Digital Camera D7000
USB Still Image Capture Device
Media Transfer Protocol (MTP) Specifications

Rev. 1.00

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1. OUTLINE

1.1. Application

These specifications describe the operations of the D7000 (hereinafter referred to as the camera) as the USB Still Image Capture Device. The specifications of the USB Still Image Capture Device are defined by "PIMA15740 Standard - Media Transfer Protocol (MTP)" and the camera is based on it.

For the operations related to the USB setting in the camera, refer to the accompanying document "Digital Camera D7000 PC Mode Specifications".

The camera conforms to the USB-related specifications below. For the details of each specification, refer to the related specifications manual.

Item	Contents
USB specifications	Revision2.0
Class	Image Interface
Subclass	Still Image Capture Device
Protocol	Bulk-Only Transport Protocol

1.2. PC Mode

When the camera is connected to the PC, the camera is switched to the PC connection mode.

1.3. Camera Operations in the PC Connection Mode

The operations of the camera in the PC connection mode differ from those of the camera alone in the following points.

- When the host mode is set (the camera is controlled by the PC), the operations by the dials and buttons of the camera body are prohibited (refer to subsection 1.4).
- The captured images are recorded either in the card or in the SDRAM (refer to subsection 1.6).
- The image playback cannot be performed. The image deletion by operating the camera body also cannot be performed.
- The Auto meter-off delay is set to "No limit".

1.4. Camera Mode and Host Mode

The PC connection mode has the camera mode and the host mode, and the camera is set to the camera mode when it is connected to the PC.

Switching between the camera mode and the host mode is performed by the command processing routine in the camera automatically for each command sent from the PC or by the ChangeCameraMode command defined as a vendor command.

If the mode is changed to the host mode automatically by the command processing routine, the mode is returned to the camera mode when the command processing is terminated. However, the specification by the ChangeCameraMode command has priority for changing the host mode to the camera mode. If a command for which changing the camera mode to the host mode is necessary is issued while the host mode is specified by the ChangeCameraMode command, the host mode is retained even when the command processing is terminated.

During switching to the host mode by the ChangeCameraMode command, the operation of each dial except the focus-mode selector is ignored and the value set by the host is valid. When switching to the camera mode, the values set by the host in the host mode are canceled and the values set by each dial are used. When switching to the host mode, the value set by the dial becomes the initial value for each dial.

For the limitations in the camera mode and the host mode, refer to the accompanying document "Digital Camera D7000 PC Mode Specifications".

1.5. Application Mode

The camera is switched to the application mode by the ApplicationMode property.
In the application mode, all the generated events must be passed to the PC in synchronization with the GetEvent command. (Refer to subsection 1.9 for sending the event.)

1.6. Recording Destination

The camera supports the following methods for the recording destinations of the image data when the images are acquired by using the shutter-release button of the camera or the release request command during the USB connection.

- Records in the card (default).
- Transfers to the PC (records in the SDRAM temporarily).
- Records in the card and transfers to the PC simultaneously.

The camera has the recording destination property (RecordingMedia property, subsection 5.5.6.2) that saves the recording destination for setting. The recording destination property can be set only by the command from the host. The menu in the camera cannot be used for setting it.
However, the setting value of the recording destination property is valid only when the image is captured by using the shutter-release button of the camera. When the image is captured by the command, the recording destination is not dependent on the recording destination property.
If the recording destination property setting is 'Records in the card' when the image is captured by using the shutter-release button of the camera, the captured image data is recorded in the card. When the recording destination property is set to 'Transfers directly to the PC', the captured image data is recorded in the SDRAM temporarily and then transferred directly to the PC. When the recording destination property is set to 'Records in the card and transfers to the PC simultaneously', both operations are performed. For the release operation by the command, when the release request is made by the InitiateCapture command or the vendor-defined InitiateCaptureRecInMedia command and the card recording is specified, the captured image data is recorded in the card. When the release request is made by the vendor-defined InitiateCaptureRecInSdram command, AfAndCaptureRecInSdram command, or InitiateCaptureRecInMedia command and the PC transfer is specified, the captured image data is recorded in the SDRAM temporarily and then transferred directly to the PC.
However, the host can set 'Transfers directly to the PC' or 'Records in the card and transfers to the PC' as the setting value of the recording destination property only when the host application has the function that can acquire the image data in the SDRAM (when the image data acquisition operation shown in subsection 1.10 can be performed). Therefore, the host application that does not have the function of acquiring the image data in the SDRAM must not change the setting of the recording destination property. In addition, when the host application that can set the recording destination property to 'Transfers directly to the PC' or 'Records in the card and transfers to the PC' is finished, the recording destination property must be set to 'Records in the card'.

1.7. Access to the Card

During the USB connection, the insertion/ejection, existence/nonexistence, capacity, and the type of the card are detected by the camera. For the access to the card, the file system of the camera is always used and that of the host is not used. Therefore the host can access the card only after the USB connection is performed and the initialization of the information in the card is completed. During the USB connection, even if the card does not exist and then it is inserted, the host cannot access the data in the card until the initialization of the card information is completed.

The file system conforms to the DCF. The DPOF specification is also supported. Therefore the host cannot access the card with the directory structure or the file structure that does not conform to the DCF or the DPOF specification.

The host can perform the reading operation for the data in the card. Writing to the card can be performed when the images are acquired by using the shutter-release button of the camera or the release operation by the command from the host while the PC is connected. The writing operation such as sending data from the PC and recording the data to the card or changing the data cannot be performed.

The camera supports the deletion and the formatting operations of the data in the card by the command from the host. However, when the release operation is performed and the new image data is recorded in the card, even if the deletion operation by the command is performed, the deletion operation cannot be accepted until all the image data saved in the buffer is recorded in the card. The deletion operation can be performed only while the recording operation to the card is not performed when the camera receives the deletion request command. Conversely, the release operation by the command or the button cannot be performed during the deletion operation. The same rules as those of the deletion operation apply to the formatting operation.

1.8. Access to the SDRAM

When accessing the image data recorded in the SDRAM, accessing can be performed only to the one image data that is ready to be taken in. Even if two or more image data are saved in the SDRAM, the image data cannot be accessed randomly. The data that can be accessed is always only the oldest image data in order of storage in the SDRAM. Therefore there is no means of accessing the image data in the SDRAM randomly (refer to subsection 7.2).

For the image data sent to the host completely, the information is not retained in the SDRAM but erased.

1.9. Sending the Event

When the status in the camera is changed, the camera sends an event by the Interrupt transfer to notify the host of the contents of the change. However, the host may not be able to get the event sent by the camera depending on the OS type of the PC (host). Therefore the camera provides two methods of getting the event. All the generated events should be acquired in order of generation by either of the two methods. The methods are shown below.

- Sending the event by the Interrupt transfer (based on the PTP specifications)
- Sending the event by the GetEvent command (vendor-defined)

The camera stores the event generated in the camera in order in the queue buffer and retains the queue buffer status until the event is acquired by the host. This queue buffer is provided for each of the two methods for getting the event.

It is necessary for the host application to use only one of the two methods of acquiring the event to perform the event processing. Therefore the camera need not manage the coordination of the two queue buffers.

However, the queue buffer that is not used for the event acquisition will become full sometime because the event is not acquired. When the queue buffer becomes full, the camera deletes the old event and stores the new event in the queue buffer.

In the application mode, all the generated events shall be passed to the PC in synchronization with the GetEvent command.

When the mode is switched from the normal camera mode to the application mode, the camera cancels all the asynchronous events that have been generated but not transferred yet.

If the mode is switched from the application mode to the normal camera mode, the camera retains the events generated in the application mode.

1.10. Shooting Operation and Image Data Acquisition in the PC Connection Mode

While the session is open in the PC connection mode, the camera performs the shooting operation by the command from the host or the shutter-release button of the camera. The captured images are stored in the card or the SDRAM by the command from the host or the setting value of the recording destination property (refer to subsection 1.6).

The host can acquire the saved image data by the GetObject or the GetPartialObject command.

1.10.1. Command Sequence (Recording in the Card)

The command sequence from the capture of the image data in the card to the acquisition of the recorded image data is shown below.

(1) When acquiring the event by the command, the host issues the GetEvent command regularly to acquire the event.
(2) The host issues the InitiateCapture command or the InitiateCaptureRecInMedia command to capture the image data. The camera performs the single shot operation or the continuous shot operation according to the shooting mode setting.
(3) When the captured image data is saved in the card, the camera issues the ObjectAdded event. The object handle indicating the saved image data is added to the ObjectAdded event.
(4) If the continuous shot operation is set, the camera repeats the procedure in (3) as many times as the number of shooting.
(5) The camera issues the CaptureComplete event when all the image data captured by the InitiateCapture command or the InitiateCaptureRecInMedia command are saved completely.
(6) The host acquires the image data information by issuing the GetObjectInfo command.
(7) The host acquires the thumbnail data by issuing the GetThumb and the GetLargeThumb commands, if necessary.
(8) The host acquires the image data by issuing the GetObject or GetPartialObject command.
(9) When two or more image data are saved by the continuous shot operation, the host repeats the procedures in (6) to (8) to acquire all the image data.

1.10.2. Command Sequence (Recording in the SDRAM)

The command sequence from the capture of the image data in the SDRAM to the acquisition of the recorded image data is shown below.

(1) When acquiring the event by the command, the host issues the GetEvent command regularly to acquire the event.
(2) The host issues the InitiateCaptureRecInSdram, the AfAndCaptureRecInSdram, or the InitiateCaptureRecInMedia command to capture the image data. The camera performs the single shot operation or the continuous shot operation according to the shooting mode setting.
(3) The host issues the DeviceReady command repeatedly while executing the operations in (4) and after.
(4) The host waits for the camera to issue the ObjectAddedInSdram event.
(5) The camera saves the captured image data in the SDRAM in order, and issues the ObjectAddedInSdram event in sequence when the sending of image data to the host becomes enabled.
(6) The host acquires the image data information by issuing the GetObjectInfo command.
(7) The host acquires the thumbnail data by issuing the GetThumb and the GetLargeThumb commands, if necessary.
(8) The host acquires the image data by issuing the GetObject or GetPartialObject command.
(9) The host repeats the procedures in (6) to (8) as many times as the number of received ObjectAddedInSdram events.
(10) When all the image data captured by the InitiateCaptureRecInSdram, the AfAndCaptureRecInSdram, or the InitiateCaptureRecInMedia command are sent completely, the camera sends the CaptureCompleteRecInSdram event.

1.10.3. Command Sequence (Recording by the Shutter-Release Button of the Camera)

The command sequence from the capture of the image data by the shutter-release button of the camera to the acquisition of the recorded image data is shown below.

(1) When acquiring the event by the command, the host issues the GetEvent command regularly to acquire the event.
(2) The shooting operation is performed by the shutter-release button of the camera. The camera performs the shooting operation (single shot operation, the continuous shot operation, or the interval-timer shooting) according to the shooting mode setting.
(3) The camera saves the images in the card or the SDRAM according to the setting of the recording destination property.
(4) When the images are saved in the card, the procedures in (5) to (10) should be performed. When the images are saved in the SDRAM, the procedures in (11) to (16) should be performed.
(5) When the captured image data is saved in the card, the camera issues the ObjectAdded event. The object handle indicating the saved image data is added to the ObjectAdded event.
(6) If the continuous shot operation is set, the camera repeats the procedure in (3) as many times

as the number of shooting.
(7) The camera issues the StorageInfoChanged event to notify the host that the capacity of the card is changed.
(8) The host acquires the image data information by issuing the GetObjectInfo command.
(9) The host acquires the thumbnail data by issuing the GetThumb and the GetLargeThumb commands, if necessary.
(10) The host acquires the image data by issuing the GetObject or GetPartialObject command.
(11) When two or more image data are saved by the continuous shot operation, the host repeats the procedures in (7) to (9) to acquire all the image data.
(12) The camera saves the captured image data in the SDRAM in order, and issues the ObjectAddedInSdram event in sequence when the sending of image data to the host becomes enabled.
(13) The host acquires the image data information by issuing the GetObjectInfo command.
(14) The host acquires the thumbnail data by issuing the GetThumb and the GetLargeThumb commands, if necessary.
(15) The host acquires the image data by issuing the GetObject or GetPartialObject command.
(16) The host repeats the procedures in (12) to (15) as many times as the number of received ObjectAddedInSdram events.

1.11. Live View and Image Data Acquisition in the PC Connection Mode

When the session is open in the PC connection mode, the camera starts the Live view by the request from the host.
During the Live view, the Live view images can be acquired by the GetLiveViewImage command.

1.11.1. Command Sequence

The command sequence from starting the Live view by the request from the host to the acquisition of the Live view image is shown below.

(1) The host issues the StartLiveView command to request the camera to start the Live view.
(2) After confirming the normal termination of the StartLiveView command, the host issues the DeviceReady command repeatedly until the DeviceReady command response other than Device_Busy appears.
(3) The camera returns the normal termination response to the DeviceReady command when the Live view image acquisition becomes enabled. If the Live view image acquisition is disabled for some reason, the camera returns an error response to the DeviceReady command to terminate the Live view.
(4) After confirming the normal termination of the DeviceReady command response, the host issues the GetLiveViewImage command to acquire the Live view image.
(5) The host issues the GetLiveViewImage command repeatedly while the Live view continues. At this time, the focal-plane contrast AF driving (AfDrive command), the MF driving (MfDrive command), the AF area change (ChangeAfArea command), etc. can be performed optionally.
(6) The host issues the InitiateCaptureRecInSdram command or the InitiateCaptureRecInMedia command when the shooting is performed and the Live view is finished. If the Live view is finished without shooting, the host issues the EndLiveView command.

1.11.2. Command Sequence (Movie Recording)

The sequence from recording the movie in the card by the MovieRec command to the acquisition of the movie file is shown below.

(1) The host issues MovieRecProhibitionCondition during Live view execution to confirm that movie recording can be performed.
(2) The host issues the StartMovieRecInCard command to start the movie recording.
(3) The camera stops the Live view or the host issues the EndMovieRec command to stop the movie recording.
(4) The camera writes the captured movie file in the card and issues the ObjectAdded event.
(5) The host acquires the ObjectAdded event by the GetEvent command to acquire the ObjectHandle of the movie file.
(6) The host acquires the file size of the movie file by the GetObjectInfo command.

(7) The host divides and acquires the movie file by the GetPartialObject command.
When the movie file is acquired by the GetObject command, the control from the host cannot be performed until the file transfer is finished because the file size of the movie file is large. Therefore, use the GetPartialObject command.

1.12. Redoing the Image Data Acquisition

When one of the following occurs during the reading sequence of the image data recorded in the SDRAM in subsections 1.10.2 and 1.10.3, the host can redo the image data acquisition by issuing the GetObjectInfo command.

- The USB connection is cut. (Such as the case that the USB cable is extracted.)
- The camera returns an error to the GetObject or the GetPartialObject command.
- It is desirable for the host to redo the acquisition of the SDRAM image.

When the image data that is not sent yet exists in the SDRAM, the camera must retain it even if the USB connection is cut.
If the shooting is performed with "RAW+JPEG", both of the image data should be sent again even if either of the image data has been sent normally.

1.13. Operation with the Empty Battery

When the battery level is in the operation-disabled condition (during the battery operation), the host is informed of the condition with the card not inserted even if it is inserted.

2. DEVICE REQUESTS

2.1. Standard Device Requests

Request		wIndex	
		Data stage	Status stage
Get Status	Device	The current device power status and the setting of REMOTE_WAKEUP function	Receive NULL data
	Endpoint: Endpoint number that is supported	The current ENDPOINT_STALL status	Receive NULL data
	Endpoint: Endpoint number that is not supported	STALL response	-
Clear Feature	Device: DEVICE_REMOTE_WAKEUP	-	Return NULL data
	Endpoint: END_POINT_HALT Endpoint number that is supported	-	Return NULL data
	Endpoint: END_POINT_HALT Endpoint number that is not supported	-	STALL response
Set Feature	Device: DEVICE_REMOTE_WAKEUP	-	Return NULL data
	Endpoint: END_POINT_HALT Endpoint number that is supported		Return NULL data
	Endpoint: END_POINT_HALT Endpoint number that is not supported		STALL response
Set Address		-	Return NULL data
Get Descriptor		The specified descriptor	Receive NULL data
Set Descriptor		STALL response	-
Get Configuration		The current configuration value	Return NULL data
Set Configuration	Configuration number that is supported	-	Return NULL data
	Configuration number that is not supported	-	STALL response
Set Interface	Interface number and alternate number that are supported	-	Return NULL data
	Interface number and alternate number that are not supported	-	STALL response
Get Interface	Interface number that is supported	The current alternate value	Return NULL data
	Interface number that is not supported	STALL response	-
Synch Frame		STALL response	-

2.2. Class-Specific Requests

The camera supports the class-specific requests below.

2.2.1. Cancel Request

This request is used for the host to cancel the data transfer.

bmRequestType	bRequest	wValue	wIndex	wLength
00100001b	01100100b	0000h	0000h	06h

The camera receives the Cancel request data according to the following format.

Offset	Field	Size	Value	Description
0	Cancellation Code	2	Code	0x4001
2	TransactionID	4	Number	TransactionID

The camera cancels the command processing that corresponds to the TransactionID.

2.2.2. DeviceResetRequest Request

This request is sent from the host to the camera in order to make the device become in the idle status when the Bulk Pipe is stalled.

bmRequestType	bRequest	wValue	wIndex	wLength
00100001b	01100110	0000h	0000h	0

2.2.3. GetDeviceStatus Request

This request is used for the host to acquire the device information for the recovery of the endpoint that is in the halt status.

bmRequestType	bRequest	wValue	wIndex	wLength
10100001b	01100110	0000h	0000h	0

The camera sends the GetDeviceStatus request data according to the following format.

Offset	Field	Size	Value	Description
0	WLength	2	Number	4
2	Code	2	Code	0x2001: Status OK 0x2019: DeviceBusy

3. DESCRIPTORS

3.1. Standard Descriptors

The camera has the following standard descriptors.

3.1.1. Device Descriptor

3.1.1.1. For HIGH-SPEED

Offset	Field	Size	Value	Description
0	bLength	1	12h	Size of the descriptor
1	bDescriptorType	1	01h	Type of the descriptor (Device descriptor)
2	bcdUSB	2	0200h	USB specification number (0200h=Revision2.00)
4	bDeviceClass	1	00h	Class (specified by the interface descriptor)
5	bDeviceSubClass	1	00h	Subclass (specified by the interface descriptor)
6	bDeviceProtocol	1	00h	Protocol (specified by the interface descriptor)
7	bMaxPacketSize0	1	40h	Maximum packet size of endpoint 0
8	idVendor	2	04B0h	Vendor ID (“NIKON”)
10	idProduct	2	0428h	Product ID
12	bcdDevice	2	0100h	Device release number (0100h=1.00)
14	iManufacture	1	01h	Index of the string descriptor describing the manufacturer name
15	iProduct	1	02h	Index of the string descriptor describing the product name
16	iSerialNumber	1	03h	Index of the string descriptor describing the serial number
17	bNumConfigurations	1	01h	The number of configurations

3.1.1.2. For FULL-SPEED

Offset	Field	Size	Value	Description
0	bLength	1	12h	Size of the descriptor
1	bDescriptorType	1	01h	Type of the descriptor (Device descriptor)
2	bcdUSB	2	0200h	USB specification number (0200h=Revision2.00)
4	bDeviceClass	1	00h	Class (specified by the interface descriptor)
5	bDeviceSubClass	1	00h	Subclass (specified by the interface descriptor)
6	bDeviceProtocol	1	00h	Protocol (specified by the interface descriptor)
7	bMaxPacketSize0	1	40h	Maximum packet size of endpoint 0
8	idVendor	2	04B0h	Vendor ID (“NIKON”)
10	idProduct	2	0428h	Product ID
12	bcdDevice	2	0100h	Device release number (0100h=1.00)
14	iManufacture	1	01h	Index of the string descriptor describing the manufacturer name
15	iProduct	1	02h	Index of the string descriptor describing the product name
16	iSerialNumber	1	03h	Index of the string descriptor describing the serial number
17	bNumConfigurations	1	01h	The number of configurations

3.1.2. Device_Qualifier Descriptor

Offset	Field	Size	Value	Description
0	bLength	1	0Ah	Size of the descriptor
1	bDescriptorType	1	06h	Type of the descriptor (Device_Qualifier descriptor)

2	bcdUSB	2	0200h	USB specification number (0200h=Revision2.00)
4	bDeviceClass	1	00h	Class (specified by the interface descriptor)
5	bDeviceSubClass	1	00h	Subclass (specified by the interface descriptor)
6	bDeviceProtocol	1	00h	Protocol (specified by the interface descriptor)
7	bMaxPacketSize0	1	40h	Maximum packet size of endpoint 0
8	bNumConfigurations	1	01h	The number of configurations other than USB2.0
10	bReserved	1	00h	Reserved

3.1.3. Configuration Descriptor

Offset	Field	Size	Value	Description
0	bLength	1	09h	Size of the descriptor
1	bDescriptorType	1	02h	Type of the descriptor (Configuration descriptor)
2	wTotalLength	2	0027h	The total length of the data returned for this configuration. All the descriptors are included (configuration, interface, endpoint, and class-specific).
4	bNumInterfaces	1	01h	The number of interfaces
5	bConfiguration Value	1	01h	The value used as an argument to Set Configuration Request for selecting this configuration
6	iConfiguration	1	00h	Index of the string descriptor
7	bmAttributes	1	C0h	Configuration characteristics Bit7: Reserved (1) Bit6: Self-powered Bit5: Remote Wakeup Bit4…0: Reserved (0)
8	MaxPower	1	01h	Maximum power consumption supplied from the bus to the USB device (2 mA)

3.1.4. Other_Speed_Configuration Descriptor

Offset	Field	Size	Value	Description
0	bLength	1	09h	Size of the descriptor
1	bDescriptorType	1	07h	Type of the descriptor (OtherSpeedConfiguration descriptor)
2	wTotalLength	2	0027h	The total length of the data returned for this configuration. All the descriptors are included (configuration, interface, endpoint, and class-specific).
4	bNumInterfaces	1	01h	The number of interfaces
5	bConfiguration Value	1	01h	The value used as an argument to Set Configuration Request for selecting this configuration
6	iConfiguration	1	00h	Index of the string descriptor
7	bmAttributes	1	C0h	Configuration characteristics Bit7: Reserved (1) Bit6: Self-powered Bit5: Remote Wakeup Bit4…0: Reserved (0)
8	MaxPower	1	01h	Maximum power consumption supplied from the bus to the USB device (2 mA)

3.1.5. Interface Descriptor

Offset	Field	Size	Value	Description
0	bLength	1	09h	Size of the descriptor
1	bDescriptorType	1	04h	Type of the descriptor (Interface descriptor)
2	bInterfaceNumber	1	00h	Interface number (0 is the standard.)
3	bAlternatingSetting	1	00h	The value used for selecting the interface
4	bNumEndpoints	1	03h	The number of endpoints

5	bInterfaceClass	1	06h	Class code (06=ImageInterface)
6	bInterfaceSubClass	1	01h	Subclass code (01=Still Image Capture Device)
7	bInterfaceProtocol	1	01h	Protocol (01h=Bulk-Only Transport)
8	iInterface	1	00h	Index of the string descriptor describing this interface

3.1.6. Endpoint Descriptor

3.1.6.1. Bulk-Out Endpoint

3.1.6.1.1. For HIGH-SPEED

Offset	Field	Size	Value	Description
0	bLength	1	07h	Size of the descriptor
1	bDescriptorType	1	05h	Type of the descriptor (Endpoint descriptor)
2	bEndpointAddress	1	02h	Address of the endpoint Bit7: Transfer direction (0=OUT, 1=IN) Bit6…4: Reserved (0) Bit3…0: Endpoint number
3	bmAttributes	1	02h	Attributes of the endpoint Bit1…0: Transfer type (00 = Control, 01 = Isochronous, 10 = Bulk, 11 = Interrupt)
4	wMaxPacketSize	2	0200h	Maximum packet size of this endpoint (0200h=512Byte)
6	bInterval	1	00h	Polling interval (invalid for the Bulk and the Control endpoints)

3.1.6.1.2. For FULL-SPEED

Offset	Field	Size	Value	Description
0	bLength	1	07h	Size of the descriptor
1	bDescriptorType	1	05h	Type of the descriptor (Endpoint descriptor)
2	bEndpointAddress	1	02h	Address of the endpoint Bit7: Transfer direction (0=OUT, 1=IN) Bit6…4: Reserved (0) Bit3…0: Endpoint number
3	bmAttributes	1	02h	Attributes of the endpoint Bit1…0: Transfer type (00 = Control, 01 = Isochronous, 10 = Bulk, 11 = Interrupt)
4	wMaxPacketSize	2	0040h	Maximum packet size of this endpoint (0040h=64Byte)
6	bInterval	1	00h	Polling interval (invalid for the Bulk and the Control endpoints)

3.1.6.2. Bulk-In Endpoint

3.1.6.2.1. For HIGH-SPEED

Offset	Field	Size	Value	Description
0	bLength	1	07h	Size of the descriptor
1	bDescriptorType	1	05h	Type of the descriptor (Endpoint descriptor)
2	bEndpointAddress	1	81h	Address of the endpoint Bit7: Transfer direction (0=OUT, 1=IN) Bit6…4: Reserved (0) Bit3…0: Endpoint number
3	bmAttributes	1	02h	Attributes of the endpoint Bit1…0: Transfer type (00 = Control, 01 = Isochronous, 10 = Bulk, 11 = Interrupt)

4	wMaxPacketSize	2	0200h	Maximum packet size of this endpoint (0200h=512Byte)
6	bInterval	1	00h	Polling interval (invalid for the Bulk and the Control endpoints)

3.1.6.2.2. For FULL-SPEED

Offset	Field	Size	Value	Description
0	bLength	1	07h	Size of the descriptor
1	bDescriptorType	1	05h	Type of the descriptor (Endpoint descriptor)
2	bEndpointAddress	1	81h	Address of the endpoint Bit7: Transfer direction (0=OUT, 1=IN) Bit6…4: Reserved (0) Bit3…0: Endpoint number
3	bmAttributes	1	02h	Attributes of the endpoint Bit1…0: Transfer type (00 = Control, 01 = Isochronous, 10 = Bulk, 11 = Interrupt)
4	wMaxPacketSize	2	0040h	Maximum packet size of this endpoint (0040h=64Byte)
6	bInterval	1	00h	Polling interval (invalid for the Bulk and the Control endpoints)

3.1.6.3. Interrupt Endpoint

3.1.6.3.1. For HIGH-SPEED

Offset	Field	Size	Value	Description
0	bLength	1	07h	Size of the descriptor
1	bDescriptorType	1	05h	Type of the descriptor (Endpoint descriptor)
2	bEndpointAddress	1	83h	Address of the endpoint Bit7: Transfer direction (0=OUT, 1=IN) Bit6…4: Reserved (0) Bit3…0: Endpoint number
3	bmAttributes	1	03h	Attributes of the endpoint Bit1…0: Transfer type (00 = Control, 01 = Isochronous, 10 = Bulk, 11 = Interrupt)
4	wMaxPacketSize	2	0008h	Maximum packet size of this endpoint (0008h=8Byte)
6	bInterval	1	09h	Polling interval

3.1.6.3.2. For FULL-SPEED

Offset	Field	Size	Value	Description
0	bLength	1	07h	Size of the descriptor
1	bDescriptorType	1	05h	Type of the descriptor (Endpoint descriptor)
2	bEndpointAddress	1	83h	Address of the endpoint Bit7: Transfer direction (0=OUT, 1=IN) Bit6…4: Reserved (0) Bit3…0: Endpoint number
3	bmAttributes	1	03h	Attributes of the endpoint Bit1…0: Transfer type (00 = Control, 01 = Isochronous, 10 = Bulk, 11 = Interrupt)
4	wMaxPacketSize	2	0008h	Maximum packet size of this endpoint (0008h=8Byte)
6	bInterval	1	0Ah	Polling interval (0Ah = 10ms)

3.1.7. String Descriptor

3.1.7.1. Index1 (iManufacture)

Offset	Field	Size	Value	Description
0	bLength	1	0Ch	Size of the descriptor
1	bDescriptorType	1	03h	Type of the descriptor (String descriptor)
2	bString	10	4E00h 4900h 4B00h 4F00h 4E00h	Unicode character string “NIKON”

3.1.7.2. Index2 (iProduct)

Offset	Field	Size	Value	Description
0	bLength	1	20h	Size of the descriptor
1	bDescriptorType	1	03h	Type of the descriptor (String descriptor)
2	bString	30	4E00h 4900h 4B00h 4F00h 4E00h 2000h 4400h 5300h 4300h 2000h 4400h 3700h 3000h 3000h 3000h	Unicode character string “NIKON DSC D7000”

3.1.7.3. Index3 (iSerialNumber)

Offset	Field	Size	Value	Description
0	bLength	1	1Ah	Size of the descriptor
1	bDescriptorType	1	03h	Type of the descriptor (String descriptor)
2	bString	24	XX00h XX00h XX00h XX00h XX00h XX00h XX00h XX00h XX00h XX00h XX00h XX00h	Unicode character string “XXXXXXXXXXXX”

3.2. Class-Specific Descriptor

The camera has no class-specific descriptor.

4. PROTOCOL

The camera supports the Bulk-Only Transport protocol. In the Bulk-Only protocol, all transmission/reception of the command, data, and response are performed by the bulk transfer. When an asynchronous event is generated in the camera, the information is sent by the Interrupt transfer.

The protocol processing is composed of three phases (command phase, data phase, and response phase). All the commands, data, and responses are stored in the Generic Container Structure and transferred between the host and the camera. The processing starts by sending the command (Bulk-Out transfer) from the host to the camera first (command phase). Then the data is transmitted or received by the bulk transfer if the command needs the data transfer (data phase). The processing is completed when the device transmits the command response to the host (Bulk-In transfer) last (response phase). The command and the response phases are always present.

When sending the event to the host, the contents of the event to be sent are stored according to the asynchronous event interrupt data format and sent as the asynchronous event (Interrupt transfer).

4.1. Generic Container Structure

Each field data of the Generic Container Structure is transferred in order of the LSB first (little endian). The Container Type and the contents of the Payload differ according to the phase difference.

Offset	Size	Field	Description
0	4	Container Length	The number of bytes in the unsigned integer of the container. The device decides the container size by using this field.
4	2	Container Type	This field describes the container type. (Not defined, Command block, Data block, Response block, and Event block)
6	2	Code	This field conforms to PIMA15740. (OperationCode, ResponseCode, or EventCode) For the data block, the OperationCode of the command block is used.
8	4	TransactionID	This is the number of the 32-bit unsigned integer created by the host related to all the phases. It starts with 0x00000001 and is incremented along with the command block issue. When the OperationCode is OpenSession, 0x00000000 is set and 0x00000001 is given by the next command block. When the number reaches the maximum value (0xFFFFFFFE), the next TransactionID becomes 0x00000001.
12	??	Payload	Differs depending on the phase.

4.2. Asynchronous Event Interrupt Data Format

When an event is generated in the camera, the information is transferred to the host according to the following format. Each field data is transferred in order of the LSB first (little endian).

Offset	Size	Field	Description
0	4	Interrupt Data Length	The number of bytes in the unsigned integer of the length of this container is coded. The value is 0x00000010.
4	2	Container Type	Container Type = 0x0004 (Event)
6	2	Event Code	EventCode
8	4	TransactionID	TransactionID = 0xFFFFFFFF
12	4	Event Parameter1	Differs depending on the event. (Refer to subsection 5.4.)

4.3. Phases

The communication between the camera and the host is composed of the three phases; command phase, data phase, and response phase.

4.3.1. Command Phase

In the command phase, the host sends the Generic Container Structure of the command block to the camera. The processing is started by sending the command block from the host in the command phase. The camera performs the processing according to the OperationCode sent in the command block. For the OperationCode and its processing, refer to subsection 5.2. The Generic Container Structure field data set in the command phase is shown below.

Offset	Size	Field	Description
0	4	Container Length	Indicates the length of this container. Each code has its own container length.
4	2	Container Type	Container Type = 1 (Command block)
6	2	Code	OperationCode
8	4	TransactionID	This is the number given by the 32-bit unsigned integer created by the host related to all the phases. It starts with 0x00000001 and is incremented by 1 along with the command block issue. When the OperationCode is OpenSession, 0x00000000 is set and 0x00000001 is given by the next command block. When the number reaches the maximum value of the field (0xFFFFFFFE), the next TransactionID becomes 0x00000001.
12	4	Parameter 1	This field includes the operation parameter. The format and the meaning of the parameter differ depending on the OperationCode.
16	4	Parameter2	This field includes the operation parameter. The format and the meaning of the parameter differ depending on the OperationCode.
20	4	Parameter 3	This field includes the operation parameter. The format and the meaning of the parameter differ depending on the OperationCode.

4.3.2. Data Phase

The data phase is an optional phase used to transfer the data that is larger than what can fit in the data sets of the command or the response block. According to the OperationCode specified by the command block, the data is transferred from the host to the camera, from the camera to the host, or not transferred at all. For the OperationCode and the corresponding data contents, refer to subsection 5.2. The Generic Container Structure field data set in the data phase is shown below.

Offset	Size	Field	Description
0	4	Container Length	Indicates the length of this container. The container length differs depending on the size of the Payload.
4	2	Container Type	Container Type = 2 (Data block)
6	2	Code	The corresponding OperationCode sent in the command phase is set.
8	4	TransactionID	This is the number given by the 32-bit unsigned integer created by the host related to all the phases. It starts with 0x00000001 and is incremented by 1 along with the command block issue. When the OperationCode is OpenSession, 0x00000000 is set and 0x00000001 is given by the next command block. When the number reaches the maximum value of the field (0xFFFFFFFE), the next TransactionID becomes 0x00000001.
12	??	Payload	The contents of this field differ depending on the OperationCode.

4.3.3. Response Phase

In the response phase, the Generic Container Structure of the response block is sent from the camera to the host in order to indicate whether the command sent in the command phase succeeds or fails.

The contents of the response can be identified by the ResponseCode stored in the Code field. For the ResponseCode, refer to subsection 5.3.

The Generic Container Structure field data set in the response phase is shown below.

Offset	Size	Field	Description
0	4	Container Length	Indicates the length of this container. Each code has its own container length.
4	2	Container Type	Container Type = 3 (Response block)
6	2	Code	The ResponseCode is set in order to indicate whether the

			processing corresponding to the OperationCode sent in the command phase succeeds or fails.
8	4	TransactionID	This is the number given by the 32-bit unsigned integer created by the host related to all the phases. It starts with 0x00000001 and is incremented by 1 along with the command block issue. When the OperationCode is OpenSession, 0x00000000 is set and 0x00000001 is given by the next command block. When the number reaches the maximum value of the field (0xFFFFFFFE), the next TransactionID becomes 0x00000001.
12	4	Response Parameter	This field includes the response parameter. The format and the meaning of the parameter differ depending on the OperationCode and the ResponseCode.

4.4. Error Handling

4.4.1. Reset Occurrence

If the following state is detected, the camera returns to the command phase status.

- Bus reset
- Reset recovery

4.4.2. Command Block Reception Failure

When the command block reception fails and the reset recovery and the bus reset are not detected, the camera stalls the Bulk-In and the Bulk-Out endpoints and returns to the command phase status.

4.4.3. Command Block Invalidity

When the following error is detected after the command block reception succeeds and the reset recovery and the bus reset are not detected, the camera stalls the Bulk-In and the Bulk-Out endpoints.

- Container Type of Generic Container Structure is other than the command block.

4.4.4. Command Execution Error

When the command execution error is detected after a valid command block is received, the phase is changed to the response phase and the response code corresponding to the error is set in the Code field of the Generic Container Structure and sent. Stalling is not performed.

5. CODES

The codes supported by the camera are described.

5.1. ObjectFormatCode

The ObjectFormatCode indicates the format of the objects in the card inserted in the camera (image file, script file, and DPOF file) and the related objects (corresponding to the directories and the virtual association representing the relation between the images that conform to the DCF standards and the DCF objects in the camera). The following table represents the ObjectFormatCodes supported by the camera.

ObjectFormatCode	Format	Description
0x3000	Undefined	NDF (dust reference image) NEF (when MTP is not supported) (In the definition of the PIMA15740, it is defined as "Format not defined".)
0x3001	Association	Association (Indicates the directories or the virtual association representing the relation between the images that conform to the DCF standards and the DCF objects.)
0x3002	Script	Script (only the virtual script file is the target)
0x3006	DPOF	Digital Print Order Format File
0x3800	Unknown Image Object	NEF (when MTP is supported)
0x3801	EXIF/JPEG	JEIDA Standard
0x3808	JFIF	JPEG File Interchange Format (represents the thumbnail format.)
0x300D	MOV	Apple QuickTime Video Format (H.264/AVC)

The ObjectFormatCode may be used as one of the parameters in the command phase.
It is also used in the ObjectInfo data set.

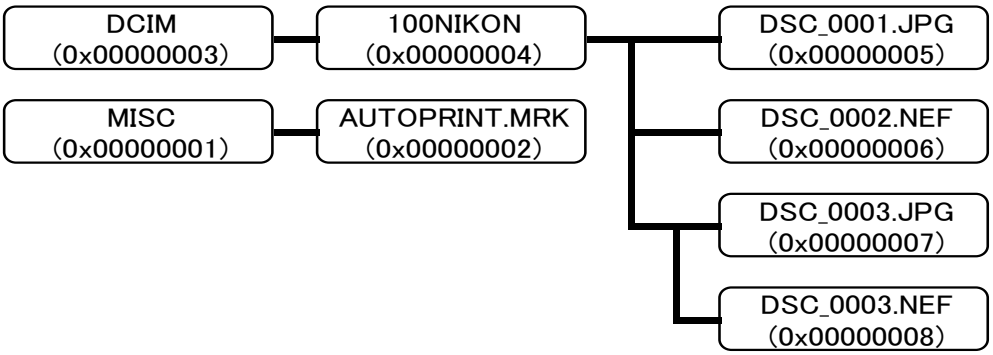
5.1.1. Association Types

There are various Types in the Association defined by ObjectFormatCode. Association is for representing the folders and the file system. All the objects that belong to the Association correspond to the branches of the tree structure under the Association. The associations to which the objects belong are specified in the ParentObject field of the ObjectInfo data set (refer to subsection 8.3) for each object. Type is specified in the AssociationType field of the ObjectInfo data set for the associations object. The Association Type used in the camera is shown below.

Association Code	Association Type	Description
0x0001	GenericFolder	Indicates the general directory. For the camera, it indicates the DCF image directory, DCF directory, and the MISC folder defined in the DPOF specifications.

An example of how the Association is used in the DCF file system for the camera is shown below.
Note, however, that the directory name, the file name, and the ObjectHandle value may differ from the ObjectHandle that is actually used in the camera to simplify the explanation.

ObjectHandle	Description	ObjectFormatCode	ParentObject
0x00000001	¥MISC folder	0x3001	0x00000000
0x00000002	¥MISC¥AUTOPRINT.MRK	0x3006	0x00000001
0x00000003	¥DCIM folder	0x3001	0x00000000
0x00000004	¥DCIM¥100NIKON	0x3001	0x00000003
0x00000005	¥DCIM¥100NIKON¥DSC_0001.JPG	0x3801	0x00000004
0x00000006	¥DCIM¥100NIKON¥DSC_0002.NEF	0x3000	0x00000004
0x00000007	¥DCIM¥100NIKON¥DSC_0003.JPG	0x3801	0x00000004
0x00000008	¥DCIM¥100NIKON¥DSC_0003.NEF	0x3000	0x00000004


DCIM
(0x00000003)
100NIKON
(0x00000004)
DSC_0001.JPG
(0x00000005)
MISC
(0x00000001)
AUTOPRINT.MRK
(0x00000002)
DSC_0002.NEF
(0x00000006)
DSC_0003.JPG
(0x00000007)
DSC_0003.NEF
(0x00000008)

5.2. Operation Codes

The OperationCode is the command that is used by the host to request the operation of the camera in the command phase. The OperationCode is sent as a part of the command block data set.
The OperationCode has two bytes.

The OperationCodes supported by the camera are shown below.

OperationCode	Operation Name	Reference item
0x1001	GetDeviceInfo	5.2.1
0x1002	OpenSession	5.2.2
0x1003	CloseSession	5.2.3
0x1004	GetStorageIDs	5.2.4
0x1005	GetStorageInfo	5.2.5
0x1006	GetNumObjects	5.2.6
0x1007	GetObjectHandles	5.2.7
0x1008	GetObjectInfo	5.2.8
0x1009	GetObject	5.2.9
0x100A	GetThumb	5.2.10
0x100B	DeleteObject	5.2.11
0x100C	SendObjectInfo	5.2.12
0x100D	SendObject	5.2.13
0x100E	InitiateCapture	5.2.14
0x100F	FormatStore	5.2.15
0x1014	GetDevicePropDesc	5.2.16
0x1015	GetDevicePropValue	5.2.17
0x1016	SetDevicePropValue	5.2.18
0x101B	GetPartialObject	5.2.19
0x90C0	InitiateCaptureRecInSdram	5.2.20
0x90C1	AfDrive	5.2.21
0x90C2	ChangeCameraMode	5.2.22
0x90C3	DeleteImagesInSdram	5.2.23
0x90C4	GetLargeThumb	5.2.24
0x90C7	GetEvent	5.2.25
0x90C8	DeviceReady	5.2.26
0x90C9	SetPreWbData	5.2.27
0x90CA	GetVendorPropCodes	5.2.28
0x90CB	AfAndCaptureRecInSdram	5.2.29
0x90CC	GetPicCtrlData	5.2.30
0x90CD	SetPicCtrlData	5.2.31
0x90CE	DeleteCustomPicCtrl	5.2.32
0x90CF	GetPicCtrlCapability	5.2.33
0x9201	StartLiveView	5.2.34
0x9202	EndLiveView	5.2.35
0x9203	GetLiveViewImage	5.2.36
0x9204	MfDrive	5.2.37
0x9205	ChangeAfArea	5.2.38
0x9206	AfDriveCancel	5.2.39
0x9207	InitiateCaptureRecInMedia	5.2.40
0x9209	GetVendorStorageIDs	5.2.43
0x920A	StartMovieRecInCard	5.2.41
0x920B	EndMovieRec	5.2.42
0x9801	GetObjectPropsSupported	5.2.44
0x9802	GetObjectPropDesc	5.2.45
0x9803	GetObjectPropValue	5.2.46
0x9805	GetObjectPropList	5.2.47

5.2.1. GetDeviceInfo

The operation by this OperationCode returns the information of the camera (DeviceInfo data set).
The DeviceInfo data set includes information such as the camera version information and the codes supported by the camera.

- OperationCode: 0x1001
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: DeviceInfo data set
- Data direction: From camera to host
- ResponseCode: OK, Parameter_Not_Supported, Incomplete_Transfer
- Response Parameter: None

This operation is the only operation that may be issued inside or outside of a session.
The contents of the DeviceInfo data set sent by the camera are shown in subsection 8.1.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.
Incomplete_Transfer	The data block transmission fails.

5.2.2. OpenSession

The operation by this OperationCode starts the logical connection (session) between the camera and the host.
The SessionID is specified optionally by the host and retained during the session.

- OperationCode: 0x1002
- Parameter1: SessionID
- Parameter2: None
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Parameter_Not_Supported, Invalid_Parameter, Session_Already_Open
- Response Parameter: None

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are specified.
Invalid_Parameter	Parameter1 is 0x00000000.
Session_Already_Open	The session between the camera and the host has been already started.

5.2.3. CloseSession

The operation by this OperationCode closes the logical connection (session) between the camera and the host.

- OperationCode: 0x1003
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: None

- Data direction: -
- ResponseCode: OK, Session_Not_Open, Parameter_Not_Supported
- Response Parameter: None

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.

5.2.4. GetStorageIDs

The operation by this OperationCode returns a list of the currently valid StorageIDs.
The camera returns two StorageIDs to get two valid logical storage devices.
During the application mode, 0x00010000 or 0x00020000 is set in each slot. Use the GetVendorStorageIDs command (subsection 5.2.43) to acquire the StorageID during the application mode.

- OperationCode: 0x1004
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: StorageIDArray
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer
- Response Parameter: None

The camera returns the StorageIDs of the main slot and the subslot.

The StorageID of the main slot takes the following values.
- 0x00010001: When the card is inserted in the main slot
- 0x00010000: When the card is not inserted in the main slot
  When the card in the main slot is being formatted
  When the battery level of the camera is “Operation disabled status”.

The StorageID of the subslot takes the following values.
- 0x00020001: When the card is inserted in the subslot
- 0x00020000: When the card is not inserted in the subslot
  When the card in the subslot is being formatted
  When the battery level of the camera is “Operation disabled status”.

The format of the StorageIDArray that is sent by the camera is shown below.
Each field data is stored in the little endian format.

Field	Size (Byte)	Data
NumElement	4	0x00000002 (Two elements for the array)
ArrayEntry1	4	StorageID (main slot)
ArrayEntry2	4	StorageID (subslot)

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.
Incomplete_Transfer	The data block transmission fails.

5.2.5. GetStorageInfo

The operation by this OperationCode obtains the information of the card inserted in the camera.

- OperationCode: 0x1005
- Parameter1: StorageID
- Parameter2: None
- Parameter3: None
- Data: StorageInfo
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Invalid_StorageID, Store_Not_Available
- Response Parameter: None

The camera returns the StorageInfo data set of the card specified by the StorageID.
The StorageIDs supported by the camera are shown in subsection 5.2.4.
The StorageInfo data set sent by the camera is described in subsection 8.2.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are specified.
Incomplete_Transfer	The data block transmission fails.
Invalid_StorageID	The StorageID sent by the camera differs from the StorageID specified by the host.
Store_Not_Available	The card is being initialized, the card does not exist, or the battery level is “Operation disabled status”.

5.2.6. GetNumObjects

The operation by this OperationCode obtains the number of objects that are present in the card. The number of objects recorded in the SDRAM is not included.

- OperationCode: 0x1006
- Parameter1: StorageID
- Parameter2: [ObjectFormatCode]
- Parameter3: [ObjectHandle of the directory]
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Invalid_StorageID, Invalid_Object_Handle, Store_Not_Available, Specification_By_Format_Unsupported, Invalid_Parent_Object
- Response Parameter: NumObjects

If the camera receives this command in the camera mode, the camera changes the setting to the host mode, and returns to the camera mode when the command processing is terminated. If the new object is being recorded in the card when this command is received, the processing starts after the acquisition of all the data is completed.
The camera returns the number of objects in the card specified by the StorageID. However, when 0xFFFFFFFF is specified, the camera returns the number of objects in all the cards. The ObjectFormatCode and the directory can be designated by specifying the optional Parameter2 and Parameter3.
The StorageIDs supported by the camera are shown in subsection 5.2.4.
When 0 or no value is set in Parameter2 and Parameter3, which are optional, the camera returns

the total number of objects in the card specified by the StorageID.
When the ObjectFormatCode of Parameter2, which is optional, is specified, the camera returns the number of objects of the designated format in the card specified by the StorageID. However, when 0xFFFFFFFF is specified, the camera returns the number of objects of all image formats in the card specified by the StorageID.
When the ObjectHandle in the directory of Parameter3, which is optional, is specified, the camera returns the number of objects directly under the specified directory. However, when 0xFFFFFFFF is specified, the camera returns the number of objects directly under the root.
In addition, Parameter2 and Parameter3, which are optional, can be combined.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	None of Parameter1, Parameter2, and Parameter3 is specified.
Invalid_StorageID	The StorageID sent by the camera differs from the StorageID specified by the host.
Invalid_Object_Handle	For an invalid object handle
Store_Not_Available	The card is being initialized, the card does not exist, or the battery level is “Operation disabled status”.
Specification_By_Format_Unsupported	The specified ObjectFormatCode is not supported.
Invalid_Parent_Object	An ObjectHandle other than that indicating the directory in the card was specified for ObjectHandle (Parameter3) of the specified directory, or the specified directory does not exist.

5.2.7. GetObjectHandles

The operation by this OperationCode obtains the handle of the object in the card. The ObjectHandle of the object recorded in the SDRAM is not included.

- OperationCode: 0x1007
- Parameter1: StorageID
- Parameter2: [ObjectFormatCode]
- Parameter3: [ObjectHandle of the directory]
- Data: ObjectHandleArray
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Invalid_StorageID, Invalid_Object_Handle, Store_Not_Available, Specification_By_Format_Unsupported, Invalid_Parent_Object
- Response Parameter: None

If the camera receives this command in the camera mode, the camera changes the setting to the host mode, and returns to the camera mode when the command processing is terminated. If the new object is being recorded in the card when this command is received, the processing starts after the acquisition of all the data is completed.
The camera returns the ObjectHandle in the card specified by the StorageID. However, when 0xFFFFFFFF is specified, the camera returns the ObjectHandles of all the cards. The ObjectFormatCode and the directory can be designated by specifying the optional Parameter2 and Parameter3.
The StorageIDs supported by the camera are shown in subsection 5.2.4.
When 0 or no value is set in Parameter2 and Parameter3, which are optional, the camera returns all the ObjectHandles in the card specified by the StorageID.
When the ObjectFormatCode of Parameter2, which is optional, is specified, the camera returns the ObjectHandle of the designated format in the card specified by the StorageID. However, when

0xFFFFFFFF is specified, the camera returns the ObjectHandles of all image formats in the card specified by the StorageID.

When the ObjectHandle in the directory of Parameter3, which is optional, is specified, the camera returns the ObjectHandle of the object directly under the specified directory. However, when 0xFFFFFFFF is specified, the camera returns the ObjectHandle of the object directly under the root.

In addition, Parameter2 and Parameter3, which are optional, can be combined.

The format of the ObjectHandleArray that is sent by the camera is shown below.
Each field data is stored in the little endian format.

Field	Size (Byte)	Data
NumElement	4	The element of the array is N (N indicates the number of objects).
ArrayEntry [0]	4	ObjectHandle [0]
ArrayEntry [1]	4	ObjectHandle [1]
ArrayEntry [2]	4	ObjectHandle [2]

ArrayEntry [N-1]	4	ObjectHandle [N-1]

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	None of Parameter1, Parameter2, and Parameter3 is specified.
Incomplete_Transfer	The data block transmission fails.
Invalid_StorageID	The StorageID sent by the camera differs from the StorageID specified by the host.
Invalid_Object_Handle	For an invalid object handle
Store_Not_Available	The card is being initialized, the card does not exist, or the battery level is “Operation disabled status”.
Specification_By_Format_Unsupported	The specified ObjectFormatCode is not supported.
Invalid_Parent_Object	An ObjectHandle other than that indicating the directory in the card was specified for ObjectHandle (Parameter3) of the specified directory, or the specified directory does not exist.

5.2.8. GetObjectInfo

The operation by this OperationCode obtains the information of the specified object (ObjectInfo). When a new object is added to the card and the host is informed of the addition of the object by the event, the host acquires the information of the object by this command.

- OperationCode: 0x1008
- Parameter1: ObjectHandle
- Parameter2: None
- Parameter3: None
- Data: ObjectInfo
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Invalid_Object_Handle, Store_Not_Available
- Response Parameter: None

The camera sends the information of the object corresponding to the ObjectHandle specified in Parameter1.

If the specified ObjectHandle is the data in the card, the camera returns the information of the object corresponding to the ObjectHandle.

The ObjectHandle passed by ObjectAddedInSdram should be specified in order to acquire the information of the object in the SDRAM. For the ObjectHandle passed by ObjectAddedInSdram, the

image data information is sent to the host.
The ObjectInfo data set sent in the data phase differs depending on the directory and the file types.
The ObjectInfo data set of each object is shown in subsection 8.3.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are specified.
Incomplete_Transfer	The data block transmission fails.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist, or an object in the SDRAM other than the ObjectHandle passed by ObjectAddedInSdram is specified.
Store_Not_Available	The card is being initialized, the card does not exist, or the battery level is “Operation disabled status”.

5.2.9. GetObject

The operation by this OperationCode obtains the specified object (DataObject).

- OperationCode: 0x1009
- Parameter1: ObjectHandle
- Parameter2: None
- Parameter3: None
- Data: DataObject
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Invalid_Object_Handle, Store_Not_Available
- Response Parameter: None

The camera sends all the file data (DataObject) corresponding to the specified ObjectHandle to the host.
If the specified ObjectHandle is the data in the card, the camera returns the object corresponding to the ObjectHandle.
The ObjectHandle passed by ObjectAddedInSdram should be specified in order to acquire information of the object in the SDRAM. For the ObjectHandle passed by ObjectAddedInSdram, the image data is sent to the host.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are specified.
Incomplete_Transfer	The data block transmission fails.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist, or an object in the SDRAM other than the ObjectHandle passed by ObjectAddedInSdram is specified.
Store_Not_Available	The card is being initialized, the card does not exist, or the battery level is “Operation disabled status”.

5.2.10. GetThumb

The operation by this OperationCode obtains the thumbnail data of the specified image/movie object (ThumbnailObject).

- OperationCode: 0x100A
- Parameter1: ObjectHandle
- Parameter2: None
- Parameter3: None
- Data: ThumbnailObject
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Invalid_Object_Handle, No_Thumbnail_Present, Store_Not_Available
- Response Parameter: None

The camera sends the thumbnail data (ThumbnailObject) corresponding to the specified ObjectHandle to the host.
If the specified ObjectHandle is the data in the card, the camera returns the thumbnail data corresponding to the ObjectHandle.
The ObjectHandle passed by ObjectAddedInSdram should be specified in order to acquire the information of the object in the SDRAM. For the ObjectHandle passed by ObjectAddedInSdram, the thumbnail data of the image or the movie data is sent to the host.

ThumbnailObject is the thumbnail data of the object (file) specified in ObjectHandle. The size of the ThumbnailObject is 160 x 120 of the small thumbnail size. When the main image is in the JPEG format, the small thumbnail in the JPEG format is sent as it is. When the main image is in the RAW or the TIFF format, the small thumbnail image recorded in the TIFF-RGB format is encoded to the JPEG format by the camera and then sent to the host. However, when the thumbnail data is acquired from RAW in the SDRAM, the small thumbnail image recorded in the TIFF-RGB format is sent to the host as it is. For the format of the RAW small thumbnail image, refer to the accompanying document “RAW Data Format for Digital Camera”.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are specified.
Incomplete_Transfer	The data block transmission fails.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist, an object in the MISC folder is specified, an object in the WAV format is specified, or an object in the SDRAM other than the ObjectHandle passed by ObjectAddedInSdram is specified.
No_Thumbnail_Present	The object corresponding to the specified ObjectHandle does not have a thumbnail.
Store_Not_Available	The card is being initialized, the card does not exist, or the battery level is “Operation disabled status”.

5.2.11. DeleteObject

The operation by this OperationCode deletes a specific object saved in the card or all the objects saved in the card.
The protected objects are not deleted.

- OperationCode: 0x100B
- Parameter1: ObjectHandle
- Parameter2: [ObjectFormatCode]
- Parameter3: None
- Data: None
- Data direction: -

- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Invalid_Object_Handle, Object_Write_Protect, Partial_Deletion, Store_Not_Available, Specification_By_Format_Unsupported, Device_Busy, Invalid_Parameter
- Response Parameter: None

If the camera receives this command in the camera mode, the camera changes the setting to the host mode, and returns to the camera mode when the command processing is terminated.

When the specified ObjectHandle is 0xFFFFFFFF, all the objects in the card are deleted. However, the protected objects are not deleted. When the ObjectHandle is set to 0xFFFFFFFF and the ObjectFormatCode of Parameter2, which is optional, is specified, all the objects corresponding to the specified format only are deleted.

The release is prohibited until the image deletion is completed.

If a file of the image format that is not supported exists, the images in a support format that is not protected are deleted.

Deleting the objects in the card is prohibited in the following cases.

- The RecordingMedia property (subsection 5.5.6.2) is [Card and SDRAM].
- Shooting is performed with [Card and SDRAM] specified in the InitiateCaptureRecInMedia command (subsection 5.2.40) and all the images recorded in the SDRAM are not acquired.
- The movie is being recorded.
- The card including the specified image is protected.
- All the inserted cards are protected.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter3 is specified.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist.
Object_Write_Protect	The object corresponding to the specified ObjectHandle is protected.
Partial_Deletion	When the deletion of two or more objects is specified, all the objects are not deleted.
Store_Not_Available	The card is being initialized, the card does not exist, or the battery level is “Operation disabled status”.
Store_Read_Only	The card including the specified image is protected. All the inserted cards are protected.
Specification_By_Format_Unsupported	The specified ObjectFormatCode is not supported.
Device_Busy	The acquisition operation is being performed when the command processing is started.
Invalid_Parameter	The ObjectFormatCode is specified with the ObjectHandle set to a value other than 0xFFFFFFFF.
Access_Denied	The RecordingMedia property is [Card and SDRAM]. Shooting is performed with [Card and SDRAM] specified in the InitiateCaptureRecInMedia command and all the images recorded in the SDRAM are not acquired. The movie is being recorded.

5.2.12. SendObjectInfo

The operation by this OperationCode sends the object information (ObjectInfo) from the host to the camera.

- OperationCode: 0x100C
- Parameter1: [StorageID]
- Parameter2: [(Parent) ObjectHandle]
- Parameter3: None
- Data: ObjectInfo
- Data direction: From host to camera
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Invalid_StorageID, Invalid_ObjectFormatCode, Store_Full, Store_Read_Only, Specification_Of_Destination_Unsupported
- Response Parameter:
- Parameter1: StorageID [0x00000000]
- Parameter2: Parent ObjectHandle [0x00000000]
- Parameter3: ObjectHandle [0xFFFF0011]

The operation by this OperationCode is effective when the StorageID is 0x00000000 (the storage destination is not specified) and the Parent ObjectHandle is 0x00000000 or 0xFFFFFFFF.

The camera retains the ObjectInfo received by this command until it receives the SendObject command to be sent from the host successively.

When the size of the object specified in the ObjectCompressedSize field of the received ObjectInfo exceeds the size of the buffer prepared by the camera (32768 bytes), the camera returns the Store_Full response.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter3 is specified.
Incomplete_Transfer	The data block reception fails.
Invalid_StorageID	The StorageID is a value other than 0x00000000.
Invalid_ObjectFormatCode	The ObjectFormat field of the received ObjectInfo is set to a value other than 0x3002 (Script).
Store_Full	The object cannot be received with the size of the buffer prepared by the camera.
Store_Read_Only	A StorageID of the card is specified.
Specification_Of_Destination_Unsupported	The (Parent) ObjectHandle is a value other than 0x00000000 or 0xFFFFFFFF.

5.2.13. SendObject

The operation by this OperationCode sends the object from the host to the camera.

- OperationCode: 0x100D
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: DataObject
- Data direction: From host to camera
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, No_Valid_ObjectInfo
- Response Parameter: None

The camera records the ObjectData based on the information of the ObjectInfo received in advance. The recording destination is not a card but a virtual recording medium (SDRAM). The camera deletes the ObjectInfo data received in advance when receiving this command and completing the ObjectData reception.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.
Incomplete_Transfer	The data block reception fails.
No_Valid_ObjectInfo	This command is received before the SendObjectInfo command is accepted.

5.2.14. InitiateCapture

The operation by this OperationCode starts the camera acquiring one or more new objects (release operation of the camera) according to the current setting. The acquired objects (image data) are always recorded in the card independently of the recording destination property.

- OperationCode: 0x100E
- Parameter1: [StorageID]
- Parameter2: [ObjectFormatCode]
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, General_Error, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Invalid_StorageID, Store_Not_Available, Device_Busy, Invalid_Parameter, Invalid_ObjectFormatCode, Store_Full
- Response Parameter: None
- EventCode: ObjectAdded, StoreFull, CaptureComplete

If the camera receives this command in the camera mode, the camera changes the setting to the host mode, and returns to the camera mode when the release operation is completed.

The camera starts the release operation when receiving this command. The acquisition of the new object by the release operation of the camera is performed asynchronously.

The transition to the response phase is performed when the start of the release operation is completed or the start of the release operation after the AF operation is completed. (The completion of the start of the release operation is different from the completion of the release operation. This command is an activation command.)

However, if this command is received with the Bit0 value of the WarningStatus property (subsection 5.5.6.15) set to 1 [Sequence error], the sequence error is released, General_Error is passed in the response phase, and the command is terminated. If the Live view is being performed, Device_Busy is passed and the command is terminated.

The camera starts acquiring one or more new objects (release operation of the camera) according to the current setting. Whether the AF is operated when the release is started depends on the setting of the focus-mode selector.

When 0x00000000 is specified in Parameter1, the acquired object is recorded in the card of the recording destination that is set in the camera. If the StorageID indicating the card is specified and the specified card disagrees with the recording destination that is set in the camera, Store_Not_Available is passed and the command is terminated.

When ObjectFormatCode (subsection 8.3.2) of Parameter2 is set to 0x00000000, the release operation is performed according to the image quality mode set in the camera. The release operation is performed after changing the image quality mode according to the format if specified.

However, if the ObjectFormatCode is 0x3801 [EXIF], the image quality mode is fixed to JPEG (NORMAL).

When the release operation is started, one or more new objects are created. When the new objects are recorded in the card, the camera generates the ObjectAdded event of the asynchronous interrupt event to inform the host of the addition of the new objects. The ObjectAdded event includes the

ObjectHandle indicating the new object that is created. If two or more new objects are created, the ObjectAdded event is issued two or more times. When all the new objects that can be acquired are recorded in the card, the camera issues the CaptureComplete event to the host to inform that the acquisition of all the new objects is completed.

The number of images that can be captured continuously by the continuous low-speed shot and the continuous high-speed shot is the least number among the setting values of the BurstNumber property (subsection 5.5.1.16), the ExposureRemaining property (subsection 5.5.6.4), and the BurstMaxNumber property (subsection 5.5.3.5.8). When Slot 1 becomes full while the continuous shot is being performed, the images are recorded in Slot 2 in succession.

When the value of the StillCaptureMode property (subsection 5.5.1.15) is set to "Self-timer" or "Mirror-up", the camera changes the value of the StillCaptureMode property (subsection 5.5.1.15) to "Single frame" temporarily for shooting.

StillCaptureMode	BurstNumber	Description
0x0001 (Single frame)	Invalid	Only one image can be captured.
0x0002 (Continuous high-speed shot) 0x8010 (Continuous low-speed shot)	Valid	Among the BurstNumber setting value, the number of images that can be recorded in the SDRAM that is calculated in the camera, and the number of remaining images for recording while the bracketing is being performed, until the least number is reached, the acquisition of the new objects can be performed. Only one image can be captured with the internal flash enabled.
0x8011 (Self-timer) 0x8012 (Mirror-up)	Invalid	Only one image can be captured (operation equivalent to the single frame).
0x8016 (Quiet shooting)	Invalid	Only one image can be captured (mirror-down after release is performed by the camera automatically).

The camera operates AutoFocus before starting the release operation according to the settings of the FocusMode property (subsection 5.5.1.7), the DynamicAFonAFC property (subsection 5.5.3.2.1), and the DynamicAFonAFS property (subsection 5.5.3.2.2). If the camera operates AutoFocus, after the AutoFocus operation is completed, the release operation is started when the focused status is set.

Focus mode	Priority in AF-C/AF-S mode	AF operation
Manual focus	-	Not performed
Single AF servo	Release	Performed
	Focus	Performed
Continuous AF servo	Release	Performed
	Focus	First image: Performed Second image and after: Operation equivalent to the release (shooting priority)

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
General_Error	An error is generated in the camera body when the command processing is started, the AF operation is not focused with the AF operation mode of AF-S (focus priority) or AF-C (focus priority), or the aperture value is "F--"and the shooting mode is a mode other than the M mode.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter3 is specified.
Invalid_StorageID	The StorageID sent by the camera differs from the StorageID specified by the host.
Invalid_ObjectFormatCode	The format of the ObjectFormatCode specified in Parameter2 is not supported by the camera.
Store_Full	The free area for recording is not provided in the card.
Store_Not_Available	A value other than 0 is specified in Parameter1, the card is being initialized, the card does not exist, or the battery level is

	"Operation disabled status".
Store_Read_Only	All the inserted cards are protected.
Device_Busy	The acquisition operation is being performed when the command processing is started, the cleaning mirror-up operation is being performed, the shutter speed is set to Bulb, the shutter-release button is being fully pressed, the Live view is being performed, or a time-out occurs for the ready waiting status of the internal flash.
Invalid_Parameter	An object that corresponds to the specified ObjectHandle does not exist.

The contents of the EventCode are shown below.

EventCode	Description
ObjectAdded	A new object is recorded in the card.
StoreFull	The free area for recording is not provided in the card.
CaptureComplete	The acquisition operation of the new object is completed.

5.2.15. FormatStore

The operation by this OperationCode formats the card inserted in the camera.

- OperationCode: 0x100F
- Parameter1: StorageID
- Parameter2: [FilesystemFormat]
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Invalid_StorageID, Store_Not_Available, Device_Busy, Invalid_Parameter
- Response Parameter: None

The camera formats the card specified by the StorageID.
The StorageIDs supported by the camera are shown in subsection 5.2.4.
The FilesystemFormat parameter shown in Parameter2 is optional. However, setting of only 0x0003 indicating the DCF is permitted.

Deleting the objects in the card is prohibited in the following cases.

- The RecordingMedia property (subsection 5.5.6.2) is [Card and SDRAM].
- Shooting is performed with [Card and SDRAM] specified in the InitiateCaptureRecInMedia command (subsection 5.2.40) and all the images recorded in the SDRAM are not acquired.
- The movie is being recorded.
- The specified card is protected.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter3 is specified.
Invalid_StorageID	The StorageID sent by the camera differs from the StorageID specified by the host.
Store_Not_Available	The card is being initialized, the card does not exist, or the battery level is "Operation disabled status".
Store_Read_Only	The specified card is protected.
Device_Busy	The acquisition operation is being performed when the command processing is started.

Invalid_Parameter	Parameter2 is neither 0x00000000 nor 0x00000003.
Access_Denied	The RecordingMedia property is [Card and SDRAM]. Shooting is performed with [Card and SDRAM] specified in the InitiateCaptureRecInMedia command and all the images recorded in the SDRAM are not acquired. The movie is being recorded.

5.2.16. GetDevicePropDesc

The operation by this OperationCode returns the DevicePropDesc data set corresponding to the specified DevicePropCode.

- OperationCode: 0x1014
- Parameter1: DevicePropCode
- Parameter2: None
- Parameter3: None
- Data: DevicePropDesc data set
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, DeviceProp_Not_Supported
- Response Parameter: None

For the supported DevicePropCode, refer to subsection 5.5.
For the DevicePropDesc, refer to subsection 8.4.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are specified.
Incomplete_Transfer	The data block transmission fails.
DeviceProp_Not_Supported	The specified DevicePropCode is not supported.

5.2.17. GetDevicePropValue

The operation by this OperationCode returns the current value corresponding to the specified DevicePropCode.

- OperationCode: 0x1015
- Parameter1: DevicePropCode
- Parameter2: None
- Parameter3: None
- Data: DevicePropValue
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, DeviceProp_Not_Supported
- Response Parameter: None

For the supported DevicePropCode and the details of the DevicePropValue, refer to subsection 5.5.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the

	TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are specified.
Incomplete_Transfer	The data block transmission fails.
DeviceProp_Not_Supported	The specified DevicePropCode is not supported.

5.2.18. SetDevicePropValue

The operation by this OperationCode sets the DevicePropValue corresponding to the specified DevicePropCode to the camera.

- OperationCode: 0x1016
- Parameter1: DevicePropCode
- Parameter2: None
- Parameter3: None
- Data: DevicePropValue
- Data direction: From host to camera
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, DeviceProp_Not_Supported, Access_Denied, Device_Busy, Invalid_DeviceProp_Format, Invalid_DeviceProp_Value, Set_Property_Not_Support, Shutter_Speed_Bulb
- Response Parameter: None
- EventCode: StorageInfoChanged

If the camera receives this command in the camera mode, the camera changes the setting to the host mode, and returns to the camera mode when the command processing is completed.
An error response is made when this command is received during shooting or the AF operation.

For the supported DevicePropCode and the details of the DevicePropValue, refer to subsection 5.5.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, Parameter2 and Parameter3 are specified, or the specified DevicePropValue is other than the character string indicating the date/time.
Incomplete_Transfer	The data block reception fails.
DeviceProp_Not_Supported	The specified DevicePropCode is not supported.
Access_Denied	An operation is denied depending on the status of the camera.
Device_Busy	The acquisition operation is being performed when the command processing is started, or the AF is being operated.
Invalid_DeviceProp_Format	The size or the format of the DevicePropDesc data set is not appropriate.
Invalid_DeviceProp_Value	The specified DevicePropValue is out of the permitted range.
Set_Property_Not_Support	The specified DevicePropCode is not permitted for setting.
Shutter_Speed_Bulb	Bulb is specified for the ExposureTime property.

The contents of the EventCode are shown below.

EventCode	Description
StorageInfoChanged	The settings of the ImageSize and the CompressionSetting properties are changed.

5.2.19. GetPartialObject

The operation by this OperationCode is the same as that of GetObject.
However, the offset and the number of bytes to be acquired can be specified and the object

(DataObject) can be acquired partially.

- OperationCode: 0x101B
- Parameter1: ObjectHandle
- Parameter2: Offset (Byte)
- Parameter3: MaxSize (Byte)
- Data: DataObject
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Invalid_Object_Handle, Store_Not_Available, Invalid_Parameter
- Response Parameter: The number of bytes actually sent

The camera sends the file data (DataObject) of the specified size corresponding to the specified ObjectHandle to the host.
When the specified ObjectHandle is the data in the card, the camera returns the object corresponding to the ObjectHandle.
The ObjectHandle passed by ObjectAddedInSdram should be specified in order to acquire the information of the object in the SDRAM. For the ObjectHandle passed by ObjectAddedInSdram, the image data is sent to the host.

For the DataObject, which is the data to be sent, the file data corresponding to the specified ObjectHandle for MaxSize starting from the position set by the offset is sent to the host. However, in the case of "(File size - Offset) < MaxSize", the data of "(File size - Offset)", not MaxSize, is sent to the host. The sent number of bytes is stored in ResponseParameter and sent to the host.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or 0 is specified.
Incomplete_Transfer	The data block transmission fails.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist, or an object in the SDRAM other than the ObjectHandle passed by ObjectAddedInSdram is specified.
Store_Not_Available	The card is being initialized, the card does not exist, or the battery level is "Operation disabled status".
Invalid_Parameter	The specified offset is larger than the file size.

5.2.20. InitiateCaptureRecInSdram

The operation by this OperationCode makes the camera start the acquisition of one or more new objects (release operation of the camera) according to the current setting. The acquired object (image data) is saved in the SDRAM.

- OperationCode: 0x90C0
- Parameter1: CaptureSort
- Parameter2: None
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Invalid_Parameter, Device_Busy, Hardware_Error, Out_of_Focus, Invalid_Status, Wb_Preset_Error, Dust_Reference_Error, Shutter_Speed_Bulb, MirrorUp_Sequence, CameraMode_Not_Adjust_Fnumber,

Store_Full, Store_Not_Available

- Response Parameter: None
- EventCode: StoreFull, ObjectAddedInSdram, CaptureCompleteRecInSdram

This command performs the same operation as that of the InitiateCaptureRecInMedia command (subsection 5.2.40) with CaptureSort set to a value other than [Image acquisition release after AF driving] and SaveMedia set to [SDRAM].

If the camera receives this command in the camera mode, the camera changes the setting to the host mode, and returns to the camera mode when the release operation is completed.

This command is an activation-type command. The transition to the response phase is performed when the start of the AF operation is completed if the AF operation is performed, and when the start of the release operation is completed if the AF operation is not performed.

The camera starts the acquisition of one or more new objects (release operation of the camera) according to the current setting. Whether the AF operation is performed or not depends on the focus mode setting.

However, if this command is received with the Bit0 value of the WarningStatus property (subsection 5.5.6.15) set to 1 [Sequence error], the sequence error is released, Hardware_Error is passed in the response phase, and the command is terminated.

When the release operation is started, one or more new objects are created. The camera saves the new objects in the SDRAM. When the transmission of the new object acquired first becomes enabled, the camera generates the ObjectAddedInSdram event of the asynchronous interrupt event to inform the host of the addition of the new objects. If two or more new objects are created, the ObjectAddedInSdram event is generated when the transmission of the new object to be sent next to the host becomes enabled.

When all the images captured by this command are sent from the SDRAM to the host completely, the camera sends the CaptureCompleteRecInSdram event to inform the host of the completion of the shooting operation. For the preset measurement release, however, the ObjectAddedInSdram and the CaptureCompleteRecInSdram events are not issued.

The number of images that can be captured continuously by the continuous low-speed shot and the continuous high-speed shot is the least number among the setting values of the BurstNumber property (subsection 5.5.1.16), the BurstMaxNumber property (subsection 5.5.3.5.8), and the RemainingExposure property (subsection 5.5.6.5).

When the value of the StillCaptureMode property (subsection 5.5.1.15) is set to “Self-timer” or “Mirror-up”, the camera changes the value of the StillCaptureMode property (subsection 5.5.1.15) to “Single frame” temporarily for shooting.

StillCaptureMode	BurstNumber	Description
0x0001 (Single frame)	Invalid	Only one image can be captured.
0x0002 (Continuous high-speed shot) 0x8010 (Continuous low-speed shot)	Valid	Among the BurstNumber setting value, the number of images that can be recorded in the SDRAM that is calculated in the camera, and the number of remaining images for recording while the bracketing is being performed, until the least number is reached, the acquisition of the new objects can be performed. Only one image can be captured with the internal flash enabled.
0x8011 (Self-timer) 0x8012 (Mirror-up)	Invalid	Only one image can be captured (operation equivalent to the single frame).
0x8016 (Quiet shooting)	Invalid	Only one image can be captured (mirror-down after release is performed by the camera automatically).

The camera operates AutoFocus before starting the release operation according to the settings of the FocusMode property (subsection 5.5.1.7), the DynamicAFonAFC property (subsection 5.5.3.2.1), and the DynamicAFonAFS property (subsection 5.5.3.2.2). If the camera operates AutoFocus, after the AutoFocus operation is completed, the release operation is started when the focused status is set.

The AutoFocus operation is not performed for the preset measurement release.

Focus mode	Priority in AF-C/AF-S mode	AF operation
Manual focus	-	Not performed

Single AF servo	Release	Performed
	Focus	Performed
Continuous AF servo	Release	Performed
	Focus	First image: Performed Second image and after: Operation equivalent to the release (shooting priority)

The type of this command (image acquisition release, preset measurement release, or dust reference image release) is distinguished by the CaptureSort value of Parameter1.

CaptureSort	Operation	Description
0xFFFFFFFF	Image acquisition release	Normal release operation
0x00000000	Preset measurement release	Stores the acquired preset gain in the preset data d0 area.
0x00000001	Preset measurement release	Stores the acquired preset gain in the preset data d0 area and copies it to d1 area.
0x00000002	Preset measurement release	Stores the acquired preset gain in the preset data d0 area and copies it to d2 area.
0x00000003	Preset measurement release	Stores the acquired preset gain in the preset data d0 area and copies it to d3 area.
0x00000004	Preset measurement release	Stores the acquired preset gain in the preset data d0 area and copies it to d4 area.
0x00000010	Dust reference image release	Dust reference image release operation

When the response phase for this command is terminated normally, the host issues the DeviceReady command two or more times to confirm the completion of the shooting operation. The camera returns the response of the normal termination to the DeviceReady command when the AF operation is completed. However, if the AF operation fails, the camera returns the error response to the DeviceReady command and the release operation is not performed.
The camera returns the Device_Busy response to the DeviceReady command until the AF operation or the preset measurement release is completed.

When the preset measurement release is requested and the preset measurement release succeeds, the camera stores the preset gain data in the specified area and returns the response of the normal termination to the DeviceReady command. If the preset measurement release fails, the camera returns the error response to the DeviceReady command.

When the dust reference image release is requested, the camera performs the dust reference image release and moves to the response phase. When the dust reference image release fails, the camera returns the error response to the DeviceReady command. When the shooting succeeds, the operation similar to the image acquisition release is performed hereafter.

For the shooting during the Live view, only the image acquisition release can be performed.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Store_Full	The free area for recording is not provided in the SDRAM.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are specified.
Invalid_Parameter	The specified CaptureSort value is out of the range.
Device_Busy	The acquisition operation is being performed when the command processing is started, or the Live view is being performed and the image acquisition release is not set.
Hardware_Error	When the command processing is started, some error is generated in the camera body.
Out_of_Focus	The AF operation is not focused with the AF operation mode of AF-S or AF-C.
Invalid_Status	The shutter-release button is being fully pressed, or a time-out

	occurs for the ready waiting status of the internal flash.
Wb_Preset_Error	The preset measurement release fails.
Dust_Reference_Error	The CPU internal lens is not mounted during the dust reference image release, or the dust reference image release fails.
Shutter_Speed_Bulb	The shutter speed is set to Bulb.
MirrorUp_Sequence	The cleaning mirror-up operation is being performed.
CameraMode_Not_Adjust_Fnumber	The aperture value is "F--" and the shooting mode is a mode other than the M mode.
Store_Not_Available	The battery level is "Operation disabled status".

The contents of the EventCode are shown below.

EventCode	Description
StoreFull	The free area for recording is not provided in the SDRAM.
ObjectAddedInSdram	A new object is recorded in the SDRAM.
CaptureCompleteRecInSdram	All the images captured by this command are sent from the SDRAM to the host completely.

5.2.21. AfDrive

The operation by this OperationCode starts the AF driving and has the same function as that of pressing the shutter-release button of the camera body halfway.

- OperationCode: 0x90C1
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, MirrorUp_Sequence, Device_Busy
- Response Parameter: None

If the camera receives this command in the camera mode, the camera changes the setting to the host mode, and returns to the camera mode when the command processing is completed.

When receiving this command, the camera starts the AF driving and moves to the response phase. However, when the value of the FocusMode property (subsection 5.5.1.7) is 0x0001 [MF], and when the Bit5 value is 1 [Minimum aperture warning status] or Bit3 value is 1 [Lens cannot be used] in the WarningStatus property (subsection 5.5.6.15), it is not regarded as an error but the response phase is terminated normally soon.

When the status is shifting to Live view by the StartLiveView command, the camera performs the focal-plane contrast AF. At this time, the timing when switching to the response phase and the actions until the AF operation is completed are not changed. When the value of the FocusMode property (subsection 5.5.1.7) is 0x8013 [F], the camera returns the Device_Busy response because the camera performs the AF operation at all times.

The camera returns the Device_Busy response in the Live view status when the value of the AfModeAtLiveView property (subsection 5.5.3.2.8) is [Constant AF servo].

This command is an activation command. When the AF driving is started, the transition to the response phase is performed.

After confirming that the response phase is terminated normally, the host issues the DeviceReady command two or more times to confirm the completion of the operation. The camera returns the Device_Busy response to the DeviceReady command until the AF operation is completed. The camera returns the response of the normal termination to the DeviceReady command when the AF operation is completed. If the AF operation fails, however, the camera returns the error response to the DeviceReady command.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination

Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1, Parameter2, and Parameter3 are specified.
MirrorUp_Sequence	The cleaning mirror-up operation is being performed.
Device_Busy	When the command processing is started, the acquisition operation or the AF operation is being performed.

5.2.22. ChangeCameraMode

The operation by this OperationCode switches between the camera mode and the host mode.

- OperationCode: 0x90C2
- Parameter1: ModeValue
- Parameter2: None
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Invalid_Parameter, Change_CameraMode_Failed
- Response Parameter: None

The camera is set to the mode specified by the ModeValue. However, the mode cannot be changed during the release operation or the Live view of the camera.

When the camera is switched to the host mode by this command, the camera changes the GetSet field setting value of the DevicePropDesc data set for the ExposureProgramMode property (subsection 5.5.1.11) and the StillCaptureMode property (subsection 5.5.1.15) to 0x01 [For reading/writing] and sends the DevicePropChanged event.

When the camera is switched from the host mode to the camera mode, the camera changes the GetSet field setting value of the DevicePropDesc data set for the above properties to 0x00 [Reading only] and sends the DevicePropChanged event.

The contents of the ModeValue are shown below.

ModeValue	Description
0	Sets to the camera mode.
1	Sets to the host mode.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are specified.
Invalid_Parameter	The specified value of ModeValue is out of the range.
Change_CameraMode_Failed	The mode cannot be changed depending on the operation status of the camera (during the release operation or the Live view).

5.2.23. DeleteImagesInSdram

The operation by this OperationCode deletes a specific object saved in the SDRAM or all the objects saved in the SDRAM.

- OperationCode: 0x90C3
- Parameter1: [ObjectHandle]
- Parameter2: None
- Parameter3: None
- Data: None

- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Device_Busy, Invalid_Object_Handle
- Response Parameter: None

If the camera receives this command in the camera mode, the camera changes the setting to the host mode, and returns to the camera mode when the command processing is completed.
When this command is received during shooting, an error response is made.

The object that corresponds to the specified ObjectHandle is deleted. All the objects in the SDRAM are deleted if there is no parameter or the value of Parameter1 is 0.
For the ObjectHandle, the ObjectHandle passed by the ObjectAddedInSDRAM event should be specified. When the object corresponding to the specified ObjectHandle has been already sent to the host or deleted, an error response is made.

If this command is issued during the acquisition of the new object when there is no parameter or the value of Parameter1 is 0, the camera does not issue the new ObjectAddedInSdram event, but waits until the deletion of all the objects in the SDRAM becomes enabled, and the deletion is performed later. The camera makes the response immediately even if the deletion cannot be performed at once, and the deletion operation is performed later.
The release operation is prohibited during the image deletion in the SDRAM.

Deleting the objects in the card is prohibited in the following cases.
- The RecordingMedia property (subsection 5.5.6.2) is [Card and SDRAM].
- Shooting is performed with [Card and SDRAM] specified in the InitiateCaptureRecInMedia command (subsection 5.2.40) and all the images recorded in the SDRAM are not acquired.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter2 and Parameter3 are specified.
Device_Busy	The transition to the host mode is prohibited, or shooting is being performed.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist.
Access_Denied	The RecordingMedia property is [Card and SDRAM]. Shooting is performed with [Card and SDRAM] specified by the InitiateCaptureRecInMedia command and all the images recorded in the SDRAM are not acquired.

5.2.24. GetLargeThumb

The operation by this OperationCode acquires the large thumbnail data of the specified object.

- OperationCode: 0x90C4
- Parameter1: ObjectHandle
- Parameter2: None
- Parameter3: None
- Data: LargeThumbnail data
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Invalid_Object_Handle, No_Thumbnail_Present, Store_Not_Available
- Response Parameter: None

The camera sends all the large thumbnail data corresponding to the specified ObjectHandle to the host.
When the specified ObjectHandle is the data in the card, the camera returns the large thumbnail data corresponding to the ObjectHandle.
The ObjectHandle passed by ObjectAddedInSdram should be specified in order to acquire the information of the object in the SDRAM. For the ObjectHandle passed by ObjectAddedInSdram, the large thumbnail data is sent to the host.

The LargeThumbnail data is the large thumbnail data of the object (file) specified by the ObjectHandle. The LargeThumbnail data is the 570 x 375-size JPEG image.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are specified.
Incomplete_Transfer	The data block transmission fails.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist, an object in the MISC folder is specified, an object in the WAV format is specified, or an object in the SDRAM other than the ObjectHandle passed by ObjectAddedInSdram is specified.
No_Thumbnail_Present	The object corresponding to the specified ObjectHandle does not include a thumbnail.
Store_Not_Available	The card is being initialized, the card does not exist, or the battery level is “Operation disabled status”.

5.2.25. GetEvent

The operation by this OperationCode sends the event retained in the camera to the host.

- OperationCode: 0x90C7
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: Event array
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer
- Response Parameter: None

The camera sends all the events saved in the event queue buffer prepared for the GetEvent command.
The format of the event array to be sent by the camera is shown below.

Offset	Value	Name	Description
0	N	EventCount	The number of events
2	EventCode	EventCode [0]	The oldest event
4		EventParameter [0]	Parameter attaching to the oldest event
8	EventCode	EventCode [1]	The second oldest event
10		EventParameter [1]	Parameter attaching to the second oldest event
---			
6 x (N-1) + 2	EventCode	EventCode [N-1]	The newest event
6 x (N-1) + 4		EventParameter [N-1]	Parameter attaching to the newest event

If there is no event to be sent, the EventCount value is set to 0 and sent to the host.
The camera sends the event by this command and then updates the contents of the event queue buffer prepared for the GetEvent command. The event that has been sent is deleted.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.
Incomplete_Transfer	The data block transmission fails.

5.2.26. DeviceReady

The operation by this OperationCode checks the action by the activation-type command.

- OperationCode: 0x90C8
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Device_Busy, Out_of_Focus, Wb_Preset_Error, Dust_Reference_Error, Invalid_Status
- Response Parameter: None

This command is issued repeatedly after issuing an activation-type command; the InitiateCaptureRecInSdram command (subsection 5.2.20), the AfAndCaptureRecInSdram command (subsection 5.2.29), the InitiateCaptureRecInMedia command (subsection 5.2.40), the AfDrive command (subsection 5.2.21), or the StartLiveView command (subsection 5.2.34), in order to check the operation.

The camera makes the error response of Device_Busy during the operation by the activation-type command and the release operation by the shutter-release button or the InitiateCapture command (subsection 5.2.14). If an error response is made, the camera cancels the operation.

When the release operation is started by a command with the continuous shot, the Device_Busy response is made until the continuous shot operation is finished (termination of the continuous shot release operation). However, if the AF operation is finished in the non-focused status when the release is started with the FocusMode property (subsection 5.5.1.7) set to “Single AF servo” or “Continuous AF servo” and with the DynamicAFonAFS property (subsection 5.5.3.2.2) set to “Focus”, the Out_of_Focus response is made and the continuous shot operation is canceled.

When the AF operation is started by the AfDrive command, the Device_Busy response is made until the AF operation is completed. If the AF operation is completed in the non-focused status, however, the Out_of_Focus response is made.

When the release operation is started by the shutter-release button and the InitiateCapture command with the continuous shot, the Device_Busy response is made until the continuous shot operation is finished (termination of the continuous shot release operation).

When the Live view status is started by the StartLiveView command, the Device_Busy response is made until the acquisition of the Live view image becomes enabled. If the acquisition of the Live view image cannot be enabled because of some problem caused by the camera (battery empty, warning information, etc.), however, the Invalid_Status response is made.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.
Device_Busy	The operation of the activation-type command is not finished, or the release operation is being performed.

Out_of_Focus	The AF operation is in the non-focused status with the AF operation mode of AF-S or AF-C.
Wb_Preset_Error	The preset measurement release fails.
Dust_Reference_Error	The dust reference image release fails.
Invalid_Status	An error caused by the camera (battery empty, warning information)
MfDrive_Step_End	The MF driving reaches the end of steps.
MfDrive_Step_ Insufficiency	The driving amount is insufficient.

5.2.27. SetPreWbData

The operation by this OperationCode sets the data in the preset manual white balance data area of the camera.

- OperationCode: 0x90C9
- Parameter1: PreWbDataIndex
- Parameter2: PreWbGainValue
- Parameter3: PreWbThumImageSize
- Data: PreWbThumImage
- Data direction: From host to camera
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer
- Response Parameter: None

If the camera receives this command in the camera mode, the camera changes the setting to the host mode, and returns to the camera mode when the command processing is completed.

The camera has d0 through d4 as the preset manual white balance data area in the flash memory. Each data area stores the gain value and the thumbnail image.

This command sets the data in the preset manual white balance data area of the camera.

The camera stores the preset white balance gain value specified by PreWbGainValue in the data area specified by PreWbDataIndex and the thumbnail image of the size set in PreWbThumImageSize. When PreWbThumImageSize is 0, the thumbnail image is not recorded.

The camera uses the thumbnail image of d0 as the initial value when a thumbnail image is not recorded in d1 through d4. Therefore, when PreWbThumImageSize is 0 for this command, the thumbnail image remains d0

The contents of PreWbDataIndex are shown below.

- byte2, 3 : Reserved (0)
- byte1 : RotateThumb (0: Horizontal, 1: Grip side upward, 2: Grip side downward)
- byte0 : PreWbDataIndex (Preset No.: from 0 to 4)
  (The byte1 is referred to by the camera when Parameter3: PreWbThumImageSize is a value other than 0.)

The contents of PreWbGainValue are shown below.

PreWbGainValue																
Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
	-	-	-	-	-	Rgain										
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	-	-	-	-	-	Bgain										

Rgain = (R/G) x 256 [Upper 3 bits: integer section, lower 8 bits: decimal section]
Bgain = (B/G) x 256 [Upper 3 bits: integer section, lower 8 bits: decimal section]
However, the range that can be set is: 0 <= Rgain, Bgain < 8

PreWbThumImageSize indicates the size of PreWbThumImage. When PreWbThumImageSize is 0, PreWbThumImage is not sent in the data phase and the camera stores PreWbGainValue only.

The format of PreWbThumImage shall be the same as that of the thumbnail image (JPEG format) recorded in the JPEG file defined in the accompanying document “D7000 recording specifications”.

In addition, PreWbThumImage should be the compression quality Fine (1/4 compression) and PreWbThumImageSize should be 13440 bytes or less.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1, Parameter2, and Parameter3 are not specified, or a value that is out of the range is specified.
Incomplete_Transfer	The data block reception fails.

5.2.28. GetVendorPropCodes

The operation by this OperationCode acquires an array of codes of the vendor property supported by the camera.

- OperationCode: 0x90CA
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: DevicePropCodeArray
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer
- Response Parameter: None

The format of DevicePropCodeArray sent by the camera is shown below.
Each field data is stored in the little endian format.

Field	Size (Byte)	Data
NumElement	4	The element of the array is N (N indicates the number of objects).
ArrayEntry [0]	2	DevicePropCode [0]
ArrayEntry [1]	2	DevicePropCode [1]
ArrayEntry [2]	2	DevicePropCode [2]

ArrayEntry [N-1]	2	DevicePropCode [N-1]

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.
Incomplete_Transfer	The data block transmission fails.

5.2.29. AfAndCaptureRecInSdram

The operation by this OperationCode starts the AF driving and makes the camera start the acquisition of one or more new objects (release operation of the camera). The acquired object (image data) is saved in the SDRAM.

- OperationCode: 0x90CB
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID,

	Device_Busy, Hardware_Error, Out_of_Focus, Invalid_Status, Shutter_Speed_Bulb, MirrorUp_Sequence, CameraMode_Not_Adjust_Fnumber, Store_Full, Parameter_Not_Supported
・ Response Parameter:	None
・ EventCode:	StoreFull, ObjectAddedInSdram, CaptureCompleteRecInSdram

This command performs the same operation as that of the InitiateCaptureRecInMedia command (subsection 5.2.40) with CaptureSort set to [Image acquisition release after AF driving] and SaveMedia set to [SDRAM].

If the camera receives this command in the camera mode, the camera changes the setting to the host mode, and returns to the camera mode when the release operation is completed.

This command is an activation-type command. The transition to the response phase is performed when the start of the release operation is completed.

The camera starts the acquisition of one or more new objects (release operation of the camera) according to the current setting. Before the release operation, the AF driving is always started. However, if the FocusMode setting is “Manual”, “F--” status, or the lens is not mounted, the release operation is started immediately.

However, if this command is received with the Bit0 value of the WarningStatus property (subsection 5.5.6.15) set to 1 [Sequence error], the sequence error is released, Hardware_Error is passed in the response phase, and the command is terminated. If the Live view is being performed, Device_Busy is passed and the command is terminated.

When the release operation is started, one or more new objects are created. The camera saves the new objects in the SDRAM. When the transmission of the new object acquired first becomes enabled, the camera generates the ObjectAddedInSdram event of the asynchronous interrupt event to inform the host of the addition of the new objects. If two or more new objects are created, the ObjectAddedInSdram event is generated when the transmission of the new object to be sent next to the host becomes enabled.

When all the images captured by this command are sent from the SDRAM to the host completely, the camera sends the CaptureCompleteRecInSdram event to inform the host of the completion of the shooting operation.

The number of images that can be captured continuously by the continuous low-speed shot and the continuous high-speed shot is the least number among the setting values of the BurstNumber property (subsection 5.5.1.16), the BurstMaxNumber property (subsection 5.5.3.5.8), and the RemainingExposure property (subsection 5.5.6.5).

When the value of the StillCaptureMode property (subsection 5.5.1.15) is set to “Self-timer” or “Mirror-up”, the camera changes the value of the StillCaptureMode property (subsection 5.5.1.15) to “Single frame” temporarily for shooting.

StillCaptureMode	BurstNumber	Description
0x0001 (Single frame)	Invalid	Only one image can be captured.
0x0002 (Continuous high-speed shot) 0x8010 (Continuous low-speed shot)	Valid	Among the BurstNumber setting value, the number of images that can be recorded in the SDRAM that is calculated in the camera, and the number of remaining images for recording while the bracketing is being performed, until the least number is reached, the acquisition of the new objects can be performed. Only one image can be captured with the internal flash enabled.
0x8011 (Self-timer) 0x8012 (Mirror-up)	Invalid	Only one image can be captured (operation equivalent to the single frame).
0x8016 (Quiet shooting)	Invalid	Only one image can be captured (mirror-down after release is performed by the camera automatically).

The release operation is started depending on the setting of the FocusMode property (subsection 5.5.1.7) and the status after AF driving. In other words, in the AF-S mode, the release operation is started if the focused status is set after AF driving, and the Out_of_Focus response is made and the processing is terminated without starting the release operation if the non-focused status is set. In addition, in the AF-C mode, the release operation is always started independent of the status after AF

driving.

Focus mode	Focused/Not focused	Release
Manual focus	-	The release operation is performed.
Single AF servo	Focused	The release operation is performed.
	Not focused (release priority)	The release operation is performed.
	Not focused (focus priority)	The release operation is not performed.
Continuous AF servo	Focused	The release operation is performed.
	Not focused (release priority)	The release operation is performed.
	Not focused (focus priority)	The release operation is not performed.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Store_Full	The free area for recording is not provided in the SDRAM.
Parameter_Not_Supported	A value is set in Parameter1, Parameter2, and Parameter3.
Device_Busy	When the command processing is started, the acquisition operation or the Live view is being performed.
Hardware_Error	When the command processing is started, some error is generated in the camera body.
Out_of_Focus	The AF operation is not focused with the AF operation mode of AF-S or AF-C.
Invalid_Status	The shutter-release button is being fully pressed, or a time-out occurs for the ready waiting status of the internal flash.
Shutter_Speed_Bulb	The shutter speed is set to Bulb.
MirrorUp_Sequence	The cleaning mirror-up operation is being performed.
CameraMode_Not_Adjust_Fnumber	The aperture value is "F--" and the shooting mode is a mode other than the M mode.

The contents of the EventCode are shown below.

EventCode	Description
StoreFull	The free area for recording is not provided in the SDRAM.
ObjectAddedInSdram	A new object is recorded in the SDRAM.
CaptureCompleteRecInSdram	All the images captured by this command are sent from the SDRAM to the host completely.

5.2.30. GetPicCtrlData

The operation by this OperationCode acquires the specified picture control data.

- OperationCode: 0x90CC
- Parameter1: PicCtrlItem
- Parameter2: DefaultFlag
- Parameter3: None
- Data: PicCtrlData
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer
- Response Parameter: None

This command acquires the picture control data of the specified picture control item for the camera.
The contents of PicCtrlItem are the same as those of ActivePicCtrlItem property (subsection 5.5.14.1).
The camera sends the current picture control data of the picture control item specified by PicCtrlItem to the host.
The current setting value is sent when DefaultFlag is 0, and the default value is sent when DefaultFlag is 1.
GetPicCtrlData can also be executed with a custom that is not registered or an option, and it is sent

to the PC with Customflag set to 2.
All the setting values are set independent of the value of QuickAdjustFlag and sent to the PC.
For the format of the picture control data to be received, refer to subsection 6.4.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Invalid_Parameter	The specified PicCtrlItem value is out of the range.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.
Incomplete_Transfer	The data block transmission fails.

5.2.31. SetPicCtrlData

The operation by this OperationCode sets the picture control data in the specified picture control item of the camera.

- OperationCode: 0x90CD
- Parameter1: PicCtrlItem
- Parameter2: ModifiedFlag
- Parameter3: None
- Data: PicCtrlData
- Data direction: From host to camera
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Invalid_Parameter, Parameter_Not_Supported, Incomplete_Transfer, Device_Busy, Access_Denied
- Response Parameter: None

This command sets the picture control data in the specified picture control item of the camera.
The contents of PicCtrlItem are the same as those of ActivePicCtrlItem property (subsection 5.5.14.1).
The camera sets the picture control data that is sent to the picture control item specified by PicCtrlItem.
If “Color” is specified in MonochromeFlag when “Monochrome” is specified in PicCtrlItem, or if “Monochrome” is specified in MonochromeFlag when an item other than “Monochrome” is specified in PicCtrlItem, the Access_Denied response is made.
The value of ModifiedFlag should be “0” or “1”. When ModifiedFlag is “0”, the contents of PicCtrlData are applied as a new picture control. When ModifiedFlag is “1”, the contents of PicCtrlData are applied to the current setting value of the existing picture control.
When QuickAdjustFlag is “1”, the camera identifies only the value of QuickAdjust to decide the adjustment value. (The camera ignores the other adjustment values in the data.)
When QuickAdjustFlag is “0”, the camera ignores the value of QuickAdjust and identifies the other adjustment values in the data to set the adjustment value.
For the format of the picture control data to be sent, refer to subsection 6.4.
When the custom picture control area is specified with PicCtrlItem, the value of CustomFlag in the picture control data format should be 1. If it is 0, the Access_Denied response is made.
When the neutral picture control or the custom picture control is set, the value of QuickAdjustFlag in the picture control data format should be 0. If it is 1, the Access_Denied response is made.
If CustomCurveData is valid, the picture control data can be set only when the custom picture control item is specified.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Invalid_Parameter	The specified value of the PicCtrlItem or ModifiedFlag is out of

	the range.
Parameter_Not_Supported	Parameter2 and Parameter3 are specified.
Incomplete_Transfer	The data block transmission fails.
Device_Busy	The camera is shooting the images.
Access_Denied	The contents of the picture control data are not coordinated with the setting status of the camera.

5.2.32. DeleteCustomPicCtrl

The operation by this OperationCode deletes the specified custom picture control item in the camera.

- OperationCode: 0x90CE
- Parameter1: CustomPicCtrlItem
- Parameter2: None
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported
- Response Parameter: None

This command deletes the specified custom picture control item of the camera.
The contents of CustomPicCtrlItem are the same as those of ActivePicCtrlItem property (subsection 5.5.14.1).

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Invalid_Parameter	The specified CustomPicCtrlItem value is out of the range.
Parameter_Not_Supported	Parameter2 and Parameter3 are specified.

5.2.33. GetPicCtrlCapability

The operation by this OperationCode acquires the function information of the picture control that is the basis of the specified picture control item.

- OperationCode: 0x90CF
- Parameter1: PicCtrlItem
- Parameter2: None
- Parameter3: None
- Data: PictureControlCapabilityData
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer
- Response Parameter: None

This command acquires the function information of the picture control of the color that is the basis of the specified picture control item. When the picture control whose basic picture control is monochrome is specified, the camera sends the data with all fields of PictureControlCapabilityData set to “0”.
The contents of PictureControlCapabilityData are shown below.

Offset	Size	Field	Data	Description
0x00	1	ValidFlag	0: Invalid 1: Valid	Indicates whether the data is valid or invalid. It should be 0 when a base does not exist or it is monochrome.
0x01	1	QuickCapa	0x80: Can be selected 0x01: AUTO enabled	Whether the quick adjustment can be selected or not and AUTO can be set or not

			0x81: Can be selected and AUTO enabled		
0x02	1	SharpnessCapa	0x80: Can be selected 0x01: AUTO enabled 0x81: Can be selected and AUTO enabled	Whether the edge enhancement can be selected or not and AUTO can be set or not	
0x03	1	ContrastCapa	0x80: Can be selected 0x01: AUTO enabled 0x81: Can be selected and AUTO enabled	Whether the contrast can be selected or not and AUTO can be set or not	
0x04	1	BrightnessCapa	0x80: Can be selected 0x01: AUTO enabled 0x81: Can be selected and AUTO enabled	Whether the brightness can be selected or not and AUTO can be set or not	
0x05	1	SaturationCapa	0x80: Can be selected 0x01: AUTO enabled 0x81: Can be selected and AUTO enabled	Whether the saturation can be selected or not and AUTO can be set or not	
0x06	1	HueCapa	0x80: Can be selected 0x01: AUTO enabled 0x81: Can be selected and AUTO enabled	Whether the hue can be selected or not and AUTO can be set or not	
0x07	1	Reserved	0	Reserved	
0x08	1	DefaultQuickLevel	From -2 to +2	The default position of the quick adjustment	
0x09	1	ContrastGridPos[0]	From 0 to 14	Contrast	Y coordinate of the grid with the value -3
0x0A	1	ContrastGridPos[1]	From 0 to 14		Y coordinate of the grid with the value -2
0x0B	1	ContrastGridPos[2]	From 0 to 14		Y coordinate of the grid with the value -1
0x0C	1	ContrastGridPos[3]	From 0 to 14		Y coordinate of the grid with the value 0
0x0D	1	ContrastGridPos[4]	From 0 to 14		Y coordinate of the grid with the value +1
0x0E	1	ContrastGridPos[5]	From 0 to 14		Y coordinate of the grid with the value +2
0x0F	1	ContrastGridPos[6]	From 0 to 14		Y coordinate of the grid with the value +3
0x10	1	SaturationGridPos[0]	From 0 to 14	Saturation	X coordinate of the grid with the value -3
0x11	1	SaturationGridPos[1]	From 0 to 14		X coordinate of the grid with the value -2
0x12	1	SaturationGridPos[2]	From 0 to 14		X coordinate of the grid with the value -1
0x13	1	SaturationGridPos[3]	From 0 to 14		X coordinate of the grid with the value 0
0x14	1	SaturationGridPos[4]	From 0 to 14		X coordinate of the grid with the value +1
0x15	1	SaturationGridPos[5]	From 0 to 14		X coordinate of the grid with the value +2
0x16	1	SaturationGridPos[6]	From 0 to 14		X coordinate of the grid with the value +3
0x17	1	DefaultLevel[0]	From 0 to 9	Quick adjustment value -2	Edge enhancement
0x18	1		From -3 to +3		Contrast
0x19	1		From -1 to +1		Brightness
0x1A	1		From -3 to +3		Saturation
0x1B	1		From -3 to +3		Hue
0x1C	1	DefaultLevel[1]	From 0 to 9	Quick adjustment value -1	Edge enhancement
0x1D	1		From -3 to +3		Contrast
0x1E	1		From -1 to +1		Brightness
0x1F	1		From -3 to +3		Saturation
0x20	1		From -3 to +3		Hue
0x21	1	DefaultLevel[2]	From 0 to 9	Quick adjustment value 0	Edge enhancement
0x22	1		From -3 to +3		Contrast
0x23	1		From -1 to +1		Brightness
0x24	1		From -3 to +3		Saturation
0x25	1		From -3 to +3		Hue
0x26	1	DefaultLevel[3]	From 0 to 9	Quick adjustment value 1	Edge enhancement
0x27	1		From -3 to +3		Contrast
0x28	1		From -1 to +1		Brightness
0x29	1		From -3 to +3		Saturation
0x2A	1		From -3 to +3		Hue

0x2B	1	DefaultLevel[4]	From 0 to 9	Quick adjustment value 2	Edge enhancement
0x2C	1		From -3 to +3		Contrast
0x2D	1		From -1 to +1		Brightness
0x2E	1		From -3 to +3		Saturation
0x2F	1		From -3 to +3		Hue

For the picture control for which the quick adjustment cannot be selected (that is, QuickCapa = 0), the default value is stored in DefaultLevel [0].

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Invalid_Parameter	The specified PicCtrlItem value is out of the range.
Parameter_Not_Supported	Parameter2 and Parameter3 are specified.
Incomplete_Transfer	The data block transmission fails.

5.2.34. StartLiveView

The operation by this OperationCode makes the camera enter the Live view status.

- OperationCode: 0x9201
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Device_Busy, Hardware_Error, Invalid_Status, MirrorUp_Sequence
- Response Parameter: None

If the camera receives this command in the camera mode, the camera changes the setting to the host mode, and returns to the camera mode when the Live view status is released.

This command is an activation-type command. The transition to the response phase is performed when the entry into the Live view status is started. However, if this command is received with the Bit0 value of the WarningStatus property (subsection 5.5.6.15) set to 1 [Sequence error], the sequence error is released, Hardware_Error is passed, and the command processing is terminated. If an error caused by the camera (battery empty, warning information) occurs, Invalid_Status is passed. When the SDRAM of the camera stores images with the recording destination SDRAM, Device_Busy is passed. Then, the command processing is terminated.

The host confirms that the response phase of this command is terminated normally, and then issues the DeviceReady command repeatedly to confirm whether the acquisition of the Live view image becomes enabled. The camera makes the Device_Busy response to the DeviceReady command until the acquisition of the Live view image becomes enabled, and makes the normal termination response to the DeviceReady command when the acquisition of the Live view image becomes enabled. If the acquisition of the Live view image cannot be enabled for some reason, however, the camera returns an error response to the DeviceReady command.

The host confirms that the response to the DeviceReady command is a normal termination, and then it can acquire the Live view image by issuing the GetLiveViewImage command.

The Live view status is released by the EndLiveView command. If the Live view status is released because of the camera (including the case that the time limit for the Live view has been reached), however, Not_LiveView is passed in the response phase such as the GetLiveViewImage command.

Because the release request by a command other than the InitiateCaptureRecInSdram command

(subsection 5.2.20) and the InitiateCaptureRecInMedia command (subsection 5.2.40)(the image acquisition release is specified in Parameter1) cannot be accepted after the camera enters upon the Live view status by this command, the InitiateCapture command (subsection 5.2.14) and the AfAndCaptureRecInSdram command (subsection 5.2.29) cannot be executed until the Live view status is released. In addition, because the host mode cannot be released during the Live view, the ChangeCameraMode command (subsection 5.2.22) cannot be executed.

The Live view prohibition condition is shown in the LiveViewProhibitionCondition property (subsection 5.5.13.3). When the prohibition condition is valid, the Live view cannot be started.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.
Device_Busy	When the command processing is started, the acquisition operation or the Live view is being performed.
Hardware_Error	When the command processing is started, some error is generated in the camera body.
Invalid_Status	An error caused by the camera (battery empty, warning information) occurs, or the shutter-release button is being fully pressed.
MirrorUp_Sequence	The cleaning mirror-up operation is being performed.

5.2.35. EndLiveView

The operation by this OperationCode releases the Live view status.

- OperationCode: 0x9202
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported
- Response Parameter: None

This command releases the Live view status.
The movie recording is also released at the same time as the Live view.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.

5.2.36. GetLiveViewImage

The operation by this OperationCode acquires the newest Live view image.
The format of the Live view image is JPEG.

- OperationCode: 0x9203
- Parameter1: None
- Parameter2: None
- Parameter3: None

- Data: LiveViewObject
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Not_LiveView
- Response Parameter: None

The camera sends the newest Live view image (LiveViewObject) to the host.
This command is valid when the camera is in the Live view status after getting the StartLiveView command. When the camera is not in the Live view status, the Not_LiveView response is made.

LiveViewObject is composed of the display information and the Live view image (JPEG).
The format of LiveViewObject is shown below.

Display information	Attached JPEG image size		Horizontal size	2 Byte	When the image is enlarged: 640x480 When the image is not enlarged: 640x480 or smaller
			Vertical size	2 Byte	
	Whole size		Horizontal size	2 Byte	Standard of the coordinates
			Vertical size	2 Byte	
	Display area size		Horizontal size	2 Byte	The whole size is equal to the display area size when the image is not enlarged.
			Vertical size	2 Byte	
	Display center coordinates		Horizontal position	2 Byte	
			Vertical position	2 Byte	
	AF frame size		Horizontal size	2 Byte	
			Vertical size	2 Byte	
	AF frame center coordinates (*1)		Horizontal position	2 Byte	
			Vertical position	2 Byte	
	Reserve			4 Byte	
	Selected focus area			1 Byte	From 0 to 39
	Rotation direction			1 Byte	0: No rotation 1: Rotate counterclockwise 2: Rotate clockwise
	Focus driving status			1 Byte	0: Not driving, 1: Driving
	Reserve			1 Byte	
	Reserve			4 Byte	
	Reserve			2 Byte	
	Countdown time			2 Byte	Countdown every one second starting from 3600 (one hour) ; countdown starting from thirty seconds with a rise in temperature
	Focusing judgement result			1 Byte	0: No information, 1: Not focused, 2: Focused
	AF driving enabled status			1 Byte	0: AF driving disabled, 1: AF driving enabled
	Reserve			2 Byte	
	Level angle information (*3)		Rolling	4 Byte	
			Pitching	4 Byte	
			Yawing	4 Byte	
	Remaining time of movie recording			4 Byte	From 0 to 1200000 [msec] * It is valid during the movie recording state.
	Movie recording information			1 Byte	0: During LV execution 1: During movie recording
	AF mode status of the face detection system			1 Byte	0: The face detection system is not set to AF. 1: The face detection system is set to AF.
	The number of persons whose faces are detected by the system			1 Byte	From 0 to 35 (Thirty-five is the maximum number of persons for D7000.)
	AF area index			1 Byte	From 0 to 34 (fixed to 0 for D7000)
	0 to 34	AF frame size	Horizontal size	2 Byte	Area of the AF frame size and the AF frame center coordinates for
			Vertical size	2 Byte	

		AF frame center coordinates	Horizontal position	2 Byte	thirty-five persons (4 Byte + 4 Byte) x 35 persons; 280 Byte in total
			Vertical position	2 Byte	
	Reserve			40 Byte	
Live view image	Image data				

*3: For the details of the level angle information, refer to the following properties:
AngleLevel property (subsection 5.5.6.16)
AngleLevelPitching property (subsection 5.5.6.17)
AngleLevelYawing property (subsection 5.5.6.18)

The size of the display information is 384Byte.
The maximum size of the Live view image is 900KByte.
The quality of the Live view image is "BASIC".

The details of the case in which the AF mode status of the face detection system is set to "1: The face detection system is set to AF" are shown below.

- Even if the number of persons whose faces are detected is zero, the AF mode status of the face detection system is set to "1: The face detection system is set to AF".
- The focusing judgement result is set to a value other than "0: No information" for one second when the camera is in focus.
- Because the AF frame size and the AF frame center coordinates for the face detection system are used, the values in the areas with (*1) in the table are not guaranteed. However, this condition is not applied to the case in which the number of persons whose faces are detected is zero because the setting is fixed to the center wide AF.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.
Incomplete_Transfer	The data block transmission fails.
Not_LiveView	The camera is not in the Live view status.

5.2.37. MfDrive

The operation by this OperationCode starts the MF driving in the Live view status.

- OperationCode: 0x9204
- Parameter1: DriveType
- Parameter2: StepValue
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Store_Not_Available, Invalid_Parameter, Invalid_Status, Not_LiveView, MfDrive_Step_End
- Response Parameter: None

This command is valid when the camera is in the Live view status after getting the StartLiveView command. When the camera is not in the Live view status, the Not_LiveView response is made.
The camera returns the Device_Busy response in the Live view status when the value of the

AfModeAtLiveView property (subsection 5.5.3.2.8) is [Constant AF servo].
The transition to the response phase is performed when the MF operation is terminated. When the MF operation is terminated, the MfDrive_Step_End response is made. If the MF driving cannot be performed due to a problem caused by the camera (an error caused by the camera, the CPU internal lens is not mounted, the lens cannot be used, etc.) or the value of the FocusMode property (subsection 5.5.1.7) is 0x0001 [MF], however, the Invalid_Status response is made. And when the value is 0x8013 [F], the Device_Busy response is made.

This command is an activation-type command. The transition to the response phase is performed when the MF driving is started.
The host confirms that the response phase is terminated normally, and then issues the DeviceReady command two or more times to confirm whether the operation is terminated. The camera makes the Device_Busy response to the DeviceReady command until the MF operation is terminated. The camera makes the normal termination response to the DeviceReady command when the MF operation is terminated. If the MF operation fails, the camera makes an error response to the DeviceReady command.

The camera performs the MF driving based on the contents of DriveType specified by Parameter1. The MF driving amount is based on the contents of StepValue specified by Parameter2. The MF driving operates according to the current position.

The contents of DriveType (AF driving direction) are shown below.

DriveType	Contents (AF driving direction)
0x00000001	No limit -> Closest
0x00000002	Closest -> No limit

The driving amount (the number of pulses) is set in StepValue. The setting range is from 1 to 32767.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 and Parameter2 are not specified, or Parameter3 is specified.
Invalid_Parameter	The specified value of DriveType or StepValue is out of the range.
Invalid_Status	The MF driving cannot be performed due to a problem caused by the camera (an error caused by the camera, the CPU internal lens is not mounted, the lens cannot be used, etc.), or the focus mode is MF.
Not_LiveView	The camera is not in the Live view status.
Device_Busy	The AF operation is being performed in the camera.

5.2.38. ChangeAfArea

The operation by this OperationCode changes the AF area in the Live view status.

- OperationCode: 0x9205
- Parameter1: XValue
- Parameter2: YValue
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Device_Busy, Invalid_Parameter, Invalid_Status, Not_LiveView
- Response Parameter: None

This command is valid when the camera is in the Live view status after getting the StartLiveView command. When the camera is not in the Live view status, the Not_LiveView response is made. If the AF operation is being performed, the Device_Busy response is made.

The camera specifies the AF area with the coordinates specified by Parameter1 and Parameter2 set to the center. XValue of Parameter1 and YValue of Parameter2 are used to set the X-axis and the Y-axis, respectively.
The range of XValue and YValue should be the "Whole size" of the header information acquired by the GetLiveViewImage command. However, the range that can be specified should be smaller by the half size of the "AF frame size". When a value that exceeds the setting permitted range is set, the maximum or the minimum value is reflected.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are specified.
Device_Busy	The AF operation is being performed.
Not_LiveView	The camera is not in the Live view status.

5.2.39. AfDriveCancel

The operation by this OperationCode cancels the AF driving.

- OperationCode: 0x9206
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported
- Response Parameter: None

The camera cancels the AF driving in operation.
The transition to the response phase is performed when the cancellation of the AF driving is completed.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.

5.2.40. InitiateCaptureRecInMedia

The operation by this OperationCode makes the camera start the acquisition of one or more new objects (release operation of the camera) according to the current setting. The acquired object (image data) is saved in the specified location.

- OperationCode: 0x9207
- Parameter1: CaptureSort
- Parameter2: SaveMedia

- Parameter3: None
- Data: None
- Data direction: -
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Invalid_Parameter, Device_Busy, Hardware_Error, Out_of_Focus, Invalid_Status, Dust_Reference_Error, Shutter_Speed_Bulb, MirrorUp_Sequence, CameraMode_Not_Adjust_Fnumber, Store_Full, Store_Not_Available, Store_Error, Store_Unformatted, Store_Read_Only
- Response Parameter: None
- EventCode: ObjectAdded, ObjectAddedInSdram, StoreFull, CaptureComplete, CaptureCompleteRecInSdram

If the camera is not set to the host mode when receiving this command, the camera changes the setting to the host mode, and returns to the camera mode when the release operation is completed.
This command is an activation-type command. The transition to the response phase is performed when the start of the AF operation is completed if the AF operation is performed, and when the start of the release operation is completed if the AF operation is not performed.
The camera starts the acquisition of one or more new objects (release operation of the camera) according to the current setting. Whether the AF operation is performed or not depends on the value of CaptureSort (described later) in Parameter1 and the focus mode setting. When the Live view is executed, it also depends on the Live view mode.
However, if this command is received with the Bit0 value of the WarningStatus property (subsection 5.5.6.15) set to 1 [Sequence error], the sequence error is released, Hardware_Error is passed in the response phase, and the command is terminated.

When the release operation is started, one or more new objects are created. The location where the new objects are created depends on the value of SaveMedia in Parameter2. When the new objects are recorded in the specified location, the camera generates the asynchronous interrupt event to inform the host of the addition of the new objects. The generated event differs according to the recording location. The new object addition event includes the ObjectHandle indicating the created new objects. If two or more new objects are created, the new object addition event should be issued two or more times. When all the new objects that can be acquired are recorded in the specified location completely, the camera issues the shooting completion event to inform the host that the acquisition of all the new objects has been completed. Moreover, the shooting completion event differs according to the recording location. The correspondence between the recording location and each event is shown below.

Recording location	New object addition event	Shooting completion event
Card	ObjectAdded	CaptureComplete
SDRAM	ObjectAddedInSdram	CaptureCompleteInSdram
Card and SDRAM	ObjectAdded and ObjectAddedInSdram	CaptureComplete and CaptureCompleteInSdram

When the recording location is set to [Card and SDRAM], a new object addition event and a shooting completion event are issued separately for the card and the SDRAM. However, the order of issuing the ObjectAdded event and the ObjectAddedInSdram event is not decided and the events are issued in order of completing image recording. The CaptureComplete event and the CaptureCompleteInSdram event are issued in the same way; the event of the recording location in which acquisition of all the new objects is completed first, is issued first.

The number of images that can be captured continuously by the continuous low-speed shot and the continuous high-speed shot is the least number among the setting values of the BurstNumber property (Card/SDRAM/Card and SDRAM, subsection 5.5.1.16), the ExposureRemaining property (Card/Card and SDRAM, subsection 5.5.6.4), the BurstMaxNumber property (Card/SDRAM/Card and SDRAM, subsection 5.5.3.5.8), and the RemainingExposure property (SDRAM/Card and SDRAM,

subsection 5.5.6.5). When the Slot2ImageSaveMode property (subsection 5.5.2.2) is [Sequential recording] and the ActiveSlot property (subsection 5.5.6.3) is [Slot 1], even if Slot 1 becomes full while the continuous shot is being performed, the images are recorded in Slot 2 in succession.

When the value of the StillCaptureMode property (subsection 5.5.1.15) is set to "Self-timer" or "Mirror-up", the camera changes the value of the StillCaptureMode property (subsection 5.5.1.15) to "Single frame" temporarily for shooting.

StillCaptureMode	BurstNumber	Description
0x0001 (Single shot)	Invalid	Only one image can be captured.
0x0002 (Continuous high-speed shot) or 0x8010 (Continuous low-speed shot)	Valid	Among the BurstNumber setting value, the number of images that can be recorded in the SDRAM that is calculated in the camera, and the number of remaining images for recording while the bracketing is being performed, until the least number is reached, the acquisition of the new objects can be performed. Only one image can be captured with the internal flash enabled.
0x8011 (Self-timer) 0x8012 (Mirror-up)	Invalid	Only one image can be captured (operation equivalent to the single frame).
0x8016 (Quiet shooting)	Invalid	Only one image can be captured (mirror-down after release is performed by the camera automatically).

The type of this command (image acquisition release, preset measurement release, or dust reference image release) is distinguished by the CaptureSort value of Parameter1.

CaptureSort	Operation	Description
0xFFFFFFFE	Image acquisition release after AF driving	The AF driving is started and then the release operation of the camera is performed.
0xFFFFFFFF	Image acquisition release	Normal release operation
0x00000000	Preset measurement release	Stores the acquired preset gain in the preset data d0 area.
0x00000001	Preset measurement release	Stores the acquired preset gain in the preset data d0 area and then copies it to d1 area.
0x00000002	Preset measurement release	Stores the acquired preset gain in the preset data d0 area and then copies it to d2 area.
0x00000003	Preset measurement release	Stores the acquired preset gain in the preset data d0 area and then copies it to d3 area.
0x00000004	Preset measurement release	Stores the acquired preset gain in the preset data d0 area and then copies it to d4 area.
0x00000010	Dust reference image release	Dust reference image release operation

When CaptureSort is the image acquisition release, the AF operation is not performed during the Live view.

Focus mode	Priority in AF-C/AF-S mode	AF operation
Manual focus	-	Not performed
Single AF servo	Release	Performed
	Focus	Performed
Continuous AF servo	Release	Performed
	Focus	First image: Performed Second image and after: Operation equivalent to the release (shooting priority)

The AF operation is always performed when CaptureSort is the image acquisition release after AF driving. Other than in the case of focus priority, the release operation is always started independent of the status after AF driving. In the case of focus priority and the non-focused status, the Out_of_Focus response is made and the processing is terminated without starting the release operation.

Focus mode	Focused/Not focused	Release
Manual focus	-	The release operation is performed.
Single AF servo	Focused	The release operation is performed.
	Not focused (release priority)	The release operation is performed.

	Not focused (focus priority)	The release operation is not performed.
Continuous AF servo	Focused	The release operation is performed.
	Not focused (release priority)	The release operation is performed.
	Not focused (focus priority)	The release operation is not performed.

The recording location of the captured images is specified by the value of SaveMedia in Parameter2. However, it should be ignored when CaptureSort is the preset measurement release.

SaveMedia	Recording location
0x0000	Card
0x0001	SDRAM
0x0002	Card and SDRAM

When the response phase for this command is terminated normally, the host issues the DeviceReady command two or more times to confirm the completion of the shooting operation. The camera returns the response of the normal termination to the DeviceReady command when the AF operation is completed. However, if the AF operation fails, the camera returns the error response to the DeviceReady command and the release operation is not performed.

When the dust reference image release is requested, the camera performs the dust reference image release and moves to the response phase. When the dust reference image release fails, the camera returns the error response to the DeviceReady command. When the shooting succeeds, the operation similar to the image acquisition release is performed hereafter.

For the shooting during the Live view, only the image acquisition release can be performed. If the image acquisition release after AF driving, the preset measurement release, or the dust reference image release is specified, the Invalid_Status response is made.

The contents of the ResponseCode are shown below.
When SaveMedia is set to [Card and SDRAM], the Store_Full response is made if the card or the SDRAM is out of capacity, and the Store_Not_Available response is made if the card is not inserted. Shooting is not performed in either case.
When SaveMedia is set to [Card] or [Card and SDRAM], the Store_Error response and the Store_Unformatted response are made if the inserted card causes a CHA error (damaged card) and the card is not formatted, respectively. Shooting is not performed in either case.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are specified.
Invalid_Parameter	The specified CaptureSort is out of the setting range.
Device_Busy	When the command processing is started, the acquisition operation is being performed.
Hardware_Error	When the command processing is started, some error is generated in the camera body.
Out_of_Focus	The AF operation is not focused with the AF operation mode of AF-S (focus priority) or AF-C (focus priority).
Invalid_Status	The shutter-release button is being fully pressed.
Dust_Reference_Error	The CPU internal lens is not mounted during the dust reference image release, or the dust reference image release fails.
Shutter_Speed_Bulb	The shutter speed is set to Bulb.
MirrorUp_Sequence	The mirror-up shooting is being performed.
CameraMode_Not_Adjust_Fnumber	The aperture value is “F--” and the shooting mode is a mode other than the M mode.
Store_Full	There is no free area for recording in the card or the SDRAM. The same operation is performed when SaveMedia is [Card and SDRAM].
Store_Not_Available	The card is being initialized, the card does not exist, or the battery level is “Operation disabled status”.

	The same operation is performed when SaveMedia is [Card and SDRAM].
Store_Error	SaveMedia is [Card] or [Card and SDRAM] and a CHA error occurs in the camera.
Store_Unformatted	SaveMedia is [Card] or [Card and SDRAM] and the card is not formatted.
Store_Read_Only	The card that is ready for recording is protected.

The contents of the EventCode are shown below.

EventCode	Description
ObjectAdded	A new object is recorded in the card.
StoreFull	There is no free area for recording in the card after shooting.
CaptureComplete	The acquisition operation of all the new objects is completed.
ObjectAddedInSdram	A new object is recorded in the SDRAM.
CaptureCompleteRecInSdram	All the images captured by this command are sent from the SDRAM to the host completely.

5.2.41. StartMovieRecInCard

The operation by this OperationCode starts movie recording in the card.

- OperationCode: 0x920A
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: None
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer
- Response Parameter: None

This command is accepted only during Live view execution. It is recommended to check the movie recording prohibition condition property (MovieRecProhibitionCondition (subsection 5.5.6.21)) before issuing this command. If the movie recording cannot be started, an error response is made.
The DevicePropertyCodes that can be set during movie recording are described in subsection 10.8.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.
Incomplete_Transfer	The data block transmission fails.
Invalid_Status	The movie recording cannot be started due to an error caused by the camera.
Not_LiveView	The camera is not in the Live view status.

5.2.42. EndMovieRec

The operation by this OperationCode finishes movie recording in the card.

- OperationCode: 0x920B
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: None
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer

- Response Parameter: None

If the InitiateCaptureRecInMedia command or the EndLiveView command is issued instead of this command during movie recording, the movie recording is finished along with the Live view completion. In this case, there is no need to issue this command. Because an error occurs if a mode other than the image acquisition release is specified by the InitiateCaptureRecInMedia command, however, the movie recording is not finished.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.
Incomplete_Transfer	The data block transmission fails.

5.2.43. GetVendorStorageIDs

The operation by this OperationCode returns a list of the currently valid StorageIDs.
The camera returns two StorageIDs to get two valid logical storage devices. For the application mode, the StorageID with the card not inserted can be acquired by GetStorageIDs. Therefore the valid StorageID can be known by using this operation.

- OperationCode: 0x9209
- Parameter1: None
- Parameter2: None
- Parameter3: None
- Data: StorageIDArray
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Paramerer_Not_Supported, Incomplete_Transfer
- Response Parameter: None

The camera returns the StorageIDs of the main slot and the subslot.

The StorageID of the main slot takes the following values.
- 0x00010001: When the card is inserted in the main slot
- 0x00010000: When the card is not inserted in the main slot
  When the card in the main slot is being formatted
  When the battery level of the camera is “Operation disabled status”.

The StorageID of the subslot takes the following values.
- 0x00020001: When the card is inserted in the subslot
- 0x00020000: When the card is not inserted in the subslot
  When the card in the subslot is being formatted
  When the battery level of the camera is “Operation disabled status”.

The format of the StorageIDArray that is sent by the camera is shown below.
Each field data is stored in the little endian format.

Field	Size (Byte)	Data
NumElement	4	0x00000002 (Two elements for the array)
ArrayEntry1	4	StorageID (main slot)
ArrayEntry2	4	StorageID (subslot)

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Any of Parameter1 to Parameter3 is specified.
Incomplete_Transfer	The data block transmission fails.

5.2.44. GetObjectPropsSupported

The operation by this OperationCode acquires an array of codes of the object property supported by the camera.

- OperationCode: 0x9801
- Parameter1: ObjectFormatCode
- Parameter2: None
- Parameter3: None
- Data: ObjectPropCodeArray
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Invalid_ObjectFormatCode
- Response Parameter: None

The camera sends the Array of the property corresponding to ObjectFormatCode specified by Parameter1.

The format of ObjectPropCodeArray sent by the camera is shown below.
Each field data is stored in the little endian format.
For the supported ObjectPropCode, refer to subsection 5.6.

Field	Size (Byte)	Data
NumElement	4	The element of the array is N (N indicates the number of objects).
ArrayEntry [0]	2	ObjectPropCode [0]
ArrayEntry [1]	2	ObjectPropCode [1]
ArrayEntry [2]	2	ObjectPropCode [2]

ArrayEntry [N-1]	2	ObjectPropCode [N-1]

The camera supports the following ObjectFormatCode only. When an ObjectFormatCode that is not supported is specified, an Invalid_ObjectFormatCode response is made and the command is terminated.

PropertyValue	ObjectFormat
0x3000	Undefined
0x3001	Association
0x3006	DPOF
0x300D	MOV Apple QuickTime Video Format (H.264/AVC)
0x3800	Unknown Image Object
0x3801	EXIF/JPEG

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 is not specified, or Parameter2 and Parameter3 are

	specified.
Incomplete_Transfer	The data block transmission fails.
Invalid_ObjectFormatCode	The specified ObjectFormatCode is not supported.

5.2.45. GetObjectPropDesc

The operation by this OperationCode returns the ObjectPropDesc data set corresponding to the specified ObjectPropCode and ObjectFormatCode.

- OperationCode: 0x9802
- Parameter1: ObjectPropCode
- Parameter2: ObjectFormatCode
- Parameter3: None
- Data: ObjectPropDesc data set
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Invalid_ObjectPropCode, Invalid_ObjectFormatCode
- Response Parameter: None

For the supported ObjectPropCodes, refer to subsection 5.6.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 and Parameter2 are not specified, or Parameter3 is specified.
Incomplete_Transfer	The data block transmission fails.
Invalid_ObjectPropCode	The specified ObjectPropCode is not supported.
Invalid_ObjectFormatCode	The specified ObjectFormatCode is not supported.

5.2.46. GetObjectPropValue

The operation by this OperationCode returns the current value corresponding to the specified ObjectPropCode.

- OperationCode: 0x9803
- Parameter1: ObjectHandle
- Parameter2: ObjectPropCode
- Parameter3: None
- Data: ObjectPropValue
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Invalid_Object_Handle, Invalid_ObjectPropCode
- Response Parameter: None

The camera sends the object property information specified by Parameter2 to the object corresponding to the ObjectHandle specified by Parameter1.
For the supported ObjectPropCode and the details of ObjectPropValue, refer to subsection 5.6.

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.

Parameter_Not_Supported	Parameter1 and Parameter2 are not specified, or Parameter3 is specified.
Incomplete_Transfer	The data block transmission fails.
Invalid_Object_Handle	An object corresponding to the specified ObjectHandle does not exist, or it indicates an object in the SDRAM.
Invalid_ObjectPropCode	The specified ObjectPropCode is not supported.

5.2.47. GetObjectPropList

The operation by this OperationCode returns the data set with all the object properties that are specified by the query defined by the five parameters.

- OperationCode: 0x9805
- Parameter1: ObjectHandle
- Parameter2: [ObjectFormatCode]
- Parameter3: ObjectPropCode
- Parameter4: [ObjectPropGroupCode]
- Parameter5: [Depth]
- Data: ObjectPropList data set
- Data direction: From camera to host
- ResponseCode: OK, Session_Not_Open, Invalid_TransactionID, Parameter_Not_Supported, Incomplete_Transfer, Invalid_Object_Handle, Store_Not_Available, Invalid_ObjectPropCode, Specification_By_Format_Unsupported
- Response Parameter: None

The camera returns the ObjectPropList data set for the object corresponding to the ObjectHandle specified by Parameter1 and the ObjectPropCode (object property) specified by Parameter3. The target can be identified by specifying the optional Parameter2, Parameter4, and Parameter5.

When 0xFFFFFFFF is specified in Parameter1, all the objects should be the targets, and when 0x00000000 is specified, the objects directly under the root should be the targets.

When the optional Parameter2 is specified, the object with a specific format should be the target.

When 0xFFFFFFFF is specified in Parameter3, all the objects without the group code of 0xFFFFFFFF should be the targets, and when 0x00000000 is specified, all the objects with the group code specified by the optional Parameter4 should be the targets.

When the optional Parameter5 is specified, all the objects from the object specified by Parameter1 to the depth specified by Parameter5 should be the targets.

When 0x00000000 is specified in Parameter5, only the object specified by Parameter1 should be the target. If both Parameter1 and Parameter5 are not specified (0x00000000), however, the camera returns an empty ObjectPropList data set.

When 0xFFFFFFFF is specified in Parameter5, all the objects included in the folder hierarchy of the object specified by Parameter1 should be the targets. If an object of the file is specified in Parameter1, however, only the object specified by Parameter1 should be the target.

For the supported ObjectPropCode and the details of ObjectPropValue, refer to subsection 5.6.

The format of ObjectPropList sent by the camera is shown below.

Field name	Field order	Size (Byte)	Datatype	Description
NumberOfElements	1	4	UINT32	Four times the number of properties (Nx4)
Element1ObjectHandle	2	4	ObjectHandle	ObjectHandle of the object to which Property 1 is applied
Element1PropertyCode	3	2	Datacode	Datacode that specifies the ObjectPropDesc describing Property 1
Element1Datatype	4	2	Datacode	Specifies DatatypeCode of Property 1.
Element1Value	5	DTS	DTS	Value of Property 1
Element2ObjectHandle	6	4	ObjectHandle	ObjectHandle of the object to which Property 2 is applied
Element2PropertyCode	7	2	Datacode	Datacode that specifies the ObjectPropDesc describing Property 2
Element2Datatype	8	2	Datacode	Specifies DatatypeCode of Property 2.

Element2Value	9	DTS	DTS	Value of Property 2

ElementNValue	N x 4 + 1	DTS	ObjectHandle	Value of Property N

The contents of the ResponseCode are shown below.

ResponseCode	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Parameter_Not_Supported	Parameter1 and Parameter3 are not specified.
Incomplete_Transfer	The data block transmission fails.
Invalid_Object_Handle	An object corresponding to the specified ObjectHandle does not exist, or it indicates an object in the SDRAM.
Store_Not_Available	The card is being initialized, the card does not exist, or the battery level is “Operation disabled status”.
Invalid_ObjectPropCode	The specified ObjectPropCode is not supported.
Specification_By_Format_Unsupported	The specified ObjectFormatCode is not supported.

5.3. Response Code

The camera returns the response for the processing in the response phase to the command sent from the host to the camera in the command phase. The ResponseCode shows the contents of the response. The relationship between the ResponseCode and the OperationCode sent in the command phase is as shown in subsection 5.2.

The ResponseCodes supported by the camera are shown below.

ResponseCode	ResponseName	Reference item
0x2001	OK	5.3.1
0x2002	General_Error	5.3.2
0x2003	Session_Not_Open	5.3.3
0x2004	Invalid_TransactionID	5.3.4
0x2005	Operation_Not_Supported	5.3.5
0x2006	Parameter_Not_Supported	5.3.6
0x2007	Incomplete_Transfer	5.3.7
0x2008	Invalid_StorageID	5.3.8
0x2009	Invalid_Object_Handle	5.3.9
0x200A	DeviceProp_Not_Supported	5.3.10
0x200B	Invalid_ObjectFormatCode	5.3.11
0x200C	Store_Full	5.3.12
0x200D	Object_Write_Protect	5.3.13
0x200E	Store_Read_Only	5.3.14
0x200F	Access_Denied	5.3.15
0x2010	No_Thumbnail_Present	5.3.16
0x2012	Partial_Deletion	5.3.17
0x2013	Store_Not_Available	5.3.18
0x2014	Specification_By_Format_Unsupported	5.3.19
0x2015	No_Valid_ObjectInfo	5.3.20
0x2019	Device_Busy	5.3.21
0x201A	Invalid_Parent_Object	5.3.22
0x201B	Invalid_DeviceProp_Format	5.3.23
0x201C	Invalid_DeviceProp_Value	5.3.24
0x201D	Invalid_Parameter	5.3.25
0x201E	Session_Already_Open	5.3.26
0x2020	Specification_of_Destination_Unsupported	5.3.27
0xA001	Hardware_Error	5.3.28
0xA002	Out_of_Focus	5.3.29
0xA003	Change_CameraMode_Failed	5.3.30
0xA004	Invalid_Status	5.3.31
0xA005	Set_Property_Not_Support	5.3.32
0xA006	Wb_Preset_Error	5.3.33
0xA007	Dust_Reference_Error	5.3.34
0xA008	Shutter_Speed_Bulb	5.3.35
0xA009	MirrorUp_Sequence	5.3.36
0xA00A	CameraMode_Not_Adjust_Fnumber	5.3.37
0xA00B	Not_LiveView	5.3.38
0xA00C	MfDrive_Step_End	5.3.39
0xA00E	MfDrive_Step_ Insufficiency	5.3.40
0xA021	Store_Error	5.3.41
0xA022	Store_Unformatted	5.3.42
0xA801	Invalid_ObjectPropCode	5.3.43
0xA802	Invalid_ObjectProp_Format	5.3.44

5.3.1. OK

- ResponseCode : 0x2001

Indicates that the processing has been terminated normally.

5.3.2. General_Error

- ResponseCode : 0x2002

Indicates that the processing cannot be terminated normally for some reason.

5.3.3. Session_Not_Open

- ResponseCode : 0x2003

Indicates that the session is not started.

5.3.4. Invalid_TransactionID

- ResponseCode : 0x2004

Indicates that the TransactionID retained by the camera differs from the TransactionID specified by the host.

5.3.5. Operation_Not_Supported

- ResponseCode : 0x2005

Indicates that an OperationCode that is not passed by the DeviceInfo data set is specified.

5.3.6. Parameter_Not_Supported

- ResponseCode : 0x2006

Indicates that the specification of a parameter is inappropriate for the requested operation.

5.3.7. Incomplete_Transfer

- ResponseCode : 0x2007

Indicates that the transmission/reception of the data block fails.
When the file access fails in the camera body, the camera may return this response.

5.3.8. Invalid_StorageID

- ResponseCode : 0x2008

Indicates that a StorageID that differs from the StorageID sent by the camera is specified.

5.3.9. Invalid_Object_Handle

- ResponseCode : 0x2009

Indicates that an invalid object handle is specified or the target object does not exist.

5.3.10. DeviceProp_Not_Supported

- ResponseCode : 0x200A

Indicates that a DevicePropCode that is not passed by the DeviceInfo data set is specified.

5.3.11. Invalid_ObjectFormatCode

- ResponseCode : 0x200B

Indicates that the specified ObjectFormatCode is not supported.
It is also used to indicate that the contents specified in the ObjectCompressedSize field of ObjectInfo are not supported with the SendObjectInfo command.

5.3.12. Store_Full

- ResponseCode : 0x200C

Indicates that the object cannot be received with the size of the buffer prepared by the camera with the SendObjectInfo command.

5.3.13. Object_Write_Protect

- ResponseCode : 0x200D

Indicates that the target object is protected.

5.3.14. Store_Read_Only

- ResponseCode : 0x200E

Indicates that a StorageID of the card is specified with the SendObjectInfo command.
The camera does not support the writing to the card from the host.

5.3.15. Access_Denied

- ResponseCode : 0x200F

Indicates that the operation is denied because of the camera status.
This means that the operation will be denied unless the camera status is changed.
It is not an event that means the busy status.

5.3.16. No_Thumbnail_Present

- ResponseCode : 0x2010

Indicates that the target object does not have a thumbnail.

5.3.17. Partial_Deletion

- ResponseCode : 0x2012

Indicates that although the deletion of two or more objects is commanded, only a part of those are deleted.
It may occur when a part of the target objects are protected.

5.3.18. Store_Not_Available

- ResponseCode : 0x2013

Indicates that the card cannot be accessed because the card is being initialized, the card does not exist, or the battery level is “Operation disabled status”.

5.3.19. Specification_By_Format_Unsupported

- ResponseCode : 0x2014

Indicates that the specified ObjectFormatCode is not supported.

5.3.20. No_Valid_ObjectInfo

- ResponseCode : 0x2015

Indicates that this command is received with the SendObject command before the SendObjectInfo command is accepted.

5.3.21. Device_Busy

- ResponseCode : 0x2019

Indicates that the camera is in the busy status.

5.3.22. Invalid_Parent_Object

- ResponseCode : 0x201A

Indicates that an ObjectHandle other than that indicating a directory is specified, or the specified directory does not exist.

5.3.23. Invalid_DeviceProp_Format

- ResponseCode : 0x201B

Indicates that the size or the format of the DevicePropDesc data set is inappropriate.

5.3.24. Invalid_DeviceProp_Value

- ResponseCode : 0x201C

Indicates that the specified DevicePropValue is out of the permitted range.

5.3.25. Invalid_Parameter

- ResponseCode : 0x201D

Indicates that the specified parameter is out of the specifications.

5.3.26. Session_Already_Open

- ResponseCode : 0x201E

Indicates that the OpenSession operation is specified with a session already started.
The camera supports only one session.

5.3.27. Specification_of_Destination_Unsupported

- ResponseCode : 0x2020

Indicates that the recording destination specified by the SendObjectInfo command is not supported.

5.3.28. Hardware_Error

- ResponseCode : 0xA001

Indicates that any error that prevents the camera from operating has occurred in the camera body.

5.3.29. Out_of_Focus

- ResponseCode : 0xA002

Indicates that the AF operation is terminated with the non-focused status.

5.3.30. Change_Cameramode_Failed

- ResponseCode : 0xA003

Indicates that the switching between the camera mode and the host mode is failed.

5.3.31. Invalid_Status

- ResponseCode: 0xA004

Indicates that the operation is invalid depending on the status of the camera.

5.3.32. Set_Property_Not_Support

- ResponseCode : 0xA005

Indicates that the specified DevicePropCode is not permitted for setting.

5.3.33. Wb_Preset_Error

- ResponseCode : 0xA006

Indicates that the preset measurement release failed.

5.3.34. Dust_Reference_Error

- ResponseCode : 0xA007

Indicates that the dust reference image release failed.

5.3.35. Shutter_Speed_Bulb

- ResponseCode : 0xA008

Indicates that the shutter speed is Bulb.

5.3.36. MirrorUp_Sequence

- ResponseCode : 0xA009

Indicates that the cleaning mirror-up operation is being performed.

5.3.37. CameraMode_Not_Adjust_Fnumber

- ResponseCode : 0xA00A

Indicates that the shooting mode is set to a mode other than M mode with the aperture value set to "F--".

5.3.38. Not_LiveView

- ResponseCode : 0xA00B

Indicates that the camera is not in the Live view status.

5.3.39. MfDrive_Step_End

- ResponseCode : 0xA00C

Indicates that the MF driving reaches the termination.

5.3.40. MfDrive_Step_Insufficiency

- ResponseCode : 0xA00E

Indicates that the driving amount is insufficient.

5.3.41. Store_Error

- ResponseCode : 0xA021

Indicates that a card in which a CHA error occurred (damaged card) is included in the inserted cards.

5.3.42. Store_Unformatted

- ResponseCode : 0xA022

Indicates that an unformatted card is included in the inserted cards.

5.3.43. Invalid_ObjectPropCode

- ResponseCode : 0xA801

Indicates that the specified ObjectPropCode is not supported.

5.3.44. Invalid_ObjectProp_Format

- ResponseCode : 0xA802

Indicates that the size or the type of the specified ObjectProp is not supported.

5.4. Event Code

The EventCodes are used when an event is passed asynchronously from the camera to the host.

The EventCodes supported by the camera are shown below.

EventCode	EventName	Reference item
0x4001	CancelTransaction	5.4.1
0x4002	ObjectAdded	5.4.2
0x4003	ObjectRemoved	5.4.3
0x4004	StoreAdded	5.4.4
0x4005	StoreRemoved	5.4.5
0x4006	DevicePropChanged	5.4.6
0x4007	ObjectInfoChanged	5.4.7
0x4008	DeviceInfoChanged	5.4.8
0x4009	RequestObjectTransfer	5.4.9
0x400A	StoreFull	5.4.10
0x400C	StorageInfoChanged	5.4.11
0x400D	CaptureComplete	5.4.12
0xC101	ObjectAddedInSdram	5.4.13
0xC102	CaptureCompleteRecInSdram	5.4.14

For the following EventCodes, however, the events are passed only when the EventCode is acquired by the GetEvent command from the host and the asynchronous event passing by the Interrupt transfer is not performed.

EventCode	EventName	Reference item
0x4006	DevicePropChanged	5.4.6
0xC101	ObjectAddedInSdram	5.4.13
0xC102	CaptureCompleteRecInSdram	5.4.14

When the camera is in the application mode, for all EventCodes, the EventCode passing is performed only when the GetEvent command is issued by the host and the asynchronous event passing by the Interrupt transfer is not performed.

5.4.1. CancelTransaction

- EventCode : 0x4001
- EventParameter : None

It is used to inform the host that the processing is canceled. However, it is not used in the camera.

5.4.2. ObjectAdded

- EventCode : 0x4002
- EventParameter : ObjectHandle

It is used to inform the host that a new object is added to the card.

5.4.3. ObjectRemoved

- EventCode : 0x4003
- EventParameter : ObjectHandle

It is used to inform the host that a specific object in the card is deleted.

5.4.4. StoreAdded

- EventCode : 0x4004
- EventParameter : StorageID

It is used to inform the host that the card is inserted in the slot in which the card has not been inserted yet.
The StorageID corresponding to the slot in which the card is inserted is passed as an EventParameter.

5.4.5. StoreRemoved

- EventCode : 0x4005
- EventParameter : StorageID

It is used to inform the host that the card is ejected from the slot in which the card has been inserted.
The StorageID corresponding to the slot in which the card has been inserted is passed as an EventParameter.
It is also used when the card is formatted to inform the host that the card information is invalid. When the formatting is completed, StoreRemoved is used to inform the host that the card information is valid.

5.4.6. DevicePropChanged

- EventCode : 0x4006
- EventParameter : PropertyCode

It is used to inform the host that the setting value of the camera is changed.
The setting value to be passed is that of DevicePropCode defined in subsection 5.5.
However, if the setting value of the camera is changed by the SetDevicePropValue command from the host, this event is not passed.
The asynchronous event passing is not performed for this event and it can be acquired by the GetEvent command only.

5.4.7. ObjectInfoChanged

- EventCode : 0x4007
- EventParameter : ObjectHandle

It is used to inform the host that the ObjectInfo data set corresponding to a specific object in the card has been changed.

5.4.8. DeviceInfoChanged

- EventCode : 0x4008
- EventParameter : None

It is used to inform the host that the device function is changed.

5.4.9. RequestObjectTransfer

- EventCode : 0x4009
- EventParameter : ObjectHandle

It is used to request the GetObject operation for the ObjectHandle specified by the parameter.

5.4.10. StoreFull

- EventCode : 0x400A
- EventParameter : StorageID

It is used to inform the host that the card corresponding to the StorageID becomes full.
This event is passed only when the card becomes full by operating the shutter-release button of the camera.

5.4.11. StorageInfoChanged

- EventCode : 0x400C
- EventParameter : StorageID

It is used to inform the host that the free area in the card corresponding to the StorageID is changed.
This event is passed when the free area in the card is changed by operating the shutter-release button of the camera, or the setting value of the image quality mode is changed.
When a new object is added by using the shutter-release button of the camera, this event is issued after the release operation is completed. For the continuous shot operation, this event is not issued every time a new object is added.

5.4.12. CaptureComplete

- EventCode : 0x400D
- EventParameter : TransactionID

It is used to inform the host that the release operation started by the InitiateCapture command or the InitiateCaptureRecInMedia command is completed.

5.4.13. ObjectAddedInSdram

- EventCode : 0xC101
- EventParameter : ObjectHandle

It is used to inform the host that a new object is added to the SDRAM (transmission of the image data to the host becomes enabled).
The ObjectHandle of the new object is passed as an EventParameter.
If the USB cutting occurs with the image data of the recording destination SDRAM saved in the SDRAM and then it is reconnected, the event is passed again.
The asynchronous event passing is not performed for this event and it can be acquired by the GetEvent command only.

5.4.14. CaptureCompleteRecInSdram

- EventCode : 0xC102
- EventParameter : None

It is used to inform the host that all the image data acquired by the release operation started by the InitiateCaptureRecInSdram, the AfAndCaptureRecInSdram, or the InitiateCaptureRecInMedia command is sent to the host completely.
The asynchronous event passing is not performed for this event and it can be acquired by the GetEvent command only.

5.4.15. ObsoleteEvent

- EventCode : 0xC104
- EventParameter : ObjectHandle

This event is passed when the recording destination of the captured image data is the SDRAM.
No action is necessary when this event is passed.
This event is scheduled to be disused in the future model.
The asynchronous event passing is not performed for this event and it can be acquired by the GetEvent command only.

5.5. DevicePropCode

The camera has an attribute that can be changed as an option. The change is made by operating the device property. The property shows the device characteristics. Each property has a corresponding DevicePropCode.

When the setting value of each defined property is changed, the camera must send the DevicePropChanged event including the DevicePropCode in order to inform the host of the change. The camera sends the event as shown below.

- The camera checks all the values of DeviceProperties at regular intervals (every second) and sends the DevicePropChanged event in order to inform the host of the change when any of the values of the DeviceProperties are changed from those of the previous check. If two or more DeviceProperties are changed, the camera sends the DevicePropChanged event for all the DeviceProperties in succession.

- When the setting value of the DeviceProperty is changed by the SetDevicePropValue command, the DevicePropChanged event including the changed DevicePropCode need not be sent. However, if any other DeviceProperty is changed under the influence of the change of the DevicePropCode, the camera needs to send the DevicePropChanged event for the property immediately. For example, if the aperture value is changed by the SetDevicePropValue command when shooting is performed in the A mode (aperture priority), the camera changes the shutter speed automatically. In this case, the camera must send the DevicePropChanged event for the shutter speed.

The error response is made to GetDevicePropDesc, GetDevicePropValue, and SetDevicePropValue as shown below.

- When either or both of getting/setting is invalid depending on the setting status of the camera for each property, the response of the ResponseCode corresponding to the invalid status is made.

- When setting is performed for the property that supports getting only, the Set_Property_Not_Support error response is made.

Sometimes another event needs to be issued after the DevicePropChanged event depending on the type of the PropertyCode. It is described in the explanation for each PropertyCode.

The DevicePropertyCodes that can be set during movie recording are described in subsection 10.8.

The DevicePropCodes supported by the camera are shown below.

DevicePropCode	DevicePropName	Menu	Reference item
0x5001	BatteryLevel	Setup	5.5.1.1
0x5003	ImageSize	Shooting	5.5.1.2
0x5004	CompressionSetting	Shooting	5.5.1.3
0x5005	WhiteBalance	Shooting	5.5.1.4
0x5007	Fnumber	-	5.5.1.5
0x5008	FocalLength	-	5.5.1.6
0x500A	FocusMode	-	5.5.1.7
0x500B	ExposureMeteringMode	-	5.5.1.8
0x500C	FlashMode	-	5.5.1.9
0x500D	ExposureTime	-	5.5.1.10
0x500E	ExposureProgramMode	-	5.5.1.11
0x500F	ExposureIndex	Shooting	5.5.1.12
0x5010	ExposureBiasCompensation	-	5.5.1.13
0x5011	DateTime	Setup	5.5.1.14
0x5013	StillCaptureMode	-	5.5.1.15
0x5018	BurstNumber	-	5.5.1.16
0x501C	FocusMeteringMode	-	5.5.1.17
0x501E	Artist	Setup	5.5.1.18
0x501F	Copyright	Setup	5.5.1.19

0xD015	ResetShootingMenu	Shooting	5.5.2.1
0xD016	RawCompressionType	Shooting	5.5.2.7
0xD017	WbTuneAuto	Shooting	5.5.2.10
0xD018	WbTuneIncandescent	Shooting	5.5.2.11
0xD019	WbTuneFluorescent	Shooting	5.5.2.13
0xD01A	WbTuneSunny	Shooting	5.5.2.14
0xD01B	WbTuneFlash	Shooting	5.5.2.15
0xD01C	WbTuneCloudy	Shooting	5.5.2.16
0xD01D	WbTuneShade	Shooting	5.5.2.17
0xD01E	WbColorTemp	Shooting	5.5.2.18
0xD01F	WbPresetDataNo	Shooting	5.5.2.20
0xD020	WbPresetDataComment0	Shooting	5.5.2.21
0xD021	WbPresetDataComment1	Shooting	5.5.2.22
0xD022	WbPresetDataComment2	Shooting	5.5.2.23
0xD023	WbPresetDataComment3	Shooting	5.5.2.24
0xD024	WbPresetDataComment4	Shooting	5.5.2.25
0xD025	WbPresetDataValue0	Shooting	5.5.2.26
0xD026	WbPresetDataValue1	Shooting	5.5.2.27
0xD027	WbPresetDataValue2	Shooting	5.5.2.28
0xD028	WbPresetDataValue3	Shooting	5.5.2.29
0xD029	WbPresetDataValue4	Shooting	5.5.2.30
0xD02E	FmmManualSetting	Setup	5.5.4.11
0xD02F	F0ManualSetting	Setup	5.5.4.12
0xD031	JpegCompressionPolicy	Shooting	5.5.2.6
0xD032	ColorSpace	Shooting	5.5.2.36
0xD034	DecreaseFlicker	Setup	5.5.4.3
0xD035	RemoteControlMode	Shooting	5.5.2.49
0xD036	VideoMode	Setup	5.5.4.2
0xD045	ResetCustomSetting	Custom	5.5.3.1
0xD048	DynamicAFonAFC	Custom a1	5.5.3.2.1
0xD049	DynamicAFonAFS	Custom a2	5.5.3.2.2
0xD04F	FocusAreaSelect	Custom a5	5.5.3.2.5
0xD050	VerticalAF-ON	Custom f10	5.5.3.7.13
0xD051	AFStillLockOn	Custom a3	5.5.3.2.3
0xD053	EnableCopyright	Setup	5.5.4.7
0xD054	ISOAutoControl	Shooting	5.5.2.42
0xD055	IsoStep	Custom b1	5.5.3.3.1
0xD056	ExposureEVStep	Custom b2	5.5.3.3.2
0xD058	ExposureCompSetting	Custom b3	5.5.3.3.3
0xD059	CenterWeightedExRange	Custom b4	5.5.3.3.4
0xD05A	ExposureBaseCompMatrix	Custom b5	5.5.3.3.5
0xD05B	ExposureBaseCompCenter	Custom b5	5.5.3.3.6
0xD05C	ExposureBaseCompSpot	Custom b5	5.5.3.3.7
0xD05D	AfAtLiveView	Custom a8	5.5.3.2.9
0xD05E	AELockRelease	Custom c1	5.5.3.4.1
0xD05F	AEAFLockSetting	Custom f5	5.5.3.7.5
0xD061	AfModeAtLiveView	Custom a8	5.5.3.2.8
0xD062	AutoMeterOffDelay	Custom c2	5.5.3.4.2
0xD063	SelfTimerDelay	Custom c3	5.5.3.4.3
0xD065	ImageConfirmTimeAfterPhoto	Custom c4	5.5.3.4.9
0xD067	AngleLevel	-	5.5.6.16
0xD068	CSpeedLow	Custom d6	5.5.3.5.7
0xD069	BurstMaxNumber	Custom d7	5.5.3.5.8
0xD06A	ExposureDelay	Custom d11	5.5.3.5.12
0xD06B	NoiseReduction	Shooting	5.5.2.39
0xD06C	NumberingMode	Custom d8	5.5.3.5.9
0xD06F	LCDIllumination	Custom d10	5.5.3.5.11
0xD070	NoiseReductionHiIso	Shooting	5.5.2.40
0xD071	ShootSetChangeGuidDisp	Custom d5	5.5.3.5.6
0xD072	ArtistV	Setup	5.5.4.8
0xD073	CopyrightV	Setup	5.5.4.9
0xD074	FlashSyncSpeed	Custom e1	5.5.3.6.1
0xD075	FlashSlowSpeedLimit	Custom e2	5.5.3.6.2
0xD077	ModelingOnPreviewButton	Custom e4	5.5.3.6.18
0xD078	BracketingType	Custom e5	5.5.3.6.19

0xD07A	BracketingOrder	Custom e6	5.5.3.6.20
0xD07D	AngleLevelPitching	-	5.5.6.17
0xD07E	AngleLevelYawing	-	5.5.6.18
0xD080	CenterButtonOnShootingMode	Custom f2	5.5.3.7.2
0xD084	FunctionButton	Custom f3	5.5.3.7.3
0xD085	CommandDialRotation	Custom f6	5.5.3.7.6
0xD086	CommandDialChange	Custom f6	5.5.3.7.7
0xD087	CommandDialFSetting	Custom f6	5.5.3.7.8
0xD088	CommandDialActiveOnPlaybackMenu	Custom f6	5.5.3.7.9
0xD089	UniversalMode	Custom f7	5.5.3.7.10
0xD08A	EnableShutter	Custom f8	5.5.3.7.11
0xD08D	EnableAFAreaPoint	Custom a6	5.5.3.2.6
0xD08F	ImageSensorCleaning	Setup	5.5.4.1
0xD090	CommentString	Setup	5.5.4.4
0xD091	EnableComment	Setup	5.5.4.5
0xD092	OrientationSensorMode	Setup	5.5.4.6
0xD093	ManualSettingLensNo	Setup	5.5.4.10
0xD0A0	MovieRecordScreenSize	Shooting	5.5.2.45
0xD0A2	MovieRecordMicrophoneLevel	Shooting	5.5.2.46
0xD0A3	MovieRecordDestination	Shooting	5.5.2.47
0xD0A4	MovieRecProhibitionCondition	-	5.5.6.21
0xD0A6	ManualSettingOfMovie	Shooting	5.5.2.48
0xD0B3	AutoOffTimerLiveView	Custom c4	5.5.3.4.10
0xD0C0	EnableBracketing	-	5.5.7.1
0xD0C1	AEBracketingStep	-	5.5.7.2
0xD0C2	AEBracketingPattern	-	5.5.7.3
0xD0C3	AEBracketingCount	-	5.5.7.4
0xD0C4	WBBracketingStep	-	5.5.7.5
0xD0C5	WBBracketingPattern	-	5.5.7.6
0xD0C6	ADLBracketingPattern	-	5.5.7.7
0xD0E0	LensID	-	5.5.10.3
0xD0E1	LensSort	-	5.5.10.1
0xD0E2	LensType	-	5.5.10.2
0xD0E3	LensFocalMin	-	5.5.10.4
0xD0E4	LensFocalMax	-	5.5.10.5
0xD0E5	LensApatureMin	-	5.5.10.6
0xD0E6	LensApatureMax	-	5.5.10.7
0xD0F0	FinderISODisplay	Custom d3	5.5.3.5.4
0xD0F2	AutoOffTimerPhoto	Custom c4	5.5.3.4.6
0xD0F3	AutoOffTimerMenu	Custom c4	5.5.3.4.7
0xD0F4	AutoOffTimerInfo	Custom c4	5.5.3.4.8
0xD0F5	SelfTimerShootExpose	Custom c3	5.5.3.4.4
0xD0F8	AutoDistortion	Shooting	5.5.2.37
0xD0F9	SceneMode	Shooting	5.5.2.3
0xD0FA	RegisterUserSetting	Setup	
0xD0FB	ResetUserSertting	Setup	
0xD0FC	UserMode1	-	5.5.2.4
0xD0FD	UserMode2	-	5.5.2.5
0xD0FE	SelfTimerContinuousReleaseInterval	Custom c3	5.5.3.4.5
0xD100	ShutterSpeed	-	5.5.6.9
0xD101	ExternalDC-IN	-	5.5.5.1
0xD102	WarningStatus	-	5.5.6.15
0xD103	RemainingExposure	-	5.5.6.5
0xD104	AFLockStatus	-	5.5.6.7
0xD105	AELockStatus	-	5.5.6.6
0xD106	FVLockStatus	-	5.5.6.8
0xD108	FocusArea	-	5.5.6.11
0xD109	FlexibleProgram	-	5.5.6.10
0xD10B	RecordingMedia	-	5.5.6.2
0xD10C	USBSpeed	-	5.5.12.1
0xD10D	CCDNumber	-	5.5.11.1
0xD10E	Orientation	-	5.5.6.1
0xD114	IlluminationSetting	Custom f1	5.5.3.7.1
0xD120	ExternalSpeedLightExist	-	5.5.8.1
0xD121	ExternalSpeedLightStatus	-	5.5.8.3
0xD122	ExternalSpeedLightSort	-	5.5.8.2
0xD124	FlashCompensation	-	5.5.8.5

0xD125	NewExternalSpeedLightMode	-	5.5.8.4
0xD126	InternalFlashCompensation	-	5.5.9.3
0xD148	Slot2ImageSaveMode	Shooting	5.5.2.2
0xD149	RawCompressionBitMode	Shooting	5.5.2.8
0xD14E	Active-D-Lighting	Shooting	5.5.2.38
0xD14F	WbTuneFluorescentType	Shooting	5.5.2.12
0xD150	WbTuneColorTemp	Shooting	5.5.2.19
0xD151	WbTune Preset0	Shooting	5.5.2.31
0xD152	WbTune Preset1	Shooting	5.5.2.32
0xD153	WbTune Preset2	Shooting	5.5.2.33
0xD154	WbTune Preset3	Shooting	5.5.2.34
0xD155	WbTune Preset4	Shooting	5.5.2.35
0xD160	Beep	Custom d1	5.5.3.5.1
0xD161	AFModeSelect	-	5.5.6.20
0xD162	BeepVolume	Custom d1	5.5.3.5.2
0xD163	AFSubLight	Custom a7	5.5.3.2.7
0xD164	ISOAutoShutterTime	Shooting	5.5.2.44
0xD166	FocusAreaLED	Custom a4	5.5.3.2.4
0xD167	InternalFlashMode	Custom e3	5.5.3.6.3
0xD169	RecommendFlashDisp	Custom d12	5.5.3.5.13
0xD16A	ISOAutoSetting	-	5.5.2.41
0xD16B	RemoteControlDelay	Custom c5	5.5.3.4.11
0xD16C	GridDisplay	Custom d2	5.5.3.5.3
0xD16D	InternalFlashManual	Custom e3	5.5.3.6.4
0xD181	FinderWarningDisplay	Custom d4	5.5.3.5.5
0xD182	CellKindSetting	Custom d13	5.5.3.5.14
0xD183	ISOAutoHighLimit	Shooting	5.5.2.43
0xD187	InformationScreenDisplaySetting	Custom d9	5.5.3.5.10
0xD189	PreviewButton	Custom f4	5.5.3.7.4
0xD18D	IndicatorDisplay	Custom f9	5.5.3.7.12
0xD18E	CellKindPrioritylevel	Custom d14	5.5.3.5.15
0xD1A2	LiveViewStatus	-	5.5.13.1
0xD1A3	LiveViewImageZoomRatio	-	5.5.13.2
0xD1A4	LiveViewProhibitionCondition	-	5.5.13.3
0xD1B0	ExposureDisplayStatus	-	5.5.6.12
0xD1B1	ExposureIndicateStatus	-	5.5.6.13
0xD1B2	InfoDisplayErrorStatus	-	5.5.6.19
0xD1B3	ExposureIndicateLightup	-	5.5.6.14
0xD1C0	InternalFlashPopup	-	5.5.9.1
0xD1C1	InternalFlashStatus	-	5.5.9.2
0xD1D0	InternalFlashManualRPTIntense	Custom e3	5.5.3.6.5
0xD1D1	InternalFlashManualRPTCount	Custom e3	5.5.3.6.6
0xD1D2	InternalFlashManualRPTInterval	Custom e3	5.5.3.6.7
0xD1D3	InternalFlashCommanderChannel	Custom e3	5.5.3.6.8
0xD1D4	InternalFlashCommanderSelfMode	Custom e3	5.5.3.6.9
0xD1D5	InternalFlashCommanderSelfComp	Custom e3	5.5.3.6.10
0xD1D6	InternalFlashCommanderSelfIntense	Custom e3	5.5.3.6.11
0xD1D7	InternalFlashCommanderGroupAMode	Custom e3	5.5.3.6.12
0xD1D8	InternalFlashCommanderGroupAComp	Custom e3	5.5.3.6.13
0xD1D9	InternalFlashCommanderGroupAIntense	Custom e3	5.5.3.6.14
0xD1DA	InternalFlashCommanderGroupBMode	Custom e3	5.5.3.6.15
0xD1DB	InternalFlashCommanderGroupBComp	Custom e3	5.5.3.6.16
0xD1DC	InternalFlashCommanderGroupBIntense	Custom e3	5.5.3.6.17
0xD1F0	ApplicationMode	-	5.5.15.1
0xD1F1	ExposureRemaining	-	5.5.6.4
0xD1F2	ActiveSlot	-	5.5.6.3
0xD200	ActivePicCtrlItem	Shooting	5.5.14.1
0xD201	ChangePicCtrlItem	-	5.5.14.2
0xD303	UseDeviceStageFlag	-	5.5.16.3
0xD406	SessionInitiatorVersionInfo	-	5.5.16.1
0xD407	PerceivedDeviceType	-	5.5.16.2

5.5.1. Standard Device Property

5.5.1.1. BatteryLevel

- PropertyCode : 0x5001
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 100 [100%]

Indicates “Remaining battery level” of the camera.

The valid PropertyValue is shown below.

From 1 [1%] to 100 [100%]

The PropertyValues sent by the camera are: 1%, 20%, 40%, 60%, 80%, and 100% only.

The relationship between the PropertyValue and the remaining battery level display is shown below:

PropertyValue	Remaining battery level display
100	5 / 5
80	4 / 5
60	3 / 5
40	2 / 5
20	1 / 5
1	1 / 5 (blinking)

When the remaining battery level is 1%, which is the shooting prohibited level, the following settings are made.

- The WarningStatus property (subsection 5.5.6.15) is set to “Battery insufficient”.
- The LiveViewProhibitionCondition property (subsection 5.5.13.3) is set to “During insufficiency of battery”.

5.5.1.2. ImageSize

- PropertyCode : 0x5003
- DataType : String
- Description form : Enumeration
- Get/Set : Get/Set
- DefaultValue : 4928x3264 [Size L]

Indicates “Image size” that is set in the camera.

The PropertyValue shows the width and the height of the image by a character string.

The valid PropertyValues are shown below.

PropertyValue	Setting
4928x3264	Size L
3696x2448	Size M
2464x1632	Size S

5.5.1.3. CompressionSetting

- PropertyCode : 0x5004
- DataType : UINT8
- Description form : Enumeration

- Get/Set : Get/Set
- DefaultValue : 0x01 [JPEG (NORMAL)]

Indicates “Image quality mode” that is set in the camera.

It indicates the control value in the camera, not a setting value in the menu.
This is a value including RAW when the Plus RAW function is valid.

When StorageInfoDataSet (subsection 8.2) is changed according to the change of this property, the StorageInfoChanged event (subsection 5.4.11) is issued.

The valid PropertyValues are shown below.

PropertyValue	Setting
0x00	JPEG (BASIC)
0x01	JPEG (NORMAL)
0x02	JPEG (FINE)
0x04	RAW
0x05	RAW + JPEG (BASIC)
0x06	RAW + JPEG (NORMAL)
0x07	RAW + JPEG (FINE)

5.5.1.4. WhiteBalance

- PropertyCode : 0x5005
- DataType : UINT16
- Description form : Enumeration
- Get/Set : Get/Set
- DefaultValue : 0x0002 [Auto]

Indicates “White Balance” that is set in the camera.

If the property is set in the following cases, the Access_Denied response is made.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

PropertyValue	Setting
0x0002	Auto
0x0004	Sunny
0x0005	Fluorescent
0x0006	Incandescent
0x0007	Flash
0x8010	Cloudy
0x8011	Shade
0x8012	Choose color temp.
0x8013	Preset manual

5.5.1.5. Fnumber

- PropertyCode : 0x5007
- DataType : UINT16
- Description form : Enumeration
- Get/Set : Get, Get/Set
- DefaultValue : (Minimum value in the setting range)

Indicates “Aperture value” with the CPU internal lens mounted.

The PropertyValue should be a hundred times the aperture value.
The PropertyValue changes depending on the value of the ExposureEVStep property (subsection 5.5.3.3.2).
The setting range of PropertyValue changes depending on the lens and the magnification setting.

The property setting is invalid in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is P, S, or Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is P, S, or Scene mode.
- The LensSort property (subsection 5.5.10.1) is [Not mounted].
- The WarningStatus property (subsection 5.5.6.15) is [Sequence error].
- The ManualSettingOfMovie property (subsection 5.5.2.48) is 1 [ON], the value of the ExposureProgramMode property (subsection 5.5.1.11) is M, and the Live view is being performed.
  And the ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is M as well.

When the CommandDialFSetting property (subsection 5.5.3.7.8) is [Aperture ring] and the LensType property (subsection 5.5.10.2) is set to a value other than [G-type lens], the PropertyValue shall be 1 EV irrespective of the value of the ExposureEVStep property (subsection 5.5.3.3.2).
If an aperture value error occurs, the number of enumeration values shall be 1 and the enumeration value, the DefaultValue, and the PropertyValue shall be 0xFFFF.

When the LensSort property (subsection 5.5.10.1) is [Not mounted], the situations are as follows.
- Because the enumeration cannot be created, the number of enumeration values shall be 1 and the enumeration value, the DefaultValue, and the PropertyValue shall be the same value. In this case, the value shall be 1 EV except the maximum aperture value.
- When the F0ManualSetting property (subsection 5.5.4.12) is [Not set], the PropertyValue shall be 0.
- When the F0ManualSetting property (subsection 5.5.4.12) is set to a value other than [Not set] and the ExposureProgramMode property (subsection 5.5.1.11) is P, S, or Scene mode, the PropertyValue is not fixed.
- When the F0ManualSetting property (subsection 5.5.4.12) is set to a value other than [Not set] and the ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2, and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is P, S, or Scene mode, the PropertyValue is not fixed.

5.5.1.6. FocalLength

- PropertyCode : 0x5008
- DataType : UINT32
- Description form : Range
- Get/Set : Get
- DefaultValue : (Minimum value in the setting range)

Indicates “Focal length” with the CPU internal lens mounted.

The PropertyValue should be a hundred times the focal length.
The setting range of PropertyValue changes depending on the lens and the magnification setting.

When the LensSort property (subsection 5.5.10.1) is [Not mounted], the PropertyValue is not fixed.

5.5.1.7. FocusMode

- PropertyCode : 0x500A
- DataType : UINT16

- Description form : Enumeration
- Get/Set : Get
- DefaultValue : 0x8010 [AF-S]

Indicates “Focus mode” that is set in the camera.

The valid PropertyValues are shown below.

PropertyValue	Setting
0x0001	[M] Manual focus
0x8010	[S] Single AF servo
0x8011	[C] Continuous AF servo
0x8012	[A] AF servo mode automatic switching
0x8013	[F] Constant AF servo

5.5.1.8. ExposureMeteringMode

- PropertyCode : 0x500B
- DataType : UINT16
- Description form : Enumeration
- Get/Set : Get/Set
- DefaultValue : 0x0003 [Multi-pattern metering]

Indicates “Metering mode” that is set in the camera.

The valid PropertyValues are shown below.

PropertyValue	Setting
0x0002	Center-weighted metering
0x0003	Multi-pattern metering
0x0004	Spot metering

If the value of PropertyValue is changed during the Live view, the changed contents are not reflected during the Live view, but are reflected when the Live view is released.
When the ExposureProgramMode property (subsection 5.5.1.11) is PSAM and the LensSort property (subsection 5.5.10.1) is [Not mounted], the camera operates with [Center-weighted metering] even if the value of this property is set to [Multi-pattern metering].

Even if the ExposureProgramMode property (subsection 5.5.1.11) is A or M and the LensSort property (subsection 5.5.10.1) is [Not mounted], Center-weighted metering/Multi-pattern metering/Spot metering can be set with Non-CPU lens data.
Only Center-weighted metering or Spot metering can be set without Non-CPU lens data.

The Access_Denied response is made and the values cannot be set in the following cases.

- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.
- During AE lock
- The ExposureProgramMode property (subsection 5.5.1.11) is P or S and the LensSort property (subsection 5.5.10.1) is [Not mounted].
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is P or S. Besides, the LensSort property (subsection 5.5.10.1) is [Not mounted].

5.5.1.9. FlashMode

- PropertyCode : 0x500C

- DataType : UINT16
- Description form : Enumeration
- Get/Set : Get/Set
- DefaultValue : 0x8010 [Normal]

Indicates “Synchronization mode” that is set in the camera.

If Rear curtain sync is set when the ExposureProgramMode property (subsection 5.5.1.11) is set to P/S/A/M and the NewExternalSpeedLightMode property (subsection 5.5.8.4) is set to Multi-flash, Front curtain sync is set.

The valid PropertyValues are shown below.

PropertyValue	Setting
0x0002	Flash prohibited
0x0004	Red-eye reduction
0x8010	Front curtain sync
0x8011	Slow sync
0x8012	Rear curtain sync
0x8013	Red-eye reduction slow sync

The camera display status differs according to the value of the ExposureProgramMode property (subsection 5.5.1.11) and the internal flash/external flash condition.

The camera display status with the internal flash firing is shown below.

	Front curtain sync	Slow sync	Rear curtain sync	Red-eye reduction	Red-eye reduction slow sync	Flash prohibited
P/A	Front curtain sync (*1)	Slow sync	Rear curtain slow sync	Red-eye reduction (*1)	Red-eye reduction slow sync (*2)	-
S/M	Front curtain sync (*1)	-	Rear curtain sync	Red-eye reduction (*1)	-	-
AUTO Portrait (SCENE) Close up (SCENE) Child (SCENE) Party/indoor (SCENE) Pet portrait (SCENE)	Auto	-	-	Red-eye reduction auto	-	Flash prohibited
Landscape (SCENE) Sports (SCENE) Night landscape (SCENE) Beach/snow (SCENE) Sunset (SCENE) Dusk/dawn (SCENE) Candlelight (SCENE) Blossom (SCENE) Autumn colors (SCENE) Silhouette (SCENE) High key (SCENE) Low key (SCENE)	-	-	-	-	-	Flash prohibited
Night portrait (SCENE)	-	Auto slow	-	-	Red-eye reduction auto slow	Flash prohibited
Flash prohibited AUTO	-	-	-	-	-	Flash prohibited
Food (SCENE)	Front curtain	-	-	-	-	-

	sync					
U1	*3	*3	*3	*3	*3	*3
U2	*3	*3	*3	*3	*3	*3

*1: If the property is got with the LCD monitor display "None", the response of the front curtain sync (0x8010) is made.
*2: If the property is got with the LCD monitor display "Slow sync", the response of the slow sync (0x8011) is made.
*3: It is based on the ExposureProgramMode property (subsection 5.5.1.11) that is set to the user mode.

The camera display status with the external flash firing is shown below.

	Front curtain sync	Slow sync	Rear curtain sync	Red-eye reduction	Red-eye reduction slow sync	Flash prohibited
P/A	Front curtain sync	Slow sync	Rear curtain slow sync	Red-eye reduction	Red-eye reduction slow sync	-
S/M	Front curtain sync	-	Rear curtain sync	Red-eye reduction	-	-
AUTO Portrait (SCENE) Close up (SCENE) Child (SCENE) Party/indoor (SCENE) Pet portrait (SCENE)	Front curtain sync	-	-	Red-eye reduction	-	-
Landscape (SCENE) Sports (SCENE) Night landscape (SCENE) Beach/snow (SCENE) Sunset (SCENE) Dusk/dawn (SCENE) Candlelight (SCENE) Blossom (SCENE) Autumn colors (SCENE) Silhouette (SCENE) High key (SCENE) Low key (SCENE)	Front curtain sync	-	-	Red-eye reduction	-	-
Night portrait (SCENE)	-	Slow sync	-	-	Red-eye reduction slow sync	-
Flash prohibited AUTO	-	-	-	-	-	Flash prohibited
Food (SCENE)	Front curtain sync	-	-	-	-	-
U1	*1	*1	*1	*1	*1	*1
U2	*1	*1	*1	*1	*1	*1

*1: It is based on the ExposureProgramMode property (subsection 5.5.1.11) that is set to the user mode.

5.5.1.10. ExposureTime

- PropertyCode : 0x500D
- DataType : UINT32
- Description form : Enumeration
- Get/Set : Get, Get/Set
- DefaultValue : (Minimum value in the setting range)

Indicates “Shutter speed” that is set in the camera.

The valid PropertyValue is shown below.
(Excluding Bulb)

Shutter speed x 10000 [unit: 1/10000 sec.]

(Example) Shutter speed 1/250 sec.: PropertyValue = 40

The property setting is invalid in the following cases.

- The ExposureProgramMode property (subsection 5.5.1.11) is P, A, or Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is P, A, or Scene mode.
- The WarningStatus property (subsection 5.5.6.15) is [Sequence error].

When the ExposureProgramMode property (subsection 5.5.1.11) is M or S, 0xFFFFFFFF that indicates Bulb is added to the enumerated value. In the case of S, however, 0xFFFFFFFF is added to the enumerated value only when CurrentValue is Bulb.
Bulb can be set only when the ExposureProgramMode property (subsection 5.5.1.11) is M. If Bulb is set when the property is S, Access_Denied is passed.

The flash shooting synchronization speed is treated in the same manner as the ordinary shutter speed.
When the flash shooting synchronization speed is set to 1/250, the PropertyValue shows 1/250.
The flash shooting synchronization speed cannot be set. (This is because the value of PropertyValue is set as the ordinary shutter speed.)

The enumerated values change depending on the value of the ExternalSpeedLightExist property (subsection 5.5.8.1).
When the ExternalSpeedLightExist property (subsection 5.5.8.1) is set to [Mounted], the minimum value and the maximum value of the enumerated values depend on the conditions below.

Minimum value: Flash shooting synchronization speed (FlashSyncSpeed property, subsection 5.5.3.6.1), external flash speed limit

Flash shooting synchronization speed	-	Minimum value
Auto FP	-	External flash speed limit
Other than Auto FP	Flash shooting synchronization speed >or= External flash speed limit	Flash shooting synchronization speed
	Flash shooting synchronization speed < External flash speed limit	External flash speed limit

Maximum value: Synchronization mode (FlashMode property (subsection 5.5.1.9))
Shooting mode (ExposureProgramMode property (subsection 5.5.1.11))
Shutter speed limit with flash (FlashSlowSpeedLimit property (subsection 5.5.3.6.2))

Synchronization mode	Shooting mode	Maximum value
Red-eye reduction Front curtain sync	P A	Shutter speed limit with flash
	M S	30 sec. (Bulb)
Slow sync Rear curtain sync Red-eye reduction slow sync	-	

Because the unit of the PropertyValue is 1/10000, a rounding occurs in some range. In this case, refer to the table below.
EV in parentheses shows the exposure setting step range (ExposureEVStep property (subsection 5.5.3.3.2)).

PropertyValue	Shutter speed	
	Get	Set
1	1/8000 (1/3 EV, 1/2 EV) 1/6400 (1/3 EV) 1/6000 (1/2 EV)	1/8000
2	1/5000 (1/3 EV) 1/4000 (1/3 EV, 1/2 EV)	1/4000
3	1/3200 (1/3 EV) 1/3000 (1/2 EV)	1/3200 (1/3 EV) 1/3000 (1/2 EV)
6	1/1600 (1/3 EV) 1/1500 (1/2 EV)	1/1600 (1/3 EV) 1/1500 (1/2 EV)

If there is a change in the enumerated values, the enumerated values and the DefaultValue are updated.

When the precise shutter speed should be set and acquired, use the ShutterSpeed property (subsection 5.5.6.9).

5.5.1.11. ExposureProgramMode

- PropertyCode : 0x500E
- DataType : UINT16
- Description form : Enumeration
- Get/Set : Get, Get/Set
- DefaultValue : 0x0002 [Program auto mode]

Indicates “Shooting mode” of the shooting mode dial that is set in the camera.

The valid PropertyValues are shown below.

PropertyValue	Setting
0x0001	[M] Manual
0x0002	[P] Program auto
0x0003	[A] Aperture priority auto
0x0004	[S] Shutter priority auto
0x8010	[Scene mode] AUTO
0x8016	[Scene mode] Flash prohibition AUTO
0x8018	[Scene mode] SCENE
0x8050	[User mode] U1
0x8051	[User mode] U2

When the shooting mode is set to [SCENE], the scene mode that is set in the SceneMode property (subsection 5.5.2.3) is used. The scene mode that can be set in the SceneMode property (subsection 5.5.2.3) is the same “Scene mode” as that in this property. They differ only in the setting method.
When the shooting mode is set to [U1] or [U2], the shooting mode that is set in the UserMode1 property (subsection 5.5.2.4) or the UserMode2 property (subsection 5.5.2.5) is used.

The property can be set only while the camera is switched to the host mode by the ChangeCameraMode command (subsection 5.2.22).
When switching between the camera mode and the host mode is performed by the ChangeCameraMode command (subsection 5.2.22), the camera changes the Get/Set field setting and issues the DevicePropChanged event (subsection 5.4.6).

If the value of PropertyValue is changed during the host mode, the changed value is canceled when the mode is switched to the camera mode by the ChangeCameraMode command (subsection

5.2.22). (Refer to subsection 1.4.)

5.5.1.12. ExposureIndex

- PropertyCode : 0x500F
- DataType : UINT16
- Description form : Enumeration
- Get/Set : Get/Set
- DefaultValue : 0x0064 [100]

Indicates “ISO sensitivity” that is set in the camera.

The value of PropertyValue changes depending on the value of the IsoStep property (subsection 5.5.3.3.1).

The valid PropertyValues are shown below.

IsoStep property: 0 [1/3 step]

PropertyValue	Setting
0x0064	100
0x007D	125
0x00A0	160
0x00C8	200
0x00FA	250
0x0140	320
0x0190	400
0x01F4	500
0x0280	640
0x0320	800
0x03E8	1000
0x04E2	1250
0x0640	1600
0x07D0	2000
0x09C4	2500
0x0C80	3200
0x0FA0	4000
0x1388	5000
0x1900	6400
0x1F40	Hi 0.3
0x2710	Hi 0.7
0x3200	Hi 1
0x6400	Hi 2

IsoStep property: 1 [1/2 step]

PropertyValue	Setting
0x0064	100
0x008C	140
0x00C8	200
0x0118	280
0x0190	400
0x0230	560
0x0320	800
0x044C	1100
0x0640	1600
0x0898	2200
0x0C80	3200
0x1194	4500
0x1900	6400
0x2328	Hi 0.5
0x3200	Hi 1
0x6400	Hi 2

5.5.1.13. ExposureBiasCompensation

- PropertyCode : 0x5010
- DataType : INT16
- Description form : Enumeration
- Get/Set : Get/Set
- DefaultValue : 0 [0.0 EV]

Indicates the compensation value of “Exposure compensation” that is set in the camera.

The enumerated values change depending on the value of the ExposureEVStep property (subsection 5.5.3.3.2).
The value of PropertyValue is a thousand times as large as the exposure compensation value.

The Access_Denied response is made and the values cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property

(subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

ExposureEVStep property: 1/3 step

PropertyValue	Setting
+5000	+5.0 EV
+4666	+4.7 EV
+4333	+4.3 EV
+4000	+4.0 EV
+3666	+3.7 EV
+3333	+3.3 EV
+3000	+3.0 EV
+2666	+2.7 EV
+2333	+2.3 EV
+2000	+2.0 EV
+1666	+1.7 EV
+1333	+1.3 EV
+1000	+1.0 EV
+ 666	+0.7 EV
+ 333	+0.3 EV
0	0.0 EV
- 333	-0.3 EV
- 666	-0.7 EV
-1000	-1.0 EV
-1333	-1.3 EV
-1666	-1.7 EV
-2000	-2.0 EV
-2333	-2.3 EV
-2666	-2.7 EV
-3000	-3.0 EV
-3333	-3.3 EV
-3666	-3.7 EV
-4000	-4.0 EV
-4333	-4.3 EV
-4666	-4.7 EV
-5000	-5.0 EV

ExposureEVStep property: 1/2 step

PropertyValue	Setting
+5000	+5.0 EV
+4500	+4.5 EV
+4000	+4.0 EV
+3500	+3.5 EV
+3000	+3.0 EV
+2500	+2.5 EV
+2000	+2.0 EV
+1500	+1.5 EV
+1000	+1.0 EV
+ 500	+0.5 EV
0	0.0 EV
- 500	-0.5 EV
-1000	-1.0 EV
-1500	-1.5 EV
-2000	-2.0 EV
-2500	-2.5 EV
-3000	-3.0 EV
-3500	-3.5 EV
-4000	-4.0 EV
-4500	-4.5 EV
-5000	-5.0 EV

5.5.1.14. DateTime

- PropertyCode : 0x5011
- DataType : String
- Description form : None
- Get/Set : Get/Set
- DefaultValue : 20100101T000000 [00:00:00, Jan. 1, 2010]

Indicates “Date and time” that is set in the camera.

The format of PropertyValue is a Unicode string of “YYYYMMDDThhmmss” where YYYY is the year, MM is the month, DD is the day of the month, T is a constant character, hh is the hours, mm is the minutes, and ss is the seconds past the minute, in accordance with the ISO8601 standards.
The PropertyValue is the date and time obtained by “UTC + difference in time with the current place setting + summer time”.
The setting range of PropertyValue is from 20000101T000000 to 20991231T235959.

If the property is set with the PropertyValue format “YYYYMMDDThhmmss.xx”, “.xx” should be ignored.
If the property is set with an abnormal format of PropertyValue, Invalid_Device_Prop_Value is passed.

This property does not send the DevicePropChanged event (subsection 5.4.6) even if the

PropertyValue is changed.

The format of PropertyValue is shown below.

Field	Size (Byte)	Data	Description
NumChar	1	0x10	The number of characters in the string. It is sixteen (including the null character).
StringChars	32		Unicode string "YYYYMMDDThhmmss"

5.5.1.15. StillCaptureMode

- PropertyCode : 0x5013
- DataType : UINT16
- Description form : Enumeration
- Get/Set : Get, Get/Set
- DefaultValue : 0x0001 [Single-frame shooting (S)]

Indicates "Operation mode" that is set in the camera.

The valid PropertyValues are shown below.

PropertyValue	Setting
0x0001	Single-frame shooting (S)
0x0002	Continuous high-speed shooting (CH)
0x8010	Continuous low-speed shooting (CL)
0x8011	Self-timer
0x8012	Mirror-up
0x8016	Quiet shooting
0x8017	Remote control

The property can be set only while the camera is switched to the host mode by the ChangeCameraMode command (subsection 5.2.22).
When switching between the camera mode and the host mode is performed by the ChangeCameraMode command (subsection 5.2.22), the camera changes the Get/Set field setting and issues the DevicePropChanged event (subsection 5.4.6).

If the value of PropertyValue is changed during the host mode, the changed value is canceled when the mode is switched to the camera mode by the ChangeCameraMode command (subsection 5.2.22). (Refer to subsection 1.4.)

5.5.1.16. BurstNumber

- PropertyCode : 0x5018
- DataType : UINT16
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [One frame]

Indicates "The number of continuous shooting frames" captured by the command.

The valid PropertyValue is shown below.

From 1 [One frame] to 100 [100 frames]

This differs from the BurstMaxNumber property (subsection 5.5.3.5.8) indicating "Shooting/display – Max. continuous release" in the custom setting menu. For shooting by the command processing, the continuous shooting is performed until the number of frames set by this property is reached.

The setting range of PropertyValue changes depending on the values of the ImageSize property (subsection 5.5.1.2) and the CompressionSetting property (subsection 5.5.1.3). However, the value of PropertyValue does not change.

If a value larger than that of BurstMaxNumber property (subsection 5.5.3.5.8) is set, the value of the BurstMaxNumber property (subsection 5.5.3.5.8) is reflected in the value of PropertyValue.
If the value of the BurstMaxNumber property (subsection 5.5.3.5.8) is smaller than that of PropertyValue, the value of PropertyValue remains unchanged.

If the value of PropertyValue exceeds its setting range, the continuous shooting is performed only until the maximum number of frames in the setting range is reached.

When the EnableBracketing property (subsection 5.5.7.1) is set to [Performed] and the bracketing is performed with continuous shooting, the value of this property must be changed. However, even if a value exceeding the number of bracketing frames is set, the continuous shooting is performed only until the number of bracketing frames is reached.

5.5.1.17. FocusMeteringMode

- PropertyCode : 0x501C
- DataType : UINT16
- Description form : Enumeration
- Get/Set : Get/Set
- DefaultValue : 0x8011 [Auto area AF mode]

Indicates “AF area mode” that is set in the camera.

The valid PropertyValues are shown below.

PropertyValue	Setting
0x0002	Dynamic AF mode (9 points)
0x8010	Single point AF mode
0x8011	Auto area AF mode
0x8012	3D-tracking
0x8013	Dynamic AF mode (21 points)
0x8014	Dynamic AF mode (39 points)

The Access_Denied response is made and the values cannot be set in the following cases.
- The FocusMode property (subsection 5.5.1.7) is [Manual focus].
- The LensSort property (subsection 5.5.10.1) is [Not mounted].
- The 3D-tracking is set when the AFModeSelect property (subsection 5.5.6.20) is AF-S.

If the ExposureProgramMode property (subsection 5.5.1.11) is changed from PSAM to Scene mode or from a Scene mode to another Scene mode, the PropertyValue is set to the AF area mode for each Scene mode automatically. If it is changed from a Scene mode to PSAM, the PropertyValue is set to the value that is set by PSAM before changing to the Scene mode. The PropertyValue can be changed in the Scene mode.

Scene mode	AF area mode
AUTO Flash prohibition AUTO Portrait (SCENE) Landscape (SCENE) Child (SCENE) Night portrait (SCENE) Night landscape (SCENE) Party/indoor (SCENE) Beach/snow (SCENE) Sunset (SCENE) Dusk/dawn (SCENE) Blossom (SCENE) Autumn colors (SCENE)	Auto area AF mode

Close up (SCENE) Candlelight (SCENE) Food (SCENE) Silhouette (SCENE) High key (SCENE) Low key (SCENE)	Single point AF mode
Sports (SCENE) Pet portrait (SCENE)	Dynamic AF mode (39 points)

5.5.1.18. Artist

- PropertyCode : 0x501E
- DataType : String
- Description form : None
- Get/Set : Get
- DefaultValue : NULL (0x00) 0 characters

Indicates “Artist” that is set in the camera.

For setting “Artist”, the ArtistV property (subsection 5.5.4.8) should be used.

The PropertyValue is an optional string of 36 characters or shorter (not including the null character).
When “Artist” is not set in the camera, it should be a string of 0 characters (not including the null character).
If the string is shorter than 36 characters, the shortage is not padded with spaces (0x20).

5.5.1.19. Copyright

- PropertyCode : 0x501F
- DataType : String
- Description form : None
- Get/Set : Get
- DefaultValue : NULL (0x00) 0 characters

Indicates “Copyright” that is set in the camera.

For setting “Copyright”, the CopyrightV property (subsection 5.5.4.9) should be used.

The PropertyValue is an optional string of 54 characters or shorter (not including the null character).
When “Copyright” is not set in the camera, it should be a string of 0 characters (not including the null character).
If the string is shorter than 54 characters, the shortage is not padded with spaces (0x20).

5.5.2. Shooting Menu

5.5.2.1. ResetShootingMenu

- PropertyCode : 0xD015
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Not reset]

Indicates “Reset shooting menu” in the shooting menu.

The valid PropertyValues are shown below.

0: Not reset, 1: Reset (for setting only)

5.5.2.2. Slot2ImageSaveMode

- PropertyCode : 0xD148
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Sequential recording]

Indicates “Function of slot 2” in the shooting menu.

The valid PropertyValues are shown below.

0: Sequential recording, 1: Back-up recording, 2: RAW+JPEG division recording

5.5.2.3. SceneMode

- PropertyCode : 0xD0F9
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Night landscape]

Indicates “Scene mode” that is set in the camera.
This is the Scene mode that is used when the ExposureProgramMode property (subsection 5.5.1.11) is set to [SCENE]. If the property is not set to [Scene mode], the acquired value is not guaranteed.
The scene mode of the ExposureProgramMode property (subsection 5.5.1.11) and that of this property are the same “Scene mode”. They differ only in the setting method; the shooting mode dial and the command dial.

The Access_Denied response is made and the value cannot be set in the following case.
- The ExposureProgramMode property (subsection 5.5.1.11) is not set to [Scene mode].

The valid PropertyValues are shown below.

0: Night landscape,	1: Party/indoor,	2: Beach/snow,	3: Sunset,
4: Dusk/dawn,	5: Pet portrait,	6: Candlelight,	7: Blossom,
8: Autumn colors,	9: Food,	10: Silhouette,	11: High key,
12: Low key,	13: Portrait,	14: Landscape,	15: Child,
16: Sports,	17: Close up,	18: Night portrait	

5.5.2.4. UserMode1

- PropertyCode : 0xD0FC
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 19 [P]

Indicates “U1 (user mode 1)” that is set in the camera.
This is the shooting mode that is used when the ExposureProgramMode property (subsection 5.5.1.11) is set to [U1]. If the property is not set to [U1], the acquired value is not guaranteed.

The valid PropertyValues are shown below.

0: Night landscape,	1: Party/indoor,	2: Beach/snow,	3: Sunset,

4: Dusk/dawn,	5: Pet portrait,	6: Candlelight,	7: Blossom,
8: Autumn colors,	9: Food,	10: Silhouette,	11: High key,
12: Low key,	13: Portrait,	14: Landscape,	15: Child,
16: Sports,	17: Close up,	18: Night portrait,	19: P,
20: S,	21: A,	22: M,	23: Auto,
24: Flash prohibition Auto			

5.5.2.5. UserMode2

- PropertyCode : 0xD0FD
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 19 [P]

Indicates “U2 (user mode 2)” that is set in the camera.
This is the shooting mode that is used when the ExposureProgramMode property (subsection 5.5.1.11) is set to [U2]. If the property is not set to [U2], the acquired value is not guaranteed.

The valid PropertyValues are shown below.

0: Night landscape,	1: Party/indoor,	2: Beach/snow,	3: Sunset,
4: Dusk/dawn,	5: Pet portrait,	6: Candlelight,	7: Blossom,
8: Autumn colors,	9: Food,	10: Silhouette,	11: High key,
12: Low key,	13: Portrait,	14: Landscape,	15: Child,
16: Sports,	17: Close up,	18: Night portrait,	19: P,
20: S,	21: A,	22: M,	23: Auto,
24: Flash prohibition Auto			

5.5.2.6. JpegCompressionPolicy

- PropertyCode : 0xD031
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Size priority]

Indicates “JPEG compression” in the shooting menu.

The valid PropertyValues are shown below.

0: Size priority, 1: Image quality priority

5.5.2.7. RawCompressionType

- PropertyCode : 0xD016
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Lossless compressed RAW]

Indicates “NEF (RAW) recording - Recording method” in the shooting menu.

The valid PropertyValues are shown below.

0: Lossless compressed RAW, 1: Compressed RAW

5.5.2.8. RawCompressionBitMode

- PropertyCode : 0xD149
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [14-bit recording]

Indicates “NEF (RAW) recording - Recording bit mode” in the shooting menu.

The valid PropertyValues are shown below.

0: 12-bit recording, 1: 14-bit recording

5.5.2.9. WbTuneAutoType

- PropertyCode : 0xD141
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Standard]

Indicates the type of “White balance - Auto” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: Standard, 1: Leave incandescent color

5.5.2.10. WbTuneAuto

- PropertyCode : 0xD017
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the fine tuning volume of “White balance - Auto” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.11. WbTuneIncandescent

- PropertyCode : 0xD018

- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the fine tuning volume of “White balance - Incandescent” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.12. WbTuneFluorescentType

- PropertyCode : 0xD14F
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 3 [White fluorescent lamp]

Indicates the light source of “White balance - Fluorescent” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: Sodium lamp mixed light,
1: Cool white fluorescent lamp,
2: Warm white fluorescent lamp,
3: White fluorescent lamp,
4: Day white fluorescent lamp,
5: Daylight fluorescent lamp,
6: High color-temperature mercury lamp

5.5.2.13. WbTuneFluorescent

- PropertyCode : 0xD019
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the fine tuning volume of “White balance - Fluorescent” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.14. WbTuneSunny

- PropertyCode : 0xD01A
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the fine tuning volume of “White balance – Direct sunlight” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.15. WbTuneFlash

- PropertyCode : 0xD01B
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the fine tuning volume of “White balance - Flash” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.16. WbTuneCloudy

- PropertyCode : 0xD01C
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the fine tuning volume of “White balance - Cloudy” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.17. WbTuneShade

- PropertyCode : 0xD01D
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the fine tuning volume of “White balance – Shade” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.18. WbColorTemp

- PropertyCode : 0xD01E
- DataType : UINT16
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 20 [5000K]

Indicates the color temperature (K) of “White balance – Choose color temp.” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 2500K, 1: 2560K, 2: 2630K, 3: 2700K, 4: 2780K, 5: 2860K, 6: 2940K,
7: 3030K, 8: 3130K, 9: 3230K, 10: 3330K, 11: 3450K, 12: 3570K, 13: 3700K,
14: 3850K, 15: 4000K, 16: 4170K, 17: 4350K, 18: 4550K, 19: 4760K, 20: 5000K,
21: 5260K, 22: 5560K, 23: 5880K, 24: 6250K, 25: 6670K, 26: 7140K, 27: 7690K,
28: 8330K, 29: 9090K, 30: 10000K

5.5.2.19. WbTuneColorTemp

- PropertyCode : 0xD150
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the fine tuning volume of “White balance – Choose color temp.” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

If the total of the color temperature (K) of the WbColorTemp property (subsection 5.5.2.18) and the fine tuning volume of this property is smaller than 2500K or it exceeds 10000K, Invalid_Status is passed.

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.20. WbPresetDataNo

- PropertyCode : 0xD01F
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [d-0]

Indicates “White balance – Preset manual” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: d-0, 1: d-1, 2: d-2, 3: d-3, 4: d-4

5.5.2.21. WbPresetDataComment0

- PropertyCode : 0xD020
- DataType : String
- Description form : None
- Get/Set : Get/Set
- DefaultValue : 36 characters of spaces (0x20)

Indicates the comment of “White balance – Preset manual – d-0” in the shooting menu.

The PropertyValue is an optional string of 36 characters (not including the null character).
When the string is shorter than 36 characters, the shortage is padded with spaces (0x20).

When a string exceeding 36 characters is set, Invalid_DeviceProp_Format is passed.

For the characters that can be input (ASCII code), refer to subsection 9.2.

5.5.2.22. WbPresetDataComment1

- PropertyCode : 0xD021
- DataType : String
- Description form : None
- Get/Set : Get/Set
- DefaultValue : 36 characters of spaces (0x20)

Indicates the comment of “White balance – Preset manual – d-1” in the shooting menu.

(The method of using this property is the same as that of the WbPresetDataComment0 property (subsection 5.5.2.21).)

5.5.2.23. WbPresetDataComment2

- PropertyCode : 0xD022
- DataType : String
- Description form : None
- Get/Set : Get/Set
- DefaultValue : 36 characters of spaces (0x20)

Indicates the comment of “White balance – Preset manual – d-2” in the shooting menu.

(The method of using this property is the same as that of the WbPresetDataComment0 property (subsection 5.5.2.21).)

5.5.2.24. WbPresetDataComment3

- PropertyCode : 0xD023
- DataType : String
- Description form : None
- Get/Set : Get/Set
- DefaultValue : 36 characters of spaces (0x20)

Indicates the comment of “White balance – Preset manual – d-3” in the shooting menu.

(The method of using this property is the same as that of the WbPresetDataComment0 property (subsection 5.5.2.21).)

5.5.2.25. WbPresetDataComment4

- PropertyCode : 0xD024
- DataType : String
- Description form : None
- Get/Set : Get/Set
- DefaultValue : 36 characters of spaces (0x20)

Indicates the comment of “White balance – Preset manual – d-4” in the shooting menu.

(The method of using this property is the same as that of the WbPresetDataComment0 property (subsection 5.5.2.21).)

5.5.2.26. WbPresetDataValue0

- PropertyCode : 0xD025

- DataType : UINT32
- Description form : None
- Get/Set : Get
- DefaultValue : 0x01000100 [Rgain: 1.0, Bgain: 1.0]

Indicates the white balance data of “White balance – Preset manual – d-0” in the shooting menu.

The format of the PropertyValue is shown below.

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
	-	-	-	-	-	Rgain										
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	-	-	-	-	-	Bgain										

Rgain = (R/G) x 256 [Upper 3 bits: integer section, lower 8 bits: decimal section]
Bgain = (B/G) x 256 [Upper 3 bits: integer section, lower 8 bits: decimal section]

5.5.2.27. WbPresetDataValue1

- PropertyCode : 0xD026
- DataType : UINT32
- Description form : None
- Get/Set : Get
- DefaultValue : 0x01000100 [Rgain: 1.0, Bgain: 1.0]

Indicates the white balance data of “White balance – Preset manual – d-1” in the shooting menu.

(The method of using this property is the same as that of the WbPresetDataValue0 property (subsection 5.5.2.26).)

5.5.2.28. WbPresetDataValue2

- PropertyCode : 0xD027
- DataType : UINT32
- Description form : None
- Get/Set : Get
- DefaultValue : 0x01000100 [Rgain: 1.0, Bgain: 1.0]

Indicates the white balance data of “White balance – Preset manual – d-2” in the shooting menu.

(The method of using this property is the same as that of the WbPresetDataValue0 property (subsection 5.5.2.26).)

5.5.2.29. WbPresetDataValue3

- PropertyCode : 0xD028
- DataType : UINT32
- Description form : None
- Get/Set : Get
- DefaultValue : 0x01000100 [Rgain: 1.0, Bgain: 1.0]

Indicates the white balance data of “White balance – Preset manual – d-3” in the shooting menu.

(The method of using this property is the same as that of the WbPresetDataValue0 property (subsection 5.5.2.26).)

5.5.2.30. WbPresetDataValue4

- PropertyCode : 0xD029

- DataType : UINT32
- Description form : None
- Get/Set : Get
- DefaultValue : 0x01000100 [Rgain: 1.0, Bgain: 1.0]

Indicates the white balance data of “White balance – Preset manual – d-4” in the shooting menu.

(The method of using this property is the same as that of the WbPresetDataValue0 property (subsection 5.5.2.26).)

5.5.2.31. WbTunePreset0

- PropertyCode : 0xD151
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the white balance fine tuning volume of “White balance – Preset manual – d-0” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.32. WbTunePreset1

- PropertyCode : 0xD152
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the white balance fine tuning volume of “White balance – Preset manual – d-1” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.33. WbTunePreset2

- PropertyCode : 0xD153

- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the white balance fine tuning volume of “White balance – Preset manual – d-2” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.34. WbTunePreset3

- PropertyCode : 0xD154
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the white balance fine tuning volume of “White balance – Preset manual – d-3” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.35. WbTunePreset4

- PropertyCode : 0xD155
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 84

Indicates the white balance fine tuning volume of “White balance – Preset manual – d-4” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From 0 to 168

For the details of the fine tuning volume, refer to subsection 10.6.

5.5.2.36. ColorSpace

- PropertyCode : 0xD032
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [sRGB]

Indicates “Color space” in the shooting menu.

The valid PropertyValues are shown below.

0: sRGB, 1: Adobe RGB

5.5.2.37. AutoDistortion

- PropertyCode : 0xD0F8
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Automatic distortion correction” in the shooting menu.

If the LensSort property (subsection 5.5.10.1) is a setting other than [CPU lens mounted] or the mounted CPU lens does not support the distortion correction, the Access_Denied response is made.

The valid PropertyValues are shown below.

0: OFF, 1: ON

5.5.2.38. Active-D-Lighting

- PropertyCode : 0xD14E
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 4 [Not performed]

Indicates “Active D-Lighting” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.

- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: Extra high, 1: High, 2: Normal, 3: Low, 4: Not performed, 5: Auto

5.5.2.39. NoiseReduction

- PropertyCode : 0xD06B
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Long exp. NR” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following case.
- [RAW with OB] of the manufacturer’s option setting is valid.

The valid PropertyValues are shown below.

0: OFF, 1: ON

5.5.2.40. NoiseReductionHiIso

- PropertyCode : 0xD070
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 2 [Normal]

Indicates “High ISO NR” in the shooting menu.

The valid PropertyValues are shown below.

0: Not performed, 1: Low, 2: Normal, 3: High

5.5.2.41. ISOAutoSetting

- PropertyCode : 0xD16A
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Valid]

Indicates the automatic control state of the ISO sensitivity setting with the shooting mode set to Scene mode.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is not Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is not Scene mode.

The valid PropertyValues are shown below.

0: Valid, 1: Invalid

5.5.2.42. ISOAutoControl

- PropertyCode : 0xD054
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set

- DefaultValue : 0 [OFF]

Indicates “ISO sensitivity settings – ISO sensitivity auto control” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: OFF, 1: ON

5.5.2.43. ISOAutoHighLimit

- PropertyCode : 0xD183
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 5 [6400]

Indicates “ISO sensitivity settings – ISO sensitivity auto control – Maximum sensitivity” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.
- The ISOAutoControl property (subsection 5.5.2.42) is set to OFF.

The valid PropertyValues are shown below.

0: 200, 1: 400, 2: 800, 3: 1600, 4: 3200, 5: 6400, 6: Hi 1, 7: Hi 2

5.5.2.44. ISOAutoShutterTime

- PropertyCode : 0xD164
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 21 [1/30 sec.]

Indicates “ISO sensitivity settings – ISO sensitivity auto control – Minimum shutter speed” in the shooting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.
- The ISOAutoControl property (subsection 5.5.2.42) is set to OFF.

The valid PropertyValues are shown below.

0: 1/4000 sec.	1: 1/3200 sec.	2: 1/2500 sec.	3: 1/2000 sec.	4: 1/1600 sec.
5: 1/1250 sec.	6: 1/1000 sec.	7: 1/800 sec.	8: 1/640 sec.	9: 1/500 sec.
10: 1/400 sec.	11: 1/320 sec.	12: 1/250 sec.	13: 1/200 sec.	14: 1/160 sec.

15: 1/125 sec. 16: 1/100 sec. 17: 1/80 sec. 18: 1/60 sec. 19: 1/50 sec.
20: 1/40 sec. 21: 1/30 sec. 22: 1/15 sec. 23: 1/8 sec. 24: 1/4 sec.
25: 1/2 sec. 26: 1 sec.

5.5.2.45. MovieRecordScreenSize

- PropertyCode : 0xD0A0
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 7 [1920x1080/24fps/High image quality]

Indicates “Movie setting – Image quality” in the shooting menu.
The frame rate is changed by the value of [Video mode] (NTSC/PAL) in the setup menu.

The valid PropertyValues are shown below.

	Size	Frame rate		Image quality
		NTSC	PAL	
0	640 x 424	30fps	25fps	Normal
1				High image quality
2	1280 x 720	24fps	24fps	Normal
3				High image quality
4		30fps	25fps	Normal
5				High image quality
6	1920 x 1080	24fps	24fps	Normal
7				High image quality

5.5.2.46. MovieRecordMicrophoneLevel

- PropertyCode : 0xD0A2
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Microphone sensitivity Auto (A)]

Indicates “Movie setting – Recording setting” in the shooting menu.

The valid PropertyValues are shown below.

0: Microphone sensitivity Auto (A), 1: Microphone sensitivity High (3),
2: Microphone sensitivity Medium (2), 3: Microphone sensitivity Low (1),
4: Not recorded

5.5.2.47. MovieRecordDestination

- PropertyCode : 0xD0A3
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Slot 1]

Indicates “Movie setting – Movie recording destination” in the shooting menu.
If a card is not inserted in the slot that is set in this property, the movie is recorded on the card that is inserted in the other slot.

The valid PropertyValues are shown below.

0: Slot 1, 1: Slot 2

5.5.2.48. ManualSettingOfMovie

- PropertyCode : 0xD0A6
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Movie setting – Manual setting of movie” in the shooting menu.

The valid PropertyValues are shown below.

0: OFF, 1: ON

When the PropertyValue is set to [1: ON], the changes of the following settings are reflected in LiveView/Movie.

Because the Fnumber property (subsection 5.5.1.5) is not reflected in LiveView/Movie, it should be set before starting LiveView.

- The ExposureTime property (subsection 5.5.1.10) can be changed in the range from 1/8000 to 1/30.
- The ShutterSpeed property (subsection 5.5.6.9) can be changed in the range from 1/8000 to 1/30.

5.5.2.49. RemoteControlMode

- PropertyCode : 0xD035
- DataType : UINT8
- Description form : Enumeration
- Get/Set : Get/Set
- DefaultValue : 0 [2s delayed remote]

Indicates “Remote control mode” in the shooting menu.

The valid PropertyValues are shown below.

0: 2s delayed remote, 1: Quick-response remote, 2: Mirror-up remote

5.5.3. Custom Setting Menu

5.5.3.1. ResetCustomSetting

- PropertyCode : 0xD045
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Reset custom settings” in the custom setting menu.

The valid PropertyValues are shown below.

0: OFF, 1: ON (for setting only)

5.5.3.2. Regarding Autofocus

5.5.3.2.1. DynamicAFonAFC

- PropertyCode : 0xD048
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Release]

Indicates “Autofocus – AF-C priority selection” in the custom setting menu.

The valid PropertyValues are shown below.

0: Release, 1: Focus

5.5.3.2.2. DynamicAFonAFS

- PropertyCode : 0xD049
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Focus]

Indicates “Autofocus – AF-S priority selection” in the custom setting menu.

The valid PropertyValues are shown below.

0: Focus, 1: Release

5.5.3.2.3. AFStillLockOn

- PropertyCode : 0xD051
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 2 [Normal]

Indicates “Autofocus – Focus tracking with lock-on” in the custom setting menu.

The valid PropertyValues are shown below.

0: High, 1: Medium high, 2: Normal, 3: Medium low, 4: Low, 5: OFF

5.5.3.2.4. FocusAreaLED

- PropertyCode : 0xD166
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Auto]

Indicates “Autofocus – AF point illumination” in the custom setting menu.

The valid PropertyValues are shown below.

0: Auto, 1: OFF, 2: ON

5.5.3.2.5. FocusAreaSelect

- PropertyCode : 0xD04F
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Autofocus – Focus point wrap-around” in the custom setting menu.

The valid PropertyValues are shown below.

0: OFF, 1: ON

5.5.3.2.6. EnableAFAreaPoint

- PropertyCode : 0xD08D
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [39 points]

Indicates “Autofocus – AF point selection” in the custom setting menu.

The valid PropertyValues are shown below.

0: 39 points, 1: 11 points

If the selected focus point is not included in the 11 points when the focus points are switched from 39 points to 11 points, the selected focus point is changed automatically.

A change pattern of focus points is shown below.
The focus points in the dotted lines (39 points) are changed to the focus points in gray (11 points).

5.5.3.2.7. AFSubLight

- PropertyCode : 0xD163
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [ON]

Indicates “Autofocus – Built-in AF-assist illuminator” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.

- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode (Landscape, Sports, Night landscape, Beach/snow, Sunset, Dusk/dawn, or Pet portrait).
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode (Landscape, Sports, Night landscape, Beach/snow, Sunset, Dusk/dawn, or Pet portrait).

The valid PropertyValues are shown below.

0: ON, 1: OFF

5.5.3.2.8. AfModeAtLiveView

- PropertyCode : 0xD061
- DataType : UINT8

- Description form : Enumeration
- Get/Set : Get/Set
- DefaultValue : 0 [Single AF servo]

Indicates “Autofocus – AF at Live view/Movie – AF mode” in the custom setting menu.
For the AF mode used for still image shooting, refer to the AFModeSelect property (subsection 5.5.6.20).

The Access_Denied response is made and the value cannot be set in the following cases.
- The MF (fixed) is set.
- The setting by the dials and buttons of the camera or the lens is MF and the Live view is being performed.

The valid PropertyValues are shown below.

0: Single AF servo, 1: Reserve (unusable), 2: Constant AF servo, 3: MF (fixed)

The PropertyValue is set to MF (fixed) under the condition that the Live view is being performed while the AF operation valid state (the LensSort property is [CPU lens]) is not set or the MF is selected by the lens setting even if the Live view is being performed and the CPU lens is mounted.

5.5.3.2.9. AfAtLiveView

- PropertyCode : 0xD05D
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Face detection system AF]

Indicates “Autofocus – AF at Live view/Movie – AF area mode” in the custom setting menu.

The valid PropertyValues are shown below.

0: Face detection system AF, 1: Wide area AF, 2: Normal area AF, 3: Target tracking AF

If the target tracking AF is set during Live view execution, the Access_Denied response is made.
If the Live view is executed with the target tracking AF set, this property is changed to the wide area AF for operation.
If the target tracking AF is set when the ActivePicCtrlItem property (subsection 5.5.14.1) is set to Monochrome or the monochrome base, the Access_Denied response is made.
If the ActivePicCtrlItem property (subsection 5.5.14.1) is set to Monochrome or the monochrome base with the target tracking AF set, this property is changed to the wide area AF.

If the ExposureProgramMode property (subsection 5.5.1.11) is changed from PSAM to Scene mode or from a Scene mode to another Scene mode, the PropertyValue is set to the AF area mode for each Scene mode automatically. If it is changed from a Scene mode to PSAM, the PropertyValue is set to the value that is set by PSAM before changing to the Scene mode. The PropertyValue can be changed in the Scene mode.

Shooting mode	AF during Live view execution
Sports (SCENE) Night landscape (SCENE) Pet portrait (SCENE) Silhouette (SCENE) High key (SCENE) Low key (SCENE)	Wide area AF
AUTO Flash prohibition AUTO Portrait (SCENE) Landscape (SCENE) Party/indoor (SCENE)	Face detection system AF

Beach/snow (SCENE) Sunset (SCENE) Dusk/dawn (SCENE) Candlelight (SCENE) Blossom (SCENE) Autumn colors (SCENE) Night portrait (SCENE) Child (SCENE)	
Close up (SCENE) Food (SCENE)	Normal area AF

5.5.3.3. Regarding Metering/Exposure

5.5.3.3.1. IsoStep

- PropertyCode : 0xD055
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [1/3 EV]

Indicates “Metering/exposure – ISO sensitivity step value” in the custom setting menu.

The valid PropertyValues are shown below.

0: 1/3 EV, 1: 1/2 EV

5.5.3.3.2. ExposureEVStep

- PropertyCode : 0xD056
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [1/3 EV]

Indicates “Metering/exposure – EV steps for exposure cntrl.” in the custom setting menu.

The valid PropertyValues are shown below.

0: 1/3 EV, 1: 1/2 EV

If the value of PropertyValue is changed, the AEBracketingStep property (subsection 5.5.7.2) is set to 1 EV.

5.5.3.3.3. ExposureCompSetting

- PropertyCode : 0xD058
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Metering/exposure – Easy exposure compensation” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.

- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

You cannot set both this property and 1 [Sensitivity display/easy setting ON] of the FinderISODisplay property (subsection 5.5.3.5.4) at one time. If this property is set to 1 [ON] or 2 [ON (auto-reset)], the FinderISODisplay property (subsection 5.5.3.5.4) is set to 2 [OFF].

The valid PropertyValues are shown below.

0: OFF, 1: ON, 2: ON (auto-reset)

5.5.3.3.4. CenterWeightedExRange

- PropertyCode : 0xD059
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [ϕ 8 mm]

Indicates “Metering/exposure – Center-weighted area” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.

- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: ϕ 6 mm, 1: ϕ 8 mm, 2: ϕ 10 mm, 3: ϕ 13 mm, 4: Average on the entire screen

5.5.3.3.5. ExposureBaseCompMatrix

- PropertyCode : 0xD05A
- DataType : INT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [0.0 EV]

Indicates “Metering/exposure – Fine tune optimal exposure - Multi-pattern metering” in the custom setting menu.

The valid PropertyValues are shown below.

From -6 [-1.0 EV] to +6 [+1.0 EV]

5.5.3.3.6. ExposureBaseCompCenter

- PropertyCode : 0xD05B
- DataType : INT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [0.0 EV]

Indicates “Metering/exposure – Fine tune optimal exposure - Center-weighted metering” in the custom setting menu.

The valid PropertyValues are shown below.

From -6 [-1.0 EV] to +6 [+1.0 EV]

5.5.3.3.7. ExposureBaseCompSpot

- PropertyCode : 0xD05C
- DataType : INT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [0.0 EV]

Indicates “Metering/exposure – Fine tune optimal exposure - Spot metering” in the custom setting menu.

The valid PropertyValues are shown below.

From -6 [-1.0 EV] to +6 [+1.0 EV]

5.5.3.4. Regarding Timers/AE Lock

5.5.3.4.1. AELockRelease

- PropertyCode : 0xD05E
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Timers/AE lock – Shutter-release button AE-L” in the custom setting menu.

The valid PropertyValues are shown below.

0: OFF, 1: ON

5.5.3.4.2. AutoMeterOffDelay

- PropertyCode : 0xD062
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [6 sec.]

Indicates “Timers/AE lock – Auto meter-off delay” in the custom setting menu.

The valid PropertyValues are shown below.

0: 4 sec., 1: 6 sec., 2: 8 sec., 3: 16 sec., 4: 30 sec.,
5: 1 min., 6: 5 min., 7: 10 min., 8: 30 min., 9: No limit

5.5.3.4.3. SelfTimerDelay

- PropertyCode : 0xD063
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 2 [10 sec.]

Indicates “Timers/AE lock – Self-timer delay - Seconds” in the custom setting menu.

The valid PropertyValues are shown below.

0: 2 sec., 1: 5 sec., 2: 10 sec., 3: 20 sec.

5.5.3.4.4. SelfTimerShootExpose

- PropertyCode : 0xD0F5
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [One frame]

Indicates “Timers/AE lock – Self-timer delay - The number of captured frames” in the custom setting menu.

The valid PropertyValues are shown below.

From 1: One frame to 9: 9 frames

5.5.3.4.5. SelfTimerContinuousReleaseInterval

- PropertyCode : 0xD0FE
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [0.5 sec.]

Indicates “Timers/AE lock – Self-timer delay – Continuous release interval” in the custom setting menu.

The valid PropertyValues are shown below.

0: 0.5 sec., 1: 1 sec., 2: 2 sec., 3: 3 sec.

5.5.3.4.6. AutoOffTimerPhoto

- PropertyCode : 0xD0F2
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [10 sec.]

Indicates “Timers/AE lock – Monitor off delay – Image playback” in the custom setting menu.

The valid PropertyValues are shown below.

0: 4 sec., 1: 10 sec., 2: 20 sec., 3: 1 min., 4: 5 min., 5: 10 min.

5.5.3.4.7. AutoOffTimerMenu

- PropertyCode : 0xD0F3
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 2 [20 sec.]

Indicates “Timers/AE lock – Monitor off delay – Menu display” in the custom setting menu.

The valid PropertyValues are shown below.

0: 4 sec., 1: 10 sec., 2: 20 sec., 3: 1 min., 4: 5 min., 5: 10 min.

5.5.3.4.8. AutoOffTimerInfo

- PropertyCode : 0xD0F4
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [10 sec.]

Indicates “Timers/AE lock – Monitor off delay – Info screen display” in the custom setting menu.

The valid PropertyValues are shown below.

0: 4 sec., 1: 10 sec., 2: 20 sec., 3: 1 min., 4: 5 min., 5: 10 min.

5.5.3.4.9. ImageConfirmTimeAfterPhoto

- PropertyCode : 0xD065
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [4 sec.]

Indicates “Timers/AE lock – Monitor off delay – Image review” in the custom setting menu.

The valid PropertyValues are shown below.

0: 4 sec., 1: 10 sec., 2: 20 sec., 3: 1 min., 4: 5 min., 5: 10 min.

5.5.3.4.10. AutoOffTimerLiveView

- PropertyCode : 0xD0B3
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [10 min.]

Indicates “Timers/AE lock – Monitor off delay – Live view display” in the custom setting menu.

The valid PropertyValues are shown below.

0: 5 min., 1: 10 min., 2: 15 min., 3: 20 min., 4: 30 min.

5.5.3.4.11. RemoteControlDelay

- PropertyCode : 0xD16B
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [1 min.]

Indicates “Timers/AE lock – Remote control delay” in the custom setting menu.

The valid PropertyValues are shown below.

0: 1 min., 1: 5 min., 2: 10 min., 3: 15 min.

5.5.3.5. Regarding Shooting/Display

5.5.3.5.1. Beep

- PropertyCode : 0xD160
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [High tone]

Indicates “Shooting/display – Beep - Tone” in the custom setting menu.

The valid PropertyValues are shown below.

0: High tone, 1: Low tone

5.5.3.5.2. BeepVolume

- PropertyCode : 0xD162
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [No beeping]

Indicates “Shooting/display – Beep - Volume” in the custom setting menu.

The valid PropertyValues are shown below.

0: No beeping, 1: 1, 2: 2, 3: 3

5.5.3.5.3. GridDisplay

- PropertyCode : 0xD16C
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Shooting/display - Viewfinder grid display” in the custom setting menu.

The valid PropertyValues are shown below.

0: OFF, 1: ON

5.5.3.5.4. FinderISODisplay

- PropertyCode : 0xD0F0
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 2 [OFF]

Indicates “Shooting/display - ISO sensitivity display and easy setting” in the custom setting menu.

The valid PropertyValues are shown below.

0: Sensitivity display ON, 1: Sensitivity display/easy setting ON, 2: OFF

You cannot set both this property and 1 [ON] or 2 [ON (auto-reset)] of the ExposureCompSetting property (subsection 5.5.3.3.3) at one time. If this property is set to 1 [Sensitivity display/easy setting ON], the ExposureCompSetting property (subsection 5.5.3.3.3) is set to 0 [OFF].

5.5.3.5.5. FinderWarningDisplay

- PropertyCode : 0xD181
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [ON]

Indicates “Shooting/display – Viewfinder warning display” in the custom setting menu.

The valid PropertyValues are shown below.

0: ON, 1: OFF

5.5.3.5.6. ShootSetChangeGuidDisp

- PropertyCode : 0xD071
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [Guide display ON]

Indicates “Shooting/display – Info screen guide display” in the custom setting menu.

The valid PropertyValues are shown below.

0: Guide display OFF, 1: Guide display ON

5.5.3.5.7. CSpeedLow

- PropertyCode : 0xD068
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 2 [3 frames/sec.]

Indicates “Shooting/display – CL mode shooting speed” in the custom setting menu.

The valid PropertyValues are shown below.

0: 5 frames/sec., 1: 4 frames/sec., 2: 3 frames/sec., 3: 2 frames/sec., 4: One frame/sec.

5.5.3.5.8. BurstMaxNumber

- PropertyCode : 0xD069
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 100 [100 frames]

Indicates “Shooting/display – Max. continuous release” in the custom setting menu.

The valid PropertyValues are shown below.

From 1 [One frame] to 100 [100 frames]

This differs from the BurstNumber property (subsection 5.5.1.16) indicating the number of continuous shooting frames captured by the command processing.

The value of PropertyValue changes depending on the values of the ImageSize property (subsection 5.5.1.2) and the CompressionSetting property (subsection 5.5.1.3).

5.5.3.5.9. NumberingMode

- PropertyCode : 0xD06C
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [ON]

Indicates “Shooting/display – File number sequence” in the custom setting menu.

The valid PropertyValues are shown below.

0: OFF, 1: ON, 2: Reset (for setting only)

5.5.3.5.10. InformationScreenDisplaySetting

- PropertyCode : 0xD187
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Auto]

Indicates “Shooting/display – Shooting info display” in the custom setting menu.

The valid PropertyValues are shown below.

0: Auto, 1: Manual (black letters), 2: Manual (white letters)

5.5.3.5.11. LCDIllumination

- PropertyCode : 0xD06F
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Shooting/display – LCD illumination” in the custom setting menu.

The valid PropertyValues are shown below.

0: OFF, 1: ON

5.5.3.5.12. ExposureDelay

- PropertyCode : 0xD06A
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Shooting/display – Exposure delay mode” in the custom setting menu.

The valid PropertyValues are shown below.

0: OFF, 1: ON

5.5.3.5.13. RecommendFlashDisp

- PropertyCode : 0xD169
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [ON]

Indicates “Shooting/display – Recommend flash display” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: ON, 1: OFF

5.5.3.5.14. CellKindSetting

- PropertyCode : 0xD182
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [AA alkali]

Indicates “Shooting/display – MB-D11 battery type” in the custom setting menu.

The valid PropertyValues are shown below.

0: AA alkali, 1: AA Ni-MH rechargeable,
2: AA lithium

5.5.3.5.15. CellKindPrioritylevel

- PropertyCode : 0xD18E
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [MB-D11 first]

Indicates “Shooting/display – Battery order” in the custom setting menu.

The valid PropertyValues are shown below.

0: MB-D11 first, 1: Camera first

5.5.3.6. Regarding Bracketing/Flash

5.5.3.6.1. FlashSyncSpeed

- PropertyCode : 0xD074
- DataType : UINT8

- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 2 [1/250 sec.]

Indicates “Bracketing/flash – Flash sync speed” in the custom setting menu.

The valid PropertyValues are shown below.

0: 1/320 sec. (auto FP),	1: 1/250 sec. (auto FP),	2: 1/250 sec.,	3: 1/200 sec.,
4: 1/160 sec.,	5: 1/125 sec.,	6: 1/100 sec.,	7: 1/80 sec.,
8: 1/60 sec.			

5.5.3.6.2. FlashSlowSpeedLimit

- PropertyCode : 0xD075
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [1/60 sec.]

Indicates “Bracketing/flash – Flash shutter speed” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 1/60 sec., 1: 1/30 sec., 2: 1/15 sec., 3: 1/8 sec., 4: 1/4 sec., 5: 1/2 sec.,
6: 1 sec., 7: 2 sec., 8: 4 sec., 9: 8 sec., 10: 15 sec., 11: 30 sec.

5.5.3.6.3. InternalFlashMode

- PropertyCode : 0xD167
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [TTL mode]

Indicates “Bracketing/flash – Flash cntrl for built-in/external flash” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues with the internal flash are shown below.

0: TTL mode, 1: Manual flash mode, 1: Repeating flash mode, 1: Commander mode

The valid PropertyValues with the external flash are shown below.

0: TTL mode, 1: Manual flash mode

When the external flash without the operating and setting section is mounted, the camera operates as “External flash”.
For the external flash types, refer to “External Flash Types” (subsection 10.7).

5.5.3.6.4. InternalFlashManual

- PropertyCode : 0xD16D
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Full]

Indicates “Bracketing/flash – Flash cntrl for built-in/external flash – Manual” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: Full, 1: 1/1.3, 2: 1/1.7, 3: 1/2, 4: 1/2.5, 5: 1/3.2, 6: 1/4, 7: 1/5,
8: 1/6.4, 9: 1/8, 10: 1/10, 11: 1/13, 12: 1/16, 13: 1/20, 14: 1/25, 15: 1/32,
16: 1/40, 17: 1/50, 18: 1/64, 19: 1/80, 20: 1/100, 21: 1/128

When the external flash without the operating and setting section is mounted, the camera operates as “External flash”.
For the external flash types, refer to “External Flash Types” (subsection 10.7).

5.5.3.6.5. InternalFlashManualRPTIntense

- PropertyCode : 0xD1D0
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 3 [1/32]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Repeating flash – Output” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 1/4, 1: 1/8, 2: 1/16, 3: 1/32, 4: 1/64, 5: 1/128

5.5.3.6.6. InternalFlashManualRPTCount

- PropertyCode : 0xD1D1
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 8 [10]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Repeating flash – Times” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 2,	1: 3,	2: 4,	3: 5,	4: 6,
5: 7,	6: 8,	7: 9,	8: 10,	9: 15,
10: 20,	11: 25,	12: 30,	13: 35	

The setting range of PropertyValue changes depending on the value of the InternalFlashManualRPTIntense property (subsection 5.5.3.6.5).

5.5.3.6.7. InternalFlashManualRPTInterval

- PropertyCode : 0xD1D2
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 9 [10 Hz]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Repeating flash – Frequency” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 1 Hz,	1: 2 Hz,	2: 3 Hz,	3: 4 Hz,	4: 5 Hz,
5: 6 Hz,	6: 7 Hz,	7: 8 Hz,	8: 9 Hz,	9: 10 Hz,
10: 20 Hz,	11: 30 Hz,	12: 40 Hz,	13: 50 Hz	

5.5.3.6.8. InternalFlashCommanderChannel

- PropertyCode : 0xD1D3
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [1 CH]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Commander mode – Channel” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 1 CH, 1: 2 CH, 2: 3 CH, 3: 4 CH

5.5.3.6.9. InternalFlashCommanderSelfMode

- PropertyCode : 0xD1D4
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [i-TTL flash]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Commander mode – Built-in flash – Mode” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: i-TTL flash, 1: Manual flash, 2: Non-flash

5.5.3.6.10. InternalFlashCommanderSelfComp

- PropertyCode : 0xD1D5
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 9 [0]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Commander mode – Built-in flash – Comp.” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: -3.0,	1: -2.7,	2: -2.3,	3: -2.0,	4: -1.7,
5: -1.3,	6: -1.0,	7: -0.7,	8: -0.3,	9: 0,
10: +0.3,	11: +0.7,	12: +1.0,	13: +1.3,	14: +1.7,
15: +2.0,	16: +2.3,	17: +2.7,	18: +3.0	

When the InternalFlashCommanderSelfMode property (subsection 5.5.3.6.9) is anything other than “i-TTL flash”, the value of PropertyValue is not fixed.

5.5.3.6.11. InternalFlashCommanderSelfIntense

- PropertyCode : 0xD1D6
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [1/1]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Commander mode – Built-in flash – Flash value” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.

- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 1/1,	1: 1/1.3,	2: 1/1.7,	3: 1/2,	4: 1/2.5,	5: 1/3.2,
6: 1/4,	7: 1/5,	8: 1/6.4,	9: 1/8,	10: 1/10,	11: 1/13,
12: 1/16,	13: 1/20,	14: 1/25,	15: 1/32,	16: 1/40,	17: 1/50,
18: 1/64,	19: 1/80,	20: 1/100,	21: 1/128		

When the InternalFlashCommanderSelfMode property (subsection 5.5.3.6.9) is anything other than “Manual flash”, the value of PropertyValue is not fixed.

5.5.3.6.12. InternalFlashCommanderGroupAMode

- PropertyCode : 0xD1D7
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [i-TTL flash]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Commander mode – Group A – Mode” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: i-TTL flash, 1: Aperture-interlocking external automatic flash, 2: Manual flash,
3: Non-flash

5.5.3.6.13. InternalFlashCommanderGroupAComp

- PropertyCode : 0xD1D8
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 9 [0]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Commander mode – Group A – Comp.” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: -3.0,	1: -2.7,	2: -2.3,	3: -2.0,	4: -1.7,
5: -1.3,	6: -1.0,	7: -0.7,	8: -0.3,	9: 0,
10: +0.3,	11: +0.7,	12: +1.0,	13: +1.3,	14: +1.7,
15: +2.0,	16: +2.3,	17: +2.7,	18: +3.0	

When the InternalFlashCommanderGroupAMode property (subsection 5.5.3.6.12) is anything other than “i-TTL flash” or “Aperture-interlocking external automatic flash”, the value of PropertyValue is not fixed.

5.5.3.6.14. InternalFlashCommanderGroupAIntense

- PropertyCode : 0xD1D9
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [1/1]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Commander mode – Group A – Flash value” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 1/1,	1: 1/1.3,	2: 1/1.7,	3: 1/2,	4: 1/2.5,	5: 1/3.2,
6: 1/4,	7: 1/5,	8: 1/6.4,	9: 1/8,	10: 1/10,	11: 1/13,
12: 1/16,	13: 1/20,	14: 1/25,	15: 1/32,	16: 1/40,	17: 1/50,
18: 1/64,	19: 1/80,	20: 1/100,	21: 1/128		

When the InternalFlashCommanderGroupAMode property (subsection 5.5.3.6.12) is anything other than “Manual flash”, the value of PropertyValue is not fixed.

5.5.3.6.15. InternalFlashCommanderGroupBMode

- PropertyCode : 0xD1DA
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [i-TTL flash]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Commander mode – Group B – Mode” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: i-TTL flash, 1: Aperture-interlocking external automatic flash, 2: Manual flash,
3: Non-flash

5.5.3.6.16. InternalFlashCommanderGroupBComp

- PropertyCode : 0xD1DB
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set

- DefaultValue : 9 [0]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Commander mode – Group B – Comp.” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: -3.0,	1: -2.7,	2: -2.3,	3: -2.0,	4: -1.7,
5: -1.3,	6: -1.0,	7: -0.7,	8: -0.3,	9: 0,
10: +0.3,	11: +0.7,	12: +1.0,	13: +1.3,	14: +1.7,
15: +2.0,	16: +2.3,	17: +2.7,	18: +3.0	

When the InternalFlashCommanderGroupBMode property (subsection 5.5.3.6.15) is anything other than “i-TTL flash” or “Aperture-interlocking external automatic flash”, the value of PropertyValue is not fixed.

5.5.3.6.17. InternalFlashCommanderGroupBIntense

- PropertyCode : 0xD1DC
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [1/1]

Indicates “Bracketing/flash – Flash cntrl for built-in flash – Commander mode – Group B – Flash value” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 1/1,	1: 1/1.3,	2: 1/1.7,	3: 1/2,	4: 1/2.5,	5: 1/3.2,
6: 1/4,	7: 1/5,	8: 1/6.4,	9: 1/8,	10: 1/10,	11: 1/13,
12: 1/16,	13: 1/20,	14: 1/25,	15: 1/32,	16: 1/40,	17: 1/50,
18: 1/64,	19: 1/80,	20: 1/100,	21: 1/128		

When the InternalFlashCommanderGroupBMode property (subsection 5.5.3.6.15) is anything other than “Manual flash”, the value of PropertyValue is not fixed.

5.5.3.6.18. ModelingOnPreviewButton

- PropertyCode : 0xD077
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [ON]

Indicates “Bracketing/flash – Modeling flash” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.

- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: ON, 1: OFF

5.5.3.6.19. BracketingType

- PropertyCode : 0xD078
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [AE/flash bracketing]

Indicates “Bracketing/flash – Auto bracketing set” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: AE/flash bracketing, 1: AE bracketing, 2: Flash bracketing,
3: WB bracketing, 4: ADL bracketing

5.5.3.6.20. BracketingOrder

- PropertyCode : 0xD07A
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [[0] -> [-] -> [+]]

Indicates “Bracketing/flash – Bracketing order” in the custom setting menu.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: [0] -> [-] -> [+], 1: [-] -> [0] -> [+]

5.5.3.7. Regarding Controls

5.5.3.7.1. IlluminationSetting

- PropertyCode : 0xD114
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Illuminator ON/OFF]

Indicates “Controls – Illuminator switch function” in the custom setting menu.

The valid PropertyValues are shown below.

0: Illuminator ON/OFF, 1: ON/OFF of the illuminator and Info screen

5.5.3.7.2. CenterButtonOnShootingMode

- PropertyCode : 0xD080
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [Focus point center reset]

Indicates “Controls – OK button function (shooting mode)” in the custom setting menu.

The valid PropertyValues are shown below.

0: Not used, 1: Focus point center reset, 2: Selected focus point display

5.5.3.7.3. FunctionButton

- PropertyCode : 0xD084
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 2 [FV-L]

Indicates “Controls – Assign FUNC. button” in the custom setting menu.

The Access_Denied response is made and the values of 10: Matrix metering, 11: Center-weighted, and 12: Spot metering cannot be set in the following cases.

- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: Reserve (unusable),	1: Preview,	2: FV-L,
3: AE-L/AF-L,	4: AE-L,	5: Reserve (unusable),
6: AE-L (hold),	7: AF-L,	8: Flash off,
9: Bracketing burst,	10: Matrix metering,	11: Center-weighted,
12: Spot metering,	13: Playback,	
14: Jump to the top item of My Menu,		15: Plus RAW recording,
16: Viewfinder grid display,		17: Active D-Lighting,
18: 1 step spd/aperture,		19: Selecting a lens set manually,
20: Viewfinder electronic virtual horizon,		21: Start movie recording

5.5.3.7.4. PreviewButton

- PropertyCode : 0xD189
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [Preview]

Indicates “Controls – Assign preview button” in the custom setting menu.

The Access_Denied response is made and the values of 10: Matrix metering, 11: Center-weighted, and 12: Spot metering cannot be set in the following cases.

- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: Reserve (unusable), 1: Preview, 2: FV-L,
3: AE-L/AF-L, 4: AE-L, 5: Reserve (unusable),
6: AE-L (hold), 7: AF-L, 8: Flash off,
9: Bracketing burst, 10: Matrix metering, 11: Center-weighted,
12: Spot metering, 13: Playback,
14: Jump to the top item of My Menu, 15: Plus RAW recording,
16: Viewfinder grid display, 17: Active D-Lighting,
18: 1 step spd/aperture, 19: Selecting a lens set manually,
20: Viewfinder electronic virtual horizon, 21: Start movie recording

5.5.3.7.5. AEAFLockSetting

- PropertyCode : 0xD05F
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 3 [AE-L/AF-L]

Indicates “Controls – Assign AE-L/AF-L button” in the custom setting menu.

The valid PropertyValues are shown below.

2: FV-L, 3: AE-L/AF-L, 4: AE-L,
6: AE-L (hold), 7: AF-L, 8: AF-ON

5.5.3.7.6. CommandDialRotation

- PropertyCode : 0xD085
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Not performedl]

Indicates “Controls – Customize command dials – Reverse rotation” in the custom setting menu.

The valid PropertyValues are shown below.

0: Not performed, 1: Performed

5.5.3.7.7. CommandDialChange

- PropertyCode : 0xD086
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Controls – Customize command dials – Change main/sub” in the custom setting menu.

The valid PropertyValues are shown below.

0: OFF, 1: ON, 2: ON (A mode)

5.5.3.7.8. CommandDialFSetting

- PropertyCode : 0xD087
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Subcommand dial]

Indicates “Controls – Customize command dials – Aperture setting” in the custom setting menu.

The valid PropertyValues are shown below.

0: Subcommand dial, 1: Aperture ring

5.5.3.7.9. CommandDialActiveOnPlaybackMenu

- PropertyCode : 0xD088
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Controls – Customize command dials – Menus and playback” in the custom setting menu.

The valid PropertyValues are shown below.

0: OFF, 1: ON, 2: ON (except during image review)

5.5.3.7.10. UniversalMode

- PropertyCode : 0xD089
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates “Controls – Release button to use dial” in the custom setting menu.

The valid PropertyValues are shown below.

0: OFF, 1: ON

5.5.3.7.11. EnableShutter

- PropertyCode : 0xD08A
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Release permitted]

Indicates “Controls – No memory card?” in the custom setting menu.

The valid PropertyValues are shown below.

0: Release permitted, 1: Release prohibited

5.5.3.7.12. IndicatorDisplay

- PropertyCode : 0xD18D
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [+ -]

Indicates “Controls – Reverse indicators” in the custom setting menu.

The valid PropertyValues are shown below.

0: + -, 1: - +

5.5.3.7.13. VerticalAF-ON

- PropertyCode : 0xD050
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1 [AE-L/AF-L]

Indicates “Controls – AF-ON for MB-D11” in the custom setting menu.

The valid PropertyValues are shown below.

0: AF-ON, 1: AE-L/AF-L, 2: AE-L,
3: FV-L, 4: AE-L (hold), 5: AF-L,
6: Same as the Fn button

5.5.4. Setup Menu

5.5.4.1. ImageSensorCleaning

- PropertyCode : 0xD08F
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 3 [Execute with power ON/OFF]

Indicates “Image sensor cleaning – Interlocking with power switch” in the setup menu.

The valid PropertyValues are shown below.

0: Not executed, 1: Execute with power ON, 2: Execute with power OFF,
3: Execute with power ON/OFF

5.5.4.2. VideoMode

- PropertyCode : 0xD036
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [NTSC]

Indicates the setting of “Video mode” in the setup menu.

The valid PropertyValues are shown below.

0: NTSC, 1: PAL

5.5.4.3. DecreaseFlicker

- PropertyCode : 0xD034
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [50 Hz]

Indicates “Flicker Reduction” in the setup menu.

The valid PropertyValues are shown below.

0: 50 Hz, 1: 60 Hz

5.5.4.4. CommentString

- PropertyCode : 0xD090
- DataType : String
- Description form : None
- Get/Set : Get/Set
- DefaultValue : 36 characters of spaces (0x20)

Indicates “Image comment” in the setup menu.

The PropertyValue is an optional string of 36 characters (not including the null character). When the string is shorter than 36 characters, the shortage is padded with spaces (0x20).

When a string exceeding 36 characters is set, Invalid_DeviceProp_Format is passed.

The camera does not send the DevicePropChanged event (subsection 5.4.6) even if the PropertyValue is changed.

For the characters that can be input (ASCII code), refer to subsection 9.2.

5.5.4.5. EnableComment

- PropertyCode : 0xD091
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Not attached]

Indicates “Image comment – Attach comment” in the setup menu.

The valid PropertyValues are shown below.

0: Not attached, 1: Attached

5.5.4.6. OrientationSensorMode

- PropertyCode : 0xD092
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [ON]

Indicates “Auto image rotation” in the setup menu.

The valid PropertyValues are shown below.

0: ON, 1: OFF

5.5.4.7. EnableCopyright

- PropertyCode : 0xD053
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Not attached]

Indicates “Copyright information – Attach copyright information” in the setup menu.

The valid PropertyValues are shown below.

0: Not attached, 1: Attached

5.5.4.8. ArtistV

- PropertyCode : 0xD072
- DataType : String
- Description form : None
- Get/Set : Get/Set
- DefaultValue : NULL (0x00) 0 characters

Indicates “Artist” in the setup menu.

The PropertyValue is an optional string of 36 characters or shorter (not including the null character).
When “Artist” is not set in the camera, it should be a string of 0 characters (not including the null character).
If the string is shorter than 36 characters, the shortage is not padded with spaces (0x20).

When a string exceeding 36 characters is set, Invalid_DeviceProp_Format is passed.

When a string in which there are spaces before the null character is set, the spaces before the null character become invalid.
(Example) When the string “A B C “ is set, it is treated as ”A B C”.

For the characters that can be input (ASCII code), refer to subsection 9.2.

5.5.4.9. CopyrightV

- PropertyCode : 0xD073
- DataType : String
- Description form : None
- Get/Set : Get/Set
- DefaultValue : NULL (0x00) 0 characters

Indicates “Copyright” in the setup menu.

The PropertyValue is an optional string of 54 characters or shorter (not including the null character).
When “Copyright” is not set in the camera, it should be a string of 0 characters (not including the null character).

If the string is shorter than 54 characters, the shortage is not padded with spaces (0x20).

When a string exceeding 54 characters is set, Invalid_DeviceProp_Format is passed.

When a string in which there are spaces before the null character is set, the spaces before the null character become invalid.
(Example) When the string "A　B　C　¥0" is set, it is treated as "A　B　C¥0".

For the characters that can be input (ASCII code), refer to subsection 9.2.

5.5.4.10. ManualSettingLensNo

- PropertyCode : 0xD093
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [No. 1]

Indicates "Non-CPU lens data – Lens No." in the setup menu.

The valid PropertyValues are shown below.

From 0: No. 1 to 8: No. 9

5.5.4.11. FmmManualSetting

- PropertyCode : 0xD02E
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Not set]

Indicates "Non-CPU lens data – Focal length (mm)" in the setup menu.

The valid PropertyValues are shown below.

0: Not set,	1:6mm,	2:8mm,	3:13mm,	4:15mm,
5:16mm,	6:18mm,	7:20mm,	8:24mm,	9:25mm,
10:28mm,	11:35mm,	12:43mm,	13:45mm,	14:50mm,
15:55mm,	16:58mm,	17:70mm,	18:80mm,	19:85mm,
20:86mm,	21:100mm,	22:105mm,	23:135mm,	24:180mm,
25:200mm,	26:300mm,	27:360mm,	28:400mm,	29:500mm,
30:600mm,	31:800mm,	32:1000mm,	33:1200mm,	34:1400mm,
35:1600mm,	36:2000mm,	37:2400mm,	38:2800mm,	39:3200mm,
40:4000mm				

5.5.4.12. F0ManualSetting

- PropertyCode : 0xD02F
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Not set]

Indicates "Non-CPU lens data – Maximum aperture" in the setup menu.

The valid PropertyValues are shown below.

0: Not set,	1: F1.2,	2: F1.4,	3: F1.8,	4: F2.0,

5: F2.5,	6: F2.8,	7: F3.3,	8: F3.5,	9: F4.0,
10: F4.5,	11: F5.0,	12: F5.6,	13: F6.3,	14: F7.1,
15: F8.0,	16: F9.5,	17: F11,	18: F13,	19: F15,
20: F16,	21: F19,	22: F22		

5.5.5. Power Supply

5.5.5.1. ExternalDC-IN

- PropertyCode : 0xD101
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Not connected]

Indicates the AC adapter connection status.

The valid PropertyValues are shown below.

0: Not connected, 1: Connected

5.5.6. Camera Information

5.5.6.1. Orientation

- PropertyCode : 0xD10E
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Landscape or not fixed]

Indicates the orientation information.

The valid PropertyValues are shown below.

0: Landscape or not fixed, 1: Portrait (grip side upward),
2: Portrait (grip side downward), 3: Landscape (upside down)

When the OrientationSensorMode property (subsection 5.5.4.6) is set to [OFF], the PropertyValue is [Landscape or not fixed].

5.5.6.2. RecordingMedia

- PropertyCode : 0xD10B
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Card]

Indicates the recording destination of the images captured by using the shutter-release button of the camera.

The valid PropertyValues are shown below.

0: Card, 1: SDRAM, 2: Card and SDRAM

5.5.6.3. ActiveSlot

- PropertyCode : 0xD1F2

- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Card not inserted]

Indicates the recording destination slot when the recording destination is the card.

The valid PropertyValues are shown below.

0: Card not inserted, 1: Slot 1, 2: Slot 2, 3: Slot 1 & Slot 2

5.5.6.4. ExposuresRemaining

- PropertyCode : 0xD1F1
- DataType : UINT16
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [0 frames]

Indicates the number of frames that can be recorded on the card.
The value changes depending on the setting of the camera.
When a card is not inserted in the camera, it should be 0 frames.
When the value of the Slot2ImageSaveMode property (subsection 5.5.2.2) is [Sequential recording] and the ActiveSlot property (subsection 5.5.6.3) is [Slot 1], the PropertyValue is set to the total of the number of frames that can be recorded in Slot 1 and that in Slot 2. Even if the total exceeds 65535 frames, the value of PropertyValue is set to 65535. When the value of the ActiveSlot property is [Slot 2], the value of PropertyValue is set to the number of frames that can be recorded in Slot 2 even if there is space in Slot 1.

The valid PropertyValues are shown below.

From 0 [0 frames] to 65535 [65535 frames]

5.5.6.5. RemainingExposure

- PropertyCode : 0xD103
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 99 [99 frames]

Indicates the number of frames that can be recorded in the SDRAM when sending to the PC for continuous shooting by the command.
This property is valid when the setting value of the RecordingMedia property (subsection 5.5.6.2) is 1: SDRAM or 2: Card and SDRAM.
Use the ContinuousShootingCount property (subsection 5.5.6.22) if the number of frames that can be captured by continuous shooting for 0: Card is also to be acquired.

The valid PropertyValues are shown below.

From 0 [0 frames] to 99 [99 frames]

The number of continuous shooting frames changes depending on the following setting values on the camera.
- Image quality mode: CompressionSetting property (subsection 5.5.1.3)
- Image size: ImageSize property (subsection 5.5.1.2)
- JPEG compression: JpegCompressionPolicy property (subsection 5.5.2.6)

- RAW recording: RawCompressionType property (subsection 5.5.2.7)
  : RawCompressionBitMode property (subsection 5.5.2.8)
- Active D-lighting: Active-D-Lighting property (subsection 5.5.2.38)
- Long-exposure noise reduction: NoiseReduction property (subsection 5.5.2.39)
- High-ISO noise reduction: NoiseReductionHiIso property (subsection 5.5.2.40)
- The number of continuous shooting frames: BurstMaxNumber property (subsection 5.5.3.5.8)

5.5.6.6. AELockStatus

- PropertyCode : 0xD105
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Lock released]

Indicates the AE lock status.

The valid PropertyValues are shown below.

0: Lock released, 1: Locked

5.5.6.7. AFLockStatus

- PropertyCode : 0xD104
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Lock released]

Indicates the AF lock status.

The valid PropertyValues are shown below.

0: Lock released, 1: Locked

5.5.6.8. FVLockStatus

- PropertyCode : 0xD106
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Lock released]

Indicates the FV lock status.

The valid PropertyValues are shown below.

0: Lock released, 1: Locked

5.5.6.9. ShutterSpeed

- PropertyCode : 0xD100
- DataType : UINT32
- Description form : Enumeration
- Get/Set : Get, Get/Set
- DefaultValue : The minimum value of the enumeration

Indicates the shutter speed.

The valid PropertyValues are shown below.
(Excluding Bulb and the flash shooting synchronization speed)

Upper 2 bytes: Numerator of the shutter speed
Lower 2 bytes: Denominator of the shutter speed

(Example) Shutter speed 1/250 sec. : PropertyValue = 0x000100FA
(Example) Shutter speed 25 sec. : PropertyValue = 0x00190001

Setting the property is invalid in the cases shown below.

- The ExposureProgramMode property (subsection 5.5.1.11) is P, A, or Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

When the WarningStatus property (subsection 5.5.6.15) is [Sequence error], Access_Denied is passed.

When the ExposureProgramMode property (subsection 5.5.1.11) is M or S, 0xFFFFFFFF indicating Bulb and 0xFFFFFFFE indicating the flash shooting synchronization speed are added to the enumerated value. In the case of S, however, 0xFFFFFFFF is added to the enumerated value only when CurrentValue is Bulb.
Bulb can be set only when the ExposureProgramMode property (subsection 5.5.1.11) is M. If Bulb is set when the property is S, Access_Denied is passed.

For the flash shooting synchronization speed, refer to the FlashSyncSpeed property (subsection 5.5.3.6.1).

The enumerated values change depending on the value of the ExternalSpeedLightExist property (subsection 5.5.8.1).
When the ExternalSpeedLightExist property (subsection 5.5.8.1) is set to [Mounted], the minimum value and the maximum value of the enumerated values depend on the conditions below.

Minimum value: Flash shooting synchronization speed (FlashSyncSpeed property (subsection 5.5.3.6.1)), external flash speed limit

Flash shooting synchronization speed	-	Minimum value
Auto FP	-	External flash speed limit
Other than Auto FP	Flash shooting synchronization speed >or= External flash speed limit	Flash shooting synchronization speed
	Flash shooting synchronization speed < External flash speed limit	External flash speed limit

Maximum value: Synchronization mode (FlashMode property (subsection 5.5.1.9))
Shooting mode (ExposureProgramMode property (subsection 5.5.1.11))
Shutter speed limit with flash (FlashSlowSpeedLimit property (subsection 5.5.3.6.2))

Synchronization mode	Shooting mode	Maximum value
Red-eye reduction Front curtain sync	P A	Shutter speed limit with flash
	M S	30 sec. (Bulb)
Slow sync Rear curtain sync Red-eye reduction slow sync	-	

If there is a change in the enumerated values, the enumerated values and the DefaultValue are updated.

5.5.6.10. FlexibleProgram

- PropertyCode : 0xD109
- DataType : INT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [0.0 EV]

Indicates the program shift value in units of 1/6 EV.

The valid PropertyValues are shown below.

From -30 [-5 EV] to +30 [+5 EV]

When the value of the ExposureProgramMode property (subsection 5.5.1.11) is a value other than [P], the value of PropertyValue is not valid but set to 0.

The StepSize of the property changes depending on the value of the ExposureEVStep property (subsection 5.5.3.3.2).

ExposureEVStep	StepSize
0 (1/3 EV)	2
1 (1/2 EV)	3

5.5.6.11. FocusArea

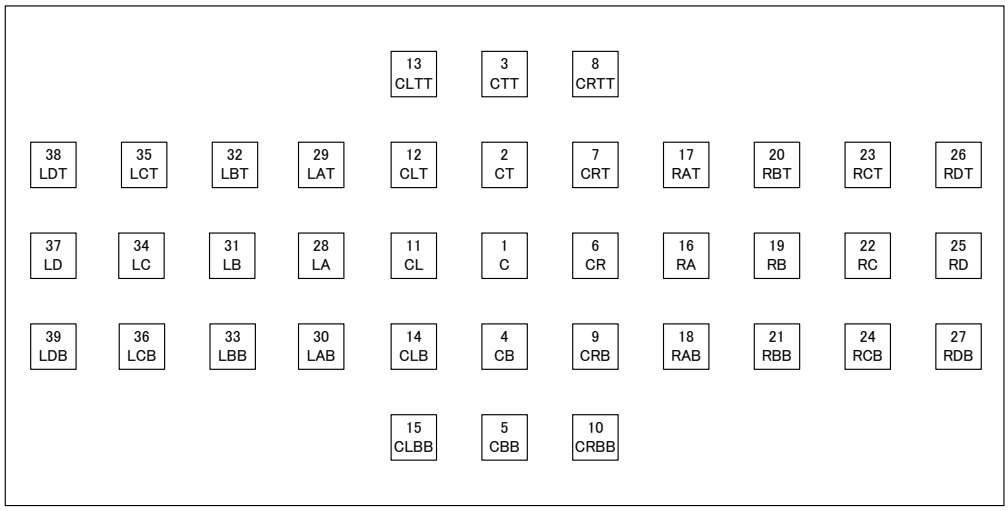
- PropertyCode : 0xD108
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 1

Indicates the focus point.

The valid PropertyValues are shown below.

From 0 to 39

The following figure shows the values of PropertyValue and the AF area positions.



When the FocusMeteringMode property (subsection 5.5.1.17) is [Auto area AF mode], Invalid_Status is passed.

The valid PropertyValues are shown below when the EnableAFAreaPoint property (subsection 5.5.3.2.6) is [11 points].

1, 3, 5, 19, 20, 21, 25, 31, 32, 33, 37

PropertyValue 0 indicates the condition in which the focus point is not fixed, and cannot be set.

5.5.6.12. ExposureDisplayStatus

- PropertyCode : 0xD1B0
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Normal]

Indicates the display status (Hi/Lo) of the shutter speed and the aperture value in the camera.

The valid PropertyValues are shown below.

		Shutter speed		
		Normal	Lo	Hi
Aperture value	Normal	0	1	2
	Lo	3	4	5
	Hi	6	7	8

5.5.6.13. ExposureIndicateStatus

- PropertyCode : 0xD1B1
- DataType : INT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [0.0 EV]

Indicates the display value of the indicator in units of 1/6 EV.

The valid PropertyValues are shown below.

From -60 [-10 EV] to +60 [+10 EV]

When the ExposureIndicateLightup property (subsection 5.5.6.14) is [OFF], the value of PropertyValue is not fixed.

5.5.6.14. ExposureIndicateLightup

- PropertyCode : 0xD1B3
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [ON]

Indicates the indicator display ON/OFF.

The valid PropertyValues are shown below.

0: ON, 1: OFF

5.5.6.15. WarningStatus

- PropertyCode : 0xD102
- DataType : UINT8
- Description form : None
- Get/Set : Get
- DefaultValue : 0 [No warning]

Indicates the camera warning information.

The valid PropertyValues are shown below.

Bit7	Check sum error (0: Invalid, 1: Valid)
Bit6	Bulb warning (0: Invalid, 1: Valid)
Bit5	Minimum aperture warning (0: Invalid, 1: Valid)
Bit4	i-TTL error (0: Invalid, 1: Valid)
Bit3	Lens shooting prohibited (Hardware error: Lens cannot be used.) (0: Invalid, 1: Valid)
Bit2	(Reserved) (0: Invalid, 1: Valid)
Bit1	Battery insufficient (0: Invalid, 1: Valid)
Bit0	Sequence error (0: Invalid, 1: Valid)

When the PropertyValue is a value other than 0, the release is locked.

If [Battery insufficient] is valid, [Shooting prohibited level] and [During insufficiency of battery] are set in the BatteryLevel property (subsection 5.5.1.1) and the LiveViewProhibitionCondition property (subsection 5.5.13.3), respectively.

5.5.6.16. AngleLevel

- PropertyCode : 0xD067
- DataType : INT32
- Description form : None
- Get/Set : Get
- DefaultValue : 0 [Horizontal]

Indicates the level angle information of the camera.

The valid PropertyValues are shown below.

Upper 16 bits: Integer section of the angle information

Lower 16 bits: Decimal section of the angle information

When the angle information cannot be acquired or it is not reliable, the PropertyValue is set to 0xFFFFFFFF.

The valid angle information is shown below.

From 0.0 degrees to 359.9999847412109375 degrees

The angle information is 0.0 degrees when the camera is in the horizontal state. The angle increases as the camera is rotated counterclockwise viewing from the person who operates the camera.

When the camera is rotated clockwise starting from 0.0 degrees, the angle becomes 359.9999847412109375 degrees or smaller.
When the camera is rotated counterclockwise starting from 359.9999847412109375 degrees, the angle becomes 0.0 degrees or larger.

The angle information is displayed in green when it is horizontal or vertical in the electronic virtual horizon of the setup menu. Add +0.5 degrees to the angle information and omit the value below the decimal section. When the result is 0 or a multiple of 90 degrees, it is judged to be horizontal or vertical.

Even if the PropertyValue is changed, the DevicePropChanged event (subsection 5.4.6) is not issued.

5.5.6.17. AngleLevelPitching

- PropertyCode : 0xD07D
- DataType : INT32
- Description form : None
- Get/Set : Get
- DefaultValue : 0 [Horizontal]

Indicates the level angle information (pitching) of the camera.
For the data type, the signed 32-bit fixed-point system is used, and the integer section and the decimal section use the upper 16 bits and the lower 16 bits, respectively.
The angle information is 0.0 or 180.0 degrees when the camera is in the horizontal state. The angle range is ±15 degrees from 0.0 or 180.0 degrees.

Camera orientation	Lens orientation	Angle range	Horizontal
Landscape	Up	From 0.0 to 15.0	0
	Down	0.0, from 359.9999847412109375 to 345.0	
Landscape (upside down)	Up	From 180.0 to 165.0	180
	Down	From 180.0 to 195.0	

The angle information is displayed in green when it is horizontal in the electronic virtual horizon of the setup menu. Add +0.5 degrees to the angle information and omit the value below the decimal section. When the result is 0.0 or 180.0 degrees, it is judged to be horizontal.

Even if there is a change in the angle information of the camera, the DevicePropChanged event (subsection 5.4.6) is not issued.
When the angle information cannot be acquired or it is not reliable, it should be minus 1 (0xFFFFFFFF) of the signed 32-bit integer.

5.5.6.18. AngleLevelYawing

- PropertyCode : 0xD07E
- DataType : INT32
- Description form : None
- Get/Set : Get
- DefaultValue : 0 [Horizontal]

Indicates the level angle information (yawing) of the camera.
For the data type, the signed 32-bit fixed-point system is used, and the integer section and the decimal section use the upper 16 bits and the lower 16 bits, respectively.
The angle information is 0.0 or 180.0 degrees when the camera is in the horizontal state. The angle range is ±15 degrees from 0.0 or 180.0 degrees.

Camera orientation	Lens orientation	Angle range	Horizontal
Portrait (grip side upward)	Up	From 0.0 to 15.0	0.0
	Down	0.0, from 359.9999847412109375 to 345.0	
Portrait (grip side downward)	Up	From 180.0 to 165.0	180.0
	Down	From 180.0 to 195.0	

The angle information is displayed in green when it is horizontal in the electronic virtual horizon of the setup menu. Add +0.5 degrees to the angle information and omit the value below the decimal section. When the result is 0.0 or 180.0 degrees, it is judged to be horizontal.

Even if there is a change in the angle information of the camera, the DevicePropChanged event (subsection 5.4.6) is not issued.
When the angle information cannot be acquired or it is not reliable, it should be minus 1 (0xFFFFFFFF) of the signed 32-bit integer.

5.5.6.19. InfoDisplayErrorStatus

- PropertyCode : 0xD1B2
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [OFF]

Indicates the error display status of the INFO display on the liquid crystal monitor.

The valid PropertyValues are shown below.

0: OFF, 1: ON

The error display conditions indicated by this command are shown below.

Name	Timing for starting message of errors and warning	Finish timing
Release sequence error	After the release sequence is completed	Generation cause released
Check sum error	When the power switch is turned ON	Generation cause released
Card hard error	When the card is inserted or the card is accessed	Generation cause released
Main MCU system startup abnormality error	When an excessive load is applied to the power supply	Generation cause released

Battery ID unauthentication error	When a battery other than the exclusive ID battery is mounted	Generation cause released
Minimum aperture warning	When the Fmin detection switch is turned OFF	Generation cause released
TTL warning	When the flash is set to TTL without mounting the CPU lens	Generation cause released
Card write-protected & not-formatted warning	When the card is inserted	Generation cause released
Card not-formatted warning	When the card is inserted	Generation cause released
Card write-protected warning	When the card is inserted	Generation cause released
Battery release prohibition level warning	After the shutter-release button is pressed fully	Generation cause released
Cleaning mirror-up operation finish warning *1	Two minutes before starting mirror-down operation	Generation cause released

*1: It is displayed when the operation-disabled battery level is detected because of the battery drop.

5.5.6.20. AFModeSelect

- PropertyCode : 0xD161
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 2 [AF-A]

Indicates “Focus mode” that is set in the camera.
For the focus mode of the Live view and the movie, refer to the AfModeAtLiveView property (subsection 5.5.3.2.8).

The valid PropertyValues are shown below.

0: AF-S, 1: AF-C, 2: AF-A, 3: MF (fixed), 4: MF (selection)

The PropertyValue that can be set in this property changes according to the two items; the FocusMode property (subsection 5.5.1.7) and the LensSort property (subsection 5.5.10.1).
The PropertyValue is MF (fixed) when not in the AF operation valid condition (the LensSort property is [CPU lens mounted]), and if the property is set, the Access_Denied response is made.
Although the CPU lens is mounted, MF (fixed) is set when MF is selected as the lens setting; therefore the Access_Denied response is made if the property is set.

For the focus mode that can be set in each condition, refer to the table below.

Condition	Item				
Lens other than CPU lens (including the case that a lens is not mounted)	MF (fixed)				
CPU lens + MF setting (setting by the dials and buttons of the camera or the lens)	MF (fixed)				
CPU lens + AF setting (setting by the dials and buttons of the camera or the lens) + PC camera mode			AF-S	AF-C	AF-A
CPU lens + AF setting (setting by the dials and buttons of the camera or the lens) +		MF (selection)	AF-S	AF-C	AF-A

PC host mode					

If AF-S is set when the FocusMeteringMode property (subsection 5.5.1.17) is set to the dynamic AF mode (9, 21, or 39 points) or 3D-tracking, the dynamic AF mode (9, 21, or 39 points) or the 3D-tracking of the FocusMeteringMode property (subsection 5.5.1.17) is released and the single point AF mode is set.

After that, if AF-A/AF-C is set, the FocusMeteringMode property (subsection 5.5.1.17) is set to the AF area mode prior to change.

5.5.6.21. MovieRecProhibitionCondition

- PropertyCode : 0xD0A4
- DataType : UINT32
- Description form : None
- Get/Set : Get
- DefaultValue : 0x00000000

Indicates the movie recording prohibition condition.

The PropertyValue takes the following values in the bit assignment. (1: Valid, 0: Invalid)
When the PropertyValue is a value other than 0, the movie recording cannot be started.
When the Live view is not started, the value of PropertyValue is not fixed. Even if a value has been entered, it is not guaranteed.

Bit31	Not used
Bit30	Not used
Bit29	Not used
Bit28	Not used
Bit27	Not used
Bit26	Not used
Bit25	Not used
Bit24	Not used
Bit23	Not used
Bit22	Not used
Bit21	Not used
Bit20	Not used
Bit19	Not used
Bit18	Not used
Bit17	Not used
Bit16	Not used
Bit15	Not used
Bit14	Not used
Bit13	Not used
Bit12	During enlarged display of Live view
Bit11	Card protected
Bit10	During movie file recording
Bit9	There is movie data in the buffer.
Bit8	There is data whose recording destination is the PC in the buffer.
Bit7	There is data whose recording destination is a card in the buffer.
Bit6	Not used
Bit5	Not used
Bit4	Not used
Bit3	No free area in the card
Bit2	Card not formatted
Bit1	Card error
Bit0	No card inserted

5.5.6.22. ContinuousShootingCount

- PropertyCode : 0xD1B4

- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 99 [99 frames]

Indicates the number of frames that can be recorded in continuous shooting by the command.
The number of frames that can be recorded in continuous shooting can be acquired with any setting value of the RecordingMedia property (subsection 5.5.6.2).

The valid PropertyValues are shown below.

From 0 [0 frames] to 99 [99 frames]

The number of continuous shooting frames changes depending on the following setting values on the camera.
- Image quality mode: CompressionSetting property (subsection 5.5.1.3)
- Image size: ImageSize property (subsection 5.5.1.2)
- JPEG compression: JpegCompressionPolicy property (subsection 5.5.2.6)
- RAW recording: RawCompressionType property (subsection 5.5.2.7)
  : RawCompressionBitMode property (subsection 5.5.2.8)
- Active D-lighting: Active-D-Lighting property (subsection 5.5.2.38)
- Long-exposure noise reduction: NoiseReduction property (subsection 5.5.2.39)
- High-ISO noise reduction: NoiseReductionHiIso property (subsection 5.5.2.40)
- The number of continuous shooting frames: BurstMaxNumber property (subsection 5.5.3.5.8)

5.5.7. Bracketing

5.5.7.1. EnableBracketing

- PropertyCode : 0xD0C0
- DataType : UINT8
- Description form : Range
- Get/Set : Get, Get/Set
- DefaultValue : 0 [Not performed]

Indicates the status of bracketing.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: Not performed, 1: Performed

Setting the property is invalid when the following conditions are completely satisfied.
- The BracketingType property (subsection 5.5.3.6.19) is set to [WB bracketing] and the CompressionSetting property (subsection 5.5.1.3) is set to [RAW] or [RAW + JPEG (BASIC/NORMAL/FINE)].

When the ExposureEVStep property (subsection 5.5.3.3.2) is changed, the PropertyValue is set to [Not performed].

5.5.7.2. AEBracketingStep

- PropertyCode : 0xD0C1
- DataType : UINT8
- Description form : Range

- Get/Set : Get, Get/Set
- DefaultValue : 0 [1/3 EV]

Indicates the step range of AE bracketing.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 1/3 EV, 1: 1/2 EV, 2: 2/3 EV, 3: 1 EV, 4: 1+1/3 EV, 5: 1+1/2 EV, 6: 1+2/3 EV, 7: 2 EV

The value of PropertyValue changes depending on the value of the ExposureEVStep property (subsection 5.5.3.3.2).

ExposureEVStep	PropertyValue
0 (1/3 EV)	0 (1/3EV), 2 (2/3EV), 3 (1EV) 4 (1+1/3EV), 6 (1+2/3EV), 7 (2EV)
1 (1/2 EV)	1 (1/2EV), 3 (1EV), 5 (1+1/2EV), 7 (2EV)

Setting the property is invalid in the case shown below.
- The BracketingType property (subsection 5.5.3.6.19) is set to [WB bracketing] or [ADL bracketing].

When the value of the ExposureEVStep property (subsection 5.5.3.3.2) is changed, the PropertyValue should be 1 EV.

When the EnableBracketing property (subsection 5.5.7.1) is set to [Not performed] and the BracketingType property (subsection 5.5.3.6.19) is set to [WB bracketing] or [ADL bracketing], the value of PropertyValue is not fixed.

5.5.7.3. AEBracketingPattern

- PropertyCode : 0xD0C2
- DataType : UINT8
- Description form : Range
- Get/Set : Get, Get/Set
- DefaultValue : 2 [3 images in both directions]

Indicates the compensation direction and the number of images to be captured for AE bracketing.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 2 images in the negative direction, 1: 2 images in the positive direction,
2: 3 images in both directions

Setting the property is invalid in the case shown below.
- The BracketingType property (subsection 5.5.3.6.19) is set to [WB bracketing] or [ADL bracketing].

When the EnableBracketing property (subsection 5.5.7.1) is set to [Not performed] and the

BracketingType property (subsection 5.5.3.6.19) is set to [WB bracketing] or [ADL bracketing], the value of PropertyValue is not fixed.

5.5.7.4. AEBracketingCount

- PropertyCode : 0xD0C3
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 1

Indicates the number of the image (nth image) to be captured next for AE bracketing and ADL bracketing.

The valid PropertyValues are shown below.
AE bracketing: From 1 to 3
ADL bracketing: From 1 to 3

When the EnableBracketing property (subsection 5.5.7.1) is set to [Not performed] and the BracketingType property (subsection 5.5.3.6.19) is set to [WB bracketing], the value of PropertyValue is not fixed.

5.5.7.5. WBBracketingStep

- PropertyCode : 0xD0C4
- DataType : UINT8
- Description form : Range
- Get/Set : Get, Get/Set
- DefaultValue : 0 [1 EV]

Indicates the step range for WB bracketing.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 1 EV, 1: 2 EV, 2: 3 EV

Setting the property is invalid in the cases shown below.
- The BracketingType property (subsection 5.5.3.6.19) is set to anything other than [WB bracketing].
- The CompressionSetting property (subsection 5.5.1.3) is set to [RAW] or [RAW + JPEG (BASIC/NORMAL/FINE)].

When the EnableBracketing property (subsection 5.5.7.1) is set to [Not performed] and the BracketingType property (subsection 5.5.3.6.19) is set to anything other than [WB bracketing], the value of PropertyValue is not fixed.

5.5.7.6. WBBracketingPattern

- PropertyCode : 0xD0C5
- DataType : UINT8
- Description form : Range
- Get/Set : Get, Get/Set
- DefaultValue : 2 [3 images in both directions]

Indicates the compensation direction and the number of images to be captured for WB bracketing.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 2 images in the negative direction, 1: 2 images in the positive direction,
2: 3 images in both directions

Setting the property is invalid in the cases shown below.
- The BracketingType property (subsection 5.5.3.6.19) is set to anything other than [WB bracketing].
- The CompressionSetting property (subsection 5.5.1.3) is set to [RAW] or [RAW + JPEG (BASIC/NORMAL/FINE)].

When the EnableBracketing property (subsection 5.5.7.1) is set to [Not performed] and the BracketingType property (subsection 5.5.3.6.19) is set to anything other than [WB bracketing], the value of PropertyValue is not fixed.

5.5.7.7. ADLBracketingPattern

- PropertyCode : 0xD0C6
- DataType : UINT8
- Description form : Range
- Get/Set : Get, Get/Set
- DefaultValue : 0 [2 images (Not performed -> User setting)]

Indicates the number of images to be captured for ADL bracketing.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

0: 2 images (Not performed -> User setting),
1: 3 images (Not performed -> Normal -> High)

For the user setting, the setting value of the Active-D-Lighting property (subsection 5.5.2.38) should be used. When the Active-D-Lighting property is set to [Not performed], Auto is used.

Setting the property is invalid in the case shown below.
- The BracketingType property (subsection 5.5.3.6.19) is set to anything other than [ADL bracketing].

When the EnableBracketing property (subsection 5.5.7.1) is set to [Not performed] and the BracketingType property (subsection 5.5.3.6.19) is set to anything other than [ADL bracketing], the value of PropertyValue is not fixed.

5.5.8. External Flash

5.5.8.1. ExternalSpeedLightExist

- PropertyCode : 0xD120
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Not mounted]

Indicates the mounting status of the external flash.

The valid PropertyValues are shown below.

0: Not mounted, 1: Mounted

5.5.8.2. ExternalSpeedLightSort

- PropertyCode : 0xD122
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Noncommunication]

Indicates the communication status of the external flash.

The valid PropertyValues are shown below.

0: Noncommunication, 1: Reserve (unusable),
2: New-type communication (with the operating and setting section),
3: New-type communication (without the operating and setting section)

When the ExternalSpeedLightExist property (subsection 5.5.8.1) is set to [Not mounted], the value of PropertyValue is not fixed.
If the external flash for old-type communication is mounted, the PropertyValue becomes [Noncommunication].

For the communication status types of the external flash, refer to “External Flash Types” (subsection 10.7).

5.5.8.3. ExternalSpeedLightStatus

- PropertyCode : 0xD121
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Not charged]

Indicates the charge status of the external flash.

The valid PropertyValues are shown below.

0: Not charged, 1: Ready

When the ExternalSpeedLightExist property (subsection 5.5.8.1) is set to [Not mounted], the value of PropertyValue is not fixed.

5.5.8.4. NewExternalSpeedLightMode

- PropertyCode : 0xD125
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [OFF]

Indicates the flash mode of the external flash (new-type communication).

The valid PropertyValues are shown below.

0: OFF, 1: i-TTL-BL, 2: i-TTL,
3: Aperture interlocking automatic flash, 4: External automatic flash,
5: Manual (distance priority), 6: Manual, 7: Multi-flash

When the ExternalSpeedLightExist property (subsection 5.5.8.1) is set to [Not mounted], the value of PropertyValue is not fixed.
When the ExternalSpeedLightSort property (subsection 5.5.8.2) is set to anything other than [New-type communication], the value of PropertyValue is not fixed.

The value of PropertyValue changes depending on the value of the InternalFlashMode property (subsection 5.5.3.6.3).

5.5.8.5. FlashCompensation

- PropertyCode : 0xD124
- DataType : INT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [0.0 EV]

Indicates the flash compensation value in units of 1/6 EV.

The valid PropertyValues are shown below.

From -18 [-3.0 EV] to +18 [+3.0 EV]

When the ExternalSpeedLightExist property (subsection 5.5.8.1) is set to [Not mounted], the value of PropertyValue is not fixed.
When the ExternalSpeedLightSort property (subsection 5.5.8.2) is set to anything other than [New-type communication], the value of PropertyValue is not fixed.

The value of PropertyValue is valid when the values of the ExternalSpeedLightSort property (subsection 5.5.8.2) and the NewExternalSpeedLightMode property (subsection 5.5.8.4) are as shown in the table below. In the cases other than those in the table below, the value of PropertyValue is 0.

ExternalSpeedLightSort	NewExternalSpeedLightMode
Noncommunication	(Invalid)
New-type communication	i-TTL-BL i-TTL Aperture interlocking automatic flash Manual (distance priority)

5.5.9. Internal Flash

5.5.9.1. InternalFlashPopup

- PropertyCode : 0xD1C0

- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Pop-down]

Indicates the pop-up status of the internal flash.

The valid PropertyValues are shown below.

0: Pop-down, 1: Pop-up

5.5.9.2. InternalFlashStatus

- PropertyCode : 0xD1C1
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Charging]

Indicates the charging status of the internal flash.

The valid PropertyValues are shown below.

0: Charging, 1: Ready status

5.5.9.3. InternalFlashCompensation

- PropertyCode : 0xD126
- DataType : INT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0

Indicates the flash compensation value of the internal flash in units of 1/6 EV.

The Access_Denied response is made and the value cannot be set in the following cases.
- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

From -18 to +6

The value of PropertyValue changes depending on the value of the ExposureEVStep property (subsection 5.5.3.3.2).

When the ExposureEVStep property (subsection 5.5.3.3.2) is changed from 1/3 EV to 1/2 EV

1/3 EV	1/2 EV
+1.0	+1.0
+0.7	+0.5
+0.3	+0.5
0.0	0.0
-0.3	-0.5
-0.7	-0.5
-1.0	-1.0
-1.3	-1.5
-1.7	-1.5

-2.0	-2.0
-2.3	-2.5
-2.7	-2.5
-3.0	-3.0

When the ExposureEVStep property (subsection 5.5.3.3.2) is changed from 1/2 EV to 1/3 EV

1/2 EV	1/3 EV
+1.0	+1.0
+0.5	+0.3
0.0	0.0
-0.5	-0.3
-1.0	-1.0
-1.5	-1.3
-2.0	-2.0
-2.5	-2.3
-3.0	-3.0

5.5.10. Lens

5.5.10.1. LensSort

- PropertyCode : 0xD0E1
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 1 [CPU lens mounted]

Indicates the mounting status of the CPU lens.

The valid PropertyValues are shown below.

0: Not mounted (lens not mounted or non-CPU lens mounted),
1: CPU lens mounted

5.5.10.2. LensType

- PropertyCode : 0xD0E2
- DataType : UINT8
- Description form : None
- Get/Set : Get
- DefaultValue : 1 [D-type lens]

Indicates information on the CPU lens.

The valid PropertyValues are shown below.

Bit7	(Reserved) (0: Invalid, 1: Valid)
Bit6	(Reserved) (0: Invalid, 1: Valid)
Bit5	(0: Invalid, 1: Valid) Lens supporting automatic distortion correction
Bit4	(Reserved) (0: Invalid, 1: Valid)
Bit3	(0: Invalid, 1: Valid) DX lens (for the exclusive use of Nikon digital cameras)
Bit2	(0: Invalid, 1: Valid) VR lens (with anti-vibration mechanism)
Bit1	(0: Invalid, 1: Valid) G-type lens (without aperture dial)

Bit0	(0: Invalid, 1: Valid) D-type lens (with distance encoder)

When the value of the LensSort property (subsection 5.5.10.1) is set to [Not mounted], the value of PropertyValue is not fixed.

5.5.10.3. LensID

- PropertyCode : 0xD0E0
- DataType : UINT8
- Description form : None
- Get/Set : Get
- DefaultValue : 0

Indicates the ID of the CPU lens.

The value of PropertyValue indicates an ID (one byte).

When the value of the LensSort property (subsection 5.5.10.1) is set to [Not mounted], the value of PropertyValue is not fixed.

5.5.10.4. LensFocalMin

- PropertyCode : 0xD0E3
- DataType : UINT32
- Description form : None
- Get/Set : Get
- DefaultValue : 5000 [50 mm]

Indicates the focal length at the Wide-end with the CPU lens mounted.

The value of PropertyValue should be a hundred times the focal length (mm).

When the value of the LensSort property (subsection 5.5.10.1) is set to [Not mounted], the value of PropertyValue is not fixed.

5.5.10.5. LensFocalMax

- PropertyCode : 0xD0E4
- DataType : UINT32
- Description form : None
- Get/Set : Get
- DefaultValue : 5000 [50 mm]

Indicates the focal length at the Tele-end with the CPU lens mounted.

The value of PropertyValue should be a hundred times the focal length (mm).

When the value of the LensSort property (subsection 5.5.10.1) is set to [Not mounted], the value of PropertyValue is not fixed.

5.5.10.6. LensApatureMin

- PropertyCode : 0xD0E5
- DataType : UINT16
- Description form : None
- Get/Set : Get
- DefaultValue : 140 [F1.4]

Indicates the maximum aperture value at the Wide-end with the CPU lens mounted.

The value of PropertyValue should be a hundred times the maximum aperture value.

When the value of the LensSort property (subsection 5.5.10.1) is set to [Not mounted], the value of PropertyValue is not fixed.

5.5.10.7. LensApatureMax

- PropertyCode : 0xD0E6
- DataType : UINT16
- Description form : None
- Get/Set : Get
- DefaultValue : 1600 [F16]

Indicates the maximum aperture value at the Tele-end with the CPU internal lens mounted.

The value of PropertyValue should be a hundred times the maximum aperture value.

When the value of the LensSort property (subsection 5.5.10.1) is set to [Not mounted], the value of PropertyValue is not fixed.

5.5.11. CCD

5.5.11.1. CCDNumber

- PropertyCode : 0xD10D
- DataType : String
- Description form : None
- Get/Set : Get
- DefaultValue : “00000000000000000000”

Indicates the serial number of the CCD.

The PropertyValue is a string of 20 characters; a lot number of 12 characters and a serial number of 8 characters (not including a null character).
When the string of the lot number and the serial number is shorter than the specified number of characters, the shortage is padded with spaces (0x20).

For the characters (ASCII code), refer to subsection 9.2.
If a character that is not shown in subsection 9.2 is included, it is replaced with a space (0x20).

5.5.12. USB

5.5.12.1. USBSpeed

- PropertyCode : 0xD10C
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [Full-Speed]

Indicates the maximum data transfer speed of the USB.

The valid PropertyValues are shown below.

0: Full-Speed, 1: High-Speed

5.5.13. Live View

5.5.13.1. LiveViewStatus

- PropertyCode : 0xD1A2
- DataType : UINT8
- Description form : Range
- Get/Set : Get
- DefaultValue : 0 [OFF]

Indicates the status of the Live view.

The valid PropertyValues are shown below.

0: OFF, 1: ON

5.5.13.2. LiveViewImageZoomRatio

- PropertyCode : 0xD1A3
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [Entire display]

Indicates the magnification of the Live view image.

The valid PropertyValues are shown below.

0: Entire display, 1: 25%, 2: 33%, 3: 50%, 4: 66%, 5: 100%

If the property is set in a state other than during the Live view, Not_LiveView is passed.
When the camera receives the StartLiveView command, the PropertyValue should be set to [Entire display].

The Access_Denied response is made and the value cannot be set in the following case.
- During movie recording

When the value of PropertyValue is changed, it takes a fixed amount of time before the contents of the change are reflected in the Live view image that can be acquired by the GetLiveViewImage command (subsection 5.2.36).

5.5.13.3. LiveViewProhibitionCondition

- PropertyCode : 0xD1A4
- DataType : UINT32
- Description form : None
- Get/Set : Get
- DefaultValue : 0x00000000

Indicates the Live view prohibition condition.

The valid PropertyValues are shown below.

Bit31	(Reserved)	(0: Invalid, 1: Valid)
Bit30	(Reserved)	(0: Invalid, 1: Valid)
Bit29	(Reserved)	(0: Invalid, 1: Valid)
Bit28	(Reserved)	(0: Invalid, 1: Valid)
Bit27	(Reserved)	(0: Invalid, 1: Valid)
Bit26	(Reserved)	(0: Invalid, 1: Valid)
Bit25	(Reserved)	(0: Invalid, 1: Valid)

Bit24	(Reserved)	(0: Invalid, 1: Valid)
Bit23	(Reserved)	(0: Invalid, 1: Valid)
Bit22	(Reserved)	(0: Invalid, 1: Valid)
Bit21	(Reserved)	(0: Invalid, 1: Valid)
Bit20	(Reserved)	(0: Invalid, 1: Valid)
Bit19	(Reserved)	(0: Invalid, 1: Valid)
Bit18	(Reserved)	(0: Invalid, 1: Valid)
Bit17	(Reserved)	(0: Invalid, 1: Valid)
Bit16	(Reserved)	(0: Invalid, 1: Valid)
Bit15	During processing by the shooting command * When the recording destination is the card, it indicates the time until the CaptureComplete event is passed. * When the recording destination is the SDRAM, it indicates the time until the CaptureCompleteRecInSdram event is passed. * When the recording destinations are the card and the SDRAM, it indicates the time until the CaptureComplete and the CaptureCompleteRecInSdram events are passed.	(0: Invalid, 1: Valid)
Bit14	The recording destination is the card or the card & SDRAM, and the card is not inserted with the release disabled without a card.	(0: Invalid, 1: Valid)
Bit13	The release mode is [Mirror-up].	(0: Invalid, 1: Valid)
Bit12	There is an image whose recording destination is SDRAM.	(0: Invalid, 1: Valid)
Bit11	The CPU lens is not mounted and the exposure mode is not M or A.	(0: Invalid, 1: Valid)
Bit10	While the aperture value operation by the lens aperture ring is valid	(0: Invalid, 1: Valid)
Bit9	TTL error	(0: Invalid, 1: Valid)
Bit8	During insufficiency of battery	(0: Invalid, 1: Valid)
Bit7	During cleaning mirror-up operation	(0: Invalid, 1: Valid)
Bit6	Bulb error	(0: Invalid, 1: Valid)
Bit5	The aperture value is being set by the lens aperture ring.	(0: Invalid, 1: Valid)
Bit4	Fully pressed button error	(0: Invalid, 1: Valid)
Bit3	(Reserved)	(0: Invalid, 1: Valid)
Bit2	Sequence error	(0: Invalid, 1: Valid)
Bit1	(Reserved)	(0: Invalid, 1: Valid)
Bit0	(Reserved)	(0: Invalid, 1: Valid)

When the PropertyValue is a value other than 0, the Live view cannot be started.

If [During insufficiency of battery] is valid, [Shooting prohibited level] and [Battery insufficient] are set in the BatteryLevel property (subsection 5.5.1.1) and the WarningStatus property (subsection 5.5.6.15), respectively.

5.5.14. Picture Control

5.5.14.1. ActivePicCtrlItem

- PropertyCode : 0xD200
- DataType : UINT16
- Description form : Enumeration
- Get/Set : Get/Set
- DefaultValue : 1 [Standard]

Indicates the picture control item whose setting is currently valid.

The Access_Denied response is made and the value cannot be set in the following cases. The value is acquired according to the Scene mode settings.

- The ExposureProgramMode property (subsection 5.5.1.11) is Scene mode.
- The ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property

(subsection 5.5.2.5) is Scene mode.

The valid PropertyValues are shown below.

1: Standard, 2: Neutral, 3: Vivid, 4: Monochrome, 5: Portrait, 6: Landscape
From 101 to 104: Option picture control (from 1 to 4),
From 201 to 209: Custom picture control (from 1 to 9)

When setting to an unregistered area is performed for the option picture control and the custom picture control, Invalid_States is passed.

5.5.14.2. ChangePicCtrlItem

- PropertyCode : 0xD201
- DataType : UINT16
- Description form : Enumeration
- Get/Set : Get
- DefaultValue : 0

Indicates the number of picture controls and items whose settings are changed.

The valid PropertyValues are shown below.

0: None, 1: Standard, 2: Neutral, 3: Vivid, 4: Monochrome, 5: Portrait, 6: Landscape
From 101 to 104: Option picture control (from 1 to 4),
From 201 to 209: Custom picture control (from 1 to 9)

When the setting of each item for the picture control is changed or each item for the option picture control and the custom picture control is edited, registered, changed in the registration name, or deleted, the items whose settings are changed are enumerated.

When the PropertyValue is acquired by the GetDevicePropDesc command (subsection 5.2.16), the PropertyValue is cleared and becomes 0.

5.5.15. Application Mode

5.5.15.1. ApplicationMode

- PropertyCode : 0xD1F0
- DataType : UINT8
- Description form : Range
- Get/Set : Get/Set
- DefaultValue : 0 [OFF]

Indicates the status of the application mode.

The valid PropertyValues are shown below.

0: OFF, 1: ON

When the property is set with the PropertyValue 1 [ON], the camera shifts to the application mode in which the asynchronous event transmission by the Interrupt transfer is not performed. After shifting to the application mode, the host application needs to acquire the event by using the GetEvent command.
* If this property is set while the camera is in the camera mode, the playback operation in the camera becomes possible. However, starting Live view by operating the camera cannot be performed.

5.5.16. MTP

5.5.16.1. SessionInitiatorVersionInfo

- PropertyCode : 0xD406
- DataType : String
- Description form : None
- Get/Set : Get/Set
- DefaultValue : "Windows/6.0.5330.0 MTPClassDriver/6.0.5330.0"
  [Session initiator version information character string]

Indicates the version information of the host in open session.

The PropertyValue should be a Unicode string of 48 characters or shorter (including a null character) ending with a null character.
(HTTP 1.1 spec (RFC 2068) User Agent string format)

5.5.16.2. PerceivedDeviceType

- PropertyCode : 0xD407
- DataType : UINT32
- Description form : None
- Get/Set : Get
- DefaultValue : 0x00000001 [Digital still camera]

Indicates the type of the device.

The valid PropertyValues are shown below.

PropertyValue = 0x00000001 [Digital still camera]

5.5.16.3. UseDeviceStage Flag

- PropertyCode : 0xD303
- DataType : UINT8
- Description form : None
- Get/Set : Get
- DefaultValue : 0x01 [ON]

Indicates that the device can use Device Stage when the PropertyValue is a value other than 0. Windows searches the metadata of Device Stage in the metadata service until the device installation is completed. If the metadata of Device Stage in the server of Microsoft cannot be acquired, Windows displays Baseline Experience instead of Device Stage.

The valid PropertyValue is shown below.

PropertyValue = 0x01 [ON]

5.6. ObjectPropCode

Each of the objects in the camera has various sorts of specific information. As a method of transmission/reception of object information, an operation already exists in the PTP for operating the ObjectInfo data set. However, this is a static data set that cannot be expanded and includes basic information on the object. Various metadata concerning objects can be handled by operating the object property. Each object property has a corresponding ObjectPropCode.

The ObjectPropCodes supported by the camera are shown below.

ObjectPropCode	ObjectPropName	Reference item
0xDC01	StorageID	5.6.1
0xDC02	ObjectFormat	5.6.2
0xDC03	ProtectionStatus	5.6.3
0xDC04	ObjectSize	5.6.4
0xDC07	ObjectFilename	5.6.5
0xDC08	DateCreated	5.6.6
0xDC09	DateModified	5.6.7
0xDC0B	ParentObject	5.6.8
0xDC41	PersistentUniqueObjectIdentifier	5.6.9
0xDC44	Name	5.6.10
0xDC81	RepresentativeSampleFormat	5.6.11
0xDC82	RepresentativeSampleSize	5.6.12
0xDC83	RepresentativeSampleHeight	5.6.13
0xDC84	RepresentativeSampleWidth	5.6.14
0xDC86	RepresentativeSampleData	5.6.15
0xDC87	Width	5.6.16
0xDC88	Height	5.6.17
0xDCD3	ImageBitDepth	5.6.18
0xDC89	Duration	5.6.19
0xDE93	SampleRate	5.6.21
0xDE94	NumberOfChannels	5.6.22
0xDE97	ScanType	5.6.23
0xDE9A	AudioBitRate	5.6.24
0xDE9B	VideoFourCCCode	5.6.25
0xDE9C	VideoBitRate	5.6.26

5.6.1. StorageID

It is applied to the objects of all the formats supported by the camera.

- PropertyCode : 0xDC01
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x00010001
- GroupCode : 0x00000001
- FormFlag : 0x00

This indicates the StorageID of the object.
(It is the same value as that of the first field of the ObjectInfo data set.)

The PropertyValue takes the following values.

0x00010001: Main slot, 0x00020001: Subslot

5.6.2. ObjectFormat

It is applied to the objects of all the formats supported by the camera.

- PropertyCode : 0xDC02
- DataType : UINT16
- Get/Set : Get

- DefaultValue : 0x3000
- GroupCode : 0x00000001
- FormFlag : 0x00

This indicates the ObjectFormatCode of the object.
(It is the same value as that of the second field of the ObjectInfo data set.)

The PropertyValue takes the following values.

PropertyValue	ObjectFormat
0x3000	Undefined
0x3001	Association
0x3002	Script
0x3006	DPOF
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)
0x3800	Unknown Image Object
0x3801	EXIF/JPEG
0x3808	JFIF

5.6.3. ProtectionStatus

It is applied to the objects of all the formats supported by the camera.

- PropertyCode : 0xDC03
- DataType : UINT16
- Get/Set : Get
- DefaultValue : 0x0000
- GroupCode : 0x00000001
- FormFlag : 0x02 (Enumeration)

This indicates the protection status of the object.
(It is the same value as that of the third field of the ObjectInfo data set.)

The PropertyValue takes the following values.

PropertyValue	Setting
0x0000	Protection is not set.
0x0001	Protection is set.

5.6.4. ObjectSize

It is applied to the objects of all the formats supported by the camera.

- PropertyCode : 0xDC04
- DataType : UINT64
- Get/Set : Get
- DefaultValue : 0x0000000000000000
- GroupCode : 0x00000001
- FormFlag : 0x00

This indicates the size of the object in units of bytes.
(It is the same value as that of the fourth field of the ObjectInfo data set.)

5.6.5. ObjectFilename

It is applied to the objects of all the formats supported by the camera.
However, the ObjectPropDesc returned in the Image format differs from that returned in the Association format.

- PropertyCode : 0xDC07

- DataType : String
- Get/Set : Get
- DefaultValue : 0x00 (Null)
- GroupCode : 0x00000001
- FormFlag : 0x05 (RegEx)

This indicates an optional string that shows a file name of an object.
(It is the same value as that of the sixteenth field of the ObjectInfo data set.)

The values in the RegEx field are shown below.

ObjectFormat	RegEx
Association	[0-9]{3}[_a-zA-Z0-9]{5}
Other than Association	[_a-zA-Z]{4}[0-9]{4}¥.[a-zA-Z]{3}

5.6.6. DateCreated

It is applied to the objects of all the formats supported by the camera.

- PropertyCode : 0xDC08
- DataType : String
- Get/Set : Get
- DefaultValue : 0x00 (Null)
- GroupCode : 0x00000001
- FormFlag : 0x03 (DateTime)

This indicates a string that shows the date/time of object creation.
(It is the same value as that of the seventeenth field of the ObjectInfo data set.)

5.6.7. DateModified

It is applied to the objects of all the formats supported by the camera.

- PropertyCode : 0xDC09
- DataType : String
- Get/Set : Get
- DefaultValue : 0x00 (Null)
- GroupCode : 0x00000001
- FormFlag : 0x03 (DateTime)

This indicates a string that shows the date/time of object update.
(It is the same value as that of the eighteenth field of the ObjectInfo data set.)

5.6.8. ParentObject

It is applied to the objects of all the formats supported by the camera.

- PropertyCode : 0xDC0B
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x00000000
- GroupCode : 0x00000001
- FormFlag : 0x00

This indicates the ObjectHandle of the parent object of the object.
(It is the same value as that of the twelfth field of the ObjectInfo data set.)

5.6.9. PersistentUniqueObjectIdentifier

It is applied to the objects of all the formats supported by the camera.

- PropertyCode : 0xDC41
- DataType : UINT128
- Get/Set : Get
- DefaultValue : 0x00^16
- GroupCode : 0x00000001
- FormFlag : 0x00

This indicates an object-specific identifier (PUOID).

The generation rule of the PUOID is shown below.

0 through 3	4 through 15
ObjectHandle (4Byte)	0 (not used)

5.6.10. Name

It is applied to the objects of all the formats supported by the camera.

- PropertyCode : 0xDC44
- DataType : String
- Get/Set : Get
- DefaultValue : 0x00 (Null)
- GroupCode : 0x00000001
- FormFlag : 0x00

This indicates an optional string that shows a file name of an object.
(It should be the same value as that of ObjectFilename.)

5.6.11. RepresentativeSampleFormat

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x3800	Unknown Image Object
0x3801	EXIF/JPEG
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDC81
- DataType : UINT16
- Get/Set : Get
- DefaultValue : 0x3000
- GroupCode : 0x00000001
- FormFlag : 0x02 (Enumeration)

This indicates the ObjectFormatCode of the thumbnail image.

The PropertyValue takes the following values.

PropertyValue	Setting
0x3000	Undefined
0x3808	JFIF

5.6.12. RepresentativeSampleSize

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x3000	Undefined
0x3800	Unknown Image Object
0x3801	EXIF/JPEG

0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDC82
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x00000000
- GroupCode : 0x00000001
- FormFlag : 0x01 (Range)

This indicates the size of the thumbnail in bytes.

The range of PropertyValue is shown below.

From 0 to 0x00010000

5.6.13. RepresentativeSampleHeight

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x3000	Undefined
0x3800	Unknown Image Object
0x3801	EXIF/JPEG
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDC83
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x00000000
- GroupCode : 0x00000001
- FormFlag : 0x01 (Range)

This indicates the height of the thumbnail in pixels.

The range of PropertyValue is shown below.

From 0 to 120

5.6.14. RepresentativeSampleWidth

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x3000	Undefined
0x3800	Unknown Image Object
0x3801	EXIF/JPEG
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDC84
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x00000000
- GroupCode : 0x00000001
- FormFlag : 0x01 (Range)

This indicates the width of the thumbnail in pixels.

The range of PropertyValue is shown below.

From 0 to 160

5.6.15. RepresentativeSampleData

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x3000	Undefined
0x3800	Unknown Image Object
0x3801	EXIF/JPEG
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDC86
- DataType : AUINT8
- Get/Set : Get
- DefaultValue : 0x00000000
- GroupCode : 0xFFFFFFFF
- FormFlag : 0x06 (ByteArray)

This indicates the thumbnail data.

The range of PropertyValue is shown below.

From 0 to 0x00010000

5.6.16. Width

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x3000	Undefined
0x3800	Unknown Image Object
0x3801	EXIF/JPEG
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDC87
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x00000000
- GroupCode : 0x00000001
- FormFlag : 0x01 (Range)

This indicates the width of the object in pixels.

The range of PropertyValue is shown below.

From 0 to 10000

5.6.17. Height

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x3000	Undefined
0x3800	Unknown Image Object

0x3801	EXIF/JPEG
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDC88
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x00000000
- GroupCode : 0x00000001
- FormFlag : 0x01 (Range)

This indicates the height of the object in pixels.

The range of PropertyValue is shown below.

From 0 to 10000

5.6.18. ImageBitDepth

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x3000	Undefined
0x3800	Unknown Image Object
0x3801	EXIF/JPEG

- PropertyCode : 0xDCD3
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x0000000C
- GroupCode : 0x00000001
- FormFlag : 0x02 (Enumeration)

This indicates the bit depth of the object.

The PropertyValue takes the following values.

PropertyValue	Description
0x0000000C	12bit
0x0000000E	14bit
0x00000018	24bit

5.6.19. Duration

It is applied to the objects of the following format.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDC89
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x00000000
- GroupCode : 0x00000001
- FormFlag : 0x01 (Range)

This indicates the length of the object in msec.

The range of PropertyValue is shown below.

From 0 to 0x124F80 (1200000 msec)

5.6.20. AudioWAVECodec

It is applied to the objects of the following format.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

This property indicates the audio codec of the object.

- PropertyCode : 0xDE99
- DataType : UINT16
- Get/Set : Get
- DefaultValue : 0x0000
- GroupCode : 0x00000001
- FormFlag : 0x02 (Enumeration)

The PropertyValue takes the following values.

PropertyValue	Description
0x0000	No sound/Unknown
0x0001	Linear PCM

5.6.21. SampleRate

It is applied to the objects of the following format.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDE93
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x00000000
- GroupCode : 0x00000001
- FormFlag : 0x02 (Enumeration)

This indicates the sample rate of the object.

The PropertyValue takes the following values.

PropertyValue	Description
0x00000000	0 Hz (no sound)/Unknown
0x00002B11	11.025 Hz
0x0000AC44	44.100 Hz
0x0000BB80	48.000 Hz

5.6.22. NumberOfChannels

It is applied to the objects of the following format.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDE94
- DataType : UINT16
- Get/Set : Get
- DefaultValue : 0x0000
- GroupCode : 0x00000001
- FormFlag : 0x02 (Enumeration)

This indicates the number of channels of the object.

The PropertyValue takes the following values.

PropertyValue	Description
0x0000	Unused (no sound) / Unknown
0x0001	Monaural (1ch)
0x0002	Stereo (2ch)

5.6.23. ScanType

It is applied to the objects of the following format.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDE97
- DataType : UINT16
- Get/Set : Get
- DefaultValue : 0x0000
- GroupCode : 0x00000001
- FormFlag : 0x02 (Enumeration)

This indicates the scan type of the object.

The PropertyValue takes the following value.

PropertyValue	Description
0x0000	Unused

5.6.24. AudioBitRate

It is applied to the objects of the following format.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDE9A
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x00000000
- GroupCode : 0x00000001
- FormFlag : 0x01 (Range)

This indicates the audio bit rate of the object.

The range of PropertyValue is shown below.

From 0x00000000 (No sound/Unknown) to 0x000BB800

5.6.25. VideoFourCCCode

It is applied to the objects of the following format.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDE9B
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x61766331
- GroupCode : 0x00000001
- FormFlag : 0x02 (Enumeration)

This indicates the FourCC code for the video codec.

The PropertyValue takes the following value.

PropertyValue	Description
0x61766331	“avc1”

5.6.26. VideoBitRate

It is applied to the objects of the following format.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format (H.264/AVC Nikon file only)

- PropertyCode : 0xDE9C
- DataType : UINT32
- Get/Set : Get
- DefaultValue : 0x00000000
- GroupCode : 0x00000001
- FormFlag : 0x01 (Range)

This indicates the number of bits of the object processed per sec.
The Property Value should be a value obtained by multiplying the maximum number of bytes per sec. of the object by 8 (bit).

The range of PropertyValue is shown below.

From 0x00000000 (Unknown) to 0x30000000

6. DATA TYPES

6.1. DataTypeCode

The standard data types used by the camera are shown below.

DataTypeCode	Type	Description
0x0001	INT8	Signed 8-bit integer
0x0002	UINT8	Unsigned 8-bit integer
0x0003	INT16	Signed 16-bit integer
0x0004	UINT16	Unsigned 16-bit integer
0x0005	INT32	Signed 32-bit integer
0x0006	UINT32	Unsigned 32-bit integer
0x0007	INT64	Signed 64-bit integer
0x0008	UINT64	Unsigned 64-bit integer
0x0009	INT128	Signed 128-bit integer
0x000A	UINT128	Unsigned 128-bit integer
0x4001	AINT8	Signed 8-bit integer array
0x4002	AUINT8	Unsigned 8-bit integer array
0x4003	AINT16	Signed 16-bit integer array
0x4004	AUINT16	Unsigned 16-bit integer array
0x4005	AINT32	Signed 32-bit integer array
0x4006	AUINT32	Unsigned 32-bit integer array
0x4007	AINT64	Signed 64-bit integer array
0x4008	AUINT64	Unsigned 64-bit integer array
0x4009	AINT128	Signed 128-bit integer array
0x400A	AUINT128	Unsigned 128-bit integer array
0xFFFF	STR	Variable length Unicode character string

6.2. Format of the Character String

The field representing the character string complies with the following format.
Each field data is stored in the little endian format.

Field	Size (Byte)	Data	Description
NumChar	1	N	Represents the number of characters in the string. The terminating null character is included. The maximum number of characters is 255.
StringChars [0]	2		Unicode character
StringChars [1]	2		Unicode character

StringChars [N-1]	2	0x0000	Unicode character (null)

6.3. Format of the Date

The character string representing the date complies with the following format.
The date and time is shown in the form of the most significant value through the least significant value according to the format of ISO8601 standard. This is a Unicode string format of "YYYYMMDDThhmmss" where YYYY is the year, MM is the month, DD is the day of the month, T is a constant character, hh is the hours, mm is the minutes, and ss is the seconds past the minute. The data is stored in the following array for the transmission/reception between the camera and the host.

Field	Size (Byte)	Data	Description
NumChar	1	0x10	Represents the number of characters in the string. The terminating null character is included. The number of characters in the string representing the time is sixteen.
StringChars	32		Unicode string "YYYYMMDDThhmmss"

When the format setting is "YYYYMMDDThhmmss.xx", the data following "YYYYMMDDThhmmss" should be ignored for use.

The array type complies with the following format.
Each field data is stored in the little endian format.

Field	Size (Byte)	Data
NumElement	4	The number of array elements is N (N is the number of objects).
ArrayEntry [0]	ElementSize	ArrayData [0]
ArrayEntry [1]	ElementSize	ArrayData [1]
ArrayEntry [2]	ElementSize	ArrayData [2]

ArrayEntry [N-1]	ElementSize	ArrayData [N-1]

ElementSize: Data size of ArrayData

6.4. Format of the Picture Control

The field representing the picture control data complies with the following format.

6.4.1. Color

Field	Size (Byte)	Data
PicCtrlItem	1	Kinds of picture control 1: Standard, 2: Neutral, 3: Vivid, 4: Monochrome, 5: Portrait, 6: Landscape 101 through 199: Option picture control (For the custom picture control, the base picture control is set.)
MonochromeFlag	1	Monochrome flag 0: Color, 1: Monochrome
CustomFlag	1	Custom flag 0: Normal, 1: Custom, 2: Custom (not used)
RegistrationName	20	Registration name of picture control It is fixed to 20byte (terminated with null).
QuickAdjustFlag	1	Quick adjustment flag 0: Invalid, 1: Valid Neutral and Custom: Invalid
QuickAdjust	1	Quick adjustment From -2 to +2
Saturation	1	Saturation From -3 to +3 -128: Auto
Hue	1	Hue From -3 to +3
Sharpening	1	Sharpening From 0 to 9 -128: Auto
Contrast	1	Contrast From -3 to +3 -128: Auto
Brightness	1	Brightness From -1 to +1
CustomCurveFlag	1	Custom curve flag 0: Custom curve is invalid, 1: Custom curve is valid.
CustomCurveData	578	Custom curve data (For the details, refer to subsection 9.1.) LUT data (Not used when the custom curve flag is invalid.)

6.4.2. Monochrome

Field	Size (Byte)	Data
PicCtrlItem	1	Kinds of picture control 1: Standard, 2: Neutral, 3: Vivid, 4: Monochrome, 5: Portrait, 6: Landscape 101 through 199: Option picture control (For the custom picture control, the base picture control is set.)
MonochromeFlag	1	Monochrome flag 0: Color, 1: Monochrome
CustomFlag	1	Custom flag 0: Normal, 1: Custom, 2: Custom (not used)
RegistrationName	20	Registration name of picture control It is fixed to 20byte (terminated with null).
FilterEffects	1	Filter effects 0: None, 1: Yellow, 2: Orange, 3:Red, 4: Green
Toning	1	Toning 0: B&W, 1: Sepia, 2: Cyanotype, 3: Red, 4: Yellow, 5: Green, 6: Blue Green, 7: Blue, 8: Purple Blue, 9: Red Purple
ToningDensity	1	Toning (density)

		From 1 to 7 It is not referred to when Toning is B&W.
(Reserve)	1	(Reserve)
Sharpening	1	Sharpening From 0 to 9 -128: Auto
Contrast	1	Contrast From -3 to +3 -128: Auto
Brightness	1	Brightness From -1 to +1
CustomCurveFlag	1	Custom curve flag 0: Custom curve is invalid, 1: Custom curve is valid.
CustomCurveDat a	578	Custom curve data (For the details, refer to subsection 9.1.) LUT data (Not used when the custom curve flag is invalid.)

7. ObjectHandle

The ObjectHandle is used to represent the individual objects in the camera (image file, non-image file, directories, and the virtual association representing the relations of the images and the DCF objects conforming to the DCF standards).

The ObjectHandle is represented by the unsigned 32 bits. A unique value is set for the ObjectHandle indicating each object. The specified ObjectHandle is fixed in one session.

7.1. ObjectHandle of the Object Recorded in the Card

The camera sets a 4-byte unique value freely for the ObjectHandle created for the data in the card by the camera. The host application does not care the contents.

7.2. ObjectHandle of the Object Recorded in the SDRAM

The object recorded in the SDRAM is the image file only.

The host can access the image data in the SDRAM by specifying the ObjectHandle passed by ObjectAddedInSdram.

7.3. Addition of the ObjectHandle

The camera acts as shown below when an object is newly added to the card during one session.

1. In accordance with the ObjectHandle format defined in section 7, the camera specifies a unique ObjectHandle that is not coordinated with other ObjectHandles already specified for the newly added object.
2. The camera sends the ObjectAdded event including the specified ObjectHandle as a parameter to the host. At this time, FreeSpaceInBytes and FreeSpaceInImages indicated in the StorageInfo data set are updated immediately.

8. DATA SET

The camera transmits the information about the camera to the host by using some data sets. The data sets supported by the camera and their contents are shown below.

8.1. DeviceInfo Data Set

The DeviceInfo data set is sent by the operation of the GetDeviceInfo command.
Each field data is stored in the little endian format.
The information sent by the DeviceInfo data set is shown below.

Field	Size (Byte)	Data	DataType	Description
StandardVersion	2	0x0064		Version 1.00
VendorExtensionID	4	0x00000006		-
VendorExtensionVersion	2	0x0064		Version 1.00
VendorExtensionDesc	39	0x13 0x6D00 0x6900 0x6300 0x7200 0x6F00 0x7300 0x6F00 0x6600 0x7400 0x2E00 0x6300 0x6F00 0x6D00 0x3A00 0x2000 0x3100 0x2E00 0x3000 0x0000	String	Unicode character string “microsoft.com: 1.0”
FunctionalMode	2	0x0000		Normal mode
OperationsSupported	94	0x0000002C 0x1001 0x1002 0x1003 0x1004 0x1005 0x1006 0x1007 0x1008 0x1009 0x100A 0x100B 0x100C 0x100D 0x100E 0x100F 0x1014 0x1015 0x1016 0x101B 0x90C0 0x90C1 0x90C2 0x90C3 0x90C4 0x90C7 0x90C8 0x90C9	Array	OperationCode supported by the camera

		0x90CA 0x90CB 0x90CC 0x90CD 0x90CE 0x90CF 0x9200 0x9201 0x9202 0x9203 0x9204 0x9205 0x9206 0x9207 0x9801 0x9802 0x9803 0x9805		
EventsSupported	30	0x0000000D 0x4001 0x4002 0x4004 0x4005 0x4006 0x4008 0x4009 0x400A 0x400C 0x400D 0xC101 0xC102 0xC104	Array	EventCode supported by the camera
DevicePropertiesSupported	48	0x00000016 0x5001 0x5003 0x5004 0x5005 0x5007 0x5008 0x500A 0x500B 0x500C 0x500D 0x500E 0x500F 0x5010 0x5011 0x5013 0x5018 0x501C 0x501E 0x501F 0xD303 0xD406 0xD407	Array	DevicePropertyCode supported by the camera The vendor codes are not enumerated in this field. The vendor codes can be acquired by the GetVendorPropCodes command (subsection 5.2.28).
CaptureFormats	8	0x00000002 0x3801 0x3000	Array	ObjectFormatCode that can be created by the camera with InitiateCapture
ImageFormats	16	0x00000006 0x3000 0x3001 0x3002 0x3006 0x300D 0x3801	Array	ObjectFormatCode supported by the camera
Manufacture	37	0x12 0x4E00 0x6900	String	Unicode character string “Nikon Corporation”

		0x6B00 0x6F00 0x6E00 0x2000 0x4300 0x6F00 0x7200 0x7000 0x6F00 0x7200 0x6100 0x7400 0x6900 0x6F00 0x6E00 0x0000		
Model	12	0x06 0x4400 0x3700 0x3000 0x3000 0x3000 0x0000	String	Unicode character string “D7000”
DeviceVersion	13	0x06 0x5600 0x3100 0x2E00 0x3000 0x3000 0x0000	String	Unicode character string “V1.00”
SerialNumber	17	0x08 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0x0000	String	Unicode character string “XXXXXXX”

- Standard Version
  This field represents the highest version of the standard that can support the device.

- VendorExtensionID
  This field represents the vendor extension ID used by the device.

- VendorExtensionVersion
  This field represents the vendor-specific version number of extensions that are supported.

- VendorExtensionDesc
  This field represents an optional string used to hold a human-readable description of the VendorExtensionID.

- FunctionalMode
  This field is an optional field used to hold the functional mode.

- OperationsSupported
  This field is an array of OperationCodes supported by the camera.

- EventsSupported
  This field is an array of EventCodes supported by the camera.

- DevicePropertiesSupported
  This field is an array of DevicePropCodes supported by the camera.

- CaptureFormats
  This field is an array of ObjectFormatCodes that can be created by the camera with InitiateCapture.

- ImageFormats
  This field is an array of ObjectFormatCodes supported by the camera.

- Manufacture
  This field is an optional human-readable string used to indicate the device manufacturer.

- Model
  This field is an optional human-readable string used to indicate the device name.

- SerialNumber
  This field is an optional human-readable string used to indicate the serial number of the camera.

8.2. StorageInfo Data Set

The StorageInfo data set is sent by the operation of the GetStorageInfo command.
This data set indicates information about the storage medium (card).
Each field data is stored in the little endian format.
Information sent by the StorageInfo data set is shown below.

Field	Size (Byte)	Data	DataType	Description
StorageType	2	0x0004		Removable Ram
FilesystemType	2	0x0003		Based on the DCF
AccessCapability	2	0x0002 0x0001 (Card lock)		Read-Only with Object Deletion Read-Only without Object Deletion (card lock)
MaxCapacity	8			Depends on the card.
FreeSpaceInBytes	8			Depends on the card and the space used.
FreeSpaceInImages	4			Depends on the card and the space used.
StorageDescription	1	0x00		-
VolumeLabel			String	Unicode character string

- StorageType
  This field indicates the type of the card.
  RemovableRam is set.

- FilesystemType
  This field indicates the filesystem of the card.
  It conforms to the DCF.

- AccessCapability
  This field indicates the access right for the card.
  When the card is not locked, it is read-only and the image deletion is allowed.
  When the card is locked, it is read-only and the image deletion is not allowed.

- MaxCapacity
  This field indicates the capacity of the card.
  It depends on the card used.

- FreeSpaceInBytes
  This field indicates the free space in the card.
  It depends on the card used and the space that is currently used.

- FreeSpaceInImages
  This field indicates the number of images that can be recorded in the free space of the card.
  It is the number of images captured in the mode that is currently set in the camera.

It depends on the card used and the space that is currently used.

- StorageDescription
  This field indicates a human-readable text description of the card.
  This field is not used for the camera.

- VolumeLabel
  This field indicates the volume label of the card.
  It is described in a human-readable character string (Unicode character string).

8.3. ObjectInfo Data Set

The ObjectInfo data set is sent by the operation of the GetObjectInfo command.
This data set indicates information about the objects in the card.
Each field data in which the data type is not specified is stored in the little endian format.

- StorageID
  This field indicates the StorageID of the card.

- ObjectFormat
  This field indicates the ObjectFormatCode of the object.

- ProtectionStatus
  This field indicates the protection status of the object.

- ObjectCompressedSize
  This field indicates the size of the object in bytes.

- ThumbFormat
  This field indicates the ObjectFormat of the thumbnail.

- ThumbCompressedSize
  This field indicates the size of the thumbnail in bytes.

- ThumbPixWidth
  This field indicates the thumbnail width in pixels.

- ThumbPixHeight
  This field indicates the thumbnail height in pixels.

- ImagePixWidth
  This field indicates the image width in pixels.

- ImagePixHeight
  This field indicates the image height in pixels.

- ImageBitDepth
  This field indicates the bit depth of the image.

- ParentObject
  This field indicates the ObjectHandle of the parent object of this object.

- AssociationType
  This field indicates the association type.
  It is used for the object of the association type.

- AssociationDesc
  This field indicates the descriptor parameter of the association.
  It is not used in the camera.

- SequenceNumber
  This field indicates the component of the association.
  It is not used in the camera.

- Filename
  This field indicates an optional character string showing the file name of the object.

- CaptureDate
  This field indicates the character string showing the object creation date/time.

- ModificationDate
  This field indicates the character string showing the object modification date/time.
  When the object does not have a modification date/time, the same date/time as that of the object creation is stored.

- Keywords
  This field indicates the character string showing the image-related keyword.
  It is not used in the camera.

8.3.1. Data Set of the Directory and the Virtual Association

Field	Size (Byte)	Data	DataType	Description
StorageID	4	StorageID		StorageID
ObjectFormat	2	0x3001		Association (Refer to ObjectFormatCode.)
ProtectionStatus	2	0x0000		-
ObjectCompressedSize	4	0x00000000		-
ThumbFormat	2	0x0000		-
ThumbCompressedSize	4	0x00000000		-
ThumbPixWidth	4	0x00000000		-
ThumbPixHeight	4	0x00000000		-
ImagePixWidth	4	0x00000000		-
ImagePixHeight	4	0x00000000		-
ImageBitDepth	4	0x00000000		-
ParentObject	4	ObjectHandle		ObjectHandle of the parent directory DCIM folder: 0x00000000 MISC folder: 0x00000000
AssociationType	2	0x0001		GenericFolder
AssociationDesc	4	0x00000000		-
SequenceNumber	4	0x00000000		-
Filename			String	Unicode character string
CaptureDate			String	Date/time of capture (Unicode character string) (Not used for the virtual association)
ModificationDate			String	Date/time of modification (Unicode character string) (Not used for the virtual association)
Keywords	1	0x00		-

8.3.2. Data Set of the Image File

Field	Size (Byte)	Data	DataType	Description
StorageID	4	StorageID		StorageID SDRAM image: 0x00000000
ObjectFormat	2			0x3000 (Undefined), 0x3801 (EXIF)
ProtectionStatus	2			0x0001 (with protection setting) or 0x0000 (without protection setting)
ObjectCompressedSize	4			File size
ThumbFormat	2	0x3808		JFIF (Refer to ObjectFormatCode.)
ThumbCompressedSize	4			Thumbnail size
ThumbPixWidth	4	0x000000A0		Horizontal size of the thumbnail (160)
ThumbPixHeight	4	0x00000078		Vertical size of the thumbnail (120)

ImagePixWidth	4			Horizontal size of the main image
ImagePixHeight	4			Vertical size of the main image
ImageBitDepth	4	0x00000000		-
ParentObject	4	ObjectHandle		ObjectHandle of the parent directory
AssociationType	2	0x0000		-
AssociationDesc	4	0x00000000		-
SequenceNumber	4	0x00000000		-
Filename			String	File name character string (Unicode character string) "File name.extension" is set for the images recorded in the card with the recording destination set to "Card" or "Card and SDRAM". "DSC_0000.extension" is set for the images whose recording destination is the SDRAM. For the images recorded in the SDRAM with the recording destination set to "Card and SDRAM", the name including the folder name and the file name of the image recorded in the card simultaneously is set. "Folder name¥(backslash)file name.extension". If the image deletion is performed by operating the camera during the card recording while "Card and SDRAM" recording is set in the application mode, the file name of the image with the recording destination SDRAM may be "DSC_0000.extension" in some cases. When the object format is "Undefined", the extension is NEF (RAW) or NDF (dust reference image).
CaptureDate			String	Date/time of capture (Unicode character string)
ModificationDate			String	Date/time of modification (Unicode character string)
Keywords	1	0x00		-

8.3.3. Data Set of the Script File

Field	Size (Byte)	Data	DataType	Description
StorageID	4	0x00000000		
ObjectFormat	2	0x3002		Script (Refer to ObjectFormatCode.)
ProtectionStatus	2	0x0000		No protection setting
ObjectCompressedSize	4			File size
ThumbFormat	2	0x0000		-
ThumbCompressedSize	4	0x00000000		-
ThumbPixWidth	4	0x00000000		-
ThumbPixHeight	4	0x00000000		-
ImagePixWidth	4	0x00000000		-
ImagePixHeight	4	0x00000000		-
ImageBitDepth	4	0x00000000		-
ParentObject	4	0x00000000		-
AssociationType	2	0x0000		-
AssociationDesc	4	0x00000000		-
SequenceNumber	4	0x00000000		-
Filename			String	File name (Unicode character string) ("DDISCVRY.DPS" or "DREQUEST.DPS")
CaptureDate			String	Creation date/time (Unicode character string)
ModificationDate			String	Modification date/time (Unicode character string)
Keywords	1	0x00		-

8.3.4. Data Set of the DPOF File

Field	Size (Byte)	Data	DataType	Description

StorageID	4			StorageID sent to the host by GetStorageID
ObjectFormat	2	0x3006		DPOF (Refer to ObjectFormatCode.)
ProtectionStatus	2			0x0001 (with protection setting) or 0x0000 (without protection setting)
ObjectCompressedSize	4			File size
ThumbFormat	2	0x0000		-
ThumbCompressedSize	4	0x00000000		-
ThumbPixWidth	4	0x00000000		-
ThumbPixHeight	4	0x00000000		-
ImagePixWidth	4	0x00000000		-
ImagePixHeight	4	0x00000000		-
ImageBitDepth	4	0x00000000		-
ParentObject	4	ObjectHandle		ObjectHandle of the MISC folder
AssociationType	2	0x0000		-
AssociationDesc	4	0x00000000		-
SequenceNumber	4	0x00000000		-
Filename			String	File name (Unicode character string)
CaptureDate			String	Date/time of capture (Unicode character string)
ModificationDate			String	Date/time of modification (Unicode character string)
Keywords	1	0x00		-

8.3.5. Data Set of the Movie File

Field	Size (Byte)	Data	DataType	Description
StorageID	4	StorageID		StorageID Image: 0x00000000
ObjectFormat	2			0x300D (MOV)
ProtectionStatus	2			0x0001 (with protection setting) or 0x0000 (without protection setting)
ObjectCompressedSize	4			File size
ThumbFormat	2	0x3808		JFIF (Refer to ObjectFormatCode.)
ThumbCompressedSize	4			Thumbnail size
ThumbPixWidth	4	0x000000A0		Horizontal size of the thumbnail (160)
ThumbPixHeight	4	0x00000078		Vertical size of the thumbnail (120)
ImagePixWidth	4			Horizontal size of the main movie
ImagePixHeight	4			Vertical size of the main movie
ImageBitDepth	4	0x00000000		-
ParentObject	4	ObjectHandle		ObjectHandle of the parent directory
AssociationType	2	0x0000		-
AssociationDesc	4	0x00000000		-
SequenceNumber	4	0x00000000		-
Filename			String	File name character string (Unicode character string) “File name.MOV”
CaptureDate			String	Date/time of capture (Unicode character string)
ModificationDate			String	Date/time of modification (Unicode character string)
Keywords	1	0x00		-

8.4. DevicePropDesc Data Set

The DevicePropDesc data set is sent by the operation of the GetDevicePropDesc command.
This data set indicates information about the settings and the attribute of the device.
Each field data in which the data type is not specified is stored in the little endian format.

Field	Size (Byte)	Data	DataType	Description
DevicePropertyCode	2	DevicePropCode		DevicePropCode supported by the camera
DataType	2			Indicates the data type of the property. It differs depending on each property. Refer to DataTypeCode (subsection 6.1).
GetSet	1			Indicates whether the property is for reading only or for both reading and writing. 0x00: Reading only (Get) 0x01: Reading/writing (Get/Set)
FactoryDefaultValue	DTS			Default value. It differs depending on each property.
CurrentValue	DTS			Current value. It differs depending on each property.
FormFlag	1			Indicates the property description data set. 0x00: None 0x01: Range 0x02: Enumeration
FORM	DTS			The contents of the field depend on the FormFlag field. It does not exist when the FormFlag field is set to 0.

- DevicePropCode
  This field indicates DevicePropCode of the property.

- DataType
  This field indicates the data type of the property.

- GetSet
  This field indicates the access attribute of the property.

- Factory Default Value
  This field indicates the default value of the property.

- Current Value
  This field indicates the current value of the property.

- FormFlag
  This field indicates the property description data set.

8.5. ObjectPropDesc Data Set

The ObjectPropDesc data set is sent by the operation of the GetObjectPropDesc command.
This data set indicates information about the settings and the attribute of the object.
Each field data in which the data type is not specified is stored in the little endian format.

Field	Size (Byte)	Data	DataType	Description
ObjectPropertyCode	2	ObjectPropCode	UINT16	ObjectPropCode supported by the camera
DataType	2	DataTypeCode	UINT16	Indicates the data type of the property. It differs depending on each property. Refer to DataTypeCode (subsection 6.1).
GetSet	1		UINT8	Indicates whether the property is for reading only or for both reading and writing. 0x00: Reading only (Get) 0x01: Reading/writing (Get/Set)
DefaultValue	DTS			The default value in the camera. It differs depending on each property.
Group Code	4		UINT32	Search group
FormFlag	1		UINT8	Indicates the property description data set. 0x00: None 0x01: Range 0x02: Enumeration 0x03: Time 0x04: Fixed-length array 0x05: Regular expression 0x06: Byte string 0x07: LongString
FORM	DTS			The contents of the field depend on the FormFlag field. It does not exist when the FormFlag field is set to 0.

- ObjectPropCode
  This field indicates ObjectPropCode of the property.

- DataType
  This field indicates the data type of the property.

- GetSet
  This field indicates the access attribute of the property.

- Default Value
  This field indicates the default value of the property.

- Group Code
  This field indicates the search group of the property.

- FormFlag
  This field indicates the property description data set.

8.6. Property Description Data Set

The property description data set is set in the FORM field of the DevicePropDesc data set and the ObjectPropDesc data set.

8.6.1. Range Form

Field	Size (Byte)	Description
MinimumValue	DTS	The minimum value supported by the PropertyValue
MaximumValue	DTS	The maximum value supported by the PropertyValue
StepSize	DTS	The property supports the value indicated as shown below. MinimumValue + N x StepSize * N: From 0 to the maximum value * PropertyValue: Smaller than the Maximum Value

8.6.2. Enumeration Form

Field	Size (Byte)	Description
NumberOfValue	2	Indicates the number of values of the PropertyValue supported by the property.
SupportedValue1	DTS	The property supports this PropertyValue.
SupportedValue2	DTS	The property supports this PropertyValue.
SupportedValue3	DTS	The property supports this PropertyValue.

SupportedValueM	DTS	The property supports this PropertyValue.

8.6.3. Time Form

For the time form, the FORM field does not exist.
The time form is represented by a Unicode character string in the ISO standard format. (Refer to ISO8601.)

"YYYYMMDDThhmmss.s"

- YYYY : Year
- MM : Month (from 01 to 12)
- DD : Date (from 01 to 31)
- T : Fixed character
- hh : Hour starting from 0 a.m. (from 00 to 23)
- mm : Minutes (from 00 to 59)
- ss.s : Seconds

8.6.4. Fixed-Length Array Form

Field	Size (Byte)	Description
Length	2	It is an unsigned 16-bit integer and indicates the number of array elements.

8.6.5. Regular Expression Form

Field	Size (Byte)	Description
RegEx	DTS	It indicates the regular expression for creating the PropertyValue correctly.

8.6.6. Byte String Form

Field	Description
MaxLength	It indicates the maximum length of the byte string.

8.6.7. LongString Form

Field	Description
MaxLength	It indicates the maximum length of the LongString. The property includes the data type of AUINT16. (Characters coded by 2-byte Unicode characters as defined in ISO10646.)

9. DATA FORMAT

9.1. LUT Format

For the LUT data, the 64-byte header to be used for the host is added to the 2048-byte (11 bit x 8 bit) actual data. The header format is specified by the host individually (storage position of the spline point of the LUT to be sent, etc., data to reproduce the LUT when reading is performed), and the camera does not care the contents. However, because the two bytes of the header are used for the camera to decide whether the header data is present or not, the data needs to be set in the header.

The LUT format is shown below.

Byte	Description
0, 1	Length (2116)
2, 3	Reserved
From 4 to 67	Lut Header
68	Data0
69	Data1
- - -	
2115	Data2047

As an example of Lut Header, the contents of the header set by the Nikon application are shown below.

Byte	Description	Range
1	AriaID (Byte1)	0x49
2	AriaID (Byte2)	0x30
3	Input Minimum (Black Point)	0-255
4	Input Maximum	0-255
5	Output Minimum	0-255
6	Output Maximum	0-255
7	Gamma (integer portion)	0-20
8	Gamma (fractional portion)	0-100
9	Number of Spline Points	2-20
10, 11	Spline Point1 (x , y)	0-255,0-255
12, 13	Spline Point2 (x , y)	0-255,0-255
- - -		
48, 49	Spline Point20 (x , y)	0-255,0-255
From 50 to 64	Reserved	0

9.2. ASCII Codes

For the property related to the comment of the camera, only the following 90 characters of ASCII codes can be input.

In the same way, for “Copyright” and “Artist”, only the following 90 characters of ASCII codes can be input.

SP	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
:	;	<	=	>	?	@	[	]	_	{	}				
0	1	2	3	4	5	6	7	8	9						
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Q	R	S	T	U	V	W	X	Y	Z						
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
q	r	s	t	u	v	w	x	y	z						

7-Bit ASCII Code Table (JIS Roman letter set: C0, GL)

	0x0?	0x1?	0x2?	0x3?	0x4?	0x5?	0x6?	0x7?
0x?0	NUL	DLE	SP	0	@	P	`	p
0x?1	SOH	DC1	!	1	A	Q	a	q
0x?2	STX	DC2	"	2	B	R	b	r
0x?3	ETX	DC3	#	3	C	S	c	s
0x?4	EOT	DC4	$	4	D	T	d	t
0x?5	ENQ	NAK	%	5	E	U	e	u
0x?6	ACK	SYN	&	6	F	V	f	v
0x?7	BEL	ETB	'	7	G	W	g	w
0x?8	BS	CAN	(	8	H	X	h	x
0x?9	HT	EM	)	9	I	Y	i	y
0x?a	LF	SUB	*	:	J	Z	j	z
0x?b	VT	ESC	+	;	K	[	k	{
0x?c	FF	FS	,	<	L	¥	l	|
0x?d	CR	GS	-	=	M	]	m	}
0x?e	SO	RS	.	>	N	^	n	~
0x?f	SI	US	/	?	O	_	o	DEL

10. APPENDICES

10.1. Properties Affected by Mounting the CPU Lens

The following properties are affected by mounting the CPU lens.

Property	CPU lens mounted	CPU lens not mounted
LensSort (5.5.10.1)	Mounted	Not mounted
Fnumber (5.5.1.5)	Get / Set	Get
FocalLength (5.5.1.6)	Valid	Not fixed
LensType (5.5.10.2)	Valid	Not fixed
LensID (5.5.10.3)	Valid	Not fixed
LensFocalMin (5.5.10.4)	Valid	Not fixed
LensFocalMax (5.5.10.5)	Valid	Not fixed
LensApatureMin (5.5.10.6)	Valid	Not fixed
LensApatureMax (5.5.10.7)	Valid	Not fixed

10.2. Properties Affected by Mounting the External Flash

The following properties are affected by mounting the external flash.

Property	External flash mounted		External flash not mounted
	New-type communication	Noncommunication	-
ExternalSpeedLightExist (5.5.8.1)	Mounted	Mounted	Not mounted
ExternalSpeedLightSort (5.5.8.2)	New-type communication	Noncommunication	Not fixed
ExternalSpeedLightStatus (5.5.8.3)	Valid	Valid	Not fixed
NewExternalSpeedLightMode (5.5.8.4)	Valid	Not fixed	Not fixed
FlashCompensation (5.5.8.5)	Valid/Not fixed	Not fixed	Not fixed
ExposureTime (5.5.1.10)	Bulb ～ *1 / *2	Bulb ～ *1	Bulb ～ 1/4000
ShutterSpeed (5.5.6.9)	Bulb ～ *1 / *2	Bulb ～ *1	Bulb ～ 1/4000

*1: Flash shooting synchronization speed
*2: Speed limit of the external flash

10.3. Properties Affected by the Shooting Mode

The following properties are affected by the setting of the shooting mode.
The user mode is not described here because it is similar to each shooting mode that has been registered.

Property	Shooting mode				
	Manual	Program auto	Aperture priority auto	Shutter priority auto	Each scene mode
ExposureProgramMode (5.5.1.11)	Manual	Program auto	Aperture priority auto	Shutter priority auto	Each scene mode
Fnumber (5.5.1.5)	Get / Set (*1)	Get	Get / Set (*1)	Get	Get
ExposureTime (5.5.1.10)	Get / Set (*2)	Get	Get	Get / Set (*2)	Get
ShutterSpeed (5.5.6.9)	Get / Set	Get	Get	Get / Set	Get
FlexibleProgram (5.5.6.10)	Not fixed	Get / Set	Not fixed	Not fixed	Not fixed

*1. Setting is disabled when a lens other than the CPU lens is mounted.
*2. Setting is disabled with Bulb.

10.4. Properties Affected by the Setting of Auto Bracketing

The following properties are affected by the setting of auto bracketing.

Property	Settings of auto bracketing					
	AE/Flash, AE, Flash		WB		ADL	
	BKT	BKT not	BKT	BKT not	BKT	BKT not

		performed	performed	performed	performed	performed	performed
BracketingType	(5.5.3.6.19)	AE/Flash, AE, Flash		WB		ADL	
EnableBracketing	(5.5.7.1)	Performed	Not performed	Performed	Not performed	Performed	Not performed
AEBracketingStep	(5.5.7.2)	Valid	Not fixed	Not fixed	Not fixed	Not fixed	Not fixed
AEBracketingPattern	(5.5.7.3)	Valid	Not fixed	Not fixed	Not fixed	Not fixed	Not fixed
AEBracketingCount	(5.5.7.4)	Valid	Not fixed	Not fixed	Not fixed	Valid	Not fixed
WBBracketingStep	(5.5.7.5)	Not fixed	Not fixed	Valid	Not fixed	Not fixed	Not fixed
WBBracketingPattern	(5.5.7.6)	Not fixed	Not fixed	Valid	Not fixed	Not fixed	Not fixed
ADLBracketingPattern	(5.5.7.7)	Not fixed	Not fixed	Not fixed	Not fixed	Valid	Not fixed

10.5. Properties Affected by the Location Setting

The UTC time is retained in the camera. When displaying the time on the menu or getting/setting the DateTime property, 'Location setting' and 'Summer time setting' in the camera are considered.

When getting the DateTime property, the calculated value shown below is passed to the host.

Time in the camera + Difference in time with the location setting + Summer time

When the camera settings are as shown in the table below, the calculation is "13:00:00 + 09:00 + 0:00" and the value passed to the host is "2006/06/01 22:00:00".

Time in the camera (UTC)	2006/06/01 13:00:00
Location setting	UTC+9 (Tokyo, Seoul)
Summer time setting	None

When the DateTime property is set, the value calculated as shown below is set in the camera.

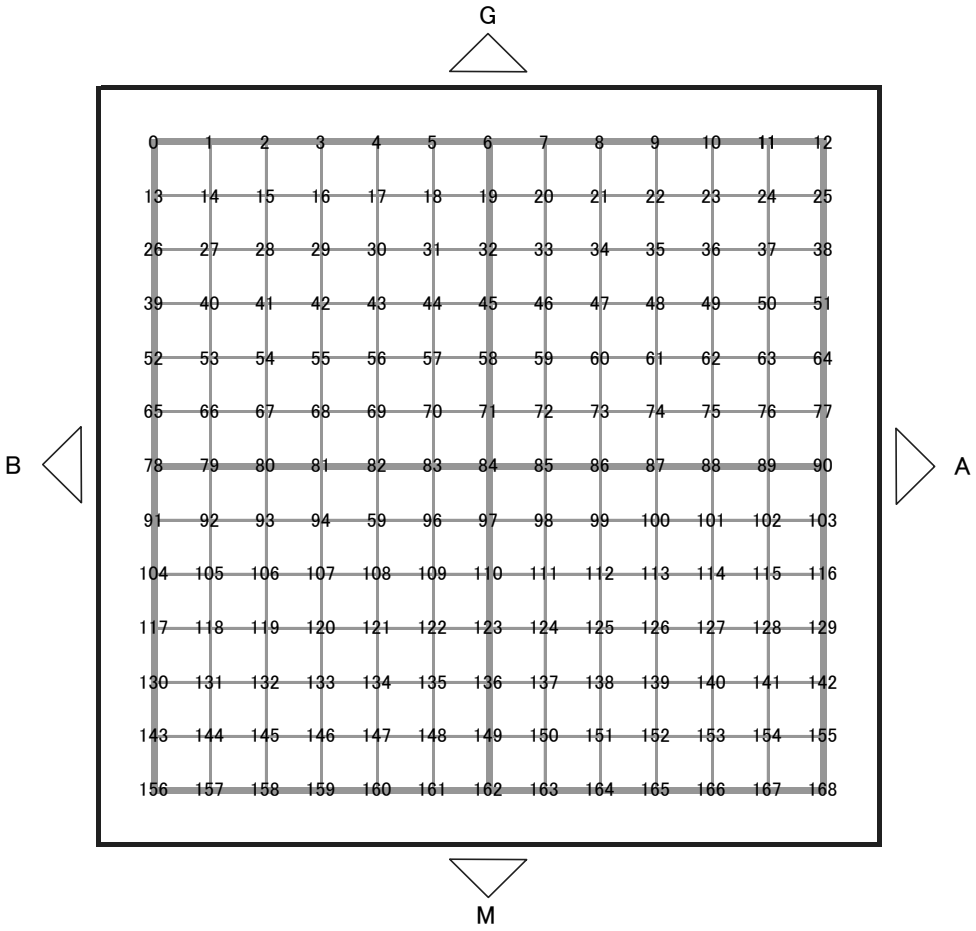
Time set by the host - Difference in time with the location setting - Summer time

When the camera settings are as shown in the table below and the time set by the host is 2006/06/01 13:00:00, the calculation is "13:00:00 - 09:00 - 0:00" and the time setting in the camera is "2006/06/01 04:00:00".

Location setting	UTC+9 (Tokyo, Seoul)
Summer time setting	None

10.6. White Balance Fine Tuning Coordinates

The relationship between the values of PropertyValue of the property affecting the white balance fine tuning and the actual setting coordinates is shown below.



10.7. External Flash Types

The communication status types of the external flash are shown below.

New-type communication (with the operating and setting section)	New-type communication (without the operating and setting section)	Old-type communication (*1)	Noncommunication (*1)	Mounting not detected
SB-900, SB-800, SB-700, SB-600, SU-800	SB-400	SB-80DX, SB-50DX, SB-28DX, SB-28D, SB-28, SB-27, SB-26, SB-25, SB-24	SB-30, SB-29, SB-29S, SB-23, SB-22, SB-22S, SB-21A, SB-21B, SB-20, SB-19, SB-18, SB-17, SB-16A, SB-16B, SB-15, SB-14, SB-12, SB-11, SB-10, SB-E	SB-9, SB-8, SB-7, SB-6, SB-5, SB-4, SB-3, SB-2, SB-1

* For old-type communication and noncomminucation, mounting is not detected in the camera.

10.8. DevicePropertyCodes that can be Set during Movie Recording

DevicePropertyCodes that can be set during movie recording are shown below.
If a value is set for a DevicePropertyCode that is not shown below, the Access_Denied response is made.

WhiteBalance	5.5.1.4
Fnumber*1	5.5.1.5
ExposureMeteringMode	5.5.1.8
FlashMode	5.5.1.9
ExposureTime	5.5.1.10
ExposureIndex	5.5.1.12
ExposureBiasCompensation	5.5.1.13
StillCaptureMode	5.5.1.15
BurstNumber	5.5.1.16
WbTuneFluorescentType	5.5.2.12
WbColorTemp	5.5.2.18
WbPresetDataNo	5.5.2.20
WbTuneAuto	5.5.2.10
WbTuneIncandescent	5.5.2.11
WbTuneFluorescent	5.5.2.13
WbTuneSunny	5.5.2.14
WbTuneFlash	5.5.2.15
WbTuneCloudy	5.5.2.16
WbTuneShade	5.5.2.17
WbTuneColorTemp	5.5.2.19
WbTunePreset0	5.5.2.31
WbTunePreset1	5.5.2.32
WbTunePreset2	5.5.2.33
WbTunePreset3	5.5.2.34

WbTunePreset4	5.5.2.35
Active-D-Lighting	5.5.2.38
ISOAutoSetting	5.5.2.41
ISOAutoControl	5.5.2.42
ISOAutoHighLimit	5.5.2.43
ISOAutoShutterTime	5.5.2.44
AfModeAtLiveView	5.5.3.2.8
AfAtLiveView	5.5.3.2.9
BracketingType	5.5.3.6.19
BracketingOrder	5.5.3.6.20
ShutterSpeed	5.5.6.9
FlexibleProgram	5.5.6.10
EnabelBracketing	5.5.7.1
AEBracketingStep	5.5.7.2
AEBracketingPattern	5.5.7.3
WBBracketingStep	5.5.7.5
WBBracketingPattern	5.5.7.6
ADLBracketingPattern	5.5.7.7
InternalFlashCompensation	5.5.9.3

*1: The Fnumber property cannot be set when the ManualSettingOfMovie property (subsection 5.5.2.48) is set to 1 [ON], the value of the ExposureProgramMode property (subsection 5.5.1.11) is M, and the Live view is being performed.
This also occurs when the ExposureProgramMode property (subsection 5.5.1.11) is U1 or U2 and the value of the corresponding UserMode1 property (subsection 5.5.2.4) and the UserMode2 property (subsection 5.5.2.5) is M.