controller.

Fig. 1 VISCA network configuration



VISCA Communication Specifications

VISCA packet structure

The basic unit of VISCA communication is called a packet (Fig. 2). 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 camera (address 1) from the controller (address 0) is 81H in hexadecimal. Packet sent to the camera (address 2) is 82H.
In the command list, as the header is 8X, input the address of the camera to X. The header of the reply packet from the camera assigned to address 1 is 90H. The packet from the camera assigned to address 2 is A0H.
Some of the setting commands can be sent to all devices at one time (broadcast).*
In the case of broadcast, the header should be 88H in hexadecimal.
When the terminator is FFH, it signifies the end of the packet.

* The broadcast function is not available for VISCA over IP.

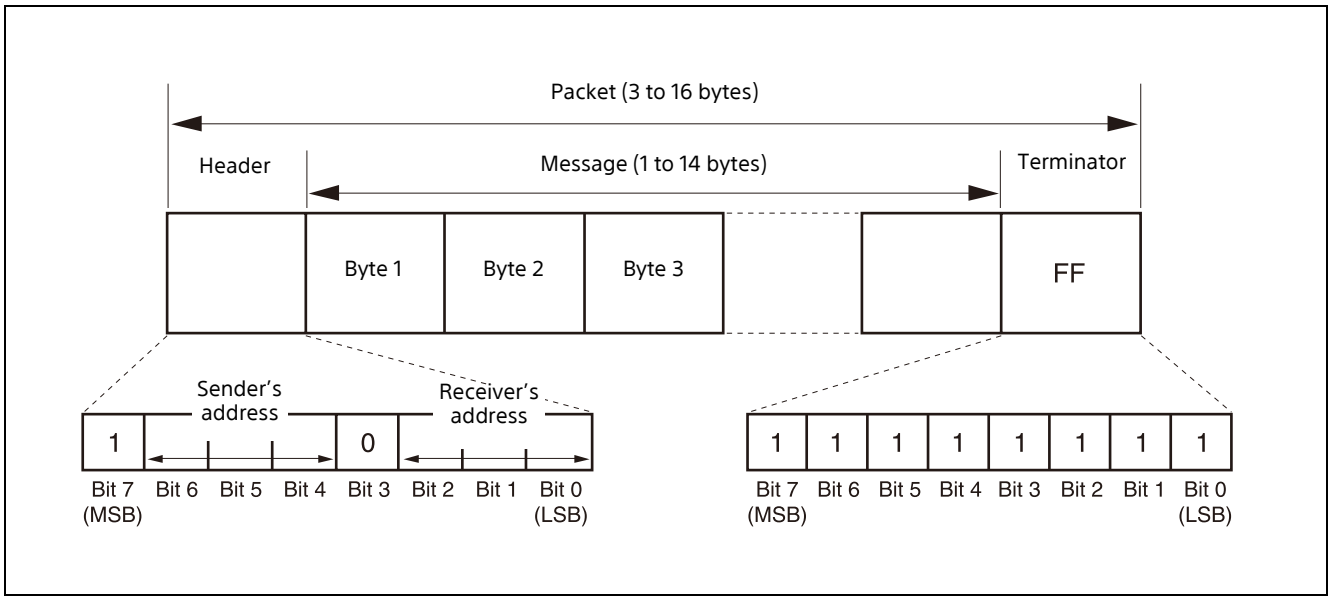


Fig. 2 Packet structure

Note

Fig. 2 shows the packet structure, while Fig. 3 shows the actual waveform. Data flow will take place with the LSB first.

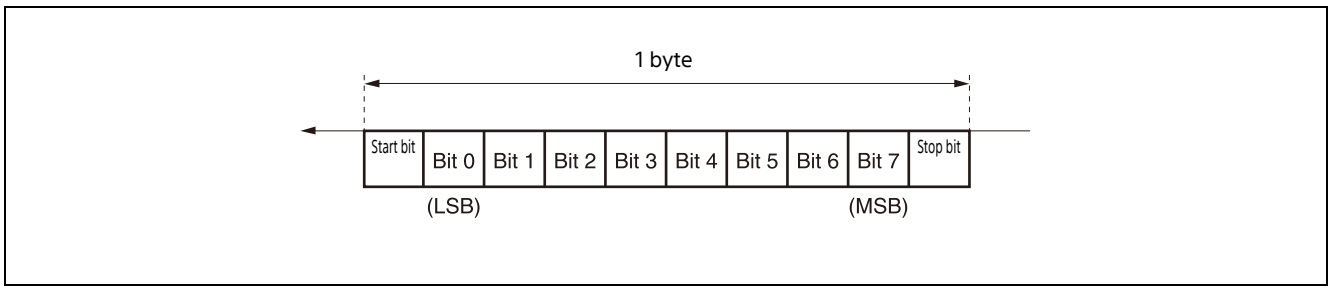


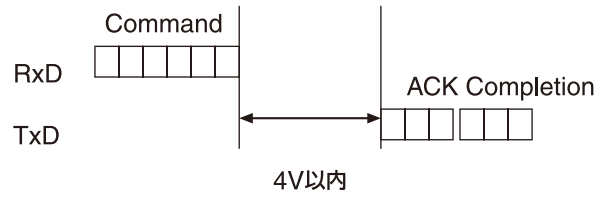
Fig. 3 Actual waveform for 1 byte

Timing chart

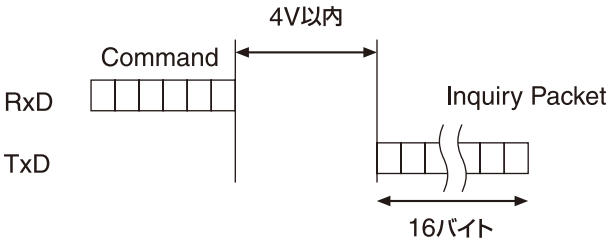
As VISCA command processing can only be carried out a maximum of one time in a Vertical (V) cycle, it takes maximum 4V-cycle time for an ACK/Completion to be returned.
If the Command and ACK/Completion communication time is shorter than 1V-cycle time, a command can be received at every 1V cycle.
From this point, if two or more commands are to be sent successively, wait for a reply command (an ACK or error message for a general command, and an inquiry packet for an inquiry command) of the previous command to be received before sending the next command.

1V= 16.7 msec (1080/59.94p, 1080/59.94i, 720/59.94p),
20 msec (1080/50p, 1080/50i, 720/50p),
33.4 msec (2160/29.97p),
40 msec (2160/25p),
41.7 msec (1080/23.98p, 2160/23.98p)

General commands



Inquiry commands



Command and inquiry

- **Command**
  Sends operational commands to the camera.

- **Inquiry**
  Used for inquiring about the current state of the camera.

Command/Inquiry Packet
8X QQ RR ... FF
QQ: Command/Inquiry (01=Command, 09=Inquiry)
RR: Category Code (00=Interface, 04=camera, 06=Pan/Tilter)
X = 1 to 7: Address of the camera (Locked to "X = 1" for VISCA over IP)

For actual values to be sent, see Command Lists or Inquiry Command Lists.

Responses for commands and inquiries

- **ACK message**

Returned by the camera when it receives a command. No ACK message is returned for an inquiry.

- **Completion message**

Returned by the camera when execution of commands or inquiries is completed. In the case of inquiry commands, reply data for the inquiry is contained after the 3rd byte of the packet. In the case of commands or inquiries that do not use sockets, the socket number will contain 0.

	Reply Packet
ACK	Y0 4Z FF
Completion (commands)	Y0 5Z FF
Completion (Inquiries)	Y0 5Z ...FF

Y = 9 to F: Address of the camera + 8 (Locked to "Y = 9" for VISCA over IP)
Z = socket number

- **Error message**

When a command or inquiry command could not be executed or failed, an error message is returned instead of a completion message.

	Error Packet
Message length error	Y0 6Z 01 FF
Syntax Error	Y0 6Z 02 FF
Command buffer full	Y0 6Z 03 FF
Command canceled	Y0 6Z 04 FF
No socket (to be canceled)	Y0 6Z 05 FF
Command not executable	Y0 6Z 41 FF

Y = 9 to F: Address of the camera + 8 (Locked to "Y = 9" for VISCA over IP)
Z = socket number

Socket number

When command messages are sent to the camera, it is normal to send the next command message after receiving the completion message or error message. However, to deal with advanced uses, the camera has two sets of buffers (memories) for commands, so that up to two commands including the commands currently being executed can be received. (There is a wait longer than a 1V cycle between commands.) However, depending on the command, it may be necessary to wait until the first command is completed due to system reasons. When the camera receives commands, it notifies which command buffer was used using the socket number of ACK 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, the camera management command and inquiry messages can be executed.
The ACK 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 a Cancel command as the next command. To cancel one of two commands which have been sent, use the cancel message.

	Cancel Packet
Cancel	8X 2Z FF

X = 1 to 7: Address of the camera (Locked to "X = 1" for VISCA over IP)
Z = socket number

Error message "Command Canceled" will be returned for this command, but this is not a fault. It indicates that the command has been canceled.

Note

To cancel a command when VISCA PAN-TILT Drive (page 17) is being executed, wait at least 200 msec after executing. Then send a cancel command to ensure that PAN-TILT Drive stops effectively.
To execute a PAN-TILT Drive command again, wait at least 200 msec after the message "Command Canceled" has appeared.

VISCA Device Setting Command

Before starting control of the camera, make sure to send the Address Set command and IF_Clear command using the broadcast.

For VISCA network administration

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

* Not available for VISCA over IP.

• 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.

* Not available for VISCA over IP.

	Packet
Address Set	88 30 01 FF
Network Change	Y0 38 FF

Y = 9 to F: Address of the camera + 8

VISCA interface command

• IF_Clear
Clears the command buffer in the camera When cleared, the operation currently being executed is not guaranteed.

	Command Packet	Reply Packet
IF_Clear	8X 01 00 01 FF	Y0 50 FF
IF_Clear (broadcast)*	88 01 00 01 FF	88 01 00 01 FF

X = 1 to 7: Address of the camera (Locked to "X = 1" for VISCA over IP)
Y = 9 to F: Address of the camera + 8 (Locked to "Y = 9" for VISCA over IP)

* Not available for VISCA over IP.

VISCA interface and inquiry

• CAM_VersionInq
Returns information on the VISCA interface.

	Inquiry Packet	Reply Packet
CAM_VersionInq	8X 09 00 02 FF	Y0 50 GG GG HH HH JJ JJ KK FF

X = 1 to 7: Address of the camera (Locked to "X = 1" for VISCA over IP)
Y = 9 to F: Address of the camera + 8 (Locked to "Y = 9" for VISCA over IP)
GGGG = Vendor ID
0001: Sony
HHHH = Model ID
051F:BRC-AM7
JJJJ = ROM revision
KK = Maximum socket # (02)

VISCA Command/ACK Protocol

Command	Command Message	Reply Message	Comments
General Command	81 01 04 38 02 FF (Example)	90 4z FF (ACK), 90 5z FF (Completion) (z: Socket No.)	Returns ACK when a command has been accepted, or 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)	Could not accept the command as there are two commands currently being executed.
	81 01 04 08 02 FF (Example)	90 6z 41 FF (Command Not Executable) (z: Socket No.)	Could not execute the command in the current mode.
Inquiry Command	81 09 04 38 FF (Example)	90 50 02 FF (Completion)	Does not return ACK 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	Broadcast only. The device address number plus 1 is returned.
IF_Clear (Broadcast)*	88 01 00 01 FF	88 01 00 01 FF	The same command is returned.
IF_Clear (For x)	8x 01 00 01 FF	y0 50 FF (Completion)	ACK is not returned for this command.
Command Cancel	8x 2p FF	y0 6p 04 FF (Command Canceled)	Returned when the command of the specified socket is canceled. Completion for the command canceled is not returned.
		y0 6p 05 FF (No Socket)	Returned when the command of the specified socket has already been completed or when the specified socket number is wrong.

* Not available for VISCA over IP.

Do not transmit the command (except Address Set, IF_Clear, Command Cancel and POWER (page 18)) when any menu is displayed on the screen. If displayed, clear the menu first using MENU (page 19) command, and then proceed.

VISCA Camera-Issued Messages

ACK/Completion Messages

Command	Command Message	Comments
ACK	y0 4z FF (z: Socket No.)	Returned when the command is accepted.
Completion	y0 5z FF (z: Socket No.)	Returned when the command has been executed.

y = Device address + 8 (Locked to “y = 9” for VISCA over IP.)

Error Messages

Command	Command Message	Comments
Syntax Error	y0 60 02 FF	Returned when the command format is different or when a command with illegal command parameters is received.
Command Buffer Full	y0 60 03 FF	Could not accept a command that is received while two commands are currently being executed (two sockets have been used).
Command Canceled	y0 6z 04 FF (z: 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	y0 6z 05 FF (z: 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	y0 6z 41 FF (z: Socket No.)	Returned when a command cannot be executed due to current conditions. For example, when a command for controlling the manual focus is received during the auto focus mode.

y = Device address + 8 (Locked to “y = 9” for VISCA over IP.)

Network Change Message

Command	Command Message	Comments
Network Change*	y0 38 FF	Issued when power is supplied to the camera.

* Not available for VISCA over IP.

y = Device address + 8

VISCA over IP

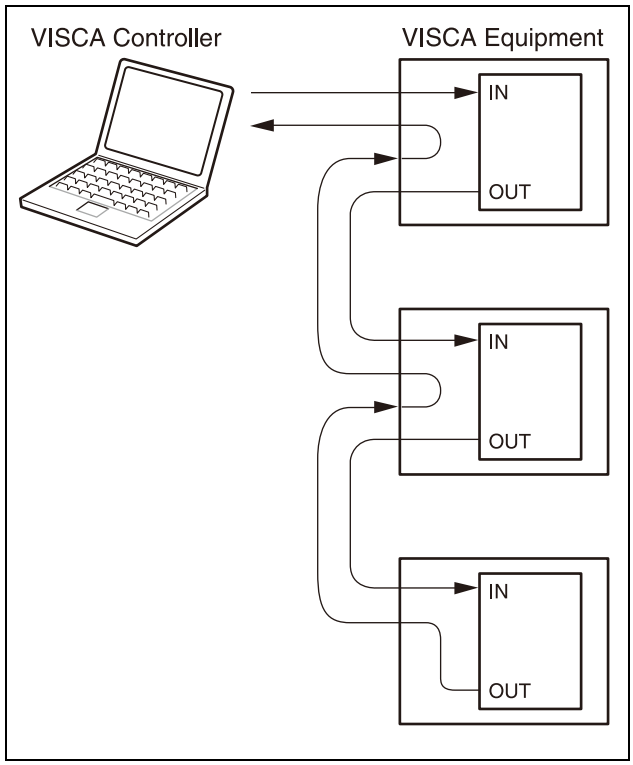
Overview of VISCA over IP

With VISCA over IP function, you can control the camera using VISCA on a controller equipped with IP communication capabilities via LAN. You can connect up to five controllers simultaneously on the network.

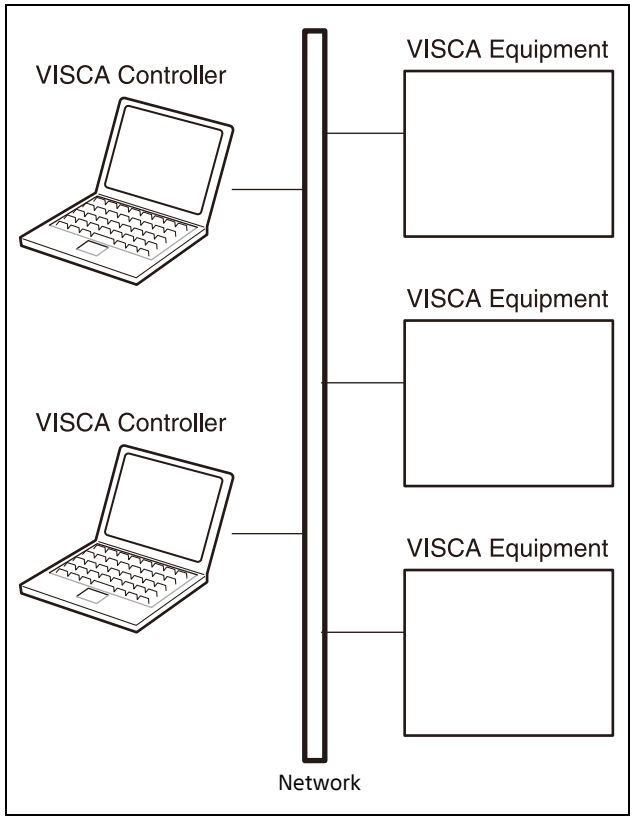
The communication specifications of VISCA over IP are as follows:

- **Interface**
  RJ-45 10BASE-T/100BASE-TX/1000BASE-T (auto sensing)
- **Internet protocol**
  IPv4
- **Transport protocol**
  UDP
- **IP address**
  Value set by the setup software (page 28)
- **Port address**
  52381
- **Delivery confirmation/Retransmission control**
  Depends on the application

In these instructions, the device outputting commands, such as a computer, is called the controller, and the device receiving the command, such as a BRC series camera, is called a peripheral device. The controllers and peripheral devices are connected to a unidirectional ring conforming to RS-422 standards. On the IP communication connection, the controllers and peripheral devices are connected by bus through a LAN.



RS422 connection



IP communication connection

While the IP communication connection, the address of each device cannot be set in the VISCA message as it is because the controllers and peripheral devices that are connected simultaneously are increased. In this case, addresses of the controllers and peripheral devices that are set in the VISCA message are locked to 0 (for the controller) or 1 (for the peripheral device).

Due to the nature of the IP communication, the use of some VISCA functions are limited. For details, see “Limitations” (page 13).

For how to set an IP address of the camera, see “Camera IP Setup Command” (page 28).

Communication Method of VISCA over IP

Communication method

VISCA over IP can process the VISCA communication between the controllers and peripheral devices using the messages that can be identified on the LAN, and sends/receives them. Because of this, VISCA over IP is not concerned about the contents of the communication between the controllers and peripheral devices. However, the VISCA communication sequence is different, depending on the types. To accommodate this, this function classifies each message for each operation sequence as follows.

VISCA command
This is a command from the controller to the peripheral device.
When the peripheral device receives this command, ACK is returned. After completing command processing, a completion notice is returned. This command uses the socket of VISCA. The order of completion notices may be changed if the multiple commands are sent to the same peripheral device.

VISCA inquiry
This is an inquiry from the controller to the peripheral device.
When the peripheral device receives this type of command, the reply for the inquiry is returned. This command does not use the socket of VISCA. The order of the replies is not changed if a multiple commands are sent.

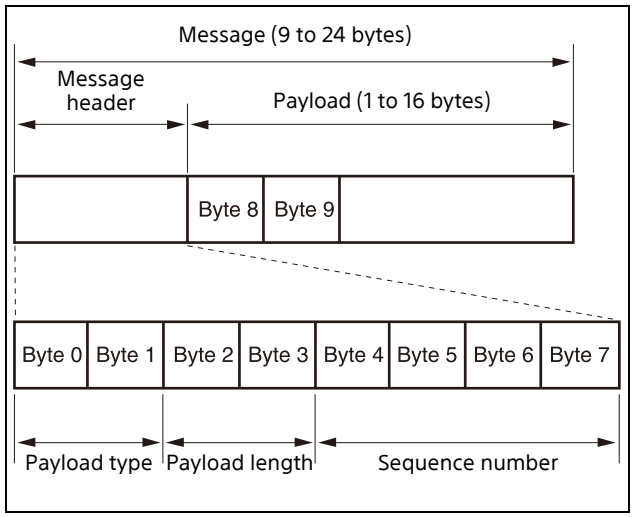
VISCA reply
This is an ACK, completion notice, reply, or error reply from the peripheral device to the controller. The classification for sending messages from the peripheral device to the controller is common.

VISCA device setting command
This is the device setting command from the controller to the peripheral device as follows. When the peripheral device receives this type of command, the command is activated.

- **Address Set**
  Sets the address of the peripheral device, and does not return a reply to the controller. While using VISCA over IP, the Address Set command is not sent from the controller because a Network Change command from the peripheral device that triggers sending command is not issued.
- **IF_Clear**
  Sends the reply message to the controller after clearing, without using VISCA socket.
- **CAM_VersionInq**
  Sends the reply message to the controller, without using a VISCA socket.

Format

These are the specifications of the message header (8 bytes) and payload (1 to 16 bytes).



Message structure

Note

The actual LAN out method is big-endian, LSB first.

Payload type
Stores the type of the data stored in the payload. The payload types are given below.

Name	Value (Byte 0)	Value (Byte 1)	Description
VISCA command	0x01	0x00	Stores the VISCA command in the payload.
VISCA inquiry	0x01	0x10	Stores the VISCA inquiry in the payload.
VISCA reply	0x01	0x11	Stores the reply to the VISCA command and inquiry, or a device setting command in the payload.
VISCA device setting command	0x01	0x20	Stores the VISCA device setting command in the payload.
Control command	0x02	0x00	Stores the control command in the payload.
Control reply	0x02	0x01	Stores the reply for the control command in the payload.

Payload length
Stores the number of bytes (1 to 16) of data that is stored in the payload.

Example: When the payload length is 16 bytes.
Byte 2: 0x00
Byte 3: 0x10

Sequence number
The controller stores the sequence number that is added every time a message is sent. If the sequence number reaches the limit, next value will be 0. The peripheral device saves the sequence number in the message from the controller, and stores the sequence number of the received message corresponding to the message sent to the controller.

Payload
Depending on the payload type, the following are stored.
- **VISCA command**
  Stores the packet of the VISCA command.
- **VISCA inquiry**
  Stores the packet of VISCA message.
- **VISCA reply**
  Stores the reply for the command or inquiry (ACK message, completion message, or error message).
- **VISCA device setting command**
  Stores the packet of the VISCA device setting command.
- **Control command**
  The following are stored on the payload division of the control command.

Name	Value	Description
RESET	0x01	Resets the sequence number to 0. The value that was set as the sequence number is ignored.
ERROR	0x0Fpp	pp=01: Abnormality in the sequence number.
		pp=02: Abnormality in the message (message type).

- **Control reply**
  The following are stored on the payload division of the reply for the control command.

Message	Value	Description
ACK	0x01	Reply for RESET.

Delivery confirmation

VISCA over IP uses UDP as a communications protocol of the transport layer. Delivery of messages is not guaranteed for the UDP communication. Delivery confirmation and retransmission should be performed on the application.

Normally, when the controller sends a message to the peripheral device, the controller sends the new message after receiving the reply for the last message. You can confirm delivery of messages by managing the time-out waiting for a reply message sent.

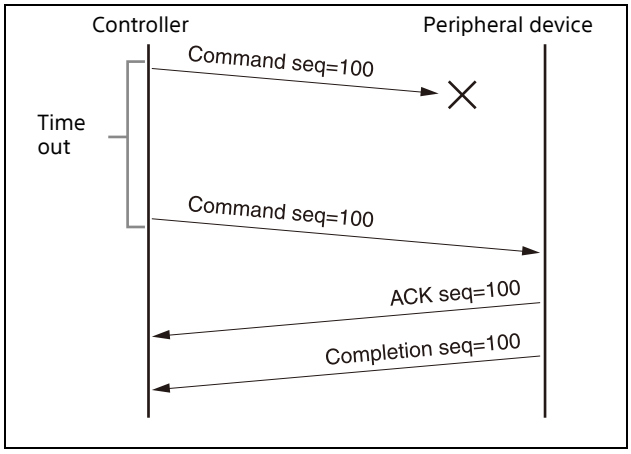
If time out occurs on the controller, loss of one of the following messages is considered:
- Command
- ACK message
- Completion message for the command
- Inquiry
- Reply message for the inquiry
- Error message
- Inquiry of the VISCA device setting command
- Reply message of the VISCA device setting command

If time out occurs on the controller, you can infer the lost message and state of the peripheral device by retransmitting the message using the same sequence number. The following table shows the received message and status by retransmission of the lost message, and the reference of correspondence after retransmission for each case.
(Except for the case that a time out occurs for reasons other than loss of message.)

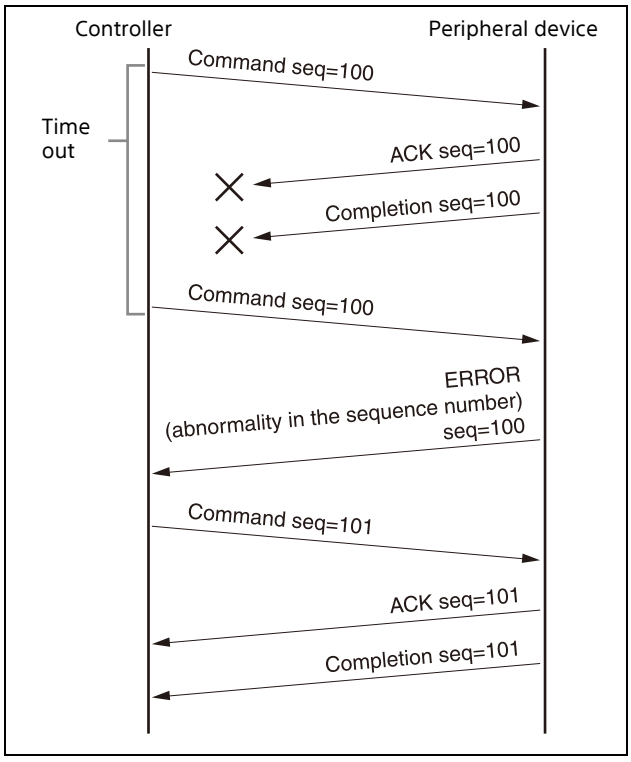
Lost message	**Received message for retransmission**	**Status after retransmission**	**Correspondence after retransmission (Reference)**
Command	ACK message	Command is performed by retransmission.	Continue processing.
ACK message	ERROR (Abnormality in the sequence number)	Command has been performed. If only the ACK message is lost, the completion message returns.	If the result by the completion message is needed, retransmit by updating the sequence number.
Completion message for the command	ERROR (Abnormality in the sequence number)	Command has been performed.	If the result by the completion message is needed, retransmit by updating the sequence number.
Inquiry	Reply message	Inquiry has been performed by retransmission.	Continue processing.
Reply message for the inquiry	ERROR (Abnormality in the sequence number)	Inquiry has been performed.	If the result by the reply message is needed, retransmit by updating the sequence number.
Error message	Error message	Command is not performed. If the error cause eliminates, normal reply returns (ACK, reply message).	Eliminate the error cause. If normal reply returns, continue processing.
Inquiry of the VISCA device setting command	Reply message of the VISCA device setting command	Inquiry has been performed by retransmission.	Continue processing.
Reply message of the VISCA device setting command	ERROR (Abnormality in the sequence number)	Inquiry has been performed.	If the result by the reply message is needed, retransmit by updating the sequence number.

The BRC series cameras have 2 buffers (memories) for the command to deal with advanced uses. When using VISCA over IP, up to 2 commands (including the current command) can be received. Depending on the message from the controller to the peripheral device, there are some messages that do not need to guarantee delivery. However, the peripheral device receives commands from multiple controllers while connected to VISCA over IP. If the multiple commands are send without waiting for the reply, the possibility of non-execution of the command and errors due to buffer overflow become high, because of limitations of order to receive commands or execution interval of command. It may cause efficiency to be reduced substantially.

Timing chart



Timing chart (loss of command)



Timing chart (loss of ACK or completion message)

Limitations

The following are limitations for VISCA over IP as compared with the VISCA specifications.

Locking the peripheral device's address of the VISCA message to 1

VISCA over IP cannot reflect each address to the address of the VISCA message because up to 112 peripheral devices and 5 controllers are connected. Because of this, the peripheral device's address of VISCA command is locked to 1 when using VISCA over IP. If the peripheral device's address is set to other than 1 for the VISCA command, the peripheral device works without hindrance since the peripheral device recognizes that its address is set to 1.

Locking the controller's address of the VISCA message to 0

For the same reason as the peripheral device's address, the controller's address is locked to 0. If the controller's address is set to other than 0, the peripheral device works without hindrance, and the reply address from the peripheral device is always set to 0.

Prohibition of specifying the broadcast address for the VISCA message

Do not use the broadcast address because it requires the serial communication. Operations under the broadcast address is set to the command are not guaranteed.

Prohibition of the Address Set for VISCA device setting command

Do not use this command because it requires the serial communication. Operations under the Address Set command is sent are not guaranteed.

VISCA Network Change command is not supported

This cannot be issued because it requires the serial communication.

Expiration time for an on status of the tally lamp

The tally lamp is turned off if not receiving an On command from any controller for 15 seconds after receiving an On command of TALLY ON/OFF.

Commands

The numeric values in parentheses in the “Comments” column indicate the display value in the Web App or camera menu.

Command List (1/6)

Command Set	Command		Command Packet	Comments
ND FILTER	MODE	PRESET/ VARIABLE	8x 01 7E 04 52 0p FF	p: 0=Preset, 1=Variable
	ND VARIABLE	UP	8x 01 7E 04 12 02 FF	
		DOWN	8x 01 7E 04 12 03 FF	
		VARIABLE	8x 01 7E 04 42 00 00 0p 0p FF	pp: 00 (1/4) to 14 (1/128) For details, see “VISCA Command Setting Values”.
	AUTO ND FILTER	–	8x 01 7E 04 53 0p FF	p: 2=On, 3=Off
	ND CLEAR	–	8x 01 7E 04 54 0p FF	p: 2=Filtered, 3=Clear
	ND PRESET	–	8x 01 7E 01 53 0p FF	p: 0=Clear, 1=Preset 1, 2=Preset 2, 3=Preset 3
IRIS	IRIS	UP	8x 01 7E 04 4B 02 0p 0p FF	pp: Step 01 to FF Approximately 1/256EV brighter per step.
		DOWN	8x 01 7E 04 4B 03 0p 0p FF	pp: Step 01 to FF Approximately 1/256EV darker per step.
	AUTO IRIS	–	8x 01 05 34 0p FF	p: 2=On, 3=Off
GAIN	AGC	–	8x 01 7E 01 75 0p FF	p: 2=On, 3=Off
SHUTTER	AUTO SHUTTER	–	8x 01 05 35 0p FF	p: 2=On, 3=Off
AUTO EXPOSURE	AE LEVEL	UP	8x 01 04 0E 02 FF	
		DOWN	8x 01 04 0E 03 FF	
	BACKLIGHT COMPENSATION	–	8x 01 04 33 0p FF	p: 2=On, 3=Off
	SPOTLIGHT COMPENSATION	–	8x 01 04 3A 0p FF	p: 2=On, 3=Off

Command List (2/6)

Command Set	Command		Command Packet	Comments
WHITE BALANCE	MODE	–	8x 01 04 35 0p FF	p: 4=ATW, 5=Memory A, A=Preset
	WB SET	–	8x 01 04 10 05 FF	WB SET
	PRESET WHITE	UP	8x 01 05 03 02 0p 0q 0q FF	p: 1=Preset qq: Step 01 to FF
		DOWN	8x 01 05 03 03 0p 0q 0q FF	p: 1=Preset qq: Step 01 to FF
		DIRECT	8x 01 05 43 0p 0r 0r 0r 0r FF	p: 1=Preset rrrr: Preset White 07D0 (2000 K) to 3A98 (15000 K)
	R GAIN	UP	8x 01 7E 01 63 02 0p 0q 0q FF	p: 2=Memory A qq: Step 01 to FF
		DOWN	8x 01 7E 01 63 03 0p 0q 0q FF	p: 2=Memory A qq: Step 01 to FF
		DIRECT	8x 01 7E 04 46 0p 0r 0r 0r 0r FF	p: 2=Memory A rrrr: R Gain 0000 (–99.0) to 03DE (0.0) to 07BC (+99.0)
	B GAIN	UP	8x 01 7E 01 64 02 0p 0q 0q FF	p: 2=Memory A qq: Step 01 to FF
		DOWN	8x 01 7E 01 64 03 0p 0q 0q FF	p: 2=Memory A qq: Step 01 to FF
		DIRECT	8x 01 7E 04 56 0p 0r 0r 0r 0r FF	p: 2=Memory A rrrr: B Gain 0000 (–99.0) to 03DE (0.0) to 07BC (+99.0)
	COLOR TEMP	UP	8x 01 05 03 02 0p 0q 0q FF	p: 2=Memory A qq: Step 01 to 1E
		DOWN	8x 01 05 03 03 0p 0q 0q FF	p: 2=Memory A qq: Step 01 to 1E
		DIRECT	8x 01 05 43 0p 0r 0r 0r 0r FF	p: 2=Memory A rrrr: Color Temp 07D0 (2000 K) to 3A98 (15000 K)
	TINT	UP	8x 01 05 04 02 0p 0q 0q FF	p: 2=Memory A qq: Step 01 to FF
		DOWN	8x 01 05 04 03 0p 0q 0q FF	p: 2=Memory A qq: Step 01 to FF
		DIRECT	8x 01 05 44 0p 00 00 0r 0r FF	p: 2=Memory A rr: Tint 00 (–99) to 63 (0) to C6 (+99)
	OFFSET COLOR TEMP	UP	8x 01 05 05 02 0p 0q 0q FF	p: 0=ATW qq: Step 1 to FF
		DOWN	8x 01 05 05 03 0p 0q 0q FF	p: 0=ATW qq: Step 1 to FF
		DIRECT	8x 01 05 45 0p 00 00 0r 0r FF	p: 0=ATW rr: Offset Color Temp 00 (–99) to 63 (0) to C6 (+99)
	OFFSET TINT	UP	8x 01 05 06 02 0p 0q 0q FF	p: 0=ATW qq: Step 1 to FF
		DOWN	8x 01 05 06 03 0p 0q 0q FF	p: 0=ATW qq: Step 1 to FF
		DIRECT	8x 01 05 46 0p 00 00 0r 0r FF	p: 0=ATW rr: Offset Tint 00 (–99) to 63 (0) to C6 (+99)

Command List (3/6)

Command Set	Command		Command Packet	Comments
BLACK	MASTER BLACK	UP	8x 01 05 18 02 0p 0p FF	pp: Step 01 to FF
		DOWN	8x 01 05 18 03 0p 0p FF	pp: Step 01 to FF
		DIRECT	8x 01 05 48 0q 0q 0q 0q FF	qqqq: Master Black 0000 (–99.0) to 03DE (0.0) to 07BC (+99.0)
	R BLACK	UP	8x 01 7E 01 65 02 0p 0p FF	pp: Step 01 to FF
		DOWN	8x 01 7E 01 65 03 0p 0p FF	pp: Step 01 to FF
		DIRECT	8x 01 7E 04 43 0q 0q 0q 0q FF	qqqq: R Black 0000 (–99.0) to 03DE (0.0) to 07BC (+99.0)
	B BLACK	UP	8x 01 7E 01 66 02 0p 0p FF	pp: Step 01 to FF
		DOWN	8x 01 7E 01 66 03 0p 0p FF	pp: Step 01 to FF
		DIRECT	8x 01 7E 04 44 0q 0q 0q 0q FF	qqqq: B Black 0000 (–99.0) to 03DE (0.0) to 07BC (+99.0)
DETAIL	SETTING	–	8x 01 7E 01 60 0p FF	p: 2=On, 3=Off
	LEVEL	UP	8x 01 04 02 02 FF	
		DOWN	8x 01 04 02 03 FF	
		DIRECT	8x 01 04 42 00 00 0p 0p FF	pp: Detail Level 00 (–7) to 07 (0) to 0E (+7)
KNEE	SETTING	–	8x 01 7E 01 6D 0p FF	p: 2=On, 3=Off
	MODE	–	8x 01 7E 01 54 0p FF	p: 0=Auto, 4=Manual
	SLOPE	–	8x 01 7E 01 6F 0p 0p FF	pp: Knee Slope 00 (–99) to 63 (0) to C6 (+99)
	POINT	–	8x 01 7E 01 6E 0p 0p FF	pp: Knee Point 00 (75 %) to 22 (109 %)
ZOOM	STANDARD SPEED	TELE	8x 01 04 07 02 FF	
		WIDE	8x 01 04 07 03 FF	
	VARIABLE SPEED	TELE	8x 01 04 07 2p FF	p: Speed 0 (Slow) to 7 (Fast)
		WIDE	8x 01 04 07 3p FF	p: Speed 0 (Slow) to 7 (Fast)
	STOP	STOP	8x 01 04 07 00 FF	
	HIGH RESOLUTION SPEED	TELE	8x 01 7E 04 17 02 0p 0p 0p 0p FF	p: Speed 0000 (Slow) to 7FFE (Fast)
		WIDE	8x 01 7E 04 17 03 0p 0p 0p 0p FF	p: Speed 0000 (Slow) to 7FFE (Fast)
		STOP	8x 01 7E 04 17 00 00 00 00 00 FF	
	DIRECT	–	8x 01 04 47 0z 0z 0z 0z FF	zzzz: Zoom Position (see “VISCA Command Setting Values”) Disabled when [Technical] > [Zoom] > [Zoom Type] is set to [On(Clear Image Zoom)] in the camera menu
	TELE CONVERT	–	8x 01 7E 04 36 0p FF	p: 2=On, 3=Off
FOCUS	MODE	–	8x 01 04 38 pp FF	pp: 02=Auto, 03=Manual, 10=Toggle
	STANDARD SPEED	FAR	8x 01 04 08 02 FF	
		NEAR	8x 01 04 08 03 FF	
	VARIABLE SPEED	FAR	8x 01 04 08 2p FF	p: Speed 0 (Slow) to 7 (Fast)
		NEAR	8x 01 04 08 3p FF	p: Speed 0 (Slow) to 7 (Fast)
	STOP	STOP	8x 01 04 08 00 FF	
	DIRECT	–	8x 01 04 48 0p 0p 0p 0p FF	pppp: Focus Position 0000 (Far) to FFFF (Near) For details, see “VISCA Command Setting Values”.
	PUSH AF/PUSH MF	–	8x 01 7E 04 58 0p FF	p: 0=Release, 1=Press For details, see “Press/Release Commands”.

Command List (4/6)

Command Set	Command		Command Packet	Comments
RECORDING	–	–	8x 01 7E 04 1D 0p FF	p: 0=Release, 1=Press For details, see “Press/Release Commands”.
AUDIO	LEVEL CONTROL	CH1, CH2	8x 01 7E 04 60 0p 0q FF	p: 1=CH1, 2=CH2 q: 0= Manual, 1=Auto
	INPUT LEVEL	Up	8x 01 7E 04 62 02 0p 0q 0q FF	p: 0=Master, 1=CH1, 2=CH2 qq: Step 01 to 0A
		Down	8x 01 7E 04 62 03 0p 0q 0q FF	p: 0=Master, 1=CH1, 2=CH2 qq: Step 01 to 0A
		Direct	8x 01 7E 04 61 0p 00 00 0q 0q FF	p: 0=Master, 1=CH1, 2=CH2 qq: Level 00 (0) to 63 (99)
PAN-TILT	PAN TILT drive	Up	8x 01 06 01 vv ww 03 01 FF	vv: Pan speed 01 to 18/7F (Speed Step Normal/Extended) ww: Tilt speed 01 to 18/7F (Speed Step Normal/Extended)
		Down	8x 01 06 01 vv ww 03 02 FF	vv: Pan speed 01 to 18/7F (Speed Step Normal/Extended) ww: Tilt speed 01 to 18/7F (Speed Step Normal/Extended)
		Left	8x 01 06 01 vv ww 01 03 FF	vv: Pan speed 01 to 18/7F (Speed Step Normal/Extended) ww: Tilt speed 01 to 18/7F (Speed Step Normal/Extended)
		Right	8x 01 06 01 vv ww 02 03 FF	vv: Pan speed 01 to 18/7F (Speed Step Normal/Extended) ww: Tilt speed 01 to 18/7F (Speed Step Normal/Extended)
		UpLeft	8x 01 06 01 vv ww 01 01 FF	vv: Pan speed 01 to 18/7F (Speed Step Normal/Extended) ww: Tilt speed 01 to 18/7F (Speed Step Normal/Extended)
		UpRight	8x 01 06 01 vv ww 02 01 FF	vv: Pan speed 01 to 18/7F (Speed Step Normal/Extended) ww: Tilt speed 01 to 18/7F (Speed Step Normal/Extended)
		DownLeft	8x 01 06 01 vv ww 01 02 FF	vv: Pan speed 01 to 18/7F (Speed Step Normal/Extended) ww: Tilt speed 01 to 18/7F (Speed Step Normal/Extended)
		DownRight	8x 01 06 01 vv ww 02 02 FF	vv: Pan speed 01 to 18/7F (Speed Step Normal/Extended) ww: Tilt speed 01 to 18/7F (Speed Step Normal/Extended)
		Stop	8x 01 06 01 vv ww 03 03 FF	vv: Pan speed 01 to 18/7F (Speed Step Normal/Extended) ww: Tilt speed 01 to 18/7F (Speed Step Normal/Extended)
		ABS (Absolute Position)	8x 01 06 02 vv ww 0p 0p 0p 0p 0p 0t 0t 0t 0t 0t FF	vv: Pan speed 01 to 18/7F (Speed Step Normal/Extended) ww: Tilt speed 00=Speed synced with pan operation, 01 to 18/7F (Speed Step Normal/Extended) ppppp: Pan coordinates ttttt: Tilt coordinates
		REL (Relative Position)	8x 01 06 03 vv ww 0p 0p 0p 0p 0p 0t 0t 0t 0t 0t FF	vv: Pan speed 01 to 18/7F (Speed Step Normal/Extended) ww: Tilt speed 00=Speed synced with pan operation, 01 to 18/7F (Speed Step Normal/Extended) ppppp: Pan movement amount ttttt: Tilt movement amount

Command List (5/6)

Command Set	Command		Command Packet	Comments
PAN-TILT	HOME	–	8x 01 06 04 FF	
	RESET	–	8x 01 06 05 FF	
	RAMP CURVE	–	8x 01 06 31 0p FF	p: Ramp Curve 1 to 9
	SPEED STEP	–	8x 01 06 45 pp FF	p: 08=Normal, 18=Extended
	SPEED MODE	–	8x 01 06 44 0p FF	p: 3=Normal, 2=Slow
	LIMIT	SET	8x 01 06 07 00 0q 0p 0p 0p 0p 0p 0t 0t 0t 0t 0t FF	q: Position 0=DownLeft, 1=UpRight ppppp: Pan coordinates ttttt: Tilt coordinates
		CLEAR	8x 01 06 07 01 0q 07 0F 0F 0F 0F 07 0F 0F 0F 0F FF	q: Position 0=DownLeft, 1=UpRight
PRESET	MODE	–	8x 01 7E 04 3D pp FF	pp: 01=POSITION
	SET	–	8x 01 04 3F 01 pp FF	Preset number – 1 (00 to 63)
	RESET	–	8x 01 04 3F 00 pp FF	Preset number – 1 (00 to 63)
	RECALL	–	8x 01 04 3F 02 pp FF	Preset number – 1 (00 to 63)
	SPEED/ DURATION	SELECT	8x 01 7E 04 1B 0p FF	1=Separate (operation with separate speed for each preset), 2=common (operation with common speed for all presets)
		SEPARATE MODE	8x 01 7E 04 27 pp 0q FF	Preset number – 1 (00 to 63) qq: Separate mode for each preset 0=Speed (specify speed) 1=Duration (specify duration)
		SEPARATE SPEED	8x 01 7E 01 0B pp qq FF	Preset number – 1 (00 to 63) qq: Separate speed for each preset 01 (1) to 7F (127)
		SEPARATE DURATION	8x 01 7E 04 67 pp 0q 0q 0q FF	Preset number – 1 (00 to 63) qq: Duration for each preset (increments of 0.1 seconds) 00a (1 second) to 3de (99 seconds)
		COMMON	8x 01 7E 04 1C 0p 0p FF	pp: Common speed for all presets 01 (1) to 7F (127)
	RAMP CURVE	–	8x 01 06 35 0p FF	p: Ramp Curve 1 to 9
PTZ AUTO FRAMING	START/STOP	–	8x 01 7E 04 3A 0p FF	p: 1=Start, 0=Stop
POWER	–	–	8x 01 04 00 0p FF	p: 2=On, 3=Standby
DISPLAY	–	–	8x 01 7E 04 75 0p FF	p: 0=Release, 1=Press For details, see “Press/Release Commands”.
ASSIGNABLE BUTTON	PRESS/RELEASE	–	8x 01 7E 04 73 pp 0q FF	pp: 01 to 0A=Assignable Button 1 to 10 q: 0=Release, 1=Press For details, see “Press/Release Commands”.
MULTI FUNCTION DIAL	SET	–	8x 01 7E 04 74 0p 0q 0q FF	p: 1=Set qq: 00=Release, 01=Press For details, see “Press/Release Commands” and “Multi Function Dial Command”.
MULTI FUNCTION DIAL 2	CW/CCW	–	8x 01 7E 04 41 0p 0q 0q FF	p: 2=CW (clockwise), 3=CCW (counterclockwise) qq: Step 01 to FF The action will differ depending on the operation target. Normally, specify 1 step. For details, see “Multi Function Dial Command”.

Command List (6/6)

Command Set	Command		Command Packet	Comments
MENU	ON/OFF	–	8x 01 06 06 pp FF	pp: 2=On, 3=Off, 10=Toggle
	MULTI SELECTOR	–	8x 01 7E 04 40 0p 0p 0q FF	pp: 31=Up, 32=Down, 13=Left, 23=Right, 11=Up-Left, 21=Up-Right, 12=Down-Left, 22=Down-Right, 70=Set, 71=Cancel/Back q: 0=Release, 1=Press For details, see “Press/Release Commands”.
DIRECT MENU	PRESS/RELEASE	–	8x 01 7E 04 72 pp 0q FF	pp: 00=ND Filter, 01=Iris, 02=ISO/Gain, 03=Shutter, 04=AE Level/Mode, 7F=Direct Menu exit q: 0=Release, 1=Press For details, see “Press/Release Commands”.
TALLY	CONTROL	RED	8x 01 7E 01 0A 00 0p FF	p: 2=On, 3=Off
		GREEN	8x 01 7E 04 1A 00 0p FF	p: 2=On, 3=Off
		YELLOW	8x 01 7E 04 11 00 0p FF	p: 2=On, 3=Off
COLOR BAR	–	–	8x 01 04 7D 0p FF	p: 2=On, 3=Off

Inquiry Command List (1/3)

Inquiry Command		Inquiry Packet	Reply Packet	Comments
SHOOTING MODE	MODE	8x 09 05 30 FF	y0 50 0p FF	p: 0=Custom, 2=Flexible
ND FILTER	MODE	8x 09 7E 04 52 FF	y0 50 0p FF	p: 0=Preset, 1=Variable
	VARIABLE	8x 09 7E 04 42 FF	y0 50 00 00 0p 0p FF	pp: See “VISCA Command Setting Values.”
	AUTO ND FILTER	8x 09 7E 04 53 FF	y0 50 0p FF	p: 2=On, 3=Off
	ND CLEAR	8x 09 7E 04 54 FF	y0 50 0p FF	p: 2=Filtered, 3=Clear
	ND PRESET	8x 09 7E 01 53 FF	y0 50 0p FF	p: 0=Clear, 1=Preset 1, 2=Preset 2, 3=Preset 3
IRIS	AUTO IRIS	8x 09 05 34 FF	y0 50 0p FF	p: 2=On, 3=Off
GAIN	AGC	8x 09 7E 01 75 FF	y0 50 0p FF	p: 2=On, 3=Off
SHUTTER	AUTO SHUTTER	8x 09 05 35 FF	y0 50 0p FF	p: 2=On, 3=Off
AUTO EXPOSURE	AE LEVEL	8x 09 04 4E FF	y0 50 00 00 0p 0p FF	pp: AE Level 00 (–3.0) to 18 (+3.0)
	BACKLIGHT COMPENSATION	8x 09 04 33 FF	y0 50 0p FF	p: 2=On, 3=Off
	SPOTLIGHT COMPENSATION	8x 09 04 3A FF	y0 50 0p FF	p: 2=On, 3=Off
WHITE BALANCE	MODE	8x 09 04 35 FF	y0 50 0p FF	p: 4=ATW, 5=Memory A, A=Preset
	PRESET WHITE	8x 09 05 43 0p FF	y0 50 0r 0r 0r 0r FF	p: 1=Preset rrrr: Preset White 07D0 (2000 K) to 3A98 (15000 K)
	R GAIN	8x 09 7E 04 46 0p FF	y0 50 0r 0r 0r 0r FF	p: 2=Memory A rrrr: R Gain 0000 (–99.0) to 03DE (0.0) to 07BC (+99.0)
	B GAIN	8x 09 7E 04 56 0p FF	y0 50 0r 0r 0r 0r FF	p: 2=Memory A rrrr: B Gain 0000 (–99.0) to 03DE (0.0) to 07BC (+99.0)
	COLOR TEMP	8x 09 05 43 0p FF	y0 50 0r 0r 0r 0r FF	p: 2=Memory A rrrr: Color Temp 07D0 (2000 K) to 3A98 (15000 K)
	TINT	8x 09 05 44 0p FF	y0 50 00 00 0r 0r FF	p: 2=Memory A rr: Tint 00 (–99) to 63 (0) to C6 (+99)
	OFFSET COLOR TEMP	8x 09 05 45 0p FF	y0 50 00 00 0r 0r FF	p: 0=ATW rr: Offset Color Temp 00 (–99) to 63 (0) to C6 (+99)
	OFFSET TINT	8x 09 05 46 0p FF	y0 50 00 00 0r 0r FF	p: 0=ATW rr: Offset Tint 00 (–99) to 63 (0) to C6 (+99)
BLACK	MASTER BLACK	8x 09 05 48 FF	y0 50 0q 0q 0q 0q FF	qqqq: Master Black 0000 (–99.0) to 03DE (0.0) to 07BC (+99.0)
	R BLACK	8x 09 7E 04 43 FF	y0 50 0q 0q 0q 0q FF	qqqq: R Black 0000 (–99.0) to 03DE (0.0) to 07BC (+99.0)
	B BLACK	8x 09 7E 04 44 FF	y0 50 0q 0q 0q 0q FF	qqqq: B Black 0000 (–99.0) to 03DE (0.0) to 07BC (+99.0)
DETAIL	SETTING	8x 09 7E 01 60 FF	y0 50 0p FF	p: 2=On, 3=Off
	LEVEL	8x 09 04 42 FF	y0 50 00 00 0p 0p FF	pp: Detail Level 00 (–7) to 07 (0) to 0E (+7)

Inquiry Command List (2/3)

Inquiry Command		Inquiry Packet	Reply Packet	Comments
KNEE	SETTING	8x 09 7E 01 6D FF	y0 50 0p FF	p: 2=On, 3=Off
	MODE	8x 09 7E 01 54 FF	y0 50 0p FF	p: 0=Auto, 4=Manual
	SLOPE	8x 09 7E 01 6F FF	y0 50 00 00 0p 0p FF	pp: Knee Slope 00 (–99) to 63 (0) to C6 (+99)
	POINT	8x 09 7E 01 6E FF	y0 50 00 00 0p 0p FF	pp: Knee Point 00 (75 %) to 22 (109 %)
	PERMISSION	8x 09 7E 04 6D 0p FF	y0 50 0q FF	p: 0=Knee Setting, 1=Knee Mode, 2=Knee Point, 3=Knee Slope q: 0=Enable, 1=Disable, 2=Display Only (non-configurable, acquired value valid)
ZOOM	POSITION	8x 09 04 47 FF	y0 50 0z 0z 0z 0z FF	zzzz: Zoom Position 0000 to 6000
FOCUS	MODE	8x 09 04 38 FF	y0 50 pp FF	pp: 02=Auto, 03=Manual
	POSITION	8x 09 04 48 FF	y0 50 0p 0p 0p 0p FF	pppp: Focus Position 0000 (Far) to FFFF (Near)
RECORDING	STATUS	8x 09 7E 04 1E FF	y0 50 0p FF	p: 0=Standby, 1=Recording
AUDIO	LEVEL CONTROL	8x 09 7E 04 60 0p FF	y0 50 0q FF	p: 1=CH1, 2=CH2 q: 0= Manual, 1=Auto
	INPUT LEVEL	8x 09 7E 04 61 0p FF	y0 50 00 00 0q 0q FF	p: 0=Master, 1=CH1, 2=CH2 qq: Level 00 to 63
PAN-TILT	POSITION	8x 09 06 12 FF	y0 50 0p 0p 0p 0p 0p 0t 0t 0t 0t 0t FF	ppppp: Pan coordinates ttttt: Tilt coordinates
	RAMP CURVE	8x 09 06 31 FF	y0 50 0p FF	p: Ramp Curve 1 to 9
	SPEED STEP	8x 09 06 45 FF	y0 50 pp FF	pp: 08=Normal, 18=Extended
	SPEED MODE	8x 09 06 44 FF	y0 50 0p FF	p: 3=Normal, 2=Slow
	LIMIT	8x 09 06 07 0q FF	y0 50 0p 0p 0p 0p 0p 0t 0t 0t 0t 0t FF	q: Position 0=DownLeft, 1=UpRight ppppp: Pan coordinates ttttt: Tilt coordinates
	STATUS	8x 09 06 10 FF	y0 50 pp pp FF	pppp: See “Pan/Tilt Status Codes.”
	CAPABILITY	8x 09 06 11 FF	y0 50 pp qq FF	pp: Pan Max Speed 18/7F (Speed Step Normal/Extended) qq: Tilt Max Speed 18/7F (Speed Step Normal/Extended)
PRESET	MODE	8x 09 7E 04 3D FF	y0 50 pp FF	pp: 01=POSITION
	SPEED	8x 09 7E 04 1B FF	y0 50 0p FF	p: 1=Separate, 2=Common
		8x 09 7E 01 0B pp FF	y0 50 qq FF	pp: Preset No. – 1 00 to 63 qq: Separate Speed 01 to 7F
		8x 09 7E 04 1C FF	y0 50 0p 0p FF	pp: Common Speed 01 to 7F
PTZ Auto FRAMING	START/STOP	8x 09 7E 04 3A FF	y0 50 0p FF	p: 1=Start, 0=Stop
POWER	–	8x 09 04 00 FF	y0 50 0p FF	p: Power On/Off, 2=On, 3=Standby
ASSIGNABLE BUTTON	LAMP	8x 09 7E 04 6E pp FF	y0 50 0q FF	pp: 01 to 0A=Assignable Button 1 to 10 q: 0=Not lit, 1=Lit
MENU	MENU ON/OFF	8x 09 06 06 FF	y0 50 pp FF	pp: 2=On, 3=Off
TALLY	RED	8x 09 7E 01 0A FF	y0 50 0p FF	p: 2=On, 3=Off
	GREEN	8x 09 7E 04 1A FF	y0 50 0p FF	p: 2=On, 3=Off
	YELLOW	8x 09 7E 04 11 FF	y0 50 0p FF	p: 2=On, 3=Off
COLOR BAR	–	8x 09 04 7D FF	y0 50 0p FF	p: 2=On, 3=Off

Inquiry Command List (3/3)

Inquiry Command		Inquiry Packet	Reply Packet	Comments
SYSTEM	SOFTWARE VERSION (CAM_VersionInq)	8x 09 00 02 FF	y0 50 pp pp qq qq rr rr 0s FF	pppp: Vendor ID qqqq: Model Code rrrr: ROM version s: Socket Number
	CAMERA GENERATION	8x 09 7E 04 30 FF	y0 50 0h 0k 0m 0n 0p 0q 0r 0s 0t 0u uu 0v vv FF	h: Number of camera generation k–t: 0 (fixed) 0uuu: Model ID 0vvv: Model ID of a similar model when operating with a remote controller

Pan/Tilt Status Codes

Pin No.	p				q				r				s				Status	Classification
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	Panning reaches the left edge.	Normal
2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	Panning reaches the right edge.	Normal
3	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	Tilting reaches the upper limit.	Normal
4	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	Tilting reaches the lower limit.	Normal
5	–	–	–	–	–	–	–	–	–	–	0	0	–	–	–	–	Pan functions normally.	Normal
6	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	Pan position cannot be detected.	Abnormal
7	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	Pan mechanism is defective.	Abnormal
8	–	–	–	–	–	–	0	0	–	–	–	–	–	–	–	–	Tilt functions normally.	Normal
9	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	Tilt position cannot be detected.	Abnormal
10	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	Tilt mechanism is defective.	Abnormal
11	–	–	–	–	0	0	–	–	–	–	–	–	–	–	–	–	No movement instruction	Normal
12	–	–	–	–	0	1	–	–	–	–	–	–	–	–	–	–	Pan/Tilt operating	Normal
13	–	–	–	–	1	0	–	–	–	–	–	–	–	–	–	–	Pan/Tilt operations completed.	Normal
14	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–	Pan/Tilt operating failed.	Abnormal
15	–	–	0	0	–	–	–	–	–	–	–	–	–	–	–	–	Not initialized	Not initialized
16	–	–	0	1	–	–	–	–	–	–	–	–	–	–	–	–	Initializing	Normal
17	–	–	1	0	–	–	–	–	–	–	–	–	–	–	–	–	Initialization completed.	Normal
18	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	Initialization failed.	Not initialized
19	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Overload condition	Overload

- "–" is optional.
- Pan/Tilt abnormal status does not distinguish between Pan and Tilt.

Press/Release Commands

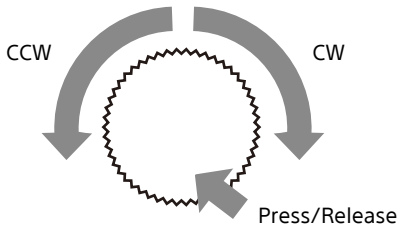
The camera supports commands that imitate a button press and button release for functions that would be active while a button is pressed. The commands can also imitate a long press for buttons that support different operations when pressed and held.
When a Press command is received, the operation starts. When a Release command is received, the operation stops. Always issue these commands in pairs.
The standard for GUI buttons of the camera that support a long-press operation, unless otherwise noted, is 1 second or longer from receiving a Press command until receiving a Release command.
Accordingly, to activate a long-press operation, make sure that the interval between receiving Press and Release commands is 1 second or longer.
To avoid activating a long-press operation, issue the Press and Release commands in quick succession.

For details about the specific operation of each command, refer to the description of the corresponding button of the Web App in the Help Guide.

Command	Corresponding Web App button
Push AF/MF	Live operation screen > Focus tab > Push AF/MF button
Recording	Live operation screen record START/STOP button
Display	Live operation screen/Playback operation screen > Display button
Assignable button	Live operation screen/Playback operation screen > assignable buttons
Multi Selector	Live operation screen/Playback operation screen > GUI control panel > up/down/left/right/Set buttons
Multi Function Dial	N/A (see "Multi Function Dial Command")
Direct Menu	N/A (see "Direct Menu Command")

Multi Function Dial Command

This command controls the GUI cursor operation. CCW/CW move the GUI cursor, and Press/Release commands apply the setting at the cursor position.
Note that if a Press/Release pair is received on the shooting screen of the camera, direct menu operation starts. It is not represent a long-press operation.
Also, you cannot select a face/eye detection frame or move the focus area using these commands.



Direct Menu Command

This command moves the cursor to a specified setup item in the direct menu of the camera. It can also be used to exit the direct menu.
The movement destination depends on the interval between receiving Press/Release commands.

Parameter name	**Interval < 1 sec**	**Interval ≥ 1 sec**
ND Filter (Variable)	ND filter value	Auto/Manual/ Clear switching
ND Filter (Preset)	(Disabled)	Clear/Preset1/ Preset2/Preset3 switching
Iris	Iris value	Auto/Manual switching
ISO/Gain	ISO value/Gain value	Auto/Manual switching
Shutter (Speed)	Shutter value	Auto/Off/Speed/ ECS switching
Shutter (Angle)	Shutter value	Auto/Angle/ECS switching
AE Level/Mode	Exposure compensation value	Backlight/ Standard/Spotlight switching

VISCA Command Setting Values

Value is a hexadecimal value.

ND filter

Value	ND Filter
00	1/4
01	1/5
02	1/6
03	1/7
04	1/8
05	1/10
06	1/11
07	1/13
08	1/16
09	1/19
0A	1/23
0B	1/27
0C	1/32
0D	1/38
0E	1/45
0F	1/54
10	1/64
11	1/76
12	1/91
13	1/108
14	1/128

Pan/tilt position

	Value	Position
Pan	2AB98	175°
	00000	0°
	D5468	–175°
Tilt (when Ceiling setting of camera is Off)	33450	+210°
	00000	0°
	F8AD0	–30°
Tilt (when Ceiling setting of camera is On)	07530	+30°
	00000	0°
	CCBB0	–210°

Pan/tilt speed, preset drive speed (reference values)

Unit: degrees/second

Pan/Tilt drive speed	Speed Step			
	Normal		Extended	
	Speed Mode			
	Normal	Slow	Normal	Slow
01 h (1)	0.05	0.05	0.02	0.004
02 h (2)	0.1	0.1	0.03	0.015
03 h (3)	0.2	0.2	0.06	0.037
04 h (4)	0.4	0.3	0.09	0.074
05 h (5)	0.5	0.4	0.14	0.128
06 h (6)	0.8	0.6	0.2	0.202
07 h (7)	1.1	0.9	0.3	0.295
08 h (8)	1.4	1.2	0.4	0.412
09 h (9)	1.9	1.5	0.6	0.552
0A h (10)	2.5	1.9	0.7	0.717
0B h (11)	3.2	2.5	1.0	0.910
0C h (12)	4.0	3.1	1.3	1.131
0D h (13)	5.1	3.9	1.6	1.381
0E h (14)	6.4	4.8	2.0	1.661
0F h (15)	8.0	6.0	2.5	1.974
10 h (16)	10.0	7.3	3.1	2.319
11 h (17)	12.5	9.1	3.7	2.698
12 h (18)	15.5	11.3	4.4	3.112
13 h (19)	19.6	13.8	5.3	3.562
14 h (20)	24.2	17.0	6.2	4.049
15 h (21)	30.1	20.9	7.1	4.575
16 h (22)	37.8	26.0	8.2	5.138
17 h (23)	47.1	31.8	9.4	5.742
18 h (24)	60.0	40.0	10.7	6.387
19 h (25)	–	–	12.0	7.073
1A h (26)	–	–	13.4	7.801
1B h (27)	–	–	15.1	8.573
1C h (28)	–	–	16.7	9.389
1D h (29)	–	–	18.2	10.249
1E h (30)	–	–	20.0	11.156
1F h (31)	–	–	21.9	12.108
20 h (32)	–	–	23.7	13.108
21 h (33)	–	–	25.5	14.156
22 h (34)	–	–	27.5	15.253
23 h (35)	–	–	29.4	16.400
24 h (36)	–	–	31.5	17.596
25 h (37)	–	–	33.6	18.843
26 h (38)	–	–	35.7	20.142
27 h (39)	–	–	38.1	21.494
28 h (40)	–	–	40.0	22.898
29 h (41)	–	–	41.8	24.356
2A h (42)	–	–	44.2	25.868

Pan/Tilt drive speed	Speed Step			
	Normal		Extended	
	Speed Mode			
	Normal	Slow	Normal	Slow
2B h (43)	–	–	46.1	27.435
2C h (44)	–	–	48.2	29.058
2D h (45)	–	–	50.1	30.737
2E h (46)	–	–	52.1	32.474
2F h (47)	–	–	54.3	34.267
30 h (48)	–	–	56.3	36.119
31 h (49)	–	–	58.3	38.030
32 h (50)	–	–	60.0	40.000
33 h (51)	–	–	61.6	41.818
34 h (52)	–	–	63.1	43.636
35 h (53)	–	–	64.7	45.455
36 h (54)	–	–	66.2	47.273
37 h (55)	–	–	67.8	49.091
38 h (56)	–	–	69.4	50.909
39 h (57)	–	–	70.9	52.727
3A h (58)	–	–	72.5	54.545
3B h (59)	–	–	74.0	56.364
3C h (60)	–	–	75.6	58.182
3D h (61)	–	–	77.1	60.000
3E h (62)	–	–	78.7	61.818
3F h (63)	–	–	80.3	63.636
40 h (64)	–	–	81.8	65.455
41 h (65)	–	–	83.4	67.273
42 h (66)	–	–	84.9	69.091
43 h (67)	–	–	86.5	70.909
44 h (68)	–	–	88.1	72.727
45 h (69)	–	–	89.6	74.545
46 h (70)	–	–	91.2	76.364
47 h (71)	–	–	92.7	78.182
48 h (72)	–	–	94.3	80.000
49 h (73)	–	–	95.8	81.818
4A h (74)	–	–	97.4	83.636
4B h (75)	–	–	99.0	85.455
4C h (76)	–	–	100.5	87.273
4D h (77)	–	–	102.1	89.091
4E h (78)	–	–	103.6	90.909
4F h (79)	–	–	105.2	92.727
50 h (80)	–	–	106.8	94.545
51 h (81)	–	–	108.3	96.364
52 h (82)	–	–	109.9	98.182
53 h (83)	–	–	111.4	100.000
54 h (84)	–	–	113.0	101.818
55 h (85)	–	–	114.5	103.636
56 h (86)	–	–	116.1	105.455
57 h (87)	–	–	117.7	107.273

Pan/Tilt drive speed	Speed Step			
	Normal		Extended	
	Speed Mode			
	Normal	Slow	Normal	Slow
58 h (88)	–	–	119.2	109.091
59 h (89)	–	–	120.8	110.909
5A h (90)	–	–	122.3	112.727
5B h (91)	–	–	123.9	114.545
5C h (92)	–	–	125.5	116.364
5D h (93)	–	–	127.0	118.182
5E h (94)	–	–	128.6	120.000
5F h (95)	–	–	130.1	121.818
60 h (96)	–	–	131.7	123.636
61 h (97)	–	–	133.2	125.455
62 h (98)	–	–	134.8	127.273
63 h (99)	–	–	136.4	129.091
64 h (100)	–	–	137.9	130.909
65 h (101)	–	–	139.5	132.727
66 h (102)	–	–	141.0	134.545
67 h (103)	–	–	142.6	136.364
68 h (104)	–	–	144.2	138.182
69 h (105)	–	–	145.7	140.000
6A h (106)	–	–	147.3	141.818
6B h (107)	–	–	148.8	143.636
6C h (108)	–	–	150.4	145.455
6D h (109)	–	–	151.9	147.273
6E h (110)	–	–	153.5	149.091
6F h (111)	–	–	155.1	150.909
70 h (112)	–	–	156.6	152.727
71 h (113)	–	–	158.2	154.545
72 h (114)	–	–	159.7	156.364
73 h (115)	–	–	161.3	158.182
74 h (116)	–	–	162.9	160.000
75 h (117)	–	–	164.4	161.818
76 h (118)	–	–	166.0	163.636
77 h (119)	–	–	167.5	165.455
78 h (120)	–	–	169.1	167.273
79 h (121)	–	–	170.6	169.091
7A h (122)	–	–	172.2	170.909
7B h (123)	–	–	173.8	172.727
7C h (124)	–	–	175.3	174.545
7D h (125)	–	–	176.9	176.364
7E h (126)	–	–	178.4	178.182
7F h (127)	–	–	180.0	180.000

Zoom position

Position	Value	Comment
Optical Wide end	0000	
Optical Tele end	4000	
Clear Image Zoom 1.5x	5556	Clear Image Zoom Tele end at 3840×2160 or higher
Clear Image Zoom 2.0×	6000	Clear Image Zoom Tele end

Focus position

Position	Value	Comment
Far end	0000	
Near end	F7FF *	

Note

The command input range is up to FFFF, but the operating range is up to F7FF.

Camera IP Setup Command

The following command is provided for setting the IP address and camera name of a camera.

No.	Name	Description
1	Setting Protocol: Inquiry	Controller inquires about the network settings of the camera.
2	Setting Protocol: Inquiry reply	Camera responds to the inquiry from the controller.
3	Setting Protocol: Network setting	Controller configures the network settings of the camera.
4	Setting Protocol: Network settings response	Camera responds to the network settings from the controller.

To set the network settings of a camera, use the following sequence.
Connect the computer used for configuring to the same network segment as the cameras.

1 Inquiry

The controller sends inquiry packets to UDP broadcast address (255.255.255.255) on the specified port number (52380). The camera responds using inquiry response packets.

2 Network settings

The controller sends network setting packets to UDP broadcast address (255.255.255.255) on the specified port number (52380). The camera refers to the MAC address units in the packets and if the packets are a request to itself, the camera returns an acknowledgment (ACK) in the network settings response.
If the camera configuration is unsuccessful, it returns NACK in the network settings response.

Command	Data
Inquiry UDP Broadcast address (255.255.255.255) Specified port number (52380)	02 ENQ:network *1 FF 03
Inquiry response UDP Broadcast address (255.255.255.255) Specified port number (52380)	02 MAC:**-**-**-**-**-** *1 FF MODEL:IPCARD *1 FF SOFTVERSION:**.**.** *1 FF IPADR:***.***.***.*** *1 FF MASK:***.***.***.*** *1 FF GATEWAY:***.***.***.*** *1 FF NAME:xxxxxxxx *1 FF WRITE:on *1 FF 03
Network settings UDP Broadcast address (255.255.255.255) Specified port number (52380)	02 MAC:**-**-**-**-**-** *1 FF IPADR:***.***.***.*** *1 FF MASK:***.***.***.*** *1 FF GATEWAY:***.***.***.*** *1 FF NAME:xxxxxxxx *1 FF 03
Network settings response UDP Broadcast address (255.255.255.255) Specified port number (52380)	02 ACK:**-**-**-**-**-** *2 “xxxx” *3 FF 03

*1 ASCII code.
*2 ASCII code. For NACK, returns “NAK:**-**-**-**-**-**”.
*3 ASCII code. If necessary, a detailed message reply can occur here. May be omitted.

Notes

- Up to 8 characters comprising alphanumeric characters or spaces can be used for the camera name (NAME).
- When the WRITE data in the inquiry response is set to off, you cannot change the camera IP address and camera name in the network settings.
- After power to the camera is first turned on, WRITE is set to off automatically after 20 minutes, at which point the network settings are no longer accepted.
- You can also set WRITE to using a CGI command. When set to off using a CGI command, network settings will not be

accepted immediately after the power is turned on. After setting the IP address of the camera, you can prevent accidental changes by setting WRITE to off.