

Digital Camera Z 7

USB Still Image Capture Device

Media Transfer Protocol (MTP)

Specifications

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Imaging Division
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Table of Contents

Table of Contents	2
1 Introduction	6
1.1 Application	6
2 Outline	7
2.1 PC Connection Mode.....	7
2.2 PC Connection Mode and Camera Operations	7
2.3 PC Camera Mode and Remote Mode.....	7
2.4 Application Mode.....	7
2.5 Recording Destination.....	8
2.5.1 Access to the Card.....	9
2.5.2 Access to the SDRAM	9
2.6 Sending the Event.....	10
2.7 Shooting Operation and Image Data Acquisition in the PC Connection Mode.....	11
2.7.1 Command Sequence (Recording in the Card).....	11
2.7.2 Command Sequence (Recording in the SDRAM).....	11
2.7.3 Command Sequence (Recording by the Shutter-Release Button of the Camera).....	12
2.7.4 Command Sequence (Bulb Shooting).....	12
2.8 Live View Image and Data Acquisition in the PC Connection Mode.....	13
2.8.1 Command Sequence	13
2.8.2 Command Sequence (Movie Recording)	14
2.8.3 Command Sequence (Over 4GB Movie Transfer).....	14
2.8.4 Command Sequence (Spot WB).....	15
2.8.5 Command Sequence (Tracking)	17
2.9 Reacquisition of the Image Data.....	18
2.10 Operation with the Empty Battery.....	18
3 Device Requests.....	19
3.1 Standard Device Requests	19
3.2 Class-Specific Requests	20
3.2.1 Cancel Request.....	20
3.2.2 DeviceReset Request.....	20
3.2.3 GetDeviceStatus Request.....	20
4 Descriptors	21
4.1 Standard Descriptors	21
4.1.1 Device Descriptor.....	21
4.1.2 Device_Qualifier Descriptor.....	23
4.1.3 Configuration Descriptor.....	24
4.1.4 Other_Speed_Configuration Descriptor.....	24
4.1.5 Interface Descriptor.....	25
4.1.6 Endpoint Descriptor	26
4.1.7 Super Speed Endpoint Companion Descriptor	29
4.1.8 String Descriptor.....	30
4.1.9 BOS Descriptor	31
4.1.10 USB 2.0 Extension Descriptor.....	31
4.1.11 Super Speed Device Capabilities Descriptor.....	31
4.2 Class-Specific Descriptor.....	32

5	Protocol.....	33
5.1	Generic Container Structure	34
5.2	Asynchronous Event Interrupt Data Format	34
5.3	Phases.....	35
5.3.1	Command Phase.....	35
5.3.2	Data Phase.....	36
5.3.3	Response Phase.....	37
5.4	Error Handling.....	38
5.4.1	Command Block Reception Failure.....	38
5.4.2	Command Block Invalidity	38
5.4.3	Command Execution Error.....	38
6	Code.....	39
6.1	ObjectFormatCode.....	39
6.1.1	Association Type	40
6.2	Operation Code.....	41
6.2.1	Standard	43
6.2.2	Vendor.....	65
6.3	Response Code.....	127
6.3.1	Standard	128
6.3.2	Vendor.....	133
6.4	Event Code	137
6.4.1	Standard	138
6.4.2	Vendor.....	141
6.5	DevicePropCode.....	145
6.5.1	Standard	151
6.5.2	Vendor (Photo Shooting Menu)	172
6.5.3	Vendor (Movie Shooting Menu).....	224
6.5.4	Vendor (Custom Setting Menu)	275
6.5.5	Vendor (Setup Menu).....	305
6.5.6	Vendor (Power Supply).....	318
6.5.7	Vendor (Camera Information).....	319
6.5.8	Vendor (Bracketing).....	342
6.5.9	Vendor (External Flash).....	350
6.5.10	Vendor (Lens).....	367
6.5.11	Vendor (USB).....	374
6.5.12	Vendor (Live View)	376
6.5.13	Vendor (Picture Control).....	386
6.5.14	Vendor (Application Mode).....	389
6.5.15	Vendor (MTP).....	390
6.6	ObjectPropCode.....	391
6.6.1	Object Information	392
6.6.2	Thumbnail	403
6.6.3	Image Information	408
6.6.4	Movie Information.....	412
6.7	SBAttributeCode.....	419
6.7.1	SBAttribute.....	420
6.7.2	SBGroupAttribute	422
7	Data Type.....	431

7.1	DataTypeCode	431
7.2	Character String Format.....	432
7.3	Date Format.....	432
7.4	Array Format	432
7.5	SBHandle.....	433
7.6	SBGroupID	433
8	ObjectHandle	434
8.1	ObjectHandle of the Object Recorded in the Card.....	434
8.2	ObjectHandle of the Object Recorded in the SDRAM.....	434
8.3	Addition of the ObjectHandle	434
9	DataSet.....	435
9.1	DeviceInfo DataSet.....	435
9.2	StorageInfo DataSet.....	440
9.3	ObjectInfo DataSet.....	441
9.3.1	Directory/Virtual Association DataSet.....	442
9.3.2	Image File DataSet.....	443
9.3.3	Script File DataSet.....	444
9.3.4	Movie File DataSet.....	445
9.4	DevicePropDesc DataSet.....	446
9.5	ObjectPropDesc DataSet.....	447
9.6	Property Description DataSet.....	448
9.6.1	Range Form	448
9.6.2	Enumeration Form.....	448
9.6.3	Time Form.....	448
9.6.4	Fixed-Length Array Form	449
9.6.5	Regular Expression Form	449
9.6.6	Byte String Form.....	449
9.6.7	LongString Form.....	449
9.7	LiveViewObject DataSet	450
9.7.1	No Version	450
9.7.2	With Version.....	452
9.8	PictureControl DataSet.....	454
9.8.1	BasePictureControl	455
9.8.2	RegistrationName	455
9.8.3	ApplyLevel	456
9.8.4	QuickSharpFlag	457
9.8.5	QuickSharp.....	457
9.8.6	Sharpening	458
9.8.7	MiddleRangeSharpening.....	458
9.8.8	Clarity	459
9.8.9	Contrast.....	459
9.8.10	Brightness	460
9.8.11	Saturation.....	460
9.8.12	Hue	461
9.8.13	FilterEffects.....	461
9.8.14	Toning.....	462
9.8.15	ToningDensity.....	462
9.8.16	CustomCurveFlag	463

9.8.17	CustomCurveData	463
9.9	PictureControlCapability DataSet	464
9.9.1	DefaultLevel	464
9.10	SBAtributeDesc DataSet	465
9.11	SBAtributeDescList DataSet	465
9.12	SBAtribute DataSet	466
9.13	SBAtributeList DataSet	466
10	Data Format	467
10.1	ASCII Codes	467
11	Appendices	468
11.1	Properties Affected by Mounting the CPU Lens	468
11.2	Properties Affected by Mounting the External Flash	468
11.3	Properties Affected by the Shooting Mode	469
11.4	Properties Affected by Time Zone	470
11.5	White Balance Fine Tuning Coordinates	471
11.6	External Flash Types	472
11.7	Command Release Operation	473
11.7.1	Continuous Shooting	473
11.7.2	AF Operation	473
11.7.3	Preset WB acquisition	473
11.7.4	Event on the Release Operation	474
11.7.5	Recovery from the Sequence Error	474
11.7.6	Silent Shooting	474

1 Introduction

1.1 Application

These specifications describe the operations of the Z 7 (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 "MTP Specification v1.0 - Media Transfer Protocol (MTP)" and the camera is based on it.

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	Revision 3.0
Class	Image Interface
Subclass	Still Image Capture Device
Protocol	Bulk-Only Transport Protocol

2 Outline

2.1 PC Connection Mode

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

2.2 PC Connection Mode and Camera Operations

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

No.	Description
1	When the remote mode is set (the camera is controlled by the PC), the operations by the dials and buttons of the camera body are locked with some exceptions. (Refer to subsection 2.4.)
2	The captured images are recorded either in the card or in the SDRAM. (Refer to subsection 2.5.)
3	The image playback cannot be performed. The image deletion by operating the camera body also cannot be performed. (Except in the application mode)
4	The Auto meter-off delay is set to "No limit".

2.3 PC Camera Mode and Remote Mode

The PC connection mode has the PC camera mode and the remote mode, and the camera is set to the PC camera mode when it is connected to the PC. Switching between the PC camera mode and the remote mode is performed by the command processing routine in the camera automatically for each command sent from the host or by the ChangeCameraMode command defined as a vendor command.

If a command for which changing the PC camera mode to the remote mode is necessary is issued while the remote mode is specified by the ChangeCameraMode command, the remote mode is retained even when the command processing is terminated.

During switching to the remote mode by the ChangeCameraMode command, the operation of each dial or button is ignored and the value set by the host is valid. When switching to the PC camera mode, the values set by the host in the remote mode are canceled and those set by each dial or button are used. For the setting value of each dial or button when switching to the remote mode, the value set by each dial or button becomes the initial value.

2.4 Application Mode

The camera is switched to the application mode by the ApplicationMode property. At this time, the StoreRemoved event is passed.

In the application mode by the PC camera mode, the image playback, deletion and the movie recording can be performed on the camera.

The host, which acquires the events by using the GetEvent command, can acquire all the events generated in the application mode.

The host, which acquires the events by using the Interrupt IN transfer, can acquire only the DevicePropChanged event of the standard property.

2.5 Recording Destination

The camera supports the following three 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 from the host during the USB connection.

No.	Description
1	Records in the card (default).
2	Transfers to the host (records in the SDRAM temporarily).
3	Records in the card and transfers to the PC simultaneously.

The camera has the RecordingMedia property (subsection 6.5.7.3) to save the recording destination setting. The RecordingMedia property can be changed only by issuing the command from the host.

The recording destination set in the RecordingMedia property is effective only when the image is captured by using the shutter-release button of the camera, and it is not effective for the shooting request command from the host. For the shooting request command from the host, the recording destination differs depending on the request command.

- When the image is captured by using the shutter-release button of the camera

RecordingMedia property	Operations
Card	The captured data are recorded in the card.
SDRAM	The captured data are recorded in the SDRAM temporarily and transferred to the host.
Card and SDRAM	Operation with the recording destination set to the card and that with the recording destination set to the SDRAM are both performed.

- When the image is captured by using the release request command from the host

RecordingMedia property	Operations
InitiateCapture	The captured data are recorded in the card.
InitiateCaptureReclnSdram	The captured data are recorded in the SDRAM temporarily and transferred to the host.
AfAndCaptureReclnSdram	Operation with the recording destination set to the card and that with the recording destination set to the SDRAM are both performed.
InitiateCaptureReclnMedia	<p>The following three operations can be performed by specifying the parameter.</p> <p>1: The captured data are recorded in the card.</p> <p>2: The captured data are recorded in the SDRAM temporarily and transferred to the host.</p> <p>3: The captured data are recorded in the card and the SDRAM, and those recorded in the SDRAM are transferred to the host.</p>

If the host is incapable of image acquisition operation by the SDRAM recording shown in subsection 2.7, the value of the RecordingMedia property must not be changed.

The host must return the changed value of the RecordingMedia property to [Card] when terminating the use of the camera by communication.

2.5.1 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 read the data in the card, but cannot write the data to the card.

The camera can make the deletion of data in the card and perform card formatting by the command from the host.

When the captured images are being recorded on the card, the data deletion and the card formatting cannot be performed until all the images are recorded on the card. The release operation by the shutter-release button of the camera and the shooting request command cannot be executed during the data deletion and the card formatting.

2.5.2 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 and to the oldest image data in order of storage in the SDRAM. The image data in the SDRAM cannot be accessed randomly. (Refer to subsection 8.2).

The image data sent to the host completely is erased from the SDRAM.

2.6 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 can be acquired in order of generation by either of the two methods. The methods are shown below.

No.	Description
1	Sending the event by the Interrupt transfer (based on the PTP specifications)
2	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. The camera is provided with two queue buffers for the two methods of getting the event.

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

When the queue buffer that is not used for the event acquisition becomes full, the camera deletes the old event from the queue buffer and stores the new event in the queue buffer.

For sending the event in the application mode, refer to “Application Mode” (subsection 2.4).

2.7 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 2.5).

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

2.7.1 Command Sequence (Recording in the Card)

The command sequence leading from the recording of the captured image data in the card to the data acquisition by the host is shown below.

No.	Description
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 InitiateCaptureReclnMedia 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 InitiateCaptureReclnMedia 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.

2.7.2 Command Sequence (Recording in the SDRAM)

The command sequence leading from the recording of the captured image data in the SDRAM to the data acquisition by the host is shown below.

No.	Description
1	When acquiring the event by the command, the host issues the GetEvent command regularly to acquire the event.
2	The host issues the InitiateCaptureReclnSdram, the AfAndCaptureReclnSdram, or the InitiateCaptureReclnMedia 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 one InitiateCaptureReclnSdram, the AfAndCaptureReclnSdram, or the InitiateCaptureReclnMedia command are sent completely, the camera sends the CaptureCompleteReclnSdram event.

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

The command sequence leading 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.

No.	Description
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, the SDRAM, or the card and 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 (15) 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 host acquires the image data information by issuing the GetObjectInfo command.
8	The host acquires the thumbnail data by issuing the GetThumb and the GetLargeThumb commands, if necessary.
9	The host acquires the image data by issuing the GetObject or GetPartialObject command.
10	When two or more image data are saved by the continuous shot operation, the host repeats the procedures in (11) to (14) to acquire all the image data.
11	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.
12	The host acquires the image data information by issuing the GetObjectInfo command.
13	The host acquires the thumbnail data by issuing the GetThumb and the GetLargeThumb commands, if necessary.
14	The host acquires the image data by issuing the GetObject or GetPartialObject command.
15	The host repeats the procedures in (12) to (15) as many times as the number of received ObjectAddedInSdram events.

2.7.4 Command Sequence (Bulb Shooting)

The command sequence to acquire the image data recorded by Bulb shooting is shown below.

No.	Description
1	The host changes the camera to the remote mode by using the ChangeCameraMode command.
2	The host sets "M" by using the ExposureProgramMode property.
3	The host sets Bulb shooting (0xFFFFFFFF) by using the ExposureTime property and the ShutterSpeed property.
4	The host issues the InitiateCaptureRecInMedia command to start shooting.
5	The host issues the DeviceReady command and confirms that the response code is <u>Bulb_Release_Busy</u> .
6	The host issues the TerminateCapture command to terminate Bulb shooting.
7	The camera records the created images in the card, the SDRAM, or the card and the SDRAM after completion of the shooting and issues the ObjectAdded event or the ObjectAddedInSdram event to the host.
8	The host acquires the ObjectAdded event or the ObjectAddedInSdram event by the GetEvent command to acquire the ObjectHandle of the created images.
9	The host acquires the image information by the GetObjectInfo command.
10	The host acquires the thumbnail image by the GetThumb and the GetLargeThumb commands, if necessary.
11	The host acquires the image data by issuing the GetObject or GetPartialObject command.
12	The camera issues the CaptureComplete event or the CaptureCompleteRecInSdram event.
13	The host acquires the CaptureComplete event or the CaptureCompleteRecInSdram event by the GetEvent command.
14	The host changes the camera to the PC camera mode by using the ChangeCameraMode command.

2.8 Live View Image and 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 remote live view after the host executed the StartLiveView command, the live view images can be acquired by the GetLiveViewImage command.

2.8.1 Command Sequence

The command sequence leading from the start of live view by the request from the host to the acquisition of the live view image is shown below.

No.	Description
1	The host issues the StartLiveView command to request the camera to start the remote 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 AF driving (AfDrive command), the MF driving (MfDrive command), the AF area change (ChangeAfArea command), etc. can be performed optionally.
6	When the remote live view is finished, the host issues the EndLiveView command.

2.8.2 Command Sequence (Movie Recording)

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

No.	Description
1	The host issues MovieRecProhibitionCondition during the movie live view execution to confirm that movie recording can be performed.
2	The host issues the StartMovieRecord command to start the movie recording.
3	The camera stops the movie recording or the host issues the EndMovieRecord command to stop the movie recording.
4	The camera writes the captured movie file in the card and issues the ObjectAdded event.
5	The camera issues the MovieRecordComplete event after stopping movie recording.
6	The host acquires the MovieRecordComplete event by the GetEvent command.
7	The host acquires the ObjectAdded event by the GetEvent command to acquire the ObjectHandle of the movie file.
8	The host acquires the file size of the movie file by the GetObjectInfo command.
9	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.

2.8.3 Command Sequence (Over 4GB Movie Transfer)

The command sequence to transfer the movie data over 4GB is shown below.

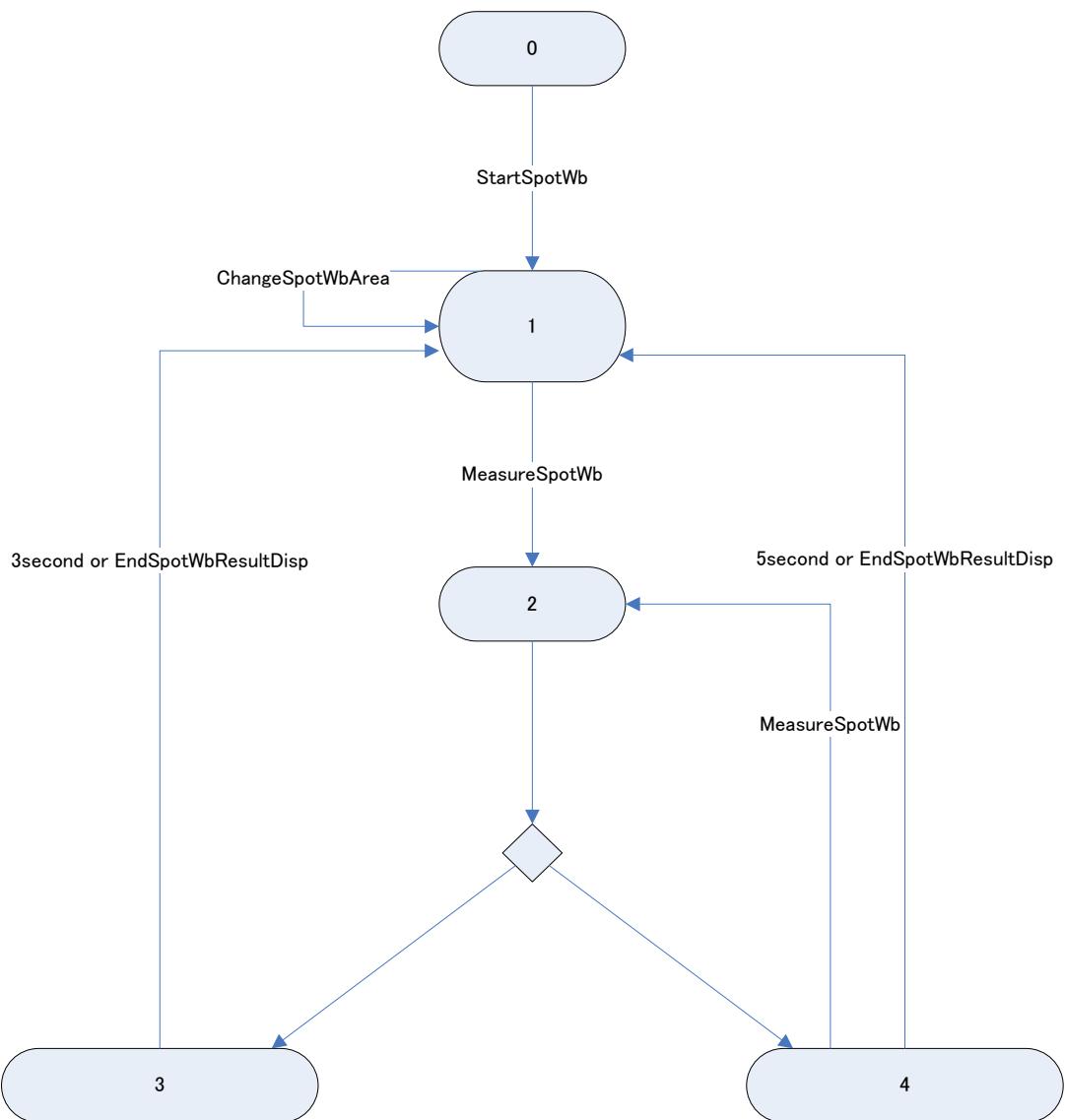
No.	Description
1	The host issues MovieRecProhibitionCondition during the movie live view execution to confirm that movie recording can be performed.
2	The host issues the StartMovieRecord command to start the movie recording.
3	The camera stops the movie recording or the host issues the EndMovieRecord command to stop the movie recording.
4	The camera writes the captured movie file in the card and issues the ObjectAdded event.
5	The camera issues the MovieRecordComplete event after stopping movie recording.
6	The host acquires the MovieRecordComplete event by the GetEvent command.
7	The host acquires the ObjectAdded event by the GetEvent command to acquire the ObjectHandle of the movie file.
8	The host acquires the file size of the movie file by the GetObjectInfo command. When the file size of the GetObjectInfo command is 0xFFFFFFFF, use the following method to get the file size. PTP: Use GetObjectSize command to get the file size. MTP: Use ObjectSize of the GetObjectPropValue command to get the file size.
9	The host divides and acquires the movie file by the GetPartialObjectHighSpeed or GetPartialObjectEx 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 GetPartialObjectHighSpeed or GetPartialObjectEx command.

2.8.4 Command Sequence (Spot WB)

The command sequence to acquire the spot WB by the MeasureSpotWB command and set it to preset manual is shown below.

No.	Description
1	The host issues the StartLiveView command to request the camera to start the remote live view.
2	The host changes the camera to the remote mode by using the ChangeCameraMode command.
3	The host sets WhiteBalance to Preset manual.
4	The host sets WbPresetDataNo in which the spot WB is saved. At this time, a WbPresetDataNo in which Preset manual is protected must not be set.
5	The host issues the StartSpotWb command to request the camera to start the spot WB acquisition standby state. Confirm the spot WB condition of LiveViewObject that can be acquired by the GetLiveViewImage command to check whether the spot WB acquisition standby state is started.
6	The host sets the area to be acquired by ChangeSpotWbArea.
7	The host issues the MeasureSpotWb command to acquire the spot WB. Confirm the spot WB condition of LiveViewObject to check the acquisition result.
8	If the acquisition succeeds, the camera cancels the spot WB acquisition standby state and sets the spot WB condition of LiveViewObject to "On standby" (acquisition success) for three seconds.
9	If the acquisition fails, the camera remains in the spot WB acquisition standby state and sets the spot WB condition of LiveViewObject to "On standby" (acquisition failure) for five seconds.
10	The host issues the EndSpotWbResultDisp command to cancel the spot WB acquisition result display quickly.
11	The host issues the EndSpotWb command to terminate the spot WB acquisition standby state.
12	The host changes the camera to the PC camera mode by using the ChangeCameraMode command.

The transition of the spot WB condition that can be acquired by GetLiveViewImage is shown below.



The figures in the diagram above show “Spot WB condition” of LiveViewObject in GetLiveViewImage (subsection 6.2.2.25).

2.8.5 Command Sequence (Tracking)

The command sequence from tracking start to tracking end is shown below.

No.	Description
1	The host issues the StartLiveView command to request the camera to start the remote live view.
2	The host sets the AF area mode to Auto-area AF.
3	<p>The host can execute the following commands to change the tracking state.</p> <ul style="list-style-type: none"> - StartTracking command <p>The host issues the StartTracking command with the area where you want to start tracking as the parameters.</p> <p>When no face is detected at the specified coordinates, the camera sets the tracking state of LiveViewObject to "On tracking" and starts tracking operation at the specified coordinates.</p> <p>When a face is detected at the specified coordinates, the camera updates the selected face index. At this time, the tracking state changes to the standby state.</p> <p>When the StartTracking command is executed with "On tracking" in the tracking state, the camera starts tracking operation at the specified coordinates with or without detected face.</p> <ul style="list-style-type: none"> - AfDrive command <p>In the case that the tracking state is being selected, the camera changes the tracking state to "On tracking" when starting AF driving.</p> <ul style="list-style-type: none"> - InitiateCaptureReInMedia command <p>In the case that the tracking state is being selected and the command is executed when "Image acquisition release after AF driving" is specified for CaptureSort, the camera changes the tracking state to "On tracking" when starting AF driving and starts the release operation. After the release operation is completed, the tracking state changed immediately before is maintained.</p>
5	The host issues the EndTracking command to end tracking action.

* Whether the tracking state has changed or not is confirmed by checking the tracking state of LiveViewObject acquired with the GetLiveViewImage command.

2.9 Reacquisition of the Image Data

When one of the following occurs during the reading sequence of the image data recorded in the SDRAM in subsections 2.7.2 and 2.7.3, the host can redo the image data acquisition by issuing the GetObjectInfo command.

No.	Description
1	The USB connection is cut. (Such as the case that the USB cable is extracted.)
2	The camera returns an error to the GetObject or the GetPartialObject command.
3	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 has been performed with “RAW+JPEG” and either of the image data has been sent normally, only the other image data should be sent again.

2.10 Operation with the Empty Battery

When the battery is exhausted, the camera cannot detect the card and notify the host of no card status even if it is inserted.

3 Device Requests

3.1 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	-	Return NULL data
	Endpoint number that is supported	-	STALL response
	Endpoint number that is not supported	-	STALL response
Set Feature	Device: DEVICE_REMOTE_WAKEUP	-	Return NULL data
	Endpoint: END_POINT_HALT	-	Return NULL data
	Endpoint number that is supported	-	STALL response
	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	-

3.2 Class-Specific Requests

The camera supports the class-specific requests below.

3.2.1 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.

3.2.2 DeviceReset 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

3.2.3 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

4 Descriptors

4.1 Standard Descriptors

The camera has the following standard descriptors.

4.1.1 Device Descriptor

4.1.1.1 HIGH-SPEED

USB 2.x				
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	0210h	USB specification number (0210h=Revision 2.10)
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	0442h	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

USB 3.x				
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	0320h	USB specification number (0320h=Revision 3.20)
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	09h	Maximum packet size of endpoint 0
8	idVendor	2	04B0h	Vendor ID ("NIKON")
10	idProduct	2	0442h	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

4.1.1.2 FULL-SPEED

USB 2.x				
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	0210h	USB specification number (0210h=Revision 2.10)
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	0442h	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

USB 3.x				
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	0320h	USB specification number (0320h=Revision 3.20)
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	09h	Maximum packet size of endpoint 0
8	idVendor	2	04B0h	Vendor ID ("NIKON")
10	idProduct	2	0442h	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

4.1.2 Device_Qualifier Descriptor

USB 2.x				
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	0210h	USB specification number (0210h=Revision 2.10)
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
9	bReserved	1	00h	Reserved

USB 3.x				
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	0210h	USB specification number (0210h=Revision 2.10)
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
9	bReserved	1	00h	Reserved

4.1.3 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). Total length is 0039h when the SuperSpeed is used.
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	fah	Maximum power consumption supplied from the bus to the USB device (2 mA). 003fh (8 mA) for SuperSpeed.

4.1.4 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	fah	Maximum power consumption supplied from the bus to the USB device (2 mA)

4.1.5 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	ilInterface	1	00h	Index of the string descriptor describing this interface

4.1.6 Endpoint Descriptor

4.1.6.1 Bulk-Out Endpoint

For SUPER-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	0400h	Maximum packet size of this endpoint (0400h=1024Byte)
6	blInterval	1	00h	Polling interval (invalid for the Bulk and the Control endpoints)

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	blInterval	1	00h	Polling interval (invalid for the Bulk and the Control endpoints)

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	blInterval	1	00h	Polling interval (invalid for the Bulk and the Control endpoints)

4.1.6.2 Bulk-In Endpoint

For SUPER-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	0400h	Maximum packet size of this endpoint (0400h=1024Byte)	
6	bInterval	1	00h	Polling interval (invalid for the Bulk and the Control endpoints)	

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)	

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)	

4.1.6.3 Interrupt Endpoint

For SUPER-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	0018h	Maximum packet size of this endpoint (0018h=24Byte)
6	blInterval	1	0Ah	Polling interval (0Ah = 10ms)

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	blInterval	1	09h	Polling interval

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	blInterval	1	09h	Polling interval

4.1.7 Super Speed Endpoint Companion Descriptor

4.1.7.1 Bulk-Out Endpoint

For SUPER-SPEED

Offset	Field	Size	Value	Description
0	bLength	1	06h	Size of the descriptor
1	bDescriptorType	1	30h	Type of the descriptor (SuperSpeed Endpoint Companion Descriptor)
2	bMaxBurst	1	0Fh	Maximum number of packets that can be transmitted and received by burst transfer. (Number of burst transfers -1) should be set. The maximum value is 15
3	bmAttributes	1	00h	Maximum number of streams for Bulk-Endpoint. 0 for no stream definition. In the case of an isochronous end point, the maximum number of packets in the service interval.
4	wBytesPerInterval	2	0000h	Maximum number of bytes at which a fixed interval interrupt or isochronous endpoint will transfer per service interval.

4.1.7.2 Bulk-In Endpoint

For SUPER-SPEED

Offset	Field	Size	Value	Description
0	bLength	1	06h	Size of the descriptor
1	bDescriptorType	1	30h	Type of the descriptor (SuperSpeed Endpoint Companion Descriptor)
2	bMaxBurst	1	0Fh	Maximum number of packets that can be transmitted and received by burst transfer. (Number of burst transfers -1) should be set. The maximum value is 15
3	bmAttributes	1	00h	Maximum number of streams for Bulk-Endpoint. 0 for no stream definition. In the case of an isochronous end point, the maximum number of packets in the service interval.
4	wBytesPerInterval	2	0000h	Maximum number of bytes at which a fixed interval interrupt or isochronous endpoint will transfer per service interval.

4.1.7.3 Interrupt Endpoint

For SUPER-SPEED

Offset	Field	Size	Value	Description
0	bLength	1	06h	Size of the descriptor
1	bDescriptorType	1	30h	Type of the descriptor (SuperSpeed Endpoint Companion Descriptor)
2	bMaxBurst	1	0Fh	Maximum number of packets that can be transmitted and received by burst transfer. (Number of burst transfers -1) should be set. The maximum value is 15
3	bmAttributes	1	00h	Maximum number of streams for Bulk-Endpoint. 0 for no stream definition. In the case of an isochronous end point, the maximum number of packets in the service interval.
4	wBytesPerInterval	2	0018h	Maximum number of bytes at which a fixed interval interrupt or isochronous endpoint will transfer per service interval.

4.1.8 String Descriptor

4.1.8.1 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”

4.1.8.2 Index2 (iProduct)

Offset	Field	Size	Value	Description
0	bLength	1	1Ch	Size of the descriptor
1	bDescriptorType	1	03h	Type of the descriptor (String descriptor)
2	bString	26	4E00h 4900h 4B00h 4F00h 4E00h 2000h 4400h 5300h 4300h 2000h 5A00h 2000h 3700h	Unicode character string “NIKON DSC Z 7”

4.1.8.3 Index3 (iSerialNumber)

4.1.9 BOS Descriptor

Offset	Field	Size	Value	Description
0	bLength	1	05h	Size of the descriptor
1	bDescriptorType	1	0Fh	Type of the descriptor (BOS descriptor)
2	wTotalLength	2	0016h	Length of this descriptor and all of its sub descriptors
4	bString	1	02h	The number of separate device capability descriptors in the BOS

4.1.10 USB 2.0 Extension Descriptor

Offset	Field	Size	Value	Description
0	bLength	1	07h	Size of the descriptor
1	bDescriptorType	1	10h	Type of the descriptor (DEVICE CAPABILITY descriptor)
2	bDevCapabilityType	1	02h	Capability type (USB 2.0 Extension)
3	bmAttributes	4	00000006h	Bit0 : Reserved Bit1 : LPM (Link Power Management protocol) Bit2 : BESL & Alternate HIRD definitions supported Bit3 to Bit31 : Reserved

4.1.11 Super Speed Device Capabilities Descriptor

Offset	Field	Size	Value	Description
0	bLength	1	0Ah	Size of the descriptor
1	bDescriptorType	1	10h	Type of the descriptor (DEVICE CAPABILITY descriptor)
2	bDevCapabilityType	1	03h	Capability type (SUPERSPEED_USB)
3	bmAttributes	1	00h	Bit0 : Reserved Bit1 : LTM Capable Bit2 to Bit31 : Reserved
4	wSpeedsSupported	2	000Eh	Bit0 : Reserved Bit1 : full-speed supported Bit2 : high-speed supported Bit3 : 5Gbs supported Bit4 to Bit15 : Reserved
6	bFunctionalitySupport	1	01h	
7	bU1DevExitLat	1	01h	U1 Device Exit Latency. 01h : Less than 1 μ s
8	wU1DevExitLat	2	0065h	U2 Device Exit Latency. 0065h : Less than 101 μ s

4.2 Class-Specific Descriptor

The camera has no class-specific descriptor.

5 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).

5.1 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 this container is coded. The still image capture device decides the container size by using this field.
4	2	Container Type	This field shows the container type. 0: Not defined 1: Command block 2: Data block 3: Response block 4: Event block
6	2	Code	This field conforms to MTP Specification v1.0. (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 (0xFFFFFFF), the next TransactionID becomes 0x00000001.
12	??	Payload	Differs depending on the phase.

5.2 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	Container 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	Code	EventCode
8	4	TransactionID	TransactionID = 0xFFFFFFFF
12	??	Payload	Differs depending on the event.

5.3 Phases

The communication between the camera and the host is composed of the three phases; command phase, data phase, and response phase. The details of each phase are shown below.

5.3.1 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 6.2. 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	1: Command block
6	2	Code	Operation Code
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 (0xFFFFFFF), 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	Parameter 2	
20	4	Parameter 3	

5.3.2 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 6.2. 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	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 (0xFFFFFFF), the next TransactionID becomes 0x00000001.
12	??	Payload	The contents of this field differ depending on the OperationCode.

5.3.3 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 6.3.

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	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 (0xFFFFFFF), 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.

5.4 Error Handling

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

No.	Description
1	Bus reset
2	Reset recovery

5.4.1 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.

5.4.2 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.

No.	Description
1	Container Type of Generic Container Structure is other than the command block.

5.4.3 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.

6 Code

The codes supported by the camera are described.

6.1 ObjectFormatCode

The ObjectFormatCode indicates the format of the objects in the card inserted in the camera (image file and script 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 MTP Specification v1.0, 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)
0x3008 (Not supported)	WAV	AudioClip
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)
0x380D	TIFF (RGB)	Tag Image File Format
0xB982	MP4 Container	ISO 14496-1

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

6.1.1 Association Type

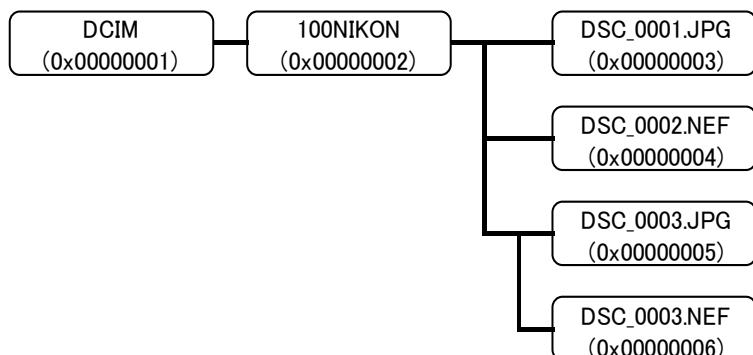
There are various Types in the Association defined by ObjectFormatCode. Association is for representing the folders and the file system. All the objects that belong to the Association correspond to the branches of the tree structure under the Association. The associations to which the objects belong are specified in the ParentObject field of the ObjectInfo data set 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 and DCF directory.

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	¥DCIM folder	0x3001	0x00000000
0x00000002	¥DCIM¥100NIKON	0x3001	0x00000001
0x00000003	¥DCIM¥100NIKON¥DSC_0001.JPG	0x3801	0x00000002
0x00000004	¥DCIM¥100NIKON¥DSC_0002.NEF	0x3000	0x00000002
0x00000005	¥DCIM¥100NIKON¥DSC_0003.JPG	0x3801	0x00000002
0x00000006	¥DCIM¥100NIKON¥DSC_0003.NEF	0x3000	0x00000002



6.2 Operation Code

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 is 2 bytes.

Operation Codes that can be executed during live view/movie recording are shown below.

The OperationCodes supported by the camera are shown below.

Yes: Can be executed, -: Cannot be executed

Operation Code	Description	Reference item	Live view photography	Movie live view	During movie recording
0x1001	GetDeviceInfo	6.2.1.1	Yes	Yes	Yes
0x1002	OpenSession	6.2.1.2	Yes	Yes	-
0x1003	CloseSession	6.2.1.3	Yes	Yes	Yes
0x1004	GetStorageIDs	6.2.1.4	Yes	Yes	Yes
0x1005	GetStorageInfo	6.2.1.5	Yes	Yes	Yes
0x1006	GetNumObjects	6.2.1.6	Yes	Yes	Yes
0x1007	GetObjectHandles	6.2.1.7	Yes	Yes	Yes
0x1008	GetObjectInfo	6.2.1.8	Yes	Yes	-
0x1009	GetObject	6.2.1.9	Yes	Yes	-
0x100A	GetThumb	6.2.1.10	Yes	Yes	-
0x100B	DeleteObject	6.2.1.11	Yes	Yes	-
0x100C	SendObjectInfo	6.2.1.12	Yes	Yes	-
0x100D	SendObject	6.2.1.13	Yes	Yes	-
0x100E	InitiateCapture	6.2.1.14	Yes	Yes	-
0x100F	FormatStore	6.2.1.15	Yes	Yes	-
0x1014	GetDevicePropDesc	6.2.1.16	Yes	Yes	Yes
0x1015	GetDevicePropValue	6.2.1.17	Yes	Yes	Yes
0x1016	SetDevicePropValue	6.2.1.18	Yes	Yes	Yes
0x101B	GetPartialObject	6.2.1.19	Yes	Yes	-
0x90C0	InitiateCaptureReclnSdram	6.2.2.16	Yes	Yes	Yes
0x90C1	AfDrive	6.2.2.19	Yes	Yes	Yes
0x90C2	ChangeCameraMode	6.2.2.5	Yes	Yes	-
0x90C3	DeleteImagesInSdram	6.2.2.14	Yes	Yes	-
0x90C4	GetLargeThumb	6.2.2.11	Yes	Yes	-
0x90C7	GetEvent	6.2.2.3	Yes	Yes	Yes
0x90C8	DeviceReady	6.2.2.2	Yes	Yes	Yes
0x90C9	SetPreWbData	6.2.2.38	Yes	Yes	-
0x90CA	GetVendorPropCodes	6.2.2.1	Yes	Yes	Yes
0x90CB	AfAndCaptureReclnSdram	6.2.2.17	Yes	Yes	Yes
0x90CC	GetPicCtrlData	6.2.2.39	Yes	Yes	Yes
0x90CD	SetPicCtrlData	6.2.2.40	Yes	Yes	-
0x90CE	DeleteCustomPicCtrl	6.2.2.41	Yes	Yes	-
0x90CF	GetPicCtrlCapability	6.2.2.42	Yes	Yes	Yes
0x9201	StartLiveView	6.2.2.23	Yes	Yes	Yes
0x9202	EndLiveView	6.2.2.24	Yes	Yes	Yes
0x9203	GetLiveViewImage	6.2.2.25	Yes	Yes	Yes
0x9204	MfDrive	6.2.2.21	Yes	Yes	Yes
0x9205	ChangeAfArea	6.2.2.28	Yes	Yes	Yes
0x9206	AfDriveCancel	6.2.2.20	Yes	Yes	Yes
0x9207	InitiateCaptureReclnMedia	6.2.2.15	Yes	Yes	Yes
0x9209	GetVendorStorageIDs	6.2.2.7	Yes	Yes	Yes
0x920A	StartMovieRecord	6.2.2.36	-	Yes	-
0x920B	EndMovieRecord	6.2.2.37	Yes	Yes	Yes
0x920C	TerminateCapture	6.2.2.18	Yes	Yes	-
0x920F	GetFhdPicture	6.2.2.12	Yes	Yes	-
0x9400	GetPartialObjectHighSpeed	6.2.2.10	Yes	Yes	-
0x9402	StartSpotWb	6.2.2.31	-	Yes	-
0x9403	EndSpotWb	6.2.2.32	Yes	Yes	-
0x9404	ChangeSpotWbArea	6.2.2.33	Yes	Yes	-

Do Not Copy

0x9405	MeasureSpotWb	6.2.2.34	Yes	Yes	-
0x9406	EndSpotWbResultDisp	6.2.2.35	Yes	Yes	-
0x940C	CancelImagesInSdram	6.2.2.13	Yes	Yes	-
0x9414	GetSBHandles	6.2.2.44	Yes	Yes	Yes
0x9415	GetSBAttrDesc	6.2.2.45	Yes	Yes	Yes
0x9416	GetSBAttrValue	6.2.2.46	Yes	Yes	Yes
0x9417	SetSBAttrValue	6.2.2.47	Yes	Yes	-
0x9418	GetSBGroupAttrDesc	6.2.2.48	Yes	Yes	Yes
0x9419	GetSBGroupAttrValue	6.2.2.49	Yes	Yes	Yes
0x941A	SetSBGroupAttrValue	6.2.2.50	Yes	Yes	-
0x941B	TestFlash	6.2.2.51	Yes	Yes	Yes
0x941C	GetEventEx	6.2.2.4	Yes	Yes	Yes
0x9420	SaveCameraSetting	6.2.2.6	Yes	Yes	-
0x9421	GetObjectSize	6.2.2.8	Yes	Yes	-
0x9423	GetLiveViewCompressedSize	6.2.2.27	Yes	Yes	Yes
0x9424	StartTracking	6.2.2.29	Yes	Yes	Yes
0x9425	EndTracking	6.2.2.30	Yes	Yes	Yes
0x9426	ChangeAELock	6.2.2.22	Yes	Yes	Yes
0x9428	GetLiveViewImageEx	6.2.2.26	Yes	Yes	Yes
0x9431	GetPartialObjectEx	6.2.2.9	Yes	Yes	-
0x9432	GetManualSettingLensData	6.2.2.43	Yes	Yes	Yes
0x9801	GetObjectPropsSupported	6.2.2.52	Yes	Yes	Yes
0x9802	GetObjectPropDesc	6.2.2.53	Yes	Yes	Yes
0x9803	GetObjectPropValue	6.2.2.54	Yes	Yes	-
0x9805	GetObjectPropList	6.2.2.55	Yes	Yes	-

6.2.1 Standard

6.2.1.1 GetDeviceInfo

○ Command Specifications

Operation Code	0x1001
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	DeviceInfo data set
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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.

○ Command Details

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 9.1.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Incomplete_Transfer	The data block transmission failed.

6.2.1.2 OpenSession

○ Command Specifications

Operation Code	0x1002
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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.

○ Operation Parameter

Operation Parameter	Details
Parameter1	SessionID
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Invalid_Parameter	The value of the parameter1 is 0x00000000.
Session_Already_Open	The session between the camera and the host has been already started.

6.2.1.3 CloseSession

○ Command Specifications

Operation Code	0x1003
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

When this operation is performed, the operation being run is terminated. Besides, the camera state changed after OpenSession returns to the default.

State	Contents of change
During shooting operation	Only the shooting operation currently being performed is executed. For the continuous shooting, it is not continued.
During AF operation	The AF operation stops.
During remote live view	The camera live view is executed.
In the remote mode	The camera enters the PC camera mode.
The recording destination is "SDRAM" or "Card and SDRAM".	The recording destination is set to "Card".
In the application mode	Set to OFF.
During AE lock	AE lock is released (when the AE lock is not assigned in the camera button).

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Session_Not_Open	The session is not started.
Parameter_Not_Supported	An unsupported parameter is specified.

6.2.1.4 GetStorageIDs

○ Command Specifications

Operation Code	0x1004
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	StorageIDArray
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode returns a list of the currently valid StorageIDs.

For the application mode, the StorageID with the card not inserted can be acquired by this command. Therefore the valid StorageID can be known by using the GetVendorStorageIDs.

○ Command Details

The camera returns the StorageID of each slot.

The StorageID of each slot takes the following values.

StorageID	Details
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 is exhausted

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	0x00000001 (One element for the array)
ArrayEntry1	4	StorageID (main slot)

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.

6.2.1.5 GetStorageInfo

○ Command Specifications

Operation Code	0x1005
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	StorageInfo
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

The camera returns the StorageInfo data set of the card specified by the StorageID.

The StorageIDs supported by the camera are shown in subsection 6.2.1.4.

The StorageInfo data set sent by the camera is described in subsection 9.2.

○ Operation Parameter

Operation Parameter	Details
Parameter1	StorageID
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
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.
	The battery is exhausted.

6.2.1.6 GetNumObjects

○ Command Specifications

Operation Code	0x1006
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	NumObjects

○ Command Outline

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.

○ Command Details

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

Operation Parameter	Value	Details
Parameter1	0xFFFFFFFF	All the cards should be the targets.
	StorageID	The specified card should be the target. Refer to subsection 6.2.1.4.
Parameter2 (Option)	0x00000000	All the object formats should be the targets.
	No value	
	0xFFFFFFFF	All the image formats in the card corresponding to the specified StorageID should be the targets.
	ObjectFormatCode	The specified object format should be the target. Refer to subsection 6.1.
Parameter3 (Option)	0x00000000	All the directories should be the targets.
	No value	
	0xFFFFFFFF	The objects directly under the root should be the targets.
	ObjectHandle	The objects directly under the specified directory should be the targets.

○ Operation Parameter

Operation Parameter	Details
Parameter1	StorageID
Parameter2	[ObjectFormatCode]
Parameter3	[ObjectHandle of the directory]

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
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_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.
	The battery is exhausted.
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.

The specified directory does not exist.

6.2.1.7 GetObjectHandles

○ Command Specifications

Operation Code	0x1007
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	ObjectHandleArray
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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.

○ Command Details

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

Operation Parameter	Value	Details
Parameter1	0xFFFFFFFF	All the cards should be the targets.
	StorageID	The specified card should be the target. Refer to subsection 6.2.1.4.
Parameter2 (Option)	0x00000000	All the object formats should be the targets.
	No value	
	0xFFFFFFFF	All the image formats in the card corresponding to the specified StorageID should be the targets.
	ObjectFormatCode	The specified object format should be the target. Refer to subsection 6.1.
Parameter3 (Option)	0x00000000	All the directories should be the targets.
	No value	
	0xFFFFFFFF	The objects directly under the root should be the targets.
	ObjectHandle	The objects directly under the specified directory should be the targets.

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]

○ Operation Parameter

Operation Parameter	Details
Parameter1	StorageID
Parameter2	[ObjectFormatCode]
Parameter3	[ObjectHandle of the directory]

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
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.
	The battery is exhausted.
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.
	The specified directory does not exist.

6.2.1.8 GetObjectInfo

○ Command Specifications

Operation Code	0x1008
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	ObjectInfo
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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.

○ Command Details

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 9.3.

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist.
	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.
	The battery is exhausted.
Access_Denied	The movie is playing.

6.2.1.9 GetObject

○ Command Specifications

Operation Code	0x1009
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	DataObject
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

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.

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist.
	The ObjectHandle of the directory (Association) is specified.
	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.
	The battery is exhausted.
Access_Denied	The movie is playing.

6.2.1.10 GetThumb

○ Command Specifications

Operation Code	0x100A
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	ThumbnailObject
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

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 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".

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist.
	An object in the SDRAM other than the ObjectHandle passed by ObjectAddedInSdram is specified.
	An object in the WAV format 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.
	The battery is exhausted.
Access_Denied	The movie is playing.

6.2.1.11 DeleteObject

○ Command Specifications

Operation Code	0x100B
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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.

○ Command Details

The protected objects are not deleted. An object with an image format that is not supported by the camera is not deleted.

The release is locked until the image deletion is completed.

Operation Parameter	Value	Details
Parameter1	0xFFFFFFFF	All the objects in the card should be the targets.
	ObjectHandle	The specified object should be the target.
Parameter2 (Option)	0x00000000	All the object formats should be the targets.
	No value	
	ObjectFormatCode	The specified object format should be the target. When 0xFFFFFFFF is specified in Parameter1, all the objects that correspond to the specified object format are deleted.

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	[ObjectFormatCode]
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
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_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.
	The battery is exhausted.
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.

6.2.1.12 SendObjectInfo

○ Command Specifications

Operation Code	0x100C
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	ObjectInfo
Data direction	From host to camera
Response Code	Refer to Response Code in this subsection.
Response Parameter	Refer to Response Parameter in this subsection.

○ Command Outline

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

○ Command Details

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.

○ Operation Parameter

Operation Parameter	Details
Parameter1	[StorageID]
Parameter2	[(Parent) ObjectHandle]
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block reception failed.
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 (32768Byte).
Access_Denied	A StorageID of the card is specified.
Specification_of_Destination_Unsupported	The (Parent) ObjectHandle is a value other than 0x00000000 or 0xFFFFFFFF.

○ Response Parameter

Response Parameter	Description
Parameter1	StorageID [0x00000000]
Parameter2	Parent ObjectHandle [0x00000000]
Parameter3	Any ObjectHandle

6.2.1.13 SendObject

○ Command Specifications

Operation Code	0x100D
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	DataObject
Data direction	From host to camera
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

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.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block reception failed.
No_Valid_ObjectInfo	This command is received before the SendObjectInfo command is accepted.

6.2.1.14 InitiateCapture

○ Command Specifications

Operation Code	0x100E
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None
Event Code	Refer to Event Code in this subsection.

○ Command Outline

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.

○ Command Details

The camera starts the release operation when receiving this command. The camera returns OK after starting the release operation. If the AF is required, the camera starts the release operation after finishing the AF. (This command is an activation command, so returns the response code before the release operation is completed.)

The camera starts acquiring one or more new objects (release operation of the camera) according to the current setting. The acquisition of the new object is performed asynchronously.

Whether the AF is operated when the release is started depends on the setting of the focus-mode selector.

Refer to Command Release Operation (subsection 11.7) for the details of the command release operation.

○ Operation Parameter

Operation Parameter	Details	
Parameter1	[StorageID]	
	0x00000000	The recording destination specified in the camera.
	StorageID	The specified recording destination.
Parameter2	[ObjectFormatCode]	
	0x00000000	The image quality mode set in the camera.
	ObjectFormatCode	The image quality mode according to the format.
Parameter3	None	

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
General_Error	An error is generated in the camera body when the command processing is started.
	All of the following conditions are satisfied and the AF operation is not focused. - The AF operation mode is set to [Focus priority]. - The LiveViewSelector is set to [Live view photography].
	The aperture value is "F--".
Invalid_StorageID	The StorageID sent by the camera differs from the StorageID specified by the host.
Invalid_ObjectFormatCode	The format of the ObjectFormatCode is not supported by the camera.
Store_Full	The free area for recording is not provided in the card.
Store_Not_Available	The card is being initialized.
	The card does not exist.

	The battery is exhausted.
Store_Read_Only	All the inserted cards are protected.
Device_Busy	The acquisition operation is being performed when the command processing is started.
	The shutter-release button is being fully pressed.
Access_Denied	When a retractable lens is mounted, the lens is retracting.
	STM lens is being initialized.
	The MovieLogOutput property (subsection 6.5.7.23) is [On]. Shooting cannot be performed depending on the state of the camera other than the above factors.

O Event Code

Event Code	Details
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.

6.2.1.15 FormatStore

○ Command Specifications

Operation Code	0x100F
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

The camera formats the card specified by the StorageID.

The StorageIDs supported by the camera are shown in subsection 6.2.1.4.

The FilesystemFormat parameter shown in Parameter2 is optional. However, setting of only 0x0003 indicating the DCF is permitted.

○ Operation Parameter

Operation Parameter	Details
Parameter1	StorageID
Parameter2	[FilesystemFormat]
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
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_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.
	The battery is exhausted.
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.

6.2.1.16 GetDevicePropDesc

○ Command Specifications

Operation Code	0x1014
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	DevicePropDesc data set
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

For the supported DevicePropCode, refer to subsection 6.5.

For the DevicePropDesc, refer to subsection 9.4.

○ Operation Parameter

Operation Parameter	Details
Parameter1	DevicePropCode
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
DeviceProp_Not_Supported	The specified DevicePropCode is not supported.

6.2.1.17 GetDevicePropValue

○ Command Specifications

Operation Code	0x1015
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	DevicePropValue
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

For the supported DevicePropCode and the details of the DevicePropValue, refer to subsection 6.5.

○ Operation Parameter

Operation Parameter	Details
Parameter1	DevicePropCode
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
DeviceProp_Not_Supported	The specified DevicePropCode is not supported.

6.2.1.18 SetDevicePropValue

○ Command Specifications

Operation Code	0x1016
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	DevicePropValue
Data direction	From host to camera
Response Code	Refer to Response Code in this subsection.
Response Parameter	None
Event Code	Refer to Event Code in this subsection.

○ Command Outline

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

○ Command Details

For the supported DevicePropCode and the details of the DevicePropValue, refer to subsection 6.5.

○ Operation Parameter

Operation Parameter	Details
Parameter1	DevicePropCode
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block reception failed.
DeviceProp_Not_Supported	The specified DevicePropCode is not supported.
Access_Denied	An operation is denied depending on the status of the camera.
	The specified DevicePropCode is not permitted for setting.
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 not supported.

○ Event Code

Event Code	Details
StorageInfoChanged	The settings of the ImageSize and the CompressionSetting properties are changed.

6.2.1.19 GetPartialObject

○ Command Specifications

Operation Code	0x101B
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	DataObject
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	The number of bytes actually sent

○ Command Outline

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.

○ Command Details

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 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. 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.

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	Offset (Byte)
Parameter3	MaxSize (Byte)

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Incomplete_Transfer	The data block transmission failed. The size of the object corresponding to the specified ObjectHandle is 4 GB or more.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist. The ObjectHandle of the directory (Association) is specified. An object in the SDRAM other than the ObjectHandle passed by ObjectAddedInSdram is specified.
Access_Denied	The movie is playing.

6.2.2 Vendor

6.2.2.1 GetVendorPropCodes

○ Command Specifications

Operation Code	0x90CA
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	DevicePropCodeArray
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

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]

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.

6.2.2.2 DeviceReady

○ Command Specifications

Operation Code	0x90C8
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

This command is issued after issuing the following activation-type commands in order to check the operation.

Activation-type commands	Reference
InitiateCapture	6.2.1.14
InitiateCaptureRecInMedia	6.2.2.15
InitiateCaptureRecInSdram	6.2.2.16
AfAndCaptureRecInSdram	6.2.2.17
AfDrive	6.2.2.19
MfDrive	6.2.2.21
StartLiveView	6.2.2.23

This command should be issued repeatedly until the operation of the activation-type command is completed.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Device_Busy	The operation of the activation-type command is not finished.
Out_of_Focus	The AF operation by the command is in the non-focused status.
Wb_Preset_Error	The preset measurement release failed.
MfDrive_Step_End	The MF driving reaches the end of steps.
MfDrive_Step_Insufficiency	The driving amount is insufficient.
Bulb_Release_Busy	The bulb shooting is being performed.
Silent_Release_Busy	During the silent photography (Only models that support the silent photography).
MovieFrame_Release_Busy	The frames for the movie recording are being saved.

6.2.2.3 GetEvent

○ Command Specifications

Operation Code	0x90C7
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	Event array
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

The camera sends all the events saved in the event queue buffer prepared for the GetEvent command.

This command cannot handle the events that have two or more parameters. The GetEventEx command (subsection 6.2.2.4) should be used for those events.

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.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.

6.2.2.4 GetEventEx

○ Command Specifications

Operation Code	0x941C
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	Event array
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

This command is the extended version of GetEvent command (subsection 6.2.2.3).

This command has the following extended functions in addition to those of GetEvent command (subsection 6.2.2.3).

The number of the event parameter is variable and the plural parameters can be specified.

The format of the event array is shown below.

Field	DataSize	DataType	Description
NumberOfElements	4	UINT32	The number of events in the list.
Element1 Event Code	2	UINT16	Event Code for element1.
Element1 NumParameters	2	UINT16	Number of parameters for element1.
Element1 Parameter1	4	UINT32	Parameter1 for element1.
Element1 Parameter2	4	UINT32	Parameter2 for element1.
...			
Element1 ParameterN	4	UINT32	Parameter N for element1.
...			
ElementN Event Code	2	UINT16	Event Code for element N.
ElementN NumParameters	2	UINT16	Number of parameters for element N.
ElementN Parameter1	4	UINT32	Parameter1 for element N.
ElementN Parameter2	4	UINT32	Parameter2 for element N.
...			
ElementN ParameterN	4	UINT32	Parameter N for element N.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.

6.2.2.5 ChangeCameraMode

○ Command Specifications

Operation Code	0x90C2
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

The camera is set to the mode specified by the ModeValue.

○ Operation Parameter

Operation Parameter	Details	
Parameter1	ModeValue	
	0	Sets to the PC camera mode.
Parameter2	1	Sets to the remote mode.
	None	
Parameter3	None	

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
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 ModeValue is out of the range.
Change_CameraMode_Failed	The mode cannot be changed during the release operation.
	The mode cannot be changed during the AF operation.
	The mode cannot be changed during cleaning image sensor.

6.2.2.6 SaveCameraSetting

○ Command Specifications

Operation Code	0x9420
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode saves the camera setting values. This is the same operation as that of saving the camera setting values when the power switch is turned off.

○ Command Details

The camera setting values are stored in the non-volatile area. If this operation is not completed in the case that the power supply is interrupted in saving the setting values, the operation of the camera is not guaranteed after that.

After responding to this command, do not execute any command (other than CloseSession) or do not operate the camera other than power OFF.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Device_Busy	The shooting operation is being performed.
Access_Denied	During the PC camera mode. The camera cannot save the setting values.

6.2.2.7 GetVendorStorageIDs

○ Command Specifications

Operation Code	0x9209
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	StorageIDArray
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode returns a list of the currently valid StorageIDs.

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.

○ Command Details

The camera returns the StorageID of each slot.

The StorageID of each slot takes the following values.

StorageID	Details
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 is exhausted

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	0x00000001 (One element for the array)
ArrayEntry1	4	StorageID (main slot)

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.

6.2.2.8 GetObjectSize

○ Command Specifications

Operation Code	0x9421
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	ObjectSize
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode obtains the size of the specified object.

○ Command Details

When the value of the ObjectCompressedSize returned by GetObjectInfo command is 0xFFFFFFFF, the correct size of the object can be obtained by this operation code.

The ObjectSize transmitted by the camera is 8 bytes of data.

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist.
	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.
	The battery is exhausted.
Access_Denied	The movie is playing.

6.2.2.9 GetPartialObjectEx

○ Command Specifications

Operation Code	0x9431
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	DataObject
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	Refer to Response Parameter in this subsection.

○ Command Outline

The operation by this OperationCode is an extension of GetPartialObject (subsection 6.2.1.19).

○ Command Details

The Offset, MaxSize and actual number of bytes sent (Response Parameter) are expanded. Objects up to the size represented by 8 Bytes can be obtained.

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	Offset (Lower 4Byte)
Parameter3	Offset (Upper 4Byte)
Parameter4	MaxSize (Lower 4Byte)
Parameter5	MaxSize (Upper 4Byte)

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Incomplete_Transfer	The data block transmission failed.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist.
	The ObjectHandle of the directory (Association) is specified.
	An object in the SDRAM other than the ObjectHandle passed by ObjectAddedInSdram is specified.
Access_Denied	The movie is playing.

○ Response Parameter

Response Parameter	Description
Parameter1	Actual number of bytes sent (Lower 4Byte)
Parameter2	Actual number of bytes sent (Upper 4Byte)

6.2.2.10 GetPartialObjectHighSpeed

○ Command Specifications

Operation Code	0x9400
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	DataObject
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	Refer to Response Parameter in this subsection.

○ Command Outline

The operation by this OperationCode transfers the file data (DataObject) of the specified size corresponding to the specified ObjectHandle (parameter1) from the camera to the host.

This command is suited to transfer large-size file because the time for the camera to read the data from the card is shorter than that of the GetPartialObject command (subsection 6.2.1.19).

○ Command Details

The maximum size of the data transferred by this command is the size of the file specified by the ObjectHandle (parameter1). The data size can be checked by the GetObjectInfo command (subsection 6.2.1.8).

The following must be satisfied to use this command.

- The ApplicationMode property (subsection 6.5.14.1) setting is valid.

The command should be issued with Terminate (parameter3) set to "Terminate transferring" in order to cancel the transfer while all data of the specified file are not transferred.

When Terminate (parameter3) is set to "Terminate transferring", data transfer with 0 byte is performed.

An example of using the virtual file data is shown below.

(ObjectHandle = 0x00000001, FileSize = 0x00100000)

In the case that all data are transferred	In the case that data transfer is canceled
The first time: ObjectHandle = 0x00000001 TransferMaxSize = 0x00020000 Terminate = 0x00000000 The second time: ObjectHandle = 0x00000001 TransferMaxSize = 0x00020000 Terminate = 0x00000000 The eighth time (last data acquisition): ObjectHandle = 0x00000001 TransferMaxSize = 0x00020000 Terminate = 0x00000000	The first time: ObjectHandle = 0x00000001 TransferMaxSize = 0x00020000 Terminate = 0x00000000 The second time: ObjectHandle = 0x00000001 TransferMaxSize = 0x00020000 Terminate = 0x00000000 The third time (data transfer is canceled): ObjectHandle = 0x00000001 TransferMaxSize = 0x00020000 Terminate = 0x00000001

The information necessary to maintain this command is released in any of the following conditions.
After the information is released, the file data is acquired from the beginning if this command is issued again.

Termination condition	Reference
The file data specified by the ObjectHandle (parameter1) has been transferred completely.	-
The parameter3 (Terminate) of this command is set to "Terminate transferring".	-
The interval between the response of this command and the next issue of this command exceeds approx. 60 seconds. * If the file data offset of the response parameter is 0 after the second transfer of divided data and before transfer of all data, it is regarded as a time-out.	-
A card has been inserted/ejected regardless of whether the card contains the file data specified by the ObjectHandle or not.	-
The file has been deleted.	-
Movie recording or movie playback has started.	-
OpenSession command is executed.	6.2.1.2
CloseSession command is executed.	6.2.1.3
GetObjectHandles command is executed.	6.2.1.7
GetObjectInfo command is executed with specifying the object in the card.	6.2.1.8
GetObject command is executed with specifying the object in the card.	6.2.1.9
GetThumb command is executed with specifying the object in the card.	6.2.1.10
DeleteObject command is executed.	6.2.1.11
SendObjectInfo command is executed.	6.2.1.12
SendObject command is executed.	6.2.1.13
InitiateCapture command is executed.	6.2.1.14
FormatStore command is executed.	6.2.1.15
SetDevicePropValue command is executed.	6.2.1.18
GetPartialObject command is executed with specifying the image in the card.	6.2.1.19
ChangeCameraMode command is executed.	6.2.2.5
GetObjectSize command is executed with specifying the image in the card.	6.2.2.8
GetPartialObjectEx command is executed with specifying the image in the card.	6.2.2.9
GetLargeThumb command is executed with specifying the image in the card.	6.2.2.11
InitiateCaptureRecInMedia command is executed with specifying the card or the card and SDRAM.	6.2.2.15
StartMovieRecord command is executed.	6.2.2.36
EndMovieRecord command is executed.	6.2.2.37
GetObjectPropValue command is executed.	6.2.2.54
GetObjectPropList command is executed.	6.2.2.55

○ Operation Parameter

Operation Parameter	Details	
Parameter1	ObjectHandle	
Parameter2	TransferMaxSize (Byte)	
Parameter3	Terminate	
	0	Continue transferring
	1	Terminate transferring

○ Response Code

Response Code	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	An unsupported parameter is specified.
Incomplete_Transfer	The data block transmission failed.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist.
	In the case of an ObjectHandle other than the image file
	In the case of an ObjectHandle of the SDRAM
Store_Not_Available	The card is being initialized.
	The card does not exist.
	The battery is exhausted.
Access_Denied	The movie is playing.
Invalid_Parameter	"Terminate" is neither 0 nor 1.
Invalid_Status	The ApplicationMode property (subsection 6.5.14.1) setting is not valid.

○ Response Parameter

Response Parameter	Description
Parameter1	The number of bytes actually sent
Parameter2	File data offset before command execution and data transfer (Lower 4Byte)
Parameter3	File data offset before command execution and data transfer (Upper 4Byte)

6.2.2.11 GetLargeThumb

○ Command Specifications

Operation Code	0x90C4
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	LargeThumbnail data
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

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.

The LargeThumbnail data is the large thumbnail data of the object (file) specified by the ObjectHandle. The size of the LargeThumbnail data shall be the reference JPEG image size acquired in order of priority shown in the table below.

Order of priority	Reference (Still image object)	Reference (Movie object)
1	MPF class 1	MPF class 1
2	VIEW	MPF class 2
3	MPF class 2	Small thumbnail

The size of small thumbnail is the same as thumbnail that can be obtained with the GetThumb command (subsection 6.2.1.10).

Aspect ratio	VIEW	MPF class 1	MPF class 2
3:2		640x424	1620x1080
5:4		600x480	1350x1080
4:3		640x480	1440x1080
1:1		480x480	1080x1080
16:9		640x360	1920x1080

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist.
	An object in the WAV format is specified.
	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.
	The battery is exhausted.
Access_Denied	The movie is playing.

6.2.2.12 GetFhdPicture

○ Command Specifications

Operation Code	0x920F
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	FullHD image data
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode acquires the FullHD image data of the specified object in the card.

○ Command Details

The camera sends all the FullHD image data corresponding to the specified ObjectHandle in the card to the host.

The FullHD image data is a maximum of 1920x1080-size JPEG image.

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist. The object other than Jpeg, RAW or TIFF is specified.
No_FullHD_Present	An object that corresponds to the specified ObjectHandle is not the FullHD image.
Store_Not_Available	The card is being initialized.
	The card does not exist.
	The battery is exhausted.
Access_Denied	The movie is playing.

6.2.2.13 CancelImagesInSdram

○ Command Specifications

Operation Code	0x940C
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode cancels the transfer of a specific object saved in the SDRAM.

○ Command Details

This command cancels the transfer of the object corresponding to the specified ObjectHandle. 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.

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Device_Busy	The shooting operation is being performed. The ObjectAddedInSdram event is not ready for passing.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist.

6.2.2.14 DeleteImagesInSdram

○ Command Specifications

Operation Code	0x90C3
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

The object that corresponds to the specified ObjectHandle is deleted. All the objects in the SDRAM are deleted if the value of Parameter1 is 0. During the process of deleting all the objects, the camera does not issue a new ObjectAddedInSdram event.

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Device_Busy	The shooting operation is being performed. The ObjectAddedInSdram event is not ready for passing.
Invalid_Object_Handle	An object that corresponds to the specified ObjectHandle does not exist.

6.2.2.15 InitiateCaptureReInMedia

○ Command Specifications

Operation Code	0x9207
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None
Event Code	Refer to Event Code in this subsection.

○ Command Outline

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.

○ Command Details

This command is an activation-type command. OK response is made when the start of the AF operation or the release operation is completed.

When the host gets the response of the normal termination, the host should issue the DeviceReady command (subsection 6.2.2.2) to confirm whether the release operation is terminated.

The following information can be returned for the DeviceReady command (subsection 6.2.2.2) when requesting the release operation.

Response Code	Description
OK	The release operation is normally terminated.
Device_Busy	The AF, the shooting or the continuous shooting operation is being performed
Bulb_Release_Busy	The bulb shooting is being performed.
Silent_Release_Busy	The silent shooting is being performed.
Out_of_Focus	The AF operation is not focused before shooting or during continuous shooting.
Wb_Preset_Error	The preset measurement release failed.
Other Response Code	Some error has occurred when requesting the release.

* For the details, refer to the DeviceReady command (subsection 6.2.2.2).

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.

For the details of the command release operation, refer to Command Release Operation (subsection 11.7).

O Operation Parameter

Operation Parameter	Details	
Parameter1	CaptureSort (The details are shown in the table below.)	
Parameter2	SaveMedia	
	0x0000	Card
	0x0001	SDRAM
Parameter3	0x0002 Card and SDRAM	
Parameter3	None	

CaptureSort	Operation	Description
0xFFFFFFF	Image acquisition release after AF driving	<p>The AF driving is started and then the release operation of the camera is performed.</p> <p>- Photography mode In the case of focus priority, the release operation is started only when the AF is focused after AF driving. Other than in the case of focus priority, the release operation is always started independent of the status after AF driving.</p> <p>- Movie mode Because it is fixed to the release priority, the release operation is always started independent of the status after AF driving.</p>
0xFFFFFFFF	Image acquisition release	Normal release operation is performed.
0x00000001	Preset measurement release 1	Stores the acquired preset gain in D1.
0x00000002	Preset measurement release 2	Stores the acquired preset gain in D2.
0x00000003	Preset measurement release 3	Stores the acquired preset gain in D3.
0x00000004	Preset measurement release 4	Stores the acquired preset gain in D4.
0x00000005	Preset measurement release 5	Stores the acquired preset gain in D5.
0x00000006	Preset measurement release 6	Stores the acquired preset gain in D6.
0x00000010	Dust reference image release	<p>Dust reference image release operation is performed.</p> <p>When the shooting succeeds, the operation similar to the image acquisition release is performed hereafter.</p>

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
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 CaptureSort or SaveMedia is out of the setting range.
Device_Busy	When the command processing is started, the acquisition operation is being performed. The STM lens is being initialized.
Hardware_Error	When the command processing is started, some error is generated in the camera body.
Out_of_Focus	All of the following conditions are satisfied and the AF operation is not focused. - CaptureSort is the image acquisition release after AF driving. - The AF operation mode is set to [Focus priority]. - The LiveViewSelector is set to [Live view photography].
Invalid_Status	The shutter-release button is being fully pressed. The shutter speed is set to Time.
Dust_Reference_Error	The CPU internal lens is not mounted during the dust reference image release. The dust reference image release failed.
CameraMode_Not_Adjust_Fnumber	An aperture value error occurs.
Store_Full	There is no free area for recording in the card. There is no free area for recording in the SDRAM.
Store_Not_Available	The card is being initialized The card does not exist when SaveMedia is set to [Card] or [Card and SDRAM]. The battery is exhausted.
Store_Error	SaveMedia is [Card] or [Card and SDRAM] and a card access 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.
Access_Denied	The preset measurement release or the dust reference image release is performed when LiveViewSelector is set to [Movie live view]. In the case of the spot WB acquisition standby state The preset measurement release is performed when HDRMode is set to [On]. The preset measurement release is performed during the PC camera mode. When a retractable lens is mounted, the lens is retracting. The MovieLogOutput property (subsection 6.5.7.23) is [On]. Shooting cannot be performed depending on the camera status by a cause other than the above.

○ Event Code

Event Code	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.
CaptureCompleteReclnSdram	All the images captured by this command are sent from the SDRAM to the host completely.

6.2.2.16 InitiateCaptureReInSdram

○ Command Specifications

Operation Code	0x90C0
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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.

○ Command Details

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

The parameters to perform the same operation as that of InitiateCaptureReInSdram by InitiateCaptureReInMedia are shown below.

Operation Parameter	
Parameter1(CaptureSort)	0x000000010(DustOff) 0xFFFFFFFF(Image acquisition release)
Parameter2(SaveMedia)	0x00000001(SDRAM)

For the details, refer to the InitiateCaptureReInMedia command (subsection 6.2.2.15).

○ Operation Parameter

Operation Parameter	Details
Parameter1	CaptureSort Refer to the InitiateCaptureReInMedia command.
Parameter2	None
Parameter3	None

○ Response Code

This subsection describes only ResponseCodes different from that of the InitiateCaptureReInMedia command.

For the details of other response codes, refer to the InitiateCaptureReInMedia command.

Response Code	Description
Shutter_Speed_Bulb	The shutter speed is set to Bulb.
Shutter_Speed_Time	The shutter speed is set to Time.

6.2.2.17 AfAndCaptureReclnSdram

○ Command Specifications

Operation Code	0x90CB
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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.

○ Command Details

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

The parameters to perform the same operation as that of AfAndCaptureReclnSdram by InitiateCaptureReclnMedia are shown below.

Operation Parameter	Description
Parameter1 (CaptureSort)	0xFFFFFFF (Image acquisition release after AF driving)
Parameter2 (SaveMedia)	0x00000001 (SDRAM)

For the details, refer to the InitiateCaptureReclnMedia command (subsection 6.2.2.15).

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

This subsection describes only ResponseCodes different from that of the InitiateCaptureReclnMedia command.

For the details of other response codes, refer to the InitiateCaptureReclnMedia command.

Response Code	Description
Shutter Speed_Bulb	The shutter speed is set to Bulb.
Shutter Speed_Time	The shutter speed is set to Time.

6.2.2.18 TerminateCapture

○ Command Specifications

Operation Code	0x920C
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode stops the shooting operation executed by the host.

○ Command Details

The camera stops the following shooting operation executed by the host.

Shooting operation	Operation after stopping
Bulb shooting	The images captured until the operation is stopped are recorded in the card or the SDRAM.
Continuous shooting	If this command is executed during continuous shooting, the shooting operation is terminated.

The transition to the response phase is performed when the start of the shooting stop processing is completed.

○ Operation Parameter

Operation Parameter	Details
Parameter1	Reserved(0)
Parameter2	Reserved(0)
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.

6.2.2.19 AfDrive

○ Command Specifications

Operation Code	0x90C1
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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.

○ Command Details

This command is an activation command. When the AF driving is started or the camera is in the AF non-driving condition described below, the OK response is made.

After the command is terminated normally, the host should issue the DeviceReady command to confirm the completion of the operation.

The following information can be returned for the DeviceReady command when the AF driving is started.

Response Code	Description
OK	AF driving operation is terminated.
Device_Busy	AF is in operation.
Out_of_Focus	AF operation failed (out of focus).
Other Response Code	AF operation failed.

For the details, refer to the DeviceReady command (subsection 6.2.2.2).

If the following conditions are true, the AF operation is not performed and the camera immediately returns OK.

No	AF non-driving condition
1	The value of the FocusMode property (subsection 6.5.1.7) is 0x0001[MF].
2	The value of the RetractableLensWarning property (subsection 6.5.10.9) is 1[(Retractable lens warning) On].

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Device_Busy	When the command processing is started, the acquisition operation or the AF operation is being performed. The STM lens is being initialized.

6.2.2.20 AfDriveCancel

○ Command Specifications

Operation Code	0x9206
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode cancels the AF driving.

○ Command Details

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.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.

6.2.2.21 MfDrive

○ Command Specifications

Operation Code	0x9204
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode starts the MF driving.

○ Command Details

This command is an activation command. OK response is made when the MF driving is started. When the host gets the response of the normal termination, the host should issue the DeviceReady command to confirm whether the operation is terminated.

The following information can be returned for the DeviceReady command when the MF driving is started.

Response Code	Description
OK	MF driving operation is terminated.
Device_Busy	MF is driving.
MfDrive_Step_End	The MF driving reaches the end of steps.
MfDrive_Step_Insufficiency	The driving amount is insufficient.
Other Response Code	The MF driving operation failed.

* For the details, refer to the DeviceReady command (subsection 6.2.2.2).

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.

○ Operation Parameter

Operation Parameter	Details	
Parameter1	DriveType	
	0x00000001	No limit -> Closest
Parameter2	0x00000002	
	Closest -> No limit	
Parameter3	StepValue (driving amount (the number of pulses))	
	From 1 to 32767	

○ Response Code

Response Code	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	An unsupported parameter is specified.
Device_Busy	The AF operation is being performed in the camera.
	The AF-F is being set.
	The STM lens is being initialized.
	When the command processing is started, the acquisition operation is being performed.
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.).
	The focus mode is MF.

6.2.2.22 ChangeAElock

○ Command Specifications

Operation Code	0x9426
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode changes the state of AE lock.

○ Operation Parameter

Operation Parameter	Details	
	LockValue	
Parameter1	0	AE lock released
	1	AE locked (hold)
Parameter2	None	
Parameter3	None	

○ Response Code

Response Code	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	An unsupported parameter is specified.
Invalid_Parameter	The specified value is out of the range.

6.2.2.23 StartLiveView

○ Command Specifications

Operation Code	0x9201
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

This command is an activation-type command. OK response is made when the entry into the remote live view status is started.

When the host gets the response code of normal termination, the host should issue the DeviceReady command to confirm whether the camera enters the remote live view status (and the acquisition of the live view image becomes enabled).

The following information can be returned for the DeviceReady command when entering the remote live view status.

Response Code	Description
OK	The camera has entered the remote live view status.
Device_Busy	The camera is entering the remote live view status.
Other Response Code *	Some error has occurred when entering the remote live view status.

* For the details, refer to the DeviceReady command (subsection 6.2.2.2).

When the live view is active on the camera but the camera does not enter the remote live view status because the StartLiveView command is not executed, commands such as GetLiveViewImage command cannot be executed.

The live view prohibition condition is shown in the LiveViewProhibitionCondition property (subsection 6.5.12.7). The StartLiveView command must be issued when there is no prohibition factor in the LiveViewProhibitionCondition property. If there is any prohibition factor in the LiveViewProhibitionCondition property, even if the StartLiveView command is issued and the live view is started, the operation is not guaranteed.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.
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.
Invalid_Status	An error caused by the camera (battery empty, warning information) occurs.

6.2.2.24 EndLiveView

○ Command Specifications

Operation Code	0x9202
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode releases the live view status.

○ Command Details

The remote live view status is released and the camera becomes into the camera live view status.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.
Device_Busy	The live view cannot be terminated because of the camera factor.

6.2.2.25 GetLiveViewImage

○ Command Specifications

Operation Code	0x9203
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	LiveViewObject (without version)
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode acquires the newest live view image.

The format of the live view image is JPEG.

○ Command Details

This command is valid when the camera is in the remote live view condition after executing the StartLiveView command.

The camera sends the newest live view image (LiveViewObject) to the host.

LiveViewObject is composed of the display information and the live view image (JPEG).

The data set of LiveViewObject is described in subsection 9.6.

For this camera, GetLiveViewImageEx (subsection 6.2.2.26) should be used.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Not_LiveView	The camera is not in the remote live view condition.

6.2.2.26 GetLiveViewImageEx

○ Command Specifications

Operation Code	0x9428
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	LiveViewObject (with version)
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode acquires the newest live view image.

The format of the live view image is JPEG.

○ Command Details

This command is an extension of GetLiveViewImage command (subsection 6.2.2.25).

The camera sends the extended LiveViewObject to the host. The size of the display information is extended and the version information is added.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Not_LiveView	The camera is not in the remote live view condition.

6.2.2.27 GetLiveViewCompressedSize

○ Command Specifications

Operation Code	0x9423
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	LiveViewObjectMaxSize Value
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode acquires the maximum size (Byte) of LiveViewObject returned by the GetLiveViewImageEx command.

○ Command Details

The size of the live view image is calculated with the value set in the LiveViewImageCompression property and LiveViewImageSize property.

The format of LiveViewObjectMaxSize is UINT32.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.
Incomplete_Transfer	The data block transmission failed.

6.2.2.28 ChangeAfArea

○ Command Specifications

Operation Code	0x9205
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode changes the AF area in the live view condition.

○ Command Details

This command is valid when the camera is in the remote live view condition after getting the StartLiveView command.

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.

○ Operation Parameter

Operation Parameter	Details
Parameter1	XValue
Parameter2	YValue
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.
Access_Denied	In the case of the spot WB acquisition standby state
Device_Busy	The AF operation is being performed in the camera.
Not_LiveView	The camera is not in the remote live view condition.

6.2.2.29 StartTracking

○ Command Specifications

Operation Code	0x9424
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode starts tracking action for auto-area AF or changes the selected face.

○ Command Details

The specification method of OperationParameter is the same as the command details of ChangeAfArea (subsection 6.2.2.28).

After this command is executed, LiveViewObject of the GetLiveViewImage command (subsection 6.2.2.25) changes as follows.

Condition		Value of LiveViewObject that changes after this command is executed		
Detected faces	Tracking state	Tracking state	Center coordinates of AF frame	Index of selected face
There is a detected face at the specified coordinates.	Waiting Selecting Tracking	Waiting	-	Index of the face at the specified coordinates
There is no detected face at the specified coordinates.	Waiting Selecting Tracking	Tracking	Specified coordinates	-

○ Operation Parameter

Operation Parameter	Details
Parameter1	XValue
Parameter2	YValue
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.
Access_Denied	The FocusMeteringMode property (subsection 6.5.1.17) is set to the value other than [Auto-area AF mode] during live view photography.
	The MovieAfAreaMode property (subsection 6.5.3.55) is set to the value other than [Auto-area AF mode] during movie live view.
Device_Busy	The image acquisition operation is being performed.
Invalid_Status	Failed to change the tracking state due to the camera factor.
	In the case of the spot WB acquisition standby state
Not_LiveView	The camera is not in the remote live view condition.

6.2.2.30 EndTracking

○ Command Specifications

Operation Code	0x9425
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode terminates the tracking operation in auto-area AF.

○ Command Details

After executing this command, the tracking state of LiveViewObject acquired by the GetLiveViewImage command (subsection 6.2.2.25) is set to [Waiting].

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.
Device_Busy	The image acquisition operation is being performed.
Invalid_Status	Failed to change the tracking state due to the camera factor.
Not_LiveView	The camera is not in the remote live view condition.

6.2.2.31 StartSpotWb

○ Command Specifications

Operation Code	0x9402
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode makes the camera enter into the spot WB acquisition standby state in the live view condition.

○ Command Details

This command is valid when the camera is in the remote live view condition after setting LiveViewSelector to [Movie live view] and executing the StartLiveView command.

The camera enters into the acquisition standby state for the storage destination specified by the MovieWbPresetDataNo property (subsection 6.5.3.21). When the MovieWhiteBalance (subsection 6.5.3.9) is set to [Same as photo settings], the storage destination specified by the WbPresetDataNo property is used.

A property other than the following cannot be set in the spot WB acquisition standby state. If it is set, the Access_Denied response is made.

Property Code	Description	Reference item
0x500E	ExposureProgramMode	6.5.1.11
0x5013	StillCaptureMode	6.5.1.15
0xD1BD	LiveViewZoomArea	6.5.12.6

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.
Access_Denied	The white balance is set to anything other than [Preset manual].
	During the PC camera mode.
	The HDRMode property (subsection 6.5.2.62) is set to [On].
	The MovieReleaseButton property (subsection 6.5.4.29) is set to [Movie shooting] during movie live view.
	The LiveViewSelector property (subsection 6.5.12.8) is set to [Live view photography].
Invalid_Status	The storage destination of the preset manual WB data is protected.
Not_LiveView	The camera is not in the remote live view condition.

6.2.2.32 EndSpotWb

○ Command Specifications

Operation Code	0x9403
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode cancels the spot WB acquisition standby state.

○ Command Details

This command cancels the spot WB acquisition standby state.

The OK response is made even when the camera is not in the spot WB acquisition standby state.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.
Device_Busy	During transition into the spot WB condition
Not_LiveView	The camera is not in the remote live view condition.

6.2.2.33 ChangeSpotWbArea

○ Command Specifications

Operation Code	0x9404
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode changes the spot WB area in the spot WB acquisition standby state.

○ Command Details

This command is valid when the camera is in the spot WB acquisition standby state after getting the StartSpotWb command.

For the details, refer to ChangeAfArea (subsection 6.2.2.28).

○ Operation Parameter

Operation Parameter	Details
Parameter1	XValue
Parameter2	YValue
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.
Invalid_Status	The camera is not in the spot WB acquisition standby state.
Not_LiveView	The camera is not in the remote live view condition.

6.2.2.34 MeasureSpotWb

○ Command Specifications

Operation Code	0x9405
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode acquires the spot WB in the spot WB acquisition standby state.

○ Command Details

This command is valid when the camera is in the spot WB acquisition standby state after getting the StartSpotWb command (subsection 6.2.2.31).

This command is an activation command. When the spot WB acquisition is started, the transition to the response phase is performed.

When receiving this command, the camera acquires the spot WB with the coordinates set by ChangeSpotWbArea command (subsection 6.2.2.33).

The spot WB acquisition result is passed by the display information in LiveViewObject acquired by GetLiveViewImage command (subsection 6.2.2.25).

After releasing the acquisition result, the camera is in the spot WB acquisition standby state and the acquisition operation can be performed again by executing this command.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.
Device_Busy	During transition into the spot WB condition
Invalid_Status	The camera is not in the spot WB acquisition standby state.
Not_LiveView	The camera is not in the remote live view condition.

6.2.2.35 EndSpotWbResultDisp

○ Command Specifications

Operation Code	0x9406
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode cancels the spot WB acquisition result screen display.

○ Command Details

This command cancels the spot WB acquisition result screen display.

The OK response is made even while the spot WB acquisition result screen is not displayed.

This command is an activation command. When the cancellation of the spot WB acquisition result screen display is started, the transition to the response phase is performed.

The result of the spot WB acquisition result screen display is passed by the display information in LiveViewObject acquired by the GetLiveViewImage command (subsection 6.2.2.25).

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.
Not_LiveView	The camera is not in the remote live view condition.

6.2.2.36 StartMovieRecord

○ Command Specifications

Operation Code	0x920A
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	Refer to Response Parameter in this subsection.

○ Command Outline

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

○ Command Details

This command is accepted only during the live view execution. It is recommended to check the movie recording prohibition condition property (MovieRecProhibitionCondition (subsection 6.5.7.21)) before issuing this command.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.
Access_Denied	In the case of the spot WB acquisition standby state
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 condition.

○ Response Parameter

Response Parameter	Description
Parameter1	When the response code is OK, the recording media is specified in this field. When the response code is not OK, this field is invalid. 0: Recording in the card 1: Recording in the external recorder 2: Recording in the card and the external recorder
Parameter2	None
Parameter3	None

6.2.2.37 EndMovieRecord

○ Command Specifications

Operation Code	0x920B
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	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	An unsupported parameter is specified.

6.2.2.38 SetPreWbData

○ Command Specifications

Operation Code	0x90C9
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	PreWbThumImage
Data direction	From host to camera
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

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 stores the thumbnail image of PreWbThumImage.

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 “RAW Data Format for Digital Camera”.

When PreWbThumImageSize is 0, PreWbThumImage is not sent in the data phase and the thumbnail image is not recorded.

○ Operation Parameter

Operation Parameter	Details	
Parameter1	byte3: Reserved(0)	
	byte2: ShootingMode	
	0 Photography	
	1 Movie	
	byte1: RotateThumb (*1)	
	0 Horizontal	
	1 Grip side upward	
	2 Grip side downward	
	byte0: PreWbDataIndex (*2)	
	This is equivalent to the WbPresetDataNo property (subsection 6.5.2.25).	
Parameter2	PreWbGainValue	
Parameter3	PreWbThumImageSize	

*1: RotateThumb is referred to by the camera when Parameter3 (PreWbThumImageSize) is a value other than 0.

*2: If the value of the WbPresetDataNo property is zero (in the case of the camera with acquired data), any data cannot be set in the preset manual white balance data area.

The contents of PreWbGainValue are shown below.

Upper 2 Bytes of PreWbGainValue are RGain and lower 2 Bytes are BGain.

The format of RGain and BGain is fixed point. RGain sets Bit 16 to 26 as decimal parts and BGain sets up to Bit 10 as decimal parts.

Since the number of significant digits of the decimal part is 9 bits, the lower 2 bits are ignored.

$$RGain = \frac{G}{R} \times 2048$$

$$BGain = \frac{G}{B} \times 2048$$

The range that can be set for RGain, BGain is as follows.

$$0 \leq RGain < 8 \times 2048$$

$$0 \leq BGain < 8 \times 2048$$

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

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

○ Response Code

Response Code	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	An unsupported parameter is specified.
Incomplete_Transfer	The data block reception failed.
Device_Busy	During shooting by the camera
Invalid_Parameter	The specified value is out of the range.
Wb_Preset_Error	The specified index of the preset is protected.

6.2.2.39 GetPicCtrlData

○ Command Specifications

Operation Code	0x90CC
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	PictureControl DataSet
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode acquires PictureControl DataSet of the specified PicCtrlItem.

○ Command Details

The parameter3 is optional and the photo shooting menu or movie shooting menu can be specified.

For the format of the PictureControl DataSet, refer to subsection 9.8.

○ Operation Parameter

Operation Parameter	Details	
Parameter1	PicCtrlItem (equivalent to the ActivePicCtrlItem property (subsection 6.5.13.1))	
Parameter2	DefaultFlag	
	0	The current setting value
Parameter3	1	The default value
	[ShootingMode]	
	None	PictureControl data for the photo shooting menu
	0	
	1	PictureControl data for the movie shooting menu

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
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 is out of the range.
Incomplete_Transfer	The data block transmission failed.

6.2.2.40 SetPicCtrlData

○ Command Specifications

Operation Code	0x90CD
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	PictureControl DataSet
Data direction	From host to camera
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode sets PictureControl DataSet to the specified PicCtrlItem.

○ Command Details

The parameter3 is optional and the photo shooting menu or movie shooting menu can be specified.

For the format of the PictureControl DataSet, refer to subsection 9.8.

○ Operation Parameter

Operation Parameter	Details	
Parameter1	PicCtrlItem (equivalent to the ActivePicCtrlItem property (subsection 6.5.13.1))	
Parameter2	ModifiedFlag	
Parameter2	0	The contents of PictureControl DataSet are applied as a new picture control.
	1	The contents of PictureControl DataSet are applied to the current setting value of the existing picture control.
Parameter3	[ShootingMode]	
	None	PictureControl data for the photo shooting menu
	0	PictureControl data for the movie shooting menu

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
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 is out of the range.
Incomplete_Transfer	The data block transmission failed.
Device_Busy	During shooting by the camera
Access_Denied	When PicCtrlItem is a custom picture control and ModifiedFlag is set to 1, the registered base picture control and BasePictureControl in PictureControl DataSet do not match.
	Invalid PictureControl DataSet (subsection 9.8) is specified.

6.2.2.41 DeleteCustomPicCtrl

○ Command Specifications

Operation Code	0x90CE
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

The contents of CustomPicCtrlItem are the same as those of ActivePicCtrlItem property (subsection 6.5.13.1).

○ Operation Parameter

Operation Parameter	Details	
Parameter1	CustomPicCtrlItem	
Parameter2	[ShootingMode]	
	None	PictureControl data for the photo shooting menu
	0	
	1	PictureControl data for the movie shooting menu
Parameter3	None	

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
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 is out of the range.
Device_Busy	During shooting by the camera
Access_Denied	An attempt is made to delete the custom picture control that is selected in the user mode.

6.2.2.42 GetPicCtrlCapability

○ Command Specifications

Operation Code	0x90CF
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	PictureControlCapabilityData
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode acquires PictureControlCapability DataSet of the picture control that is the basis of the specified PicCtrlItem.

○ Command Details

The parameter2 is optional and the photo shooting menu or movie shooting menu can be specified.

For the format of the PictureControlCapability DataSet, refer to subsection 9.9.

○ Operation Parameter

Operation Parameter	Details	
Parameter1	PicCtrlItem (equivalent to the ActivePicCtrlItem property (subsection 6.5.13.1))	
Parameter2	[ShootingMode]	
	None	PictureControl data for the photo shooting menu
	0	
	1	PictureControl data for the movie shooting menu
Parameter3	None	

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
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 is out of the range.
Incomplete_Transfer	The data block transmission failed.

6.2.2.43 GetManualSettingLensData

○ Command Specifications

Operation Code	0x9432
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	ManualSettingLens DataSet
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode acquires the information about “Non-CPU lens data” in the setup menu.

○ Command Details

The camera sends the information (ManualSettingLens DataSet) about “Non-CPU lens data” of LensNo specified by the parameter1 to the host.

When 0xFFFFFFFF is set to LensNo, the camera sends all the information to the host.

The ManualSettingLens DataSet is shown below.

Field	Size	Description
Lens No. being set	4	Refer to ManualSettingLensNo property (subsection 6.5.5.7).
Number of manual setting lens information (N)	4	Acquire one data : 1 / Acquire all data : 20
Manual setting lens information[0]	Focal length	1
	Maximum aperture	1
	Reserved	2
Manual setting lens information [1]	Focal length	1
	Maximum aperture	1
	Reserved	2
Manual setting lens information [N - 1]	Focal length	1
	Maximum aperture	1
	Reserved	2

○ Operation Parameter

Operation Parameter	Description	
Parameter1	LensNo	
	Refer to ManualSettingLensNo property (subsection 6.5.5.7).	Acquire one data
	0xFFFFFFFF	Acquire all data
Parameter2	None	
Parameter3	None	

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
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 is out of the range.
Incomplete_Transfer	The data block transmission failed.

6.2.2.44 GetSBHandles

○ Command Specifications

Operation Code	0x9414
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	SBHandleList
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode obtains the handle of the flash attached with the camera.

○ Command Details

When the parameter1 (SBGroupID, subsection 7.6) is specified, the handle of the flash in the specified group is transferred.

When the parameter1 (SBGroupID, subsection 7.6) is not specified or set to zero, the handles of all flash are transferred.

The data set of SBHandleList is shown below.

Field	DataSize	DataType	Description
NumberOfElements	4	UINT32	The number of SBHandle in the list.
Element1 SBHandle	4	SBHandle	The handle of the element1 flash.
Element2 SBHandle	4	SBHandle	The handle of the element2 flash.
		...	
ElementN SBHandle	4	SBHandle	The handle of the element N flash.

○ Operation Parameter

Operation Parameter	Details
Parameter1	[SBGroupID]
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Parameter	Invalid SBGroupID is specified.

6.2.2.45 GetSBAttrDesc

○ Command Specifications

Operation Code	0x9415
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	SBHandleAttributeDescList
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode obtains the descriptor of the attribute for the flash.

○ Command Details

When the parameter1 (SBHandle, subsection 7.5) is specified, the descriptor for the specified flash is transferred. When the parameter1 (SBHandle, subsection 7.5) is not specified or set to zero, the descriptors for all flash are transferred.

When the parameter2 (SBAttrID) is specified, the descriptor for the specified SBAttribute (subsection 6.7.1) is transferred. When the parameter2 (SBAttrID) is not specified, the descriptors for all SBAttribute are transferred.

The data set of SBHandleAttributeDescList is shown below.

Field	DataSize	DataType or DataSet	Description
NumberOfElements	4	UINT32	The number of SBHandle in the list.
Element1 SBHandle	4	SBHandle	SBHandle for element1.
Element1 SBAttributeDescList	DTS	SBAttributeDescList (subsection 9.11)	Attribute descriptor of the element1 flash.
Element2 SBHandle	4	SBHandle	SBHandle for element2.
Element2 SBAttributeDescList	DTS	SBAttributeDescList	Attribute descriptor of the element2 flash.
...			
ElementN SBHandle	4	SBHandle	SBHandle for element N.
ElementN SBAttributeDescList	DTS	SBAttributeDescList	Attribute descriptor of the element N flash.

○ Operation Parameter

Operation Parameter	Details
Parameter1	[SBHandle]
Parameter2	[SBAttrID]
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Parameter	Invalid SBHandle is specified.
	Invalid SBAttrID is specified.
Valid SB information cannot be acquired.	

6.2.2.46 GetSBAttrValue

○ Command Specifications

Operation Code	0x9416
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	SBHandleAttributeList
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode obtains the current attribute value for the specified flash.

○ Command Details

When the parameter1 (SBHandle, subsection 7.5) is specified, the value for the specified flash is transferred. When the parameter1 (SBHandle, subsection 7.5) is not specified or set to zero, the values for all flash are transferred.

When the parameter2 (SBAttrID) is specified, the value for the specified SBAttribute (subsection 6.7.1) is transferred. When the parameter2 (SBAttrID) is not specified, the values for all SBAttribute are transferred.

The data set of SBHandleAttributeList is shown below.

Field	DataSize	DataType or DataSet	Description
NumberOfElements	4	UINT32	The number of SBHandle in the list.
Element1 SBHandle	4	SBHandle	SBHandle for element1.
Element1 SBAttributeList	DTS	SBAttributeList (subsection 9.13)	SBAttributeList for element1.
Element2 SBHandle	4	SBHandle	SBHandle for element2.
Element2 SBAttributeList	DTS	SBAttributeList	SBAttributeList for element2.
...			
ElementN SBHandle	4	SBHandle	SBHandle for element N.
ElementN SBAttributeList	DTS	SBAttributeList	SBAttributeList for element N.

○ Operation Parameter

Operation Parameter	Details
Parameter1	[SBHandle]
Parameter2	[SBAttrID]
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Parameter	Invalid SBHandle is specified.
	Invalid SBAttrID is specified.
Valid SB information cannot be acquired.	

6.2.2.47 SetSBAttrValue

○ Command Specifications

Operation Code	0x9417
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	SBHandleAttributeList
Data direction	From host to camera
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode updates the current attribute value for the specified flash.

○ Command Details

The data set of SBHandleAttributeList is shown below.

Field	DataSize	DataType or Data Set	Description
NumberOfElements	4	UINT32	The number of SBHandle in the list.
Element1 SBHandle	4	SBHandle	SBHandle for element1.
Element1 SBAttributeList	DTS	SBAttributeList (subsection 9.13)	SBAttributeList for element1.
Element2 SBHandle	4	SBHandle	SBHandle for element2.
Element2 SBAttributeList	DTS	SBAttributeList	SBAttributeList for element2.
...			
ElementN SBHandle	4	SBHandle	SBHandle for element N.
ElementN SBAttributeList	DTS	SBAttributeList	SBAttributeList for element N.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Parameter	Invalid SBHandle is specified.
Invalid_SBAtrrID	Invalid SBAtrrID is specified.
Invalid_SBAtrrValue	The specified attribute value is not supported.
Access_Denied	The specified flash is not in a settable state.
	An operation is denied depending on the status of the camera.
	The specified SBAtrrCode is not permitted for setting.
Device_Busy	The shooting operation or the AF operation is being performed when starting this command.

6.2.2.48 GetSBGroupAttrDesc

○ Command Specifications

Operation Code	0x9418
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	SBGroupAttributeDescList
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode obtains the attribute descriptor for the flash group.

○ Command Details

When the parameter1 (SBGroupID, subsection 7.6) is specified, the data for the specified flash is transferred. When the parameter1 (SBGroupID, subsection 7.6) is not specified or set to zero, the data for all flash are transferred.

When the parameter2 (SBGroupAttrID) is specified, the data for the specified SBGroupAttribute (subsection 6.7.2) is transferred. When the parameter2 (SBGroupAttrID) is not specified, the data for all SBGroupAttribute are transferred.

The data set of SBGroupAttributeList is shown below.

Field	DataSize	DataType or DataSet	Description
NumberOfElements	4	UINT32	The number of SBGroupID in the list.
Element1 SBGroupID	4	SBGroupID	SBGroupID for element1.
Element1 SBAttributeDescList	DTS	SBAttributeDescList (subsection 9.11)	Attribute descriptor for the element1 flash.
Element2 SBGroupID	4	SBGroupID	SBGroupID for element2.
Element2 SBAttributeDescList	DTS	SBAttributeDescList	Attribute descriptor for the element2 flash.
...			
ElementN SBGroupID	4	SBGroupID	SBGroupID for element N.
ElementN SBAttributeDescList	DTS	SBAttributeDescList	Attribute descriptor for the element N flash.

○ Operation Parameter

Operation Parameter	Details
Parameter1	[SBGroupID]
Parameter2	[SBGroupAttrID]
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Parameter	Invalid SBGroupID is specified. Invalid SBGroupAttrID is specified.

6.2.2.49 GetSBGroupAttrValue

○ Command Specifications

Operation Code	0x9419
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	SBGroupAttributeList
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode obtains the current attribute value for the flash group.

○ Command Details

When the parameter1 (SBGroupID, subsection 7.6) is specified, the data for the specified flash group is transferred. When the parameter1 (SBGroupID, subsection 7.6) is not specified or set to zero, the data for all flash group are transferred.

When the parameter2 (SBGroupAttrID) is specified, the data for the specified SBGroupAttribute (subsection 6.7.2) is transferred. When the parameter2 (SBGroupAttrID) is not specified, the data for all SBGroupAttribute are transferred.

The data set of SBGroupAttributeList is shown below.

Field	DataSize	DataType or DataSet	Description
NumberOfElements	4	UINT32	The number of SBGroupID in the list.
Element1 SBGroupID	4	SBGroupID	SBGroupID for element1.
Element1 SBAttributeList	DTS	SBAttributeList (subsection 9.13)	SBAttributeList for element1.
Element2 SBGroupID	4	SBGroupID	SBGroupID for element2.
Element2 SBAttributeList	DTS	SBAttributeList	SBAttributeList for element2.
...			
ElementN SBGroupID	4	SBGroupID	SBGroupID for element N.
ElementN SBAttributeList	DTS	SBAttributeList	SBAttributeList for element N.

○ Operation Parameter

Operation Parameter	Details
Parameter1	[SBGroupID]
Parameter2	[SBGroupAttrID]
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Parameter	Invalid SBGroupID is specified. Invalid SBGroupAttrID is specified.

6.2.2.50 SetSBGroupAttrValue

○ Command Specifications

Operation Code	0x941A
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	SBGroupAttributeList
Data direction	From host to camera
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode updates the current attribute value for the flash group.

○ Command Details

The data set of SBGroupAttributeList is shown below.

Field	DataSize	DataType or DataSet	Description
NumberOfElements	4	UINT32	The number of SBGroupID in the list.
Element1 SBGroupID	4	SBGroupID	SBGroupID for element1.
Element1 SBAttributeList	DTS	SBAttributeList (subsection 9.13)	SBAttributeList for element1.
Element2 SBGroupID	4	SBGroupID	SBGroupID for element2.
Element2 SBAttributeList	DTS	SBAttributeList	SBAttributeList for element2.
...			
ElementN SBGroupID	4	SBGroupID	SBGroupID for element N.
ElementN SBAttributeList	DTS	SBAttributeList	SBAttributeList for element N.

○ Operation Parameter

Operation Parameter	Details
Parameter1	None
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
Invalid_Parameter	Invalid SBHandle is specified.
Invalid_SBAtrrID	Invalid SBAtrrID is specified.
Invalid_SBAtribute_Value	The specified attribute value is not supported.
Access_Denied	An operation is denied depending on the status of the camera.
	The specified SBAtributeCode is not permitted for setting.
Device_Busy	The shooting operation or the AF operation is being performed when starting this command.

6.2.2.51 TestFlash

○ Command Specifications

Operation Code	0x941B
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	None
Data direction	-
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode makes the flash fire for testing.

○ Command Details

The parameter1 (Flash mode) should be set to the flash testing.

When the parameter1 is set to the flash testing:

The flash specified by the parameter2 (SBHandle, subsection 7.5) fires. When the parameter2 is set to zero, all flashes fire.

○ Operation Parameter

Operation Parameter	Details
Parameter1	Flash mode (fixed to zero)
Parameter2	SBHandle
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
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	Invalid flash mode is specified. Invalid SBHandle is specified.
Access_Denied	The specified flash cannot be operated.

6.2.2.52 GetObjectPropsSupported

○ Command Specifications

Operation Code	0x9801
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	ObjectPropCodeArray
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

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 6.6.

Field	Size (Byte)	Data
NumElement	4	The element of the array is N (N means 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 ObjectFormatCodes only.

PropertyValue	ObjectFormat
0x3000	Undefined
0x3001	Association
0x300D	MOV Apple QuickTime Video Format (H.264/AVC)
0x3800	Unknown Image Object
0x3801	EXIF/JPEG
0x380D	TIFF (RGB)
0xB982	MP4 Container

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectFormatCode
Parameter2	None
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
ObjectProp_Not_Supported	The specified ObjectFormatCode is not supported.

6.2.2.53 GetObjectPropDesc

○ Command Specifications

Operation Code	0x9802
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	ObjectPropDesc data set
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

For the supported ObjectPropCodes, refer to subsection 6.6.

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectPropCode
Parameter2	ObjectFormatCode
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
ObjectProp_Not_Supported	The specified ObjectPropCode is not supported. The specified ObjectFormatCode is not supported.

6.2.2.54 GetObjectPropValue

○ Command Specifications

Operation Code	0x9803
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	ObjectPropValue
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

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

○ Command Details

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 6.6.

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	ObjectPropCode
Parameter3	None

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
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_Object_Handle	An object corresponding to the specified ObjectHandle does not exist, or it indicates an object in the SDRAM.
Incomplete_Transfer	The data block transmission failed.
Access_Denied	The movie is playing.
ObjectProp_Not_Supported	The specified ObjectPropCode is not supported.

6.2.2.55 GetObjectPropList

○ Command Specifications

Operation Code	0x9805
Operation Parameter	Refer to Operation Parameter in this subsection.
Data	ObjectPropList data set
Data direction	From camera to host
Response Code	Refer to Response Code in this subsection.
Response Parameter	None

○ Command Outline

The operation by this OperationCode returns the ObjectPropList data set.

○ Command Details

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.

For the supported ObjectPropCode and the details of ObjectPropValue, refer to subsection 6.6.

Operation Parameter	Value	Details
Parameter1	0x00000000	The objects directly under the root should be the targets.
	ObjectHandle	The object matching with the specified object handle should be the target.
	0xFFFFFFFF	All the objects should be the targets.
Parameter2 (Optional)	0x00000000	Parameter2 is not specified. The objects with all the object formats should be the targets.
	ObjectFormatCode	The object with the specified format should be the target.
Parameter3	0x00000000	All the objects with the group code specified by Parameter4 should be the targets.
	ObjectPropCode	The object with the specified property should be the target.
	0xFFFFFFFF	All the objects without the group code of 0xFFFFFFFF should be the targets.
Parameter4 (Optional)	ObjectPropGroupCode	The object with the specified group code should be the target. *This is used only when Parameter3 is set to 0x00000000.
Parameter5 (Optional)	No value *1	Only the object specified by Parameter1 should be the target. If Parameter1 is not specified (0x00000000), the camera returns an empty ObjectPropList data set.
	0x00000000	
	Depth	All the objects from the objects specified by Parameter1 to the depth specified by Parameter5 should be the targets.
	0xFFFFFFFF	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.

*1 This is the case that ObjectHandle is specified in Parameter1. When Parameter1 is set to 0x00000000, all the objects should be the targets.

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

Field name	Field order	Size(Byte)	Datatype	Description
NumberOfElements	1	4	UINT32	Number of properties (N) The number of property fields is four times the number of properties.
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
...				
ElementNObjectHandle	N x 4 - 2	4	ObjectHandle	ObjectHandle of the object to which Property N is applied
ElementNPropertyCode	N x 4 - 1	2	Datacode	Datacode that specifies the ObjectPropDesc describing Property N
ElementNDatatype	N x 4	2	Datacode	Specifies DatatypeCode of Property N.
ElementNValue	N x 4 + 1	DTS	DTS	Value of Property N

○ Operation Parameter

Operation Parameter	Details
Parameter1	ObjectHandle
Parameter2	[ObjectFormatCode]
Parameter3	ObjectPropCode
Parameter4	[ObjectPropGroupCode]
Parameter5	[Depth]

○ Response Code

Response Code	Description
OK	Normal termination
Parameter_Not_Supported	An unsupported parameter is specified.
Session_Not_Open	The session is not started.
Invalid_TransactionID	The TransactionID retained by the camera differs from the TransactionID specified by the host.
Incomplete_Transfer	The data block transmission failed.
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.
	The battery is exhausted.
Access_Denied	The movie is playing.
Specification_By_Format_Unsupported	The specified ObjectFormatCode is not supported.
Invalid_ObjectPropCode	The specified ObjectPropCode is not supported.

6.3 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 6.2.

The ResponseCodes supported by the camera are shown below.

Response Code	Description	Reference item
0x2001	OK	6.3.1.1
0x2002	General_Error	6.3.1.2
0x2003	Session_Not_Open	6.3.1.3
0x2004	Invalid_TransactionID	6.3.1.4
0x2005	Operation_Not_Supported	6.3.1.5
0x2006	Parameter_Not_Supported	6.3.1.6
0x2007	Incomplete_Transfer	6.3.1.7
0x2008	Invalid_StoragelD	6.3.1.8
0x2009	Invalid_Object_Handle	6.3.1.9
0x200A	DeviceProp_Not_Supported	6.3.1.10
0x200B	Invalid_ObjectFormatCode	6.3.1.11
0x200C	Store_Full	6.3.1.12
0x200D	Object_Write_Protect	6.3.1.13
0x200E	Store_Read_Only	6.3.1.14
0x200F	Access_Denied	6.3.1.15
0x2010	No_Thumbnail_Present	6.3.1.16
0x2012	Partial_Deletion	6.3.1.17
0x2013	Store_Not_Available	6.3.1.18
0x2014	Specification_By_Format_Unsupported	6.3.1.19
0x2015	No_Valid_ObjectInfo	6.3.1.20
0x2019	Device_Busy	6.3.1.21
0x201A	Invalid_Parent_Object	6.3.1.22
0x201B	Invalid_DeviceProp_Format	6.3.1.23
0x201C	Invalid_DeviceProp_Value	6.3.1.24
0x201D	Invalid_Parameter	6.3.1.25
0x201E	Session_Already_Open	6.3.1.26
0x201F	Transaction_Cancelled	6.3.1.27
0x2020	Specification_of_Destination_Unsupported	6.3.1.28
0xA001	Hardware_Error	6.3.2.1
0xA002	Out_of_Focus	6.3.2.2
0xA003	Change_CameraMode_Failed	6.3.2.3
0xA004	Invalid_Status	6.3.2.4
0xA006	Wb_Preset_Error	6.3.2.5
0xA007	Dust_Reference_Error	6.3.2.6
0xA008	Shutter_Speed_Bulb	6.3.2.7
0xA00A	CameraMode_Not_Adjust_Fnumber	6.3.2.8
0xA00B	Not_LiveView	6.3.2.9
0xA00C	MfDrive_Step_End	6.3.2.10
0xA00E	MfDrive_Step_Insufficiency	6.3.2.11
0xA00F	No_FullHD_Present	6.3.2.12
0xA021	Store_Error	6.3.2.13
0xA022	Store_Unformatted	6.3.2.14
0xA200	Bulb_Release_Busy	6.3.2.15
0xA201	Silent_Release_Busy	6.3.2.16
0xA202	MovieFrame_Release_Busy	6.3.2.17
0xA204	Shutter_Speed_Time	6.3.2.18
0xA209	Invalid_SBAttribute_Value	6.3.2.19
0xA801	Invalid_ObjectPropCode	6.3.2.20
0xA802	Invalid_ObjectProp_Format	6.3.2.21
0xA80A	ObjectProp_Not_Supported	6.3.2.22

6.3.1 Standard

6.3.1.1 OK

- Response Specifications**

Response Code	0x2001
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- Response Outline**

Indicates that the processing has been terminated normally.

6.3.1.2 General_Error

- Response Specifications**

Response Code	0x2002
---------------	--------

- Response Outline**

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

6.3.1.3 Session_Not_Open

- Response Specifications**

Response Code	0x2003
---------------	--------

- Response Outline**

Indicates that the session is not started.

6.3.1.4 Invalid_TransactionID

- Response Specifications**

Response Code	0x2004
---------------	--------

- Response Outline**

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

6.3.1.5 Operation_Not_Supported

- Response Specifications**

Response Code	0x2005
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- Response Outline**

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

6.3.1.6 Parameter_Not_Supported

- Response Specifications**

Response Code	0x2006
---------------	--------

- Response Outline**

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

6.3.1.7 Incomplete_Transfer

- **Response Specifications**

Response Code	0x2007
---------------	--------

- **Response Outline**

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.

6.3.1.8 Invalid_StorageID

- **Response Specifications**

Response Code	0x2008
---------------	--------

- **Response Outline**

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

6.3.1.9 Invalid_Object_Handle

- **Response Specifications**

Response Code	0x2009
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- **Response Outline**

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

6.3.1.10 DeviceProp_Not_Supported

- **Response Specifications**

Response Code	0x200A
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- **Response Outline**

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

6.3.1.11 Invalid_ObjectFormatCode

- **Response Specifications**

Response Code	0x200B
---------------	--------

- **Response Outline**

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.

6.3.1.12 Store_Full

- **Response Specifications**

Response Code	0x200C
---------------	--------

- **Response Outline**

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

6.3.1.13 Object_Write_Protect

- Response Specifications**

Response Code	0x200D
---------------	--------

- Response Outline**

Indicates that the target object is protected.

6.3.1.14 Store_Read_Only

- Response Specifications**

Response Code	0x200E
---------------	--------

- Response Outline**

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.

6.3.1.15 Access_Denied

- Response Specifications**

Response Code	0x200F
---------------	--------

- Response Outline**

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.

6.3.1.16 No_Thumbnail_Present

- Response Specifications**

Response Code	0x2010
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- Response Outline**

Indicates that the target object does not have a thumbnail.

6.3.1.17 Partial_Deletion

- Response Specifications**

Response Code	0x2012
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- Response Outline**

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.

6.3.1.18 Store_Not_Available

- Response Specifications**

Response Code	0x2013
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- Response Outline**

Indicates that the card cannot be accessed because the card is being initialized, the card does not exist, or the battery is exhausted.

6.3.1.19 Specification_By_Format_Unsupported

- Response Specifications**

Response Code	0x2014
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- Response Outline**

Indicates that the specified ObjectFormatCode is not supported.

6.3.1.20 No_Valid_ObjectInfo

- Response Specifications**

Response Code	0x2015
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- Response Outline**

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

6.3.1.21 Device_Busy

- Response Specifications**

Response Code	0x2019
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- Response Outline**

Indicates that the camera is in the busy status.

6.3.1.22 Invalid_Parent_Object

- Response Specifications**

Response Code	0x201A
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- Response Outline**

Indicates that an ObjectHandle other than that indicating a directory is specified for a parameter with which an ObjectHandle of the directory should be specified.

It indicates that the specified directory does not exist.

6.3.1.23 Invalid_DeviceProp_Format

Response Specifications

Response Code	0x201B
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Response Outline

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

6.3.1.24 Invalid_DeviceProp_Value

Response Specifications

Response Code	0x201C
---------------	--------

Response Outline

Indicates that the specified DevicePropValue is not supported.

6.3.1.25 Invalid_Parameter

Response Specifications

Response Code	0x201D
---------------	--------

Response Outline

Indicates that the specified parameter is out of the specifications.

6.3.1.26 Session_Already_Open

Response Specifications

Response Code	0x201E
---------------	--------

Response Outline

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

6.3.1.27 Transaction_Cancelled

Response Specifications

Response Code	0x201F
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Response Outline

Indicates that the transfer was cancelled.

6.3.1.28 Specification_of_Destination_Unsupported

Response Specifications

Response Code	0x2020
---------------	--------

Response Outline

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

6.3.2 Vendor

6.3.2.1 Hardware_Error

- Response Specifications**

Response Code	0xA001
---------------	--------

- Response Outline**

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

6.3.2.2 Out_of_Focus

- Response Specifications**

Response Code	0xA002
---------------	--------

- Response Outline**

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

6.3.2.3 Change_CameraMode_Failed

- Response Specifications**

Response Code	0xA003
---------------	--------

- Response Outline**

Indicates that the switching between the PC camera mode and the remote mode failed.

6.3.2.4 Invalid_Status

- Response Specifications**

Response Code	0xA004
---------------	--------

- Response Outline**

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

6.3.2.5 Wb_Preset_Error

- Response Specifications**

Response Code	0xA006
---------------	--------

- Response Outline**

Indicates that the preset measurement release failed.

6.3.2.6 Dust_Reference_Error

- Response Specifications**

Response Code	0xA007
---------------	--------

- Response Outline**

Indicates that the dust reference image release failed.

6.3.2.7 Shutter_Speed_Bulb

- Response Specifications

Response Code	0xA008
---------------	--------

- Response Outline

Indicates that the shutter speed is Bulb.

6.3.2.8 CameraMode_Not_Adjust_Fnumber

- Response Specifications

Response Code	0xA00A
---------------	--------

- Response Outline

Indicates that the aperture value is set to "F--".

6.3.2.9 Not_LiveView

- Response Specifications

Response Code	0xA00B
---------------	--------

- Response Outline

Indicates that the camera is not in the live view condition.

6.3.2.10 MfDrive_Step_End

- Response Specifications

Response Code	0xA00C
---------------	--------

- Response Outline

Indicates that the MF driving reaches the termination.

6.3.2.11 MfDrive_Step_Insufficiency

- Response Specifications

Response Code	0xA00E
---------------	--------

- Response Outline

Indicates that the driving amount is insufficient.

6.3.2.12 No_FullHD_Present

- Response Specifications

Response Code	0xA00F
---------------	--------

- Response Outline

Indicates that the target object does not include FullHD image data.

6.3.2.13 Store_Error**○ Response Specifications**

Response Code	0xA021
---------------	--------

○ Response Outline

Indicates that a damaged card is included in the inserted cards.

6.3.2.14 Store_Unformatted**○ Response Specifications**

Response Code	0xA022
---------------	--------

○ Response Outline

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

6.3.2.15 Bulb_Release_Busy**○ Response Specifications**

Response Code	0xA200
---------------	--------

○ Response Outline

Indicates that bulb shooting is being performed.

6.3.2.16 Silent_Release_Busy**○ Response Specifications**

Response Code	0xA201
---------------	--------

○ Response Outline

Indicates that silent shooting is being performed.

6.3.2.17 MovieFrame_Release_Busy**○ Response Specifications**

Response Code	0xA202
---------------	--------

○ Response Outline

Indicates that the still image shooting is being performed during movie recording.

6.3.2.18 Shutter_Speed_Time**○ Response Specifications**

Response Code	0xA204
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○ Response Outline

Indicates that the shutter speed is Time.

6.3.2.19 Invalid_SBAttribute_Value

- Response Specifications**

Response Code	0xA209
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- Response Outline**

Indicates that the specified attribute value is not supported.

6.3.2.20 Invalid_ObjectPropCode

- Response Specifications**

Response Code	0xA801
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- Response Outline**

Indicates that the specified ObjectPropCode is not supported.

6.3.2.21 Invalid_ObjectProp_Format

- Response Specifications**

Response Code	0xA802
---------------	--------

- Response Outline**

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

6.3.2.22 ObjectProp_Not_Supported

- Response Specifications**

Response Code	0xA80A
---------------	--------

- Response Outline**

Indicates that the specified ObjectPropCode is valid but the camera doesn't support it.

6.4 Event Code

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

Following chart describes the EventCodes supported by the camera and whether event sending by command from host or by interrupt transfer is permitted.

Event Code	Description	Reference	Interrupt transfer	GetEvent command	GetEventEx command
0x4001	CancelTransaction	6.4.1.1	Yes	Yes	Yes
0x4002	ObjectAdded	6.4.1.2	Yes	Yes	Yes
0x4003	ObjectRemoved	6.4.1.3	Yes	Yes	Yes
0x4004	StoreAdded	6.4.1.4	Yes	Yes	Yes
0x4005	StoreRemoved	6.4.1.5	Yes	Yes	Yes
0x4006	DevicePropChanged	6.4.1.6	Yes	Yes	Yes
0x4007	ObjectInfoChanged	6.4.1.7	Yes	Yes	Yes
0x4008	DeviceInfoChanged	6.4.1.8	Yes	Yes	Yes
0x4009	RequestObjectTransfer	6.4.1.9	Yes	Yes	Yes
0x400A	StoreFull	6.4.1.10	Yes	Yes	Yes
0x400C	StorageInfoChanged	6.4.1.11	Yes	Yes	Yes
0x400D	CaptureComplete	6.4.1.12	Yes	Yes	Yes
0xC101	ObjectAddedInSdram	6.4.2.1	-	Yes	Yes
0xC102	CaptureCompleteRecInSdram	6.4.2.2	-	Yes	Yes
0xC105	MovieRecordInterrupted	6.4.2.5	-	-	Yes
0xC108	MovieRecordComplete	6.4.2.4	-	Yes	Yes
0xC10A	MovieRecordStarted	6.4.2.3	-	Yes	Yes
0xC10B	PictureControlAdjustChanged	6.4.2.6	-	-	Yes
0xC10C	LiveViewStateChanged	6.4.2.7	-	Yes	Yes
0xC10E	ManualSettingLensDataChanged	6.4.2.8	-	Yes	Yes
0xC120	SBAdded	6.4.2.9	-	Yes	Yes
0xC121	SBRemoved	6.4.2.10	-	Yes	Yes
0xC122	SBAttrChanged	6.4.2.11	-	-	Yes
0xC123	SBGroupAttrChanged	6.4.2.12	-	-	Yes

For sending the event in the application mode, refer to “Application Mode” (subsection 2.4).

6.4.1 Standard

6.4.1.1 CancelTransaction

- Event Specifications

Event Code	0x4001
Event Parameter1	None

- Event Outline

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

6.4.1.2 ObjectAdded

- Event Specifications

Event Code	0x4002
Event Parameter1	ObjectHandle

- Event Outline

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

6.4.1.3 ObjectRemoved

- Event Specifications

Event Code	0x4003
Event Parameter1	ObjectHandle

- Event Outline

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

6.4.1.4 StoreAdded

- Event Specifications

Event Code	0x4004
Event Parameter1	StorageID

- Event Outline

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.

6.4.1.5 StoreRemoved

- Event Specifications

Event Code	0x4005
Event Parameter1	StorageID

- Event Outline

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, StoreAdded is used to inform the host that the card information is

valid.

6.4.1.6 DevicePropChanged

○ Event Specifications

Event Code	0x4006
Event Parameter1	PropertyCode

○ Event Outline

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 6.5.
 If the setting value of the camera is changed by the SetDevicePropValue command from the host, this event is not passed.

When the InterruptIN transfer is used, this event is passed only for the standard property.
 When the GetEvent command is used, this event is passed for all the properties.

6.4.1.7 ObjectInfoChanged

○ Event Specifications

Event Code	0x4007
Event Parameter1	ObjectHandle

○ Event Outline

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

6.4.1.8 DeviceInfoChanged

○ Event Specifications

Event Code	0x4008
Event Parameter1	None

○ Event Outline

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

6.4.1.9 RequestObjectTransfer

○ Event Specifications

Event Code	0x4009
Event Parameter1	ObjectHandle

○ Event Outline

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

6.4.1.10 **StoreFull**

- **Event Specifications**

Event Code	0x400A
Event Parameter1	StorageID

- **Event Outline**

It is used to inform the host that the card corresponding to the StorageID becomes full.

This event is passed when the card becomes full by operating the shutter-release button of the camera or by recording the movie.

6.4.1.11 **StorageInfoChanged**

- **Event Specifications**

Event Code	0x400C
Event Parameter1	StorageID

- **Event Outline**

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 setting value of the image size or that of the image quality mode is changed.

6.4.1.12 **CaptureComplete**

- **Event Specifications**

Event Code	0x400D
Event Parameter1	TransactionID

- **Event Outline**

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

6.4.2 Vendor

6.4.2.1 ObjectAddedInSdram

○ Event Specifications

Event Code	0xC101
Event Parameter1	ObjectHandle

○ Event Outline

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.

6.4.2.2 CaptureCompleteRecInSdram

○ Event Specifications

Event Code	0xC102
Event Parameter1	None

○ Event Outline

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.

6.4.2.3 MovieRecordStarted

- Event Specifications

Event Code	0xC10A
Event Parameter1	RecordKind

- Event Outline

It is used to inform the host that the movie recording has started on the camera.

This event is not issued when the movie recording has started by using StartMovieRecord command.

The recording method is sent as an EventParameter.

RecordKind	Recording method
0x00000000	Card
0x00000001	External recorder
0x00000002	Card and external recorder

6.4.2.4 MovieRecordComplete

- Event Specifications

Event Code	0xC108
Event Parameter1	RecordKind

- Event Outline

It is used to inform the host that the movie recording is successfully completed.

The recording method is sent as an EventParameter.

RecordKind	Recording method
0x00000000	Card
0x00000001	External recorder
0x00000002	Card and external recorder

6.4.2.5 MovieRecordInterrupted

- Event Specifications

Event Code	0xC105
Event Parameter1	ErrorCode
Event Parameter2	RecordKind

- Event Outline

It is used to inform the host that the movie recording is interrupted.

The interruption cause and the recording method are sent as EventParameter.

ErrorCode	Interruption cause
0x00000001	A certain error
0x00000002	Low-speed card error

RecordKind	Interrupted recording method
0x00000000	Card
0x00000001	External recorder
0x00000002	Card and external recorder

6.4.2.6 PictureControlAdjustChanged

○ Event Specifications

Event Code	0xC10B
Event Parameter1	PicCtrlItem (equivalent to the ActivePicCtrlItem property (subsection 6.5.13.1))
Event Parameter2	ShootingMode

○ Event Outline

It is used to inform the host that any setting value of the picture control was changed, or any setting value of the custom picture control was changed, registered, renamed or deleted.

The changed menu (photo shooting menu or movie shooting menu) is set in Parameter 2.

ShootingMode	Menu
0x00000000	Photo shooting menu
0x00000001	Movie shooting menu

6.4.2.7 LiveViewStateChanged

○ Event Specifications

Event Code	0xC10C
Event Parameter1	CameraLiveViewStatus

○ Event Outline

It is used to inform the host that the state of live view has changed on the camera.

CameraLiveViewStatus	Description
0	OFF
1	ON

6.4.2.8 ManualSettingLensDataChanged

○ Event Specifications

Event Code	0xC10E
Event Parameter1	LensNo

○ Event Outline

It is used to inform the host that the information of “Non-CPU lens data” in the setup menu has been changed.

The lens No. of the changed lens is passed as an EventParameter.

LensNo	Description
Refer to ManualSettingLensNo property (subsection 6.5.5.7)	Lens No. of the changed lens
0xFFFFFFFF	All lenses (Not supported on this camera)

6.4.2.9 SBAdded

○ Event Specifications

Event Code	0xC120
Event Parameter1	SBHandle

○ Event Outline

It is used to inform the host that the flash unit is newly attached to the camera.

6.4.2.10 SBRemoved

○ Event Specifications

Event Code	0xC121
Event Parameter1	SBHandle

○ Event Outline

It is used to inform the host that the flash unit is detached from the camera.

6.4.2.11 SBAttrChanged

○ Event Specifications

Event Code	0xC122
Event Parameter1	SBHandle
Event Parameter2	SBAtrrID

○ Event Outline

It is used to inform the host that the attributes of the flash unit have changed.

This event is not issued when the attributes of the flash have changed by receiving SetSBAtrrValue command from the host.

6.4.2.12 SBGroupAttrChanged

○ Event Specifications

Event Code	0xC123
Event Parameter1	SBGroupID
Event Parameter2	SBGroupAttrID

○ Event Outline

It is used to inform the host that the attribute descriptor for the flash group or the current value has changed.

This event is not issued when the attributes of the flash group have changed by receiving SetSBGroupAttrValue command from the host.

If the SBWirelessMode property (subsection 6.5.9.7) is set to other than "Stand-alone flash" and the SBWirelessMultipleFlashMode property (subsection 6.5.9.8) is set to "Repeating", SBGroupID of the master flash is used to inform the changes for the following flash group regardless of the value of the SBUsableGroup property (subsection 6.5.9.9).

- SBGroupFlashLevel (subsection 6.7.2.4)
- SBGroupRepeatCount (subsection 6.7.2.7)
- SBGroupRepeatInterval (subsection 6.7.2.8)

6.5 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 sends the DevicePropChanged event including the DevicePropCode in order to inform the host of the change. The camera sends the event as shown below.

No.	Description
1	The camera periodically (every 1 second) checks all the values of DeviceProperty. When a DeviceProperty whose value has changed since the last checking is detected, the camera sends the DevicePropChanged event in order to inform the host of the change. When detecting changes in two or more DeviceProperties, the camera sends the DevicePropChanged event for all the DeviceProperties in succession.
2	When the setting value of the DeviceProperty is changed by the SetDevicePropValue command, the camera does not send the DevicePropChanged event including the changed DevicePropCode. However, if any other DeviceProperty is changed under the influence of the change of the DeviceProperty, the camera sends the DevicePropChanged event for the property. 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 sends the DevicePropChanged event for the shutter speed.

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

No.	Description
1	When either or both of getting/setting are invalid depending on the setting status of the camera for each property, the response of the ResponseCode corresponding to the invalid status is made.
2	When setting is performed for the property that supports getting only, the Access_Denied 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 properties whose values cannot be set during live view or movie recording are described in the following table of DevicePropCodes instead of Response Code of each property. If a value is set to a DevicePropertyCode that is not shown in the table, the Access_Denied response is made.

Regarding the description of the shooting mode indicated by the ExposureProgramMode property such as property details and setting prohibition conditions, the condition also includes the case where the ExposureProgramMode property is the corresponding shooting mode in the user mode.

Example)

Access_Denied ExposureProgramMode property is set to anything other than PSAM.

In this case, Access_Denied returns when ExposureProgramMode property is set to U1/U2/U3 and UserMode property is set to anything other than PSAM.

The DevicePropCodes supported by the camera are shown below.

Property Code	Description	Reference	Live view photography	Movie live view	During movie recording
0x5001	BatteryLevel	6.5.1.1			
0x5003	ImageSize	6.5.1.2	Yes	Yes	Yes
0x5004	CompressionSetting	6.5.1.3	Yes	-	-
0x5005	WhiteBalance	6.5.1.4	Yes	Yes	Yes
0x5007	Fnumber	6.5.1.5	Yes	Yes	Yes
0x5008	FocalLength	6.5.1.6			
0x500A	FocusMode	6.5.1.7			
0x500B	ExposureMeteringMode	6.5.1.8	Yes	Yes	-
0x500C	FlashMode	6.5.1.9	Yes	-	-

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0x500D	ExposureTime	6.5.1.10	Yes	-	-
0x500E	ExposureProgramMode	6.5.1.11	Yes	Yes	-
0x500F	ExposureIndex	6.5.1.12	Yes	Yes	Yes
0x5010	ExposureBiasCompensation	6.5.1.13	Yes	Yes	Yes
0x5011	DateTime	6.5.1.14	Yes	Yes	-
0x5013	StillCaptureMode	6.5.1.15	Yes	Yes	-
0x5018	BurstNumber	6.5.1.16	Yes	Yes	Yes
0x501C	FocusMeteringMode	6.5.1.17	Yes	Yes	-
0x501E	Artist	6.5.1.18			
0x501F	Copyright	6.5.1.19			
0xD015	ResetShootingMenu	6.5.2.1	Yes	Yes	-
0xD016	RawCompressionType	6.5.2.4	Yes	Yes	-
0xD017	WbTuneAuto	6.5.2.14	Yes	Yes	Yes
0xD018	WbTuneIncandescent	6.5.2.19	Yes	Yes	Yes
0xD019	WbTuneFluorescent	6.5.2.21	Yes	Yes	Yes
0xD01A	WbTuneSunny	6.5.2.16	Yes	Yes	Yes
0xD01B	WbTuneFlash	6.5.2.22	Yes	Yes	Yes
0xD01C	WbTuneCloudy	6.5.2.17	Yes	Yes	Yes
0xD01D	WbTuneShade	6.5.2.18	Yes	Yes	Yes
0xD01E	WbColorTemp	6.5.2.23	Yes	Yes	Yes
0xD01F	WbPresetDataNo	6.5.2.25	Yes	Yes	Yes
0xD021	WbPresetDataComment1	6.5.2.26	Yes	Yes	-
0xD022	WbPresetDataComment2	6.5.2.27	Yes	Yes	-
0xD023	WbPresetDataComment3	6.5.2.28	Yes	Yes	-
0xD024	WbPresetDataComment4	6.5.2.29	Yes	Yes	-
0xD026	WbPresetDataValue1	6.5.2.32			
0xD027	WbPresetDataValue2	6.5.2.33			
0xD028	WbPresetDataValue3	6.5.2.34			
0xD029	WbPresetDataValue4	6.5.2.35			
0xD02E	FmmManualSetting	6.5.5.8	Yes	Yes	-
0xD02F	F0ManualSetting	6.5.5.9	Yes	Yes	-
0xD030	CaptureAreaCrop	6.5.2.2	Yes	Yes	-
0xD032	ColorSpace	6.5.2.51	Yes	Yes	-
0xD034	DecreaseFlicker	6.5.3.52	Yes	Yes	-
0xD038	WbPresetDataComment5	6.5.2.30	Yes	Yes	-
0xD039	WbPresetDataComment6	6.5.2.31	Yes	Yes	-
0xD03A	WbTunePreset5	6.5.2.42	Yes	Yes	Yes
0xD03B	WbTunePreset6	6.5.2.43	Yes	Yes	Yes
0xD03C	WbPresetProtect5	6.5.2.48	Yes	Yes	-
0xD03D	WbPresetProtect6	6.5.2.49	Yes	Yes	-
0xD03E	WbPresetDataValue5	6.5.2.36			
0xD03F	WbPresetDataValue6	6.5.2.37			
0xD045	ResetCustomSetting	6.5.4.1	Yes	Yes	-
0xD046	AFStillLockOnAcross	6.5.4.4	Yes	Yes	-
0xD048	DynamicAFonAFC	6.5.4.2	Yes	Yes	-
0xD049	DynamicAFonAFS	6.5.4.3	Yes	Yes	-
0xD04F	FocusAreaSelect	6.5.4.7	Yes	Yes	-
0xD053	EnableCopyright	6.5.5.6	Yes	Yes	-
0xD054	ISOAutoControl	6.5.2.8	Yes	Yes	-
0xD056	ExposureEVStep	6.5.4.9	Yes	Yes	-
0xD059	CenterWeightedExRange	6.5.4.10	Yes	Yes	-
0xD05A	ExposureBaseCompMatrix	6.5.4.11	Yes	Yes	-
0xD05B	ExposureBaseCompCenter	6.5.4.12	Yes	Yes	-
0xD05C	ExposureBaseCompSpot	6.5.4.13	Yes	Yes	-
0xD061	AfModeAtLiveView	6.5.2.59	Yes	Yes	-
0xD067	AngleLevel	6.5.7.16			
0xD068	CSpeedLow	6.5.4.15	Yes	Yes	-
0xD069	BurstMaxNumber	6.5.4.16	Yes	Yes	-
0xD06A	ExposureDelay	6.5.4.17	Yes	Yes	-
0xD06B	NoiseReduction	6.5.2.53	Yes	Yes	-
0xD06C	NumberingMode	6.5.4.19	Yes	Yes	-
0xD070	NoiseReductionHilso	6.5.2.54	Yes	Yes	-
0xD072	ArtistV	6.5.5.4	Yes	Yes	-
0xD073	CopyrightV	6.5.5.5	Yes	Yes	-

0xD074	FlashSyncSpeed	6.5.4.22	Yes	Yes	-
0xD075	FlashSlowSpeedLimit	6.5.4.23	Yes	Yes	-
0xD078	BracketingType	6.5.2.61	Yes	Yes	-
0xD079	SelectBracketChangeFactor	6.5.4.25	Yes	Yes	-
0xD07A	BracketingOrder	6.5.4.26	Yes	Yes	-
0xD07D	AngleLevelPitching	6.5.7.17			
0xD07E	AngleLevelYawing	6.5.7.18			
0xD08A	EnableShutter	6.5.5.11	Yes	Yes	-
0xD08D	EnableAFAreaPoint	6.5.4.6	Yes	Yes	-
0xD08F	ImageSensorCleaning	6.5.5.1	Yes	Yes	-
0xD090	CommentString	6.5.5.2	Yes	Yes	-
0xD091	EnableComment	6.5.5.3	Yes	Yes	-
0xD093	ManualSettingLensNo	6.5.5.7	Yes	Yes	-
0xD09C	RetractableLensWarning	6.5.10.9			
0xD09D	FaceDetection	6.5.4.5	Yes	Yes	-
0xD0A0	MovieRecordScreenSize	6.5.3.3	Yes	Yes	-
0xD0A2	MovieRecordMicrophoneLevel	6.5.3.58	Yes	Yes	Yes
0xD0A4	MovieRecProhibitionCondition	6.5.7.21			
0xD0A7	MovieRecordQuality	6.5.3.4	Yes	Yes	-
0xD0A8	MovieRecordMicrophoneLevelValue	6.5.3.59	Yes	Yes	Yes
0xD0AA	MovieWindNoiseReduction	6.5.3.62	Yes	Yes	Yes
0xD0AC	MovieRecordingZone	6.5.3.61	Yes	Yes	Yes
0xD0AD	MovieISOAutoControl	6.5.3.7	Yes	Yes	Yes
0xD0AE	MovieISOAutoHighLimit	6.5.3.6	Yes	Yes	Yes
0xD0AF	MovieFileType	6.5.3.5	Yes	Yes	-
0xD0B4	ExposureIndexEx	6.5.2.6	Yes	Yes	Yes
0xD0B5	ISOControlSensitivity	6.5.7.12			
0xD0B6	RawImageSize	6.5.2.3	Yes	Yes	-
0xD0B7	FlickerReductionSetting	6.5.2.67	Yes	Yes	-
0xD0BA	DiffractionCompensation	6.5.2.56	Yes	Yes	-
0xD0BB	MovieLogOutput	6.5.7.23			
0xD0BC	MovieAutoDistortion	6.5.3.51	Yes	Yes	-
0xD0BF	MovieLogSetting	6.5.5.12	Yes	Yes	-
0xD0C0	EnableBracketing	6.5.8.1	Yes	Yes	-
0xD0C1	AEBRacketingStep	6.5.8.2	Yes	Yes	-
0xD0C2	AEBRacketingPattern	6.5.8.3	Yes	Yes	-
0xD0C3	AEBRacketingCount	6.5.8.4			
0xD0C4	WBBracketingStep	6.5.8.5	Yes	Yes	-
0xD0C5	WBBracketingPattern	6.5.8.6	Yes	Yes	-
0xD0C6	ADLBracketingPattern	6.5.8.7	Yes	Yes	-
0xD0C7	ADLBracketingStep	6.5.8.8	Yes	Yes	-
0xD0CC	HDMIOutputDataDepth	6.5.5.13	Yes	Yes	-
0xD0CD	SaveFocusPosition	6.5.5.14	Yes	Yes	-
0xD0E0	LensID	6.5.10.4			
0xD0E1	LensSort	6.5.10.1			
0xD0E2	LensTypeF	6.5.10.3			
0xD0E3	LensFocalMin	6.5.10.5			
0xD0E4	LensFocalMax	6.5.10.6			
0xD0E5	LensApertureMin	6.5.10.7			
0xD0E6	LensApertureMax	6.5.10.8			
0xD0E7	LensTypeML	6.5.10.2			
0xD0F7	VignetteControl	6.5.2.55	Yes	Yes	-
0xD0F8	AutoDistortion	6.5.2.57	Yes	Yes	-
0xD0FC	UserMode	6.5.7.1			
0xD100	ShutterSpeed	6.5.7.10	Yes	-	-
0xD101	ExternalDC-IN	6.5.6.1			
0xD102	WarningStatus	6.5.7.19			
0xD104	AFLockStatus	6.5.7.8			
0xD105	AELockStatus	6.5.7.7			
0xD106	FVLockStatus	6.5.7.9			
0xD109	FlexibleProgram	6.5.7.11	Yes	Yes	-
0xD10B	RecordingMedia	6.5.7.3	Yes	Yes	-
0xD10C	USBSpeed	6.5.11.1			
0xD10E	Orientation	6.5.7.2			

0xD112	TVLockSetting	6.5.4.27	Yes	Yes	-
0xD113	AVLockSetting	6.5.4.28	Yes	Yes	-
0xD118	ExposureCompFlashUsed	6.5.4.24	Yes	Yes	-
0xD120	ExternalSpeedLightExist	6.5.9.1			
0xD121	ExternalSpeedLightStatus	6.5.9.3			
0xD122	ExternalSpeedLightSort	6.5.9.2			
0xD124	FlashCompensation	6.5.9.5			
0xD125	NewExternalSpeedLightMode	6.5.9.4			
0xD126	InternalFlashCompensation	6.5.2.58	Yes	-	-
0xD12D	ExternalSpeedLightMultiFlashMode	6.5.9.6			
0xD12E	ConnectionPath	6.5.11.2			
0xD130	HDRMode	6.5.2.62	Yes	-	-
0xD131	HDREV	6.5.2.63	Yes	-	-
0xD132	HDRSmoothing	6.5.2.64	Yes	-	-
0xD133	HDRSaveIndividualImages	6.5.2.65	Yes	-	-
0xD138	VibrationReduction	6.5.2.60	Yes	Yes	-
0xD141	WbAutoType	6.5.2.13	Yes	Yes	Yes
0xD149	RawCompressionBitMode	6.5.2.5	Yes	Yes	-
0xD14E	Active-D-Lighting	6.5.2.52	Yes	Yes	-
0xD14F	WbFluorescentType	6.5.2.20	Yes	Yes	Yes
0xD150	WbTuneColorTemp	6.5.2.24	Yes	Yes	Yes
0xD152	WbTunePreset1	6.5.2.38	Yes	Yes	Yes
0xD153	WbTunePreset2	6.5.2.39	Yes	Yes	Yes
0xD154	WbTunePreset3	6.5.2.40	Yes	Yes	Yes
0xD155	WbTunePreset4	6.5.2.41	Yes	Yes	Yes
0xD158	WbPresetProtect1	6.5.2.44	Yes	Yes	-
0xD159	WbPresetProtect2	6.5.2.45	Yes	Yes	-
0xD15A	WbPresetProtect3	6.5.2.46	Yes	Yes	-
0xD15B	ActiveFolder	6.5.7.22			
0xD15C	WbPresetProtect4	6.5.2.47	Yes	Yes	-
0xD15D	WhiteBalanceReset	6.5.2.50	Yes	Yes	-
0xD15E	WbTuneNatural	6.5.2.15	Yes	Yes	-
0xD164	ISOAutoShutterTime	6.5.2.11	Yes	Yes	-
0xD16A	ISOAutoSetting	6.5.2.7	Yes	Yes	-
0xD17A	LowLightAF	6.5.4.8	Yes	Yes	-
0xD17B	ApplyLiveViewSetting	6.5.4.20	Yes	Yes	-
0xD17C	MovieAfSpeed	6.5.4.30	Yes	Yes	-
0xD17D	MovieAfSpeedWhenToApply	6.5.4.31	Yes	Yes	-
0xD17E	MovieAfTrackingSensitivity	6.5.4.32	Yes	Yes	-
0xD183	ISOAutoHighLimit	6.5.2.9	Yes	Yes	-
0xD197	MovieReleaseButton	6.5.4.29	Yes	Yes	-
0xD199	FlashISOAutoHighLimit	6.5.2.10	Yes	Yes	-
0xD1A2	RemoteLiveViewStatus	6.5.12.1			
0xD1A4	LiveViewProhibitionCondition	6.5.12.7			
0xD1A6	LiveViewSelector	6.5.12.8	Yes	Yes	-
0xD1A8	MovieShutterSpeed	6.5.12.10	-	Yes	Yes
0xD1A9	MovieFnumber	6.5.12.9	-	Yes	Yes
0xD1AA	MovieExposureIndex	6.5.3.8	Yes	Yes	Yes
0xD1AB	MovieExposureBiasCompensation	6.5.12.11	-	Yes	Yes
0xD1AC	LiveViewImageSize	6.5.12.4	Yes	Yes	-
0xD1AD	LiveViewPhotography	6.5.2.66	Yes	Yes	-
0xD1AF	MovieExposureMeteringMode	6.5.3.53	Yes	Yes	-
0xD1B0	ExposureDisplayStatus	6.5.7.13			
0xD1B1	ExposureIndicateStatus	6.5.7.14			
0xD1B2	InfoDisplayErrorStatus	6.5.7.20			
0xD1B3	ExposureIndicateLightup	6.5.7.15			
0xD1B4	ContinuousShootingCount	6.5.7.5			
0xD1B7	MovieRecFrameCount	6.5.7.6			
0xD1B8	CameraLiveViewStatus	6.5.12.1			
0xD1B9	DetectionPeaking	6.5.4.21	Yes	Yes	Yes
0xD1BB	LiveViewImageStatus	6.5.12.3			
0xD1BC	LiveViewImageCompression	6.5.12.5	Yes	Yes	-
0xD1BD	LiveViewZoomArea	6.5.12.6	Yes	Yes	-
0xD1DE	ExternalRecordingControl	6.5.5.10	Yes	Yes	-

0xD1DF	HighlightBrightness	6.5.4.33	Yes	Yes	Yes
0xD1E2	SBWirelessMode	6.5.9.7	Yes	-	-
0xD1E3	SBWirelessMultipleFlashMode	6.5.9.8	Yes	-	-
0xD1E4	SBUseableGroup	6.5.9.9			
0xD1E5	WirelessCLSEntryMode	6.5.9.10	Yes	Yes	-
0xD1E6	SBPINCode	6.5.9.11	Yes	Yes	-
0xD1E7	RadioMultipleFlashChannel	6.5.9.12			
0xD1E8	OpticalMultipleFlashChannel	6.5.9.13	Yes	-	-
0xD1E9	FlashRangeDisplay	6.5.9.14			
0xD1EA	AllTestFiringDisable	6.5.9.15			
0xD1EC	SBSettingMemberLock	6.5.9.16	Yes	-	-
0xD1ED	SBIntegrationFlashReady	6.5.9.17			
0xD1F0	ApplicationMode	6.5.14.1	Yes	Yes	-
0xD1F1	ExposureRemaining	6.5.7.4			
0xD1F4	ISOAutoShutterTimeCorrectionValue	6.5.2.12	Yes	Yes	-
0xD1F8	MovieAfAreaMode	6.5.3.55	Yes	Yes	Yes
0xD1F9	MovieVibrationReduction	6.5.3.56	Yes	Yes	-
0xD1FA	MovieFocusMode	6.5.3.54	Yes	Yes	Yes
0xD1FB	RecordTimeCodes	6.5.3.63	Yes	Yes	-
0xD1FC	CountUpMethod	6.5.3.64	Yes	Yes	-
0xD1FD	TimeCodeOrigin	6.5.3.65	Yes	Yes	-
0xD1FE	DropFrame	6.5.3.66	Yes	Yes	-
0xD200	ActivePicCtrlItem	6.5.13.1	Yes	Yes	-
0xD20D	ElectronicFrontCurtainShutter	6.5.4.18	Yes	Yes	-
0xD20E	MovieResetShootingMenu	6.5.3.1	Yes	Yes	-
0xD20F	MovieCaptureAreaCrop	6.5.3.2	Yes	Yes	-
0xD211	MovieWbAutoType	6.5.3.10	Yes	Yes	Yes
0xD212	MovieWbTuneAuto	6.5.3.11	Yes	Yes	Yes
0xD213	MovieWbTuneIncandescent	6.5.3.16	Yes	Yes	Yes
0xD214	MovieWbFluorescentType	6.5.3.17	Yes	Yes	Yes
0xD215	MovieWbTuneFluorescent	6.5.3.18	Yes	Yes	Yes
0xD216	MovieWbTuneSunny	6.5.3.13	Yes	Yes	Yes
0xD218	MovieWbTuneCloudy	6.5.3.14	Yes	Yes	Yes
0xD219	MovieWbTuneShade	6.5.3.15	Yes	Yes	Yes
0xD21A	MovieWbColorTemp	6.5.3.19	Yes	Yes	Yes
0xD21B	MovieWbTuneColorTemp	6.5.3.20	Yes	Yes	Yes
0xD21C	MovieWbPresetDataNo	6.5.3.21	Yes	Yes	Yes
0xD21D	MovieWbPresetDataComment1	6.5.3.22	Yes	Yes	-
0xD21E	MovieWbPresetDataComment2	6.5.3.23	Yes	Yes	-
0xD21F	MovieWbPresetDataComment3	6.5.3.24	Yes	Yes	-
0xD220	MovieWbPresetDataComment4	6.5.3.25	Yes	Yes	-
0xD221	MovieWbPresetDataComment5	6.5.3.26	Yes	Yes	-
0xD222	MovieWbPresetDataComment6	6.5.3.27	Yes	Yes	-
0xD223	MovieWbPresetDataValue1	6.5.3.28			
0xD224	MovieWbPresetDataValue2	6.5.3.29			
0xD225	MovieWbPresetDataValue3	6.5.3.30			
0xD226	MovieWbPresetDataValue4	6.5.3.31			
0xD227	MovieWbPresetDataValue5	6.5.3.32			
0xD228	MovieWbPresetDataValue6	6.5.3.33			
0xD229	MovieWbTunePreset1	6.5.3.34	Yes	Yes	Yes
0xD22A	MovieWbTunePreset2	6.5.3.35	Yes	Yes	Yes
0xD22B	MovieWbTunePreset3	6.5.3.36	Yes	Yes	Yes
0xD22C	MovieWbTunePreset4	6.5.3.37	Yes	Yes	Yes
0xD22D	MovieWbTunePreset5	6.5.3.38	Yes	Yes	Yes
0xD22E	MovieWbTunePreset6	6.5.3.39	Yes	Yes	Yes
0xD22F	MovieWbPresetProtect1	6.5.3.40	Yes	Yes	-
0xD230	MovieWbPresetProtect2	6.5.3.41	Yes	Yes	-
0xD231	MovieWbPresetProtect3	6.5.3.42	Yes	Yes	-
0xD232	MovieWbPresetProtect4	6.5.3.43	Yes	Yes	-
0xD233	MovieWbPresetProtect5	6.5.3.44	Yes	Yes	-
0xD234	MovieWbPresetProtect6	6.5.3.45	Yes	Yes	-
0xD235	MovieWhiteBalanceReset	6.5.3.46	Yes	Yes	-
0xD236	MovieNoiseReductionHilso	6.5.3.48	Yes	Yes	-
0xD237	MovieActivePicCtrlItem	6.5.13.2	Yes	Yes	-

0xD239	ExposureBaseCompHighlight	6.5.4.14	Yes	Yes	-
0xD23A	MovieWhiteBalance	6.5.3.9	Yes	Yes	Yes
0xD23B	MovieActive-D-Lighting	6.5.3.47	Yes	Yes	-
0xD23C	MovieWbTuneNatural	6.5.3.12	Yes	Yes	Yes
0xD23D	MovieAttenuator	6.5.3.60	Yes	Yes	Yes
0xD23E	MovieVignetteControl	6.5.3.49	Yes	Yes	-
0xD23F	MovieDiffractionCompensation	6.5.3.50	Yes	Yes	-
0xD303	UseDeviceStageFlag	6.5.15.3			
0xD314	ElectronicVR	6.5.3.57	Yes	Yes	-
0xD406	SessionInitiatorVersionInfo	6.5.15.1	Yes	Yes	-
0xD407	PerceivedDeviceType	6.5.15.2			

6.5.1 Standard

6.5.1.1 BatteryLevel

○ Property Specifications

Property Code	0x5001
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	100 [100 %]
Property Value	From 1 [1 %] to 100 [100 %]

○ Property Outline

Indicates "Remaining battery level" of the camera.

○ Property Details

When the battery level is reduced, 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% and the shutter release is disabled, the following settings are made.

No.	Description
1	The WarningStatus property (subsection 6.5.7.19) is set to "Battery exhausted".
2	The LiveViewProhibitionCondition property (subsection 6.5.12.7) is set to "Battery exhausted".

6.5.1.2 ImageSize

○ Property Specifications

Property Code	0x5003
DataType	String
Description form	Enumeration
Get / Set	Get / Set
Default Value	Size L
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Image size" that is set in the camera.

For the change of RAW image size, refer to the RawImageSize property (subsection 6.5.2.3).

○ Property Value

The valid PropertyValues are shown below.

	PropertyValue				
	FX	DX	5:4	1:1	16:9
CaptureAreaCrop					
Size L	8256x5504	5408x3600	6880x5504	5504x5504	8256x4640
Size M	6192x4128	4048x2696	5152x4120	4128x4128	6192x3480
Size S	4128x2752	2704x1800	3440x2752	2752x2752	4128x2320

The image size of photos taken in movie live view is as shown below.

MovieRecordScreenSize	PropertyValue	
	4K	Full HD
Size	3840x2160	1920x1080

6.5.1.3 CompressionSetting

○ Property Specifications

Property Code	0x5004
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	2 [JPEG (NORMAL)]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Details

This property 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 StorageInfo DataSet (subsection 9.2) is changed according to the change of this property, the StorageInfoChanged event (subsection 6.4.1.11) is issued.

JPEG (FINE★) is set during movie live view.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	JPEG (BASIC)
1	JPEG (BASIC★)
2	JPEG (NORMAL)
3	JPEG (NORMAL★)
4	JPEG (FINE)
5	JPEG (FINE★)
6	TIFF (RGB)
7	RAW
8	RAW+JPEG (BASIC)
9	RAW+JPEG (BASIC★)
10	RAW+JPEG (NORMAL)
11	RAW+JPEG (NORMAL★)
12	RAW+JPEG (FINE)
13	RAW+JPEG (FINE★)

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	When the HDRMode property (subsection 6.5.2.62) is set to [On], RAW or RAW+JPEG is set.

6.5.1.4 WhiteBalance

○ Property Specifications

Property Code	0x5005
DataType	UINT16
Description form	Enumeration
Get / Set	Get / Set
Default Value	0x0002 [Auto]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "White Balance" that is set in the camera.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x0002	Auto
0x0004	Sunny
0x0005	Fluorescent
0x0006	Incandescent
0x0007	Flash
0x8010	Cloudy
0x8011	Shade
0x8012	Choose color temp.
0x8013	Preset manual
0x8016	Natural light auto

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>During movie recording, the MovieWhiteBalance (subsection 6.5.3.9) is set to anything other than [Same as photo settings].</p>

6.5.1.5 Fnumber

○ Property Specifications

Property Code	0x5007
DataType	UINT16
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	(Minimum value in the setting range)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Aperture value" with the CPU internal lens mounted.

○ Property Details

When the LensSort property (subsection 6.5.10.1) is [Not mounted], the enumeration cannot be created. Therefore the number of enumeration values shall be 1 and the enumeration value, the DefaultValue, and the PropertyValue shall be the same value. The value shall be 1 EV except the maximum aperture value.

When the F0ManualSetting property (subsection 6.5.5.9) is [Not set], the PropertyValue shall be 0.

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.

○ Property Value

The PropertyValue should be a hundred times the aperture value.

The PropertyValue changes depending on the value of the ExposureEVStep property (subsection 6.5.4.9).

The setting range of PropertyValue changes depending on the lens and the magnification setting.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is anything other than [A] or [M].
	The LensSort property (subsection 6.5.10.1) is [Not mounted].
	The WarningStatus property (subsection 6.5.7.19) is [Sequence error].
	The RetractableLensWarning property (subsection 6.5.10.9) is [(Retractable lens warning) On].
	The AVLockSetting property (subsection 6.5.4.28) is [On].
	The aperture value error.

6.5.1.6 FocalLength

○ Property Specifications

Property Code	0x5008
DataType	UINT32
Description form	Range
Get / Set	Get
Default Value	(Minimum value in the setting range)
Property Value	The value of a hundred times the focal length

○ Property Outline

Indicates "Focal length" with the CPU internal lens mounted.

○ Property Details

The setting range of PropertyValue changes depending on the lens and the magnification setting. When the LensSort property (subsection 6.5.10.1) is [Not mounted], the PropertyValue is not fixed.

6.5.1.7 FocusMode

○ Property Specifications

Property Code	0x500A
DataType	UINT16
Description form	Enumeration
Get / Set	Get
Default Value	0x8010 [Single AF]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description	Photo / Movie
0x0001	Manual focus	Photo / Movie
0x8010	Single AF	Photo / Movie
0x8011	Continuous AF	Photo / Movie
0x8013	Constant AF	Movie

6.5.1.8 ExposureMeteringMode

○ Property Specifications

Property Code	0x500B
DataType	UINT16
Description form	Enumeration
Get / Set	Get / Set
Default Value	0x0003 [Matrix metering]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x0002	Center-weighted metering
0x0003	Matrix metering
0x0004	Spot metering
0x8010	Highlight-weighted metering

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The AELockStatus property (subsection 6.5.7.7) is [Locked].</p>

6.5.1.9 FlashMode

○ Property Specifications

Property Code	0x500C
DataType	UINT16
Description form	Enumeration
Get / Set	Get / Set
Default Value	0x8010 [Normal]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Details

If Rear curtain is set when the ExposureProgramMode property (subsection 6.5.1.11) is set to P/S/A/M and the NewExternalSpeedLightMode property (subsection 6.5.9.4) is set to Multi-flash, normal flash is set.

The camera display status depends on the value of the ExposureProgramMode property (subsection 6.5.1.11). In addition, it also differs according to the external flash condition.

When the camera is in the Access_Denied condition of this property or while movie live view is being performed, this property is set to [Flash off].

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

Shooting mode or selected scene	Normal flash	Normal flash + slow shutter	Rear curtain flash	Red-eye reduction flash	Red-eye reduction flash + slow shutter	Flash off
P / A	Normal flash	Normal flash + slow shutter	Rear curtain flash	Red-eye reduction flash	Red-eye reduction flash + slow shutter	Flash off
S / M	Normal flash	-	Rear curtain flash	Red-eye reduction flash	-	Flash off
AUTO	Normal flash	-	-	Red-eye reduction flash	-	Flash off
U1/U2/U3	Depends on the ExposureProgramMode property set to user mode.					

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x0002	Flash off
0x0004	Red-eye reduction flash
0x8010	Normal flash
0x8011	Normal flash + slow shutter
0x8012	Rear curtain flash
0x8013	Red-eye reduction + slow shutter

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The HDRMode property (subsection 6.5.2.62) is set to [On].
	The LiveViewPhotography property (subsection 6.5.2.66) is set to [On].
	The StillCaptureMode property (6.5.1.15) is [Continuous high-speed shooting (extension)].
	During SB setting warning.

6.5.1.10 ExposureTime

○ Property Specifications

Property Code	0x500D
DataType	UINT32
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	(Minimum value in the setting range)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Shutter speed" that is set in the camera.

For the shutter speed during movie live view, the MovieShutterSpeed property (subsection 6.5.12.10) should be used.

○ Property Details

When the ExposureProgramMode property (subsection 6.5.1.11) is M, the following values are added to the enumerated value. In the case of S, a value corresponding to the current value of bulb shooting/time shooting is added to the enumerated value.

PropertyValue	Use	Condition in which the value can be set
0xFFFFFFFFFF	Bulb shooting	ExposureProgramMode is M
0xFFFFFFFFFD	Time shooting	ExposureProgramMode is M

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 1/200, the PropertyValue shows 1/200.

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 ExposureEVStep property (subsection 6.5.4.9), that of the ExternalSpeedLightExist property (subsection 6.5.9.1) and that of the NewExternalSpeedLightMode property (subsection 6.5.9.4).

When the ExternalSpeedLightExist property (subsection 6.5.9.1) is set to [Mounted], the minimum value and the maximum value of the enumerated values depend on the conditions below.

Minimum value:

The minimum value is limited to the slower value between Flash shooting synchronization speed (FlashSyncSpeed property, subsection 6.5.4.22) and the external flash speed limit. The minimum value is not limited when the auto FP is supported by the flash mode of the external flash and the flash shooting synchronization speed is set to the auto FP.

Maximum value:

When both synchronization mode (FlashMode property, subsection 6.5.1.9) and shooting mode (ExposureProgramMode property, subsection 6.5.1.11) have the values shown below, it is limited to the value set by shutter speed limit with flash (FlashSlowSpeedLimit property, subsection 6.5.4.23).

Flash mode	Shooting mode
Red-eye reduction flash	P
Normal flash	A

When the ElectronicFrontCurtainShutter property (subsection 6.5.4.18) is set to [Electronic front curtain shutter], the minimum value is limited to 1/2000.

Because the unit of the PropertyValue is 1/10000, a rounding occurs in some range. Use the ShutterSpeed property (subsection 6.5.7.10) to get the precise shutter speed.

In this case, refer to the table below.

EV in parentheses shows the exposure setting step range (ExposureEVStep property).

Do Not Copy

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.

○ Property Value

The valid PropertyValues are shown below. (Excluding bulb shooting and time shooting)

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

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

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than [S] or [M].</p> <p>The WarningStatus property (subsection 6.5.7.19) is [Sequence error] or [Minimum aperture warning].</p> <p>The TVLockSetting property (subsection 6.5.4.27) is set to [On].</p> <p>The RetractableLensWarning property (subsection 6.5.10.9) is [(Retractable lens warning) On].</p> <p>Bulb shooting or time shooting is set when the ExposureProgramMode property (subsection 6.5.1.11) is [S].</p> <p>Bulb shooting or time shooting is set when the HDRMode property (subsection 6.5.2.62) is set to [On].</p>

6.5.1.11 ExposureProgramMode

○ Property Specifications

Property Code	0x500E
DataType	UINT16
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0x0002 [Program auto]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Details

When [U1], [U2] or [U3] is set in the shooting mode, the shooting mode set by the UserMode property (subsection 6.5.7.1) is used.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description	Used setting
0x0001	[M] Manual	-
0x0002	[P] Program auto	-
0x0003	[A] Aperture priority auto	-
0x0004	[S] Shutter priority auto	-
0x8010	[Auto mode] AUTO	-
0x8050	[User mode] U1	UserMode (subsection 6.5.7.1)
0x8051	[User mode] U2	
0x8052	[User mode] U3	

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	During PC camera mode. Any value other than PSAM was set in the spot WB acquisition standby state.

6.5.1.12 ExposureIndex

○ Property Specifications

Property Code	0x500F
DataType	UINT16
Description form	Enumeration
Get / Set	Get / Set
Default Value	100 [ISO100]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "ISO sensitivity" that is set in the camera.

Refer to the MovieExposureIndex property (subsection 6.5.3.8) for the ISO sensitivity on the movie live view.

○ Property Details

The maximum ISO sensitivity of this camera is Hi-2 and the maximum value of this property is Hi-1. When Hi-2 is set on the camera, this property value is set to Hi-1. Use the ExposureIndexEx property (subsection 6.5.2.6) to get the value of Hi-2.

When handling the value from Lo-1 to Hi-1, either of ExposureIndexEx property and this property may be used.

The maximum ISO sensitivity value is limited in the following conditions. Check the descriptor of this property to confirm available range.

No	Condition
1	The LiveViewPhotography property (subsection 6.5.2.66) is set to [On].

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description	ExposureEVStep		
		1/3 step	1/2 step	1 step
32	Lo 1	✓	✓	✓
40	Lo 0.7	✓	-	-
45	Lo 0.5	-	✓	-
50	Lo 0.3	✓	-	-
64	64	✓	✓	✓
72	72	-	✓	-
80	80	✓	-	-
100	100	✓	✓	✓
125	125	✓	-	-
140	140	-	✓	-
160	160	✓	-	-
200	200	✓	✓	✓
250	250	✓	-	-
280	280	-	✓	-
320	320	✓	-	-
400	400	✓	✓	✓
500	500	✓	-	-
560	560	-	✓	-
640	640	✓	-	-
800	800	✓	✓	✓
1000	1000	✓	-	-
1100	1100	-	✓	-
1250	1250	✓	-	-
1600	1600	✓	✓	✓
2000	2000	✓	-	-

2200	2200	-	✓	-
2500	2500	✓	-	-
3200	3200	✓	✓	✓
4000	4000	✓	-	-
4500	4500	-	✓	-
5000	5000	✓	-	-
6400	6400	✓	✓	✓
8000	8000	✓	-	-
9000	9000	-	✓	-
10000	10000	✓	-	-
12800	12800	✓	✓	✓
16000	16000	✓	-	-
18000	18000	-	✓	-
20000	20000	✓	-	-
25600	25600	✓	✓	✓
32000	Hi 0.3	✓	-	-
36000	Hi 0.5	-	✓	-
40000	Hi 0.7	✓	-	-
51200	Hi 1	✓	✓	✓

6.5.1.13 ExposureBiasCompensation

○ Property Specifications

Property Code	0x5010
DataType	INT16
Description form	Enumeration
Get / Set	Get / Set
Default Value	0 [0.0 EV]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

For the exposure compensation during movie live view, the MovieExposureBiasCompensation property (subsection 6.5.12.11) should be used.

○ Property Value

The valid PropertyValues are shown below.

The value of PropertyValue changes depending on the value of the ExposureEVStep property (subsection 6.5.4.9).

Property Value	Description	ExposureEVStep		
		1/3 step	1/2 step	1 step
+5000	+5.0 EV	✓	✓	✓
+4666	+4.7 EV	✓	-	-
+4500	+4.5 EV	-	✓	-
+4333	+4.3 EV	✓	-	-
+4000	+4.0 EV	✓	✓	✓
+3666	+3.7 EV	✓	-	-
+3500	+3.5 EV	-	✓	-
+3333	+3.3 EV	✓	-	-
+3000	+3.0 EV	✓	✓	✓
+2666	+2.7 EV	✓	-	-
+2500	+2.5 EV	-	✓	-
+2333	+2.3 EV	✓	-	-
+2000	+2.0 EV	✓	✓	✓
+1666	+1.7 EV	✓	-	-
+1500	+1.5 EV	-	✓	-
+1333	+1.3 EV	✓	-	-
+1000	+1.0 EV	✓	✓	✓
+666	+0.7 EV	✓	-	-
+500	+0.5 EV	-	✓	-
+333	+0.3 EV	✓	-	-
0	0.0 EV	✓	✓	✓
-333	-0.3 EV	✓	-	-
-500	-0.5 EV	-	✓	-
-666	-0.7 EV	✓	-	-
-1000	-1.0 EV	✓	✓	✓
-1333	-1.3 EV	✓	-	-
-1500	-1.5 EV	-	✓	-
-1666	-1.7 EV	✓	-	-
-2000	-2.0 EV	✓	✓	✓
-2333	-2.3 EV	✓	-	-
-2500	-2.5 EV	-	✓	-
-2666	-2.7 EV	✓	-	-
-3000	-3.0 EV	✓	✓	✓
-3333	-3.3 EV	✓	-	-
-3500	-3.5 EV	-	✓	-

-3666	-3.7 EV	✓	-	-
-4000	-4.0 EV	✓	✓	✓
-4333	-4.3 EV	✓	-	-
-4500	-4.5 EV	-	✓	-
-4666	-4.7 EV	✓	-	-
-5000	-5.0 EV	✓	✓	✓

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to [Auto mode].

6.5.1.14 DateTime

○ Property Specifications

Property Code	0x5011
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	20180101T000000 [00:00:00, Jan. 1, 2018]
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

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 + Time zone difference + Daylight saving time”.

The setting range of PropertyValue is from 20000101T000000 to 20991231T235959.

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”

The DevicePropChanged event (subsection 6.4.1.6) is not issued even if this PropertyValue has changed.

6.5.1.15 StillCaptureMode

○ Property Specifications

Property Code	0x5013
DataType	UINT16
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0x0001 [Single-frame shooting]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Details

[Single-frame shooting] and [Continuous high-speed shooting] can be set in movie live view.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x0001	Single-frame shooting
0x0002	Continuous high-speed shooting
0x8010	Continuous low-speed shooting
0x8011	Self-timer
0x8019	Continuous high-speed shooting (extension)

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The MovieReleasButton property (subsection 6.5.4.29) is set to [Record movies] in movie live view.

6.5.1.16 BurstNumber

○ Property Specifications

Property Code	0x5018
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	1 [One frame]
Property Value	From 1 [One frame] to 65535 [65535 frames]

○ Property Outline

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

○ Property Details

For shooting by the command processing, the continuous shooting is performed until the number of frames set by this property is reached.

Refer to Continuous Shooting (subsection 11.7.1) about the maximum number of continuous shooting.

6.5.1.17 FocusMeteringMode

○ Property Specifications

Property Code	0x501C
DataType	UINT16
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0x8010 [Single-point AF]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "AF-area mode" in photo shooting.

○ Property Details

In the following cases, this property is set to the single-point AF mode. When the following state is canceled without changing the AF area mode, it returns to the AF area mode which was set immediately before.

- In the case that the AfModeAtLiveView property (subsection 6.5.2.59) is [MF].
- In the case that the AF area mode that cannot be selected is set when the AfModeAtLiveView property is changed.

○ Property Value

The valid PropertyValues are shown below.

The value of PropertyValue changes depending on the value of the photo focus mode.

Property Value	Description	Photo focus mode setting		
		MF	AF-S	AF-C
0x0002	Dynamic AF	-	-	✓
0x8010	Single-point AF mode	✓	✓	✓
0x8011	Auto-area AF mode	-	✓	✓
0x8017	Pinpoint AF	-	✓	-
0x8018	Wide-area AF (S)	-	✓	✓
0x8019	Wide-area AF (L)	-	✓	✓

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The photo focus mode is set to the manual focus.

6.5.1.18 Artist

○ Property Specifications

Property Code	0x501E
DataType	String
Description form	None
Get / Set	Get
Default Value	NULL (0x00) 0 character
Property Value	(Depends on the user setting)

○ Property Outline

Indicates "Artist" that is set in the camera.

○ Property Details

For setting "Artist", the ArtistV property (subsection 6.5.5.4) should be used.

The PropertyValue is an optional string of 36 characters or shorter (not including the null character).

If the artist is not set in the camera, the value is zero length string (not including the null character).

6.5.1.19 Copyright

○ Property Specifications

Property Code	0x501F
DataType	String
Description form	None
Get / Set	Get
Default Value	NULL (0x00) 0 character
Property Value	(Depends on the user setting)

○ Property Outline

Indicates "Copyright" that is set in the camera.

○ Property Details

For setting "Copyright", the CopyrightV property (subsection 6.5.5.5) should be used.

The PropertyValue is an optional string of 54 characters or shorter (not including the null character).

If the copyright is not set in the camera, the value is zero length string (not including the null character).

6.5.2 Vendor (Photo Shooting Menu)

6.5.2.1 ResetShootingMenu

○ Property Specifications

Property Code	0xD015
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [No]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Reset photo shooting menu" in the photo shooting menu.

If 1 [Yes] is specified when setting the property, the photo shooting menu is reset.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	No
1	Yes (for setting only)

6.5.2.2 CaptureAreaCrop

○ Property Specifications

Property Code	0xD030
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	0 [FX]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Image area" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	FX
1	DX
2	5:4
3	1:2
4	16:9

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	DX lens is mounted on the camera.

6.5.2.3 RawImageSize

○ Property Specifications

Property Code	0xD0B6
DataType	String
Description form	Enumeration
Get / Set	Get / Set
Default Value	Size L
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Image size - RAW" set in the camera.

○ Property Value

The image size may be changed depending on the camera condition. The size is the same as that of the ImageSize property (subsection 6.5.1.2).

6.5.2.4 RawCompressionType

○ Property Specifications

Property Code	0xD016
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Lossless compressed]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "NEF (RAW) recording – Compression type" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Lossless compressed
1	Compressed
2	Uncompressed

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The RawImageSize property (subsection 6.5.2.3) is set to the value other than [Size L].

6.5.2.5 RawCompressionBitMode

○ Property Specifications

Property Code	0xD149
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	1 [14-bit]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "NEF (RAW) recording - NEF (RAW) bit depth" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	12-bit
1	14-bit

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The RawImageSize property (subsection 6.5.2.3) is set to the value other than [Size L].

6.5.2.6 ExposureIndexEx

○ Property Specifications

Property Code	0xD0B4
DataType	UINT32
Description form	Enumeration
Get / Set	Get / Set
Default Value	100 [ISO100]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "ISO sensitivity" that is set in the camera.

This property is 32bit-expanded version of ExposureIndex property (subsection 6.5.1.12) and is able to use Hi-2 and above.

Refer to the MovieExposureIndex property (subsection 6.5.3.8) for the ISO sensitivity on the movie live view.

○ Property Details

Both ExposureIndex property (subsection 6.5.1.12) and this property can be used when setting from Lo-1 to Hi-1. This property should be used when setting Hi-2 and above.

The maximum ISO sensitivity value is limited in the following conditions. Check the descriptor of this property to confirm available range.

No	Condition		
	1	The LiveViewPhotography property (subsection 6.5.2.66) is set to [On].	

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description	ExposureEVStep		
		1/3 step	1/2 step	1 step
32	Lo 1	✓	✓	✓
40	Lo 0.7	✓	-	-
45	Lo 0.5	-	✓	-
50	Lo 0.3	✓	-	-
64	64	✓	✓	✓
72	72	-	✓	-
80	80	✓	-	-
100	100	✓	✓	✓
125	125	✓	-	-
140	140	-	✓	-
160	160	✓	-	-
200	200	✓	✓	✓
250	250	✓	-	-
280	280	-	✓	-
320	320	✓	-	-
400	400	✓	✓	✓
500	500	✓	-	-
560	560	-	✓	-
640	640	✓	-	-
800	800	✓	✓	✓
1000	1000	✓	-	-
1100	1100	-	✓	-
1250	1250	✓	-	-
1600	1600	✓	✓	✓
2000	2000	✓	-	-
2200	2200	-	✓	-
2500	2500	✓	-	-

3200	3200	✓	✓	✓
4000	4000	✓	-	-
4500	4500	-	✓	-
5000	5000	✓	-	-
6400	6400	✓	✓	✓
8000	8000	✓	-	-
9000	9000	-	✓	-
10000	10000	✓	-	-
12800	12800	✓	✓	✓
16000	16000	✓	-	-
18000	18000	-	✓	-
20000	20000	✓	-	-
25600	25600	✓	✓	✓
32000	Hi 0.3	✓	-	-
36000	Hi 0.5	-	✓	-
40000	Hi 0.7	✓	-	-
51200	Hi 1	✓	✓	✓
102400	Hi 2	✓	✓	✓

6.5.2.7 ISOAutoSetting

○ Property Specifications

Property Code	0xD16A
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	1 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the auto value of “ISO sensitivity settings – ISO sensitivity” in the photo shooting menu.

○ Property Details

This represents the state of auto ISO sensitivity control when the ExposureProgramMode property (subsection 6.5.1.11) is set to the value other than PSAM.

When the ExposureProgramMode property is PSAM, the PropertyValue is not fixed.

○ Property Value

The valid PropertyValue are shown below.

PropertyValue	Description
0	On
1	Off

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to PSAM.

6.5.2.8 ISOAutoControl

○ Property Specifications

Property Code	0xD054
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	1 [On]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "ISO sensitivity settings – Auto ISO sensitivity control" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.9 ISOAutoHighLimit

○ Property Specifications

Property Code	0xD183
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	32 [25600]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "ISO sensitivity settings – Auto ISO sensitivity control – Maximum sensitivity" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description	ExposureEVStep		
		1/3 step	1/2 step	1 step
0	100	✓	✓	✓
1	125	✓	-	-
2	140	-	✓	-
3	160	✓	-	-
4	200	✓	✓	✓
5	250	✓	-	-
6	280	-	✓	-
7	320	✓	-	-
8	400	✓	✓	✓
9	500	✓	-	-
10	560	-	✓	-
11	640	✓	-	-
12	800	✓	✓	✓
13	1000	✓	-	-
14	1100	-	✓	-
15	1250	✓	-	-
16	1600	✓	✓	✓
17	2000	✓	-	-
18	2200	-	✓	-
19	2500	✓	-	-
20	3200	✓	✓	✓
21	4000	✓	-	-
22	4500	-	✓	-
23	5000	✓	-	-
24	6400	✓	✓	✓
25	8000	✓	-	-
26	9000	-	✓	-
27	10000	✓	-	-
28	12800	✓	✓	✓
29	16000	✓	-	-
30	18000	-	✓	-
31	20000	✓	-	-
32	25600	✓	✓	✓
33	Hi 0.3	✓	-	-
34	Hi 0.5	-	✓	-
35	Hi 0.7	✓	-	-
36	Hi 1	✓	✓	✓
37	Hi 2	✓	✓	✓

O Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ISOAutoControl property (subsection 6.5.2.8) is set to [Off].</p> <p>A value that cannot be set is specified depending on the setting of the ExposureEVStep property (subsection 6.5.4.9).</p> <p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p>

6.5.2.10 FlashISOAutoHighLimit

○ Property Specifications

Property Code	0xD199
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	38 [The setting in the case that the flash is not attached]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "ISO sensitivity settings – Auto ISO sensitivity control – Maximum sensitivity with flash" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
From 0 to 37	Refer to the property value of ISOAutoHighLimit (subsection 6.5.2.9).
38	The setting in the case that the flash is not attached.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ISOAutoControl property (subsection 6.5.2.8) is set to [Off].</p> <p>A value that cannot be set is specified depending on the setting of the ExposureEVStep property (subsection 6.5.4.9).</p> <p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p>

6.5.2.11 ISOAutoShutterTime

○ Property Specifications

Property Code	0xD164
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	52 [Auto]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "ISO sensitivity settings – Auto ISO sensitivity control – Minimum shutter speed" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
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	1/25 sec.
23	1/20 sec.
24	1/15 sec.
25	1/13 sec.
26	1/10 sec.
27	1/8 sec.
28	1/6 sec.
29	1/5 sec.
30	1/4 sec.
31	1/3 sec.
32	1/2.5 sec.
33	1/2 sec.
34	1/1.6 sec.
35	1/1.3 sec.
36	1 sec.
37	1.3 sec.
38	1.6 sec.

39	2 sec.
40	2.5 sec.
41	3 sec.
42	4 sec.
43	5 sec.
44	6 sec.
45	8 sec.
46	10 sec.
47	13 sec.
48	15 sec.
49	20 sec.
50	25 sec.
51	30 sec.
52	Auto

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ISOAutoControl property (subsection 6.5.2.8) is set to [Off].</p> <p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p>

6.5.2.12 ISOAutoShutterTimeCorrectionValue

○ Property Specifications

Property Code	0xD1F4
DataType	INT8
Description form	Range
Get / Set	Get / Set
Default Value	0
Property Value	From -2 to +2

○ Property Outline

Indicates the correction value when “ISO sensitivity settings – Auto ISO sensitivity control – Minimum shutter speed” in the photo shooting menu is [Auto].

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ISOAutoControl property (subsection 6.5.2.8) is set to [Off].</p> <p>The ISOAutoShutterTime property (subsection 6.5.2.11) is not set to [Auto].</p> <p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p>

6.5.2.13 WbAutoType

○ Property Specifications

Property Code	0xD141
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Keep overall atmosphere]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Keep overall atmosphere
1	Keep warm lighting colors
2	Keep white

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.14 WbTuneAuto

○ Property Specifications

Property Code	0xD017
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance - Auto” in the photo shooting menu.
For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.15 WbTuneNatural

○ Property Specifications

Property Code	0xD15E
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance – Natural light auto” in the photo shooting menu.
For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.16 WbTuneSunny

○ Property Specifications

Property Code	0xD01A
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance – Direct sunlight” in the photo shooting menu.
For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.17 WbTuneCloudy

○ Property Specifications

Property Code	0xD01C
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance - Cloudy” in the photo shooting menu.
For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.18 WbTuneShade

○ Property Specifications

Property Code	0xD01D
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance – Shade” in the photo shooting menu.
For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.19 WbTunelIncandescent

○ Property Specifications

Property Code	0xD018
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance - Incandescent” in the photo shooting menu.
For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.20 WbFluorescentType

○ Property Specifications

Property Code	0xD14F
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	3 [White fluorescent lamp]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
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

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.21 WbTuneFluorescent

○ Property Specifications

Property Code	0xD019
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance - Fluorescent” in the photo shooting menu. For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.22 WbTuneFlash

○ Property Specifications

Property Code	0xD01B
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance - Flash” in the photo shooting menu.
For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.23 WbColorTemp

○ Property Specifications

Property Code	0xD01E
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	5000 [K]
Property Value	From 2500 K to 10000 K (increase or decrease in units of 10 K)

○ Property Outline

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

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.24 WbTuneColorTemp

○ Property Specifications

Property Code	0xD150
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	24
Property Value	From 0 to 48

○ Property Outline

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

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.25 WbPresetDataNo

○ Property Specifications

Property Code	0xD01F
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	1 [d-1]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "White balance – Preset manual" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
1	d-1
2	d-2
3	d-3
4	d-4
5	d-5
6	d-6

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.</p>

6.5.2.26 WbPresetDataComment1

○ Property Specifications

Property Code	0xD021
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	36 characters of spaces (0x20)
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

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).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.
Access_Denied	The WbPresetProtect1 property (subsection 6.5.2.44) is [On]. The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.27 WbPresetDataComment2

○ Property Specifications

Property Code	0xD022
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	36 characters of spaces (0x20)
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

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).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.
Access_Denied	The WbPresetProtect2 property (subsection 6.5.2.45) is [On]. The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.28 WbPresetDataComment3

○ Property Specifications

Property Code	0xD023
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	36 characters of spaces (0x20)
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

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).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.
Access_Denied	The WbPresetProtect3 property (subsection 6.5.2.46) is [On]. The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.29 WbPresetDataComment4

○ Property Specifications

Property Code	0xD024
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	36 characters of spaces (0x20)
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

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).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.
Access_Denied	The WbPresetProtect4 property (subsection 6.5.2.47) is [On]. The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.30 WbPresetDataComment5

○ Property Specifications

Property Code	0xD038
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	36 characters of spaces (0x20)
Property Value	(Depends on the user setting)

○ Property Outline

Indicates the comment of “White balance – Preset manual – d-5” in the photo shooting menu.

○ Property Details

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).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.
Access_Denied	The WbPresetProtect5 property (subsection 6.5.2.48) is [On]. The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.31 WbPresetDataComment6

○ Property Specifications

Property Code	0xD039
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	36 characters of spaces (0x20)
Property Value	(Depends on the user setting)

○ Property Outline

Indicates the comment of “White balance – Preset manual – d-6” in the photo shooting menu.

○ Property Details

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).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.
Access_Denied	The WbPresetProtect6 property (subsection 6.5.2.49) is [On]. The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.32 WbPresetDataValue1

○ Property Specifications

Property Code	0xD026
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x08000800 [Rgain: 1.0, Bgain: 1.0]
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

Refer to PreWbGainValue in SetPreWbData (subsection 6.2.2.38) about the format of the PropertyValue.

6.5.2.33 WbPresetDataValue2

○ Property Specifications

Property Code	0xD027
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x08000800 [Rgain: 1.0, Bgain: 1.0]
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

Refer to PreWbGainValue in SetPreWbData (subsection 6.2.2.38) about the format of the PropertyValue.

6.5.2.34 WbPresetDataValue3

○ Property Specifications

Property Code	0xD028
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x08000800 [Rgain: 1.0, Bgain: 1.0]
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

Refer to PreWbGainValue in SetPreWbData (subsection 6.2.2.38) about the format of the PropertyValue.

6.5.2.35 WbPresetDataValue4

○ Property Specifications

Property Code	0xD029
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x08000800 [Rgain: 1.0, Bgain: 1.0]
PropertyValue	(Depends on the user setting)

○ Property Outline

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

○ Property Details

Refer to PreWbGainValue in SetPreWbData (subsection 6.2.2.38) about the format of the PropertyValue.

6.5.2.36 WbPresetDataValue5

○ Property Specifications

Property Code	0xD03E
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x08000800 [Rgain: 1.0, Bgain: 1.0]
PropertyValue	(Depends on the user setting)

○ Property Outline

Indicates the white balance data of “White balance – Preset manual – d-5” in the photo shooting menu.

○ Property Details

Refer to PreWbGainValue in SetPreWbData (subsection 6.2.2.38) about the format of the PropertyValue.

6.5.2.37 WbPresetDataValue6

○ Property Specifications

Property Code	0xD03F
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x08000800 [Rgain: 1.0, Bgain: 1.0]
PropertyValue	(Depends on the user setting)

○ Property Outline

Indicates the white balance data of “White balance – Preset manual – d-6” in the photo shooting menu.

○ Property Details

Refer to PreWbGainValue in SetPreWbData (subsection 6.2.2.38) about the format of the PropertyValue.

6.5.2.38 WbTunePreset1

○ Property Specifications

Property Code	0xD152
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

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

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The WbPresetProtect1 property (subsection 6.5.2.44) is [On].
	The WbPresetDataNo property (subsection 6.5.2.25) is set to anything other than [d-1].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.

6.5.2.39 WbTunePreset2

○ Property Specifications

Property Code	0xD153
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

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

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The WbPresetProtect2 property (subsection 6.5.2.45) is [On].
	The WbPresetDataNo property (subsection 6.5.2.25) is set to anything other than [d-2].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.

6.5.2.40 WbTunePreset3

○ Property Specifications

Property Code	0xD154
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

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

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The WbPresetProtect3 property (subsection 6.5.2.46) is [On].
	The WbPresetDataNo property (subsection 6.5.2.25) is set to anything other than [d-3].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.

6.5.2.41 WbTunePreset4

○ Property Specifications

Property Code	0xD155
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

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

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The WbPresetProtect4 property (subsection 6.5.2.47) is [On].
	The WbPresetDataNo property (subsection 6.5.2.25) is set to anything other than [d-4].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.

6.5.2.42 WbTunePreset5

○ Property Specifications

Property Code	0xD03A
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the white balance fine tuning volume of “White balance – Preset manual – d-5” in the photo shooting menu.

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The WbPresetProtect5 property (subsection 6.5.2.48) is [On].
	The WbPresetDataNo property (subsection 6.5.2.25) is set to anything other than [d-5].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.

6.5.2.43 WbTunePreset6

○ Property Specifications

Property Code	0xD03B
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the white balance fine tuning volume of “White balance – Preset manual – d-6” in the photo shooting menu.

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The WbPresetProtect6 property (subsection 6.5.2.49) is [On].
	The WbPresetDataNo property (subsection 6.5.2.25) is set to anything other than [d-6].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to anything other than [Same as photo settings] during movie recording.

6.5.2.44 WbPresetProtect1

○ Property Specifications

Property Code	0xD158
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.45 WbPresetProtect2

○ Property Specifications

Property Code	0xD159
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.46 WbPresetProtect3

○ Property Specifications

Property Code	0xD15A
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.47 WbPresetProtect4

○ Property Specifications

Property Code	0xD15C
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.48 WbPresetProtect5

○ Property Specifications

Property Code	0xD03C
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the protection of “White balance – Preset manual – d-5” in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.49 WbPresetProtect6

○ Property Specifications

Property Code	0xD03D
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the protection of “White balance – Preset manual – d-6” in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.50 WhiteBalanceReset

○ Property Specifications

Property Code	0xD15D
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [No]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates reset of the WhiteBalance property (subsection 6.5.1.4).

If 1 [Yes] is specified when setting the property, the values of the following properties are reset to the DefaultValues.

Property
WhiteBalance property (6.5.1.4)
WbAutoType property (6.5.2.13)
WbTuneAuto property (6.5.2.14)
WbTuneNatural property (6.5.2.15)
WbTuneIncandescent property (6.5.2.19)
WbFluorescentType property (6.5.2.20)
WbTuneFluorescent property (6.5.2.21)
WbTuneSunny property (6.5.2.16)
WbTuneFlash property (6.5.2.22)
WbTuneCloudy property (6.5.2.17)
WbTuneShade property (6.5.2.18)
WbColorTemp property (6.5.2.23)
WbTuneColorTemp property (6.5.2.24)
WbPresetDataNo property (6.5.2.25)

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	No
1	Yes (for setting only)

6.5.2.51 ColorSpace

○ Property Specifications

Property Code	0xD032
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [sRGB]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Color space" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	sRGB
1	Adobe RGB

6.5.2.52 Active-D-Lighting

○ Property Specifications

Property Code	0xD14E
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	1 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Active D-Lighting" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Auto
1	Off
2	Low
3	Normal
4	High
5	Extra high

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.53 NoiseReduction

○ Property Specifications

Property Code	0xD06B
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Long exposure NR" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The LiveViewPhotography property (subsection 6.5.2.66) is set to [On].

6.5.2.54 NoiseReductionHilso

○ Property Specifications

Property Code	0xD070
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	2 [Normal]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "High ISO NR" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	Low
2	Normal
3	High

6.5.2.55 VignetteControl

○ Property Specifications

Property Code	0xD0F7
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	2 [Normal]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Vignette control" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	Low
2	Normal
3	High

6.5.2.56 Diffraction Compensation

○ Property Specifications

Property Code	0xD0BA
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	1 [On]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Diffraction compensation" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

6.5.2.57 AutoDistortion

○ Property Specifications

Property Code	0xD0F8
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	1 [On]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Auto distortion control" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The LensTypeML property (subsection 6.5.10.2) is set to [Lens whose automatic distortion correction is always effective].

6.5.2.58 InternalFlashCompensation

○ Property Specifications

Property Code	0xD126
DataType	INT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	0
Property Value	From -18 to +6

○ Property Outline

Indicates "Flash compensation value" in the photo shooting menu in units of 1/6 EV.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description	ExposureEVStep		
		1/3 EV	1/2 EV	1 EV
-18	-3.0EV	✓	✓	✓
-16	-2.7EV	✓	-	-
-15	-2.5EV	-	✓	-
-14	-2.3EV	✓	-	-
-12	-2.0EV	✓	✓	✓
-10	-1.7EV	✓	-	-
-9	-1.5EV	-	✓	-
-8	-1.3EV	✓	-	-
-6	-1.0EV	✓	✓	✓
-4	-0.7EV	✓	-	-
-3	-0.5EV	-	✓	-
-2	-0.3EV	✓	-	-
0	0.0EV	✓	✓	✓
2	0.3EV	✓	-	-
3	0.5EV	-	✓	-
4	0.7EV	✓	-	-
6	1.0EV	✓	✓	✓

The StepSize of this property changes depending on the value of the ExposureEVStep property (subsection 6.5.4.9).

ExposureEVStep	StepSize
0 (1/3 EV)	2
1 (1/2 EV)	3
2 (1 EV)	6

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The HDRMode property (subsection 6.5.2.62) is set to [On].
	The LiveViewPhotography property (subsection 6.5.2.66) is set to [On].
	StillCaptureMode property (6.5.1.15) is [Continuous high-speed shooting (extension)].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	During SB setting warning.
Invalid_DeviceProp_Value	A value that cannot be set is specified depending on the setting of the ExposureEVStep property (subsection 6.5.4.9).

6.5.2.59 AfModeAtLiveView

○ Property Specifications

Property Code	0xD061
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	0 [AF-S]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Focus mode" in photo shooting.

○ Property Details

If the following conditions are satisfied, it operates with MF mode even when this property is set to AF.

- CPU lens is not mounted.
- The switches on the camera or lens are set to MF.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	AF-S
1	AF-C
4	MF

6.5.2.60 Vibration Reduction

○ Property Specifications

Property Code	0xD138
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	1 [Normal]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Vibration reduction" in the photo shooting menu.

○ Property Details

The supported value changes depending on the type of mounted lens.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	Normal
2	Sports

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The mounted lens has VR switch.</p> <p>The LensSort property (subsection 6.5.10.1) is set to [Not mounted] and the FmmManualSetting property (subsection 6.5.5.8) is set to [Not set].</p> <p>The ML lens with VR function is mounted.</p>

6.5.2.61 BracketingType

○ Property Specifications

Property Code	0xD078
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [AE & flash]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Auto bracketing - Auto bracketing set" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	AE & flash
1	AE only
2	Flash only
3	WB bracketing
4	ADL bracketing

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.62 HDRMode

○ Property Specifications

Property Code	0xD130
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "HDR (high dynamic range) – HDR mode" in the photo shooting menu.

○ Property Details

When the StillCaptureMode property (subsection 6.5.1.15) is [Continuous low-speed shooting] or [Continuous high-speed shooting], HDR is applied to only the first image with the continuous shot operation.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On (single photo)
2	On (series)

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The CompressionSetting property (subsection 6.5.1.3) is set to [RAW] or [RAW + JPEG].</p> <p>The EnableBracketing property (subsection 6.5.8.1) is set to [On].</p> <p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p>

6.5.2.63 HDREv

○ Property Specifications

Property Code	0xD131
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Auto]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "HDR (high dynamic range) – Exposure differential" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Auto
1	1EV
2	2EV
3	3EV

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The CompressionSetting property (subsection 6.5.1.3) is set to [RAW] or [RAW + JPEG].
	The EnableBracketing property (subsection 6.5.8.1) is set to [On].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.2.64 HDRSmoothing

○ Property Specifications

Property Code	0xD132
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	1 [Normal]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "HDR (high dynamic range) – Smoothing" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	High
1	Normal
2	Low

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The CompressionSetting property (subsection 6.5.1.3) is set to [RAW] or [RAW + JPEG].</p> <p>The EnableBracketing property (subsection 6.5.8.1) is set to [On].</p> <p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p>

6.5.2.65 HDRSaveIndividualImages

○ Property Specifications

Property Code	0xD133
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "HDR (high dynamic range) – Save individual images (NEF)" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The CompressionSetting property (subsection 6.5.1.3) is set to [RAW] or [RAW + JPEG].</p> <p>The EnableBracketing property (subsection 6.5.8.1) is set to [On].</p> <p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p>

6.5.2.66 LiveViewPhotography

○ Property Specifications

Property Code	0xD1AD
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Silent shooting" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

6.5.2.67 FlickerReductionSetting

○ Property Specifications

Property Code	0xD0B7
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Flicker reduction shooting" in the photo shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureDelay property (subsection 6.5.4.17) is not set to [Off].</p> <p>The HDRMode property (subsection 6.5.2.62) is set to [On].</p> <p>The LiveViewPhotography property (subsection 6.5.2.66) is set to [On].</p>

6.5.3 Vendor (Movie Shooting Menu)

6.5.3.1 MovieResetShootingMenu

○ Property Specifications

Property Code	0xD20E
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [No]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Reset shooting menu" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	No
1	Yes (for setting only)

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access Denied	During storing movie frame.

6.5.3.2 MovieCaptureAreaCrop

○ Property Specifications

Property Code	0xD20F
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	0 [FX]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Choose image area" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	FX
1	DX

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The MovieRecordScreenSize property (subsection 6.5.3.3) is set to [slow], [1920x1080 120p] or [1920x1080 100p]. DX lens is mounted on the camera.

6.5.3.3 MovieRecordScreenSize

○ Property Specifications

Property Code	0xD0A0
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	5 [1920×1080 60p]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Image size/frame rate" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	3840x2160 30p
1	3840x2160 25p
2	3840x2160 24p
3	1920x1080 120p
4	1920x1080 100p
5	1920x1080 60p
6	1920x1080 50p
7	1920x1080 30p
8	1920x1080 25p
9	1920x1080 24p
10	1920x1080 30p 4-times slow
11	1920x1080 25p 4-times slow
12	1920x1080 24p 5-times slow

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	During storing movie frame.

6.5.3.4 MovieRecordQuality

○ Property Specifications

Property Code	0xD0A7
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	1 [High quality]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Movie quality" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Normal
1	High quality

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The MovieRecordScreenSize property (subsection 6.5.3.3) is set to [slow], [3840x2160], [1920x1080 120p] or [1920x1080 100p].

6.5.3.5 **MovieFileType**

○ **Property Specifications**

Property Code	0xD0AF
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	0 [MOV]
Property Value	Refer to Property Value in this subsection.

○ **Property Outline**

Indicates "Movie file type" in the movie shooting menu.

○ **Property Value**

The valid PropertyValues are shown below.

Property Value	Description
0	MOV
1	MP4

6.5.3.6 MovieISOAutoHighLimit

○ Property Specifications

Property Code	0xD0AE
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	28 [25600]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Movie ISO sensitivity settings – Maximum sensitivity" in the movie shooting menu.

○ Property Details

When the following conditions are satisfied, the minimum value and maximum value for Movie ISO sensitivity are limited. The setting effective range can be confirmed in the descriptor of this property.

No	Condition
1	The MovieLogOutput property (subsection 6.5.7.23) is [On].

○ Property Value

The valid PropertyValues are shown below.

Maximum sensitivity		ExposureEVStep		
Property Value	Description	1/3 step	1/2 step	1 step
0	200	✓	✓	✓
1	250	✓	-	-
2	280	-	✓	-
3	320	✓	-	-
4	400	✓	✓	✓
5	500	✓	-	-
6	560	-	✓	-
7	640	✓	-	-
8	800	✓	✓	✓
9	1000	✓	-	-
10	1100	-	✓	-
11	1250	✓	-	-
12	1600	✓	✓	✓
13	2000	✓	-	-
14	2200	-	✓	-
15	2500	✓	-	-
16	3200	✓	✓	✓
17	4000	✓	-	-
18	4500	-	✓	-
19	5000	✓	-	-
20	6400	✓	✓	✓
21	8000	✓	-	-
22	9000	-	✓	-
23	10000	✓	-	-
24	12800	✓	✓	✓
25	16000	✓	-	-
26	18000	-	✓	-
27	20000	✓	-	-
28	25600	✓	✓	✓
29	Hi 0.3	✓	-	-
30	Hi 0.5	-	✓	-
31	Hi 0.7	✓	-	-
32	Hi 1	✓	✓	✓
33	Hi 2	✓	✓	✓

O Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	A value that cannot be set is specified depending on the setting of the ExposureEVStep property (subsection 6.5.4.9). The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.7 MovieISOAutoControl

○ Property Specifications

Property Code	0xD0AD
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	1 [On]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Movie ISO sensitivity settings – Auto ISO control (mode M)" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than M during movie recording.</p>

6.5.3.8 MovieExposureIndex

○ Property Specifications

Property Code	0xD1AA
DataType	UINT32
Description form	Enumeration
Get / Set	Get / Set
Default Value	100 [ISO100]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Movie ISO sensitivity settings – ISO sensitivity (mode M)" in the movie shooting menu.

○ Property Details

When the following conditions are satisfied, the minimum value and maximum value for Movie ISO sensitivity are limited. The setting effective range can be confirmed in the descriptor of this property.

No	Condition
1	The MovieLogOutput property (subsection 6.5.7.23) is [On].

○ Property Value

The valid PropertyValues are shown below.

The property value changes depending on the setting of the ExposureEVStep property (subsection 6.5.4.9).

Property Value	Description	ExposureEVStep		
		1/3 step	1/2 step	1 step
64	64	✓	✓	✓
72	72	-	✓	-
80	80	✓	-	-
100	100	✓	✓	✓
125	125	✓	-	-
140	140	-	✓	-
160	160	✓	-	-
200	200	✓	✓	✓
250	250	✓	-	-
280	280	-	✓	-
320	320	✓	-	-
400	400	✓	✓	✓
500	500	✓	-	-
560	560	-	✓	-
640	640	✓	-	-
800	800	✓	✓	✓
1000	1000	✓	-	-
1100	1100	-	✓	-
1250	1250	✓	-	-
1600	1600	✓	✓	✓
2000	2000	✓	-	-
2200	2200	-	✓	-
2500	2500	✓	-	-
3200	3200	✓	✓	✓
4000	4000	✓	-	-
4500	4500	-	✓	-
5000	5000	✓	-	-
6400	6400	✓	✓	✓
8000	8000	✓	-	-
9000	9000	-	✓	-
10000	10000	✓	-	-
12800	12800	✓	✓	✓

Do Not Copy

16000	16000	✓	-	-
18000	18000	-	✓	-
20000	20000	✓	-	-
25600	25600	✓	✓	✓
32000	Hi 0.3	✓	-	-
36000	Hi 0.5	-	✓	-
40000	Hi 0.7	✓	-	-
51200	Hi 1	✓	✓	✓
102400	Hi 2	✓	✓	✓

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than M during movie recording.</p>

6.5.3.9 MovieWhiteBalance

○ Property Specifications

Property Code	0xD23A
DataType	UINT16
Description form	Enumeration
Get / Set	Get / Set
Default Value	0x8015 [Same as photo settings]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "White Balance" in the movie shooting menu.

○ Property Details

When the property value is set to [Same as photo settings], the white balance value that is set in the WhiteBalance (6.5.1.4) is applied to the movie white balance. In this case, the photo white balance setting is used for movie setting as in the following table.

Item	Property
Auto - Type	WbAutoType(6.5.2.13)
Auto - FineTune	WbTuneAuto(6.5.2.14)
Incandescent - FineTune	WbTuneIncandescent(6.5.2.19)
Fluorescent - Type	WbFluorescentType(6.5.2.20)
Fluorescent - FineTune	WbTuneFluorescent(6.5.2.21)
Sunny - FineTune	WbTuneSunny(6.5.2.16)
Flash - FineTune	WbTuneFlash(6.5.2.22)
Cloudy - FineTune	WbTuneCloudy(6.5.2.17)
Shade - FineTune	WbTuneShade(6.5.2.18)
Choose color temp - Value	WbColorTemp(6.5.2.23)
Choose color temp - FineTune	WbTuneColorTemp(6.5.2.24)
Natural light auto - FineTune	WbTuneNatural(6.5.2.15)
Preset manual	WbPresetDataNo(6.5.2.25)
Preset manual-D1- Comment	WbPresetDataComment1(6.5.2.26)
Preset manual-D2- Comment	WbPresetDataComment2(6.5.2.27)
Preset manual-D3- Comment	WbPresetDataComment3(6.5.2.28)
Preset manual-D4- Comment	WbPresetDataComment4(6.5.2.29)
Preset manual-D5- Comment	WbPresetDataComment5(6.5.2.30)
Preset manual-D6- Comment	WbPresetDataComment6(6.5.2.31)
Preset manual-D1- Data	WbPresetDataValue1(6.5.2.32)
Preset manual-D2- Data	WbPresetDataValue2(6.5.2.33)
Preset manual-D3- Data	WbPresetDataValue3(6.5.2.34)
Preset manual-D4- Data	WbPresetDataValue4(6.5.2.35)
Preset manual-D5- Data	WbPresetDataValue5(6.5.2.36)
Preset manual-D6- Data	WbPresetDataValue6(6.5.2.37)
Preset manual-D1- FineTune	WbTunePreset1(6.5.2.38)
Preset manual-D2- FineTune	WbTunePreset2(6.5.2.39)
Preset manual-D3- FineTune	WbTunePreset3(6.5.2.40)
Preset manual-D4- FineTune	WbTunePreset4(6.5.2.41)
Preset manual-D5- FineTune	WbTunePreset5(6.5.2.42)
Preset manual-D6- FineTune	WbTunePreset6(6.5.2.43)
Preset manual-D1- Protect	WbPresetProtect1(6.5.2.44)
Preset manual-D2- Protect	WbPresetProtect2(6.5.2.45)
Preset manual-D3- Protect	WbPresetProtect3(6.5.2.46)
Preset manual-D4- Protect	WbPresetProtect4(6.5.2.47)
Preset manual-D5- Protect	WbPresetProtect5(6.5.2.48)
Preset manual-D6- Protect	WbPresetProtect6(6.5.2.49)

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x0002	Auto
0x0004	Sunny
0x0005	Fluorescent
0x0006	Incandescent
0x8010	Cloudy
0x8011	Shade
0x8012	Choose color temp.
0x8013	Preset manual
0x8015	Same as photo settings
0x8016	Natural light auto

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.</p> <p>[Same as photo settings] was set during movie recording.</p>

6.5.3.10 MovieWbAutoType

○ Property Specifications

Property Code	0xD211
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Keep overall atmosphere]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Keep overall atmosphere
1	Keep warm lighting colors
2	Keep white

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.11 MovieWbTuneAuto

○ Property Specifications

Property Code	0xD212
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

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

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.12 MovieWbTuneNatural

○ Property Specifications

Property Code	0xD23C
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance – Natural light auto” in the movie shooting menu.

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.13 MovieWbTuneSunny

○ Property Specifications

Property Code	0xD216
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

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

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.14 MovieWbTuneCloudy

○ Property Specifications

Property Code	0xD218
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance - Cloudy” in the movie shooting menu.
For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.15 MovieWbTuneShade

○ Property Specifications

Property Code	0xD219
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance – Shade” in the movie shooting menu.
For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.16 MovieWbTuneIncandescent

○ Property Specifications

Property Code	0xD213
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance - Incandescent” in the movie shooting menu.
For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.17 MovieWbFluorescentType

○ Property Specifications

Property Code	0xD214
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	3 [White fluorescent lamp]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
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

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.18 MovieWbTuneFluorescent

○ Property Specifications

Property Code	0xD215
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the fine tuning volume of “White balance - Fluorescent” in the movie shooting menu.
For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.</p>

6.5.3.19 MovieWbColorTemp

○ Property Specifications

Property Code	0xD21A
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	5000 [K]
Property Value	From 2500 K to 10000 K (increase or decrease in units of 10 K)

○ Property Outline

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

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.20 MovieWbTuneColorTemp

○ Property Specifications

Property Code	0xD21B
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	24
Property Value	From 0 to 48

○ Property Outline

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

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.21 MovieWbPresetDataNo

○ Property Specifications

Property Code	0xD21C
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	1 [d-1]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "White balance – Preset manual" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
1	d-1
2	d-2
3	d-3
4	d-4
5	d-5
6	d-6

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.</p>

6.5.3.22 MovieWbPresetDataComment1

○ Property Specifications

Property Code	0xD21D
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	36 characters of spaces (0x20)
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

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).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.
Access_Denied	The MovieWbPresetProtect1 property (subsection 6.5.3.40) is [On]. The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.23 MovieWbPresetDataComment2

○ Property Specifications

Property Code	0xD21E
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	36 characters of spaces (0x20)
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

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).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.
Access_Denied	The MovieWbPresetProtect2 property (subsection 6.5.3.41) is [On]. The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.24 MovieWbPresetDataComment3

○ Property Specifications

Property Code	0xD21F
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	36 characters of spaces (0x20)
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

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).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.
Access_Denied	The MovieWbPresetProtect3 property (subsection 6.5.3.42) is [On]. The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.25 MovieWbPresetDataComment4

○ Property Specifications

Property Code	0xD220
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	36 characters of spaces (0x20)
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

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).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.
Access_Denied	The MovieWbPresetProtect4 property (subsection 6.5.3.43) is [On]. The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.26 MovieWbPresetDataComment5

○ Property Specifications

Property Code	0xD221
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	36 characters of spaces (0x20)
Property Value	(Depends on the user setting)

○ Property Outline

Indicates the comment of “White balance – Preset manual – d-5” in the movie shooting menu.

○ Property Details

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).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.
Access_Denied	The MovieWbPresetProtect5 property (subsection 6.5.3.44) is [On]. The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.27 MovieWbPresetDataComment6

○ Property Specifications

Property Code	0xD222
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	36 characters of spaces (0x20)
Property Value	(Depends on the user setting)

○ Property Outline

Indicates the comment of “White balance – Preset manual – d-6” in the movie shooting menu.

○ Property Details

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).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.
Access_Denied	The MovieWbPresetProtect6 property (subsection 6.5.3.45) is [On]. The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.28 MovieWbPresetDataValue1

○ Property Specifications

Property Code	0xD223
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x08000800 [Rgain: 1.0, Bgain: 1.0]
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

Refer to PreWbGainValue in SetPreWbData (subsection 6.2.2.38) about the format of the PropertyValue.

6.5.3.29 MovieWbPresetDataValue2

○ Property Specifications

Property Code	0xD224
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x08000800 [Rgain: 1.0, Bgain: 1.0]
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

Refer to PreWbGainValue in SetPreWbData (subsection 6.2.2.38) about the format of the PropertyValue.

6.5.3.30 MovieWbPresetDataValue3

○ Property Specifications

Property Code	0xD225
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x08000800 [Rgain: 1.0, Bgain: 1.0]
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

Refer to PreWbGainValue in SetPreWbData (subsection 6.2.2.38) about the format of the PropertyValue.

6.5.3.31 MovieWbPresetDataValue4

○ Property Specifications

Property Code	0xD226
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x08000800 [Rgain: 1.0, Bgain: 1.0]
Property Value	(Depends on the user setting)

○ Property Outline

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

○ Property Details

Refer to PreWbGainValue in SetPreWbData (subsection 6.2.2.38) about the format of the PropertyValue.

6.5.3.32 MovieWbPresetDataValue5

○ Property Specifications

Property Code	0xD227
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x08000800 [Rgain: 1.0, Bgain: 1.0]
Property Value	(Depends on the user setting)

○ Property Outline

Indicates the white balance data of “White balance – Preset manual – d-5” in the movie shooting menu.

○ Property Details

Refer to PreWbGainValue in SetPreWbData (subsection 6.2.2.38) about the format of the PropertyValue.

6.5.3.33 MovieWbPresetDataValue6

○ Property Specifications

Property Code	0xD228
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x08000800 [Rgain: 1.0, Bgain: 1.0]
Property Value	(Depends on the user setting)

○ Property Outline

Indicates the white balance data of “White balance – Preset manual – d-6” in the movie shooting menu.

○ Property Details

Refer to PreWbGainValue in SetPreWbData (subsection 6.2.2.38) about the format of the PropertyValue.

6.5.3.34 MovieWbTunePreset1

○ Property Specifications

Property Code	0xD229
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

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

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The MovieWbPresetProtect1 property (subsection 6.5.3.40) is [On].
	The MovieWbPresetDataNo property (subsection 6.5.3.21) is set to anything other than [d-1].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.35 MovieWbTunePreset2

○ Property Specifications

Property Code	0xD22A
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

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

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The MovieWbPresetProtect2 property (subsection 6.5.3.41) is [On].
	The MovieWbPresetDataNo property (subsection 6.5.3.21) is set to anything other than [d-2].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.36 MovieWbTunePreset3

○ Property Specifications

Property Code	0xD22B
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

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

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The MovieWbPresetProtect3 property (subsection 6.5.3.42) is [On].
	The MovieWbPresetDataNo property (subsection 6.5.3.21) is set to anything other than [d-3].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.37 MovieWbTunePreset4

○ Property Specifications

Property Code	0xD22C
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

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

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The MovieWbPresetProtect4 property (subsection 6.5.3.43) is [On].
	The MovieWbPresetDataNo property (subsection 6.5.3.21) is set to anything other than [d-4].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.38 MovieWbTunePreset5

○ Property Specifications

Property Code	0xD22D
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the white balance fine tuning volume of “White balance – Preset manual – d-5” in the movie shooting menu.

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The MovieWbPresetProtect5 property (subsection 6.5.3.44) is [On].
	The MovieWbPresetDataNo property (subsection 6.5.3.21) is set to anything other than [d-5].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.39 MovieWbTunePreset6

○ Property Specifications

Property Code	0xD22E
DataType	UINT16
Description form	Range
Get / Set	Get / Set
Default Value	612
Property Value	From 0 to 1224

○ Property Outline

Indicates the white balance fine tuning volume of “White balance – Preset manual – d-6” in the movie shooting menu.

For the details of the fine tuning volume, refer to subsection 0.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The MovieWbPresetProtect6 property (subsection 6.5.3.45) is [On].
	The MovieWbPresetDataNo property (subsection 6.5.3.21) is set to anything other than [d-6].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The MovieWhiteBalance property (subsection 6.5.3.9) is set to [Same as photo settings] during movie recording.

6.5.3.40 MovieWbPresetProtect1

○ Property Specifications

Property Code	0xD22F
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.41 MovieWbPresetProtect2

○ Property Specifications

Property Code	0xD230
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.42 MovieWbPresetProtect3

○ Property Specifications

Property Code	0xD231
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.43 MovieWbPresetProtect4

○ Property Specifications

Property Code	0xD232
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.44 MovieWbPresetProtect5

○ Property Specifications

Property Code	0xD233
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the protection of “White balance – Preset manual – d-5” in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.45 MovieWbPresetProtect6

○ Property Specifications

Property Code	0xD234
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the protection of “White balance – Preset manual – d-6” in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.3.46 MovieWhiteBalanceReset

○ Property Specifications

Property Code	0xD235
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [No]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates reset of the MovieWhiteBalance property (subsection 6.5.3.9).

If 1 [Yes] is specified when setting the property, the values of the following properties are reset to the DefaultValues.

Property
MovieWhiteBalance property (6.5.3.9)
MovieWbAutoType property (6.5.3.10)
MovieWbTuneAuto property (6.5.3.11)
MovieWbTuneIncandescent property (6.5.3.16)
MovieWbFluorescentType property (6.5.3.17)
MovieWbTuneFluorescent property (6.5.3.18)
MovieWbTuneNatural property (6.5.3.12)
MovieWbTuneSunny property (6.5.3.13)
MovieWbTuneCloudy property (6.5.3.14)
MovieWbTuneShade property (6.5.3.15)
MovieWbColorTemp property (6.5.3.19)
MovieWbTuneColorTemp property (6.5.3.20)
MovieWbPresetDataNo property (6.5.3.21)

○ Property Value

The valid PropertyValues are shown below.

PropertyValue	Description
0	No
1	Yes (for setting only)

6.5.3.47 MovieActive-D-Lighting

○ Property Specifications

Property Code	0xD23B
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Active D-Lighting" in the movie shooting menu.

○ Property Details

When this is set to [Same as photo settings], the current value of the Active-D-Lighting property (subsection 6.5.2.52) is used in this property. If the Active-D-Lighting property is set to [Auto], this property is set to [Normal].

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	Low
2	Normal
3	High
4	Extra high
5	Same as photo settings

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM. The MovieLogOutput property (subsection 6.5.7.23) is [On].

6.5.3.48 MovieNoiseReductionHilso

○ Property Specifications

Property Code	0xD236
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	2 [Normal]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "High ISO NR" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	Low
2	Normal
3	High

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The MovieLogOutput property (subsection 6.5.7.23) is [On].

6.5.3.49 MovieVignetteControl

○ Property Specifications

Property Code	0xD23E
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	2 [Normal]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Vignette control" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	Low
2	Normal
3	High
100	Same as photo settings

6.5.3.50 MovieDiffractionCompensation

○ Property Specifications

Property Code	0xD23F
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	1 [On]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Diffraction compensation" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

6.5.3.51 MovieAutoDistortion

○ Property Specifications

Property Code	0xD0BC
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	1 [On]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Auto distortion control" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The LensTypeML property (subsection 6.5.10.2) is set to [Lens whose automatic distortion correction is always effective].

6.5.3.52 DecreaseFlicker

○ Property Specifications

Property Code	0xD034
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	2 [Auto]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the setting of “Flicker reduction” in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	50 Hz
1	60 Hz
2	Auto

6.5.3.53 MovieExposureMeteringMode

○ Property Specifications

Property Code	0xD1AF
DataType	UINT16
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0x0003 [Matrix metering]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the setting of “Exposure metering mode” in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x0002	Center-weighted metering
0x0003	Matrix metering
0x8010	Highlight-weighted metering

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM. The AELockStatus property (subsection 6.5.7.7) is [Locked].

6.5.3.54 MovieFocusMode

○ Property Specifications

Property Code	0xD1FA
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	2 [AF-F]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates “Focus mode” in movie shooting.

○ Property Details

If the following conditions are satisfied, it operates with MF mode even when this property is set to AF.

- CPU lens is not mounted.
- The switches on the camera or lens are set to MF.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	AF-S
1	AF-C
2	AF-F
4	MF

6.5.3.55 MovieAfAreaMode

○ Property Specifications

Property Code	0xD1F8
DataType	UINT16
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0x8011 [Auto-area AF mode]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "AF-area mode" in movie shooting.

○ Property Details

In the following cases, this property is set to the single-point AF mode. When the following state is canceled without changing the AF area mode, it returns to the AF area mode which was set immediately before.

- In the case that the MovieFocusMode property (subsection 6.5.3.54) is [MF].

○ Property Value

The valid PropertyValues are shown below.

The value of PropertyValue changes depending on the value of the movie focus mode.

Property Value	Description	Movie focus mode setting			
		MF	AF-S	AF-C	AF-F
0x8010	Single-point AF mode	✓	✓	✓	✓
0x8011	Auto-area AF mode	-	✓	✓	✓
0x8018	Wide-area AF (S)	-	✓	✓	✓
0x8019	Wide-area AF (L)	-	✓	✓	✓

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The movie focus mode is set to the manual focus.

6.5.3.56 MovieVibrationReduction

○ Property Specifications

Property Code	0xD1F9
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	100 [Same as photo settings]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the setting of “Vibration reduction” in the movie shooting menu.

○ Property Details

The supported value changes depending on the type of mounted lens.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	Normal
2	Sports
100	Same as photo settings

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The mounted lens has VR switch.</p> <p>The LensSort property (subsection 6.5.10.1) is set to [Not mounted] and the FmmManualSetting property (subsection 6.5.5.8) is set to [Not set].</p> <p>The ML lens with VR function is mounted.</p>

6.5.3.57 ElectronicVR

○ Property Specifications

Property Code	0xD314
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the setting of “Electronic VR” in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The MovieRecordScreenSize property (subsection 6.5.3.3) is set to [slow], [1920x1080 120p] or [1920x1080 100p].

6.5.3.58 MovieRecordMicrophoneLevel

○ Property Specifications

Property Code	0xD0A2
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Auto sensitivity]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Microphone sensitivity" in the movie shooting menu.

○ Property Details

Switching between [Auto sensitivity/Manual sensitivity] and [Microphone off] cannot be performed during movie recording.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Auto sensitivity
1	Reserved
2	Reserved
3	Reserved
4	Microphone off
5	Manual sensitivity

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	[Microphone off] is set during movie recording. [Microphone off] is set while [Auto sensitivity] or [Manual sensitivity] is specified during movie recording. The MovieRecordScreenSize property (subsection 6.5.3.3) is set to [slow].

6.5.3.59 MovieRecordMicrophoneLevelValue

○ Property Specifications

Property Code	0xD0A8
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	15
Property Value	From 1 to 20

○ Property Outline

Indicates the microphone sensitivity of “Microphone sensitivity – Manual sensitivity” in the movie shooting menu.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The MovieRecordMicrophoneLevel property (subsection 6.5.3.58) is set to anything other than [Manual sensitivity].</p> <p>The MovieRecordScreenSize property (subsection 6.5.3.3) is set to [slow].</p>

6.5.3.60 MovieAttenuator

○ Property Specifications

Property Code	0xD23D
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Attenuator" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The MovieRecordMicrophoneLevel property (subsection 6.5.3.58) is set to [Microphone off] during movie recording.</p> <p>The MovieRecordScreenSize property (subsection 6.5.3.3) is set to [slow].</p>

6.5.3.61 MovieRecordingZone

○ Property Specifications

Property Code	0xD0AC
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Wide range]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Frequency response" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Wide range
1	Vocal range

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The MovieRecordMicrophoneLevel property (subsection 6.5.3.58) is set to [Microphone off] during movie recording.</p> <p>The MovieRecordScreenSize property (subsection 6.5.3.3) is set to [slow].</p>

6.5.3.62 MovieWindNoiseReduction

○ Property Specifications

Property Code	0xD0AA
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Wind noise reduction" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>An external microphone is connected.</p> <p>The MovieRecordMicrophoneLevel property (subsection 6.5.3.58) is set to [Microphone off] during movie recording.</p> <p>The MovieRecordScreenSize property (subsection 6.5.3.3) is set to [slow].</p>

6.5.3.63 RecordTimeCodes

○ Property Specifications

Property Code	0xD1FB
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Time codes – Recording time codes" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On
2	On (with HDMI external output)

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	During time not set warning.

6.5.3.64 CountUpMethod

○ Property Specifications

Property Code	0xD1FC
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0 [Rec Run]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Time codes – Count up method" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Rec Run
1	Free Run

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The RecordTimeCodes property (subsection 6.5.3.63) is set to [Off]. During time not set warning.

6.5.3.65 TimeCodeOrigin

○ Property Specifications

Property Code	0xD1FD
DataType	AUINT8
Description form	None
Get / Set	Get, Get / Set
Default Value	Array[0]: 2 [Current time] From Array[1] to [4]: 0
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Time codes – Time code origin" in the movie shooting menu.

○ Property Details

If Array[0] (Time code origin information) is set to the value other than 1 (Manual input), it is as follows.

Get/Set	Description
Get operation	The values from Array[1] to Array[4] are not fixed.
Set operation	Any values set from Array[1] to Array[4] are ignored.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description	
NumElement	Time code origin information, Number of elements of time	
Array[0]	Time code origin information	
0	Reset	
1	Manual input	
2	Current time	
Array[1]	Hour (From 00 to 23)	
Array[2]	Minute (From 00 to 59)	
Array[3]	Second (From 00 to 59)	
Array[4]	Frame *1 24fps (From 00 to 23) 25/50/100fps (From 00 to 24) 30/60/120fps (From 00 to 29)	

*1 The range of the settable value changes depending on the frame rate of the MovieRecordScreenSize property (subsection 6.5.3.3).

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The RecordTimeCodes property (subsection 6.5.3.63) is set to [Off]. During time not set warning.

6.5.3.66 DropFrame

○ Property Specifications

Property Code	0xD1FE
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	1 [On]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Time codes – Drop frame" in the movie shooting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The RecordTimeCodes property (subsection 6.5.3.63) is set to [Off]. During time not set warning.

6.5.4 Vendor (Custom Setting Menu)

6.5.4.1 ResetCustomSetting

○ Property Specifications

Property Code	0xD045
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [No]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates “Reset custom settings” in the custom setting menu.

If [Yes] is specified when setting the property, resetting of the custom setting menu is performed.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	No
1	Yes (for setting only)

6.5.4.2 DynamicAFonAFC

○ Property Specifications

Property Code	0xD048
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Release]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Autofocus – AF-C priority selection" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Release
1	Focus

6.5.4.3 DynamicAFonAFS

○ Property Specifications

Property Code	0xD049
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Focus]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Autofocus – AF-S priority selection" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Focus
1	Release

6.5.4.4 AFStillLockOnAcross

○ Property Specifications

Property Code	0xD046
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	3
Property Value	From 1 [High sensitivity] to 5 [Low sensitivity]

○ Property Outline

Indicates “Autofocus – Focus tracking with lock-on – Across” in the custom setting menu.

6.5.4.5 FaceDetection

○ Property Specifications

Property Code	0xD09D
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	2 [Face and eye detection]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Autofocus – Face and eye detection on auto-area AF" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	Face detection
2	Face and eye detection
3	Animal detection

6.5.4.6 EnableAFAreaPoint

○ Property Specifications

Property Code	0xD08D
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [All points]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

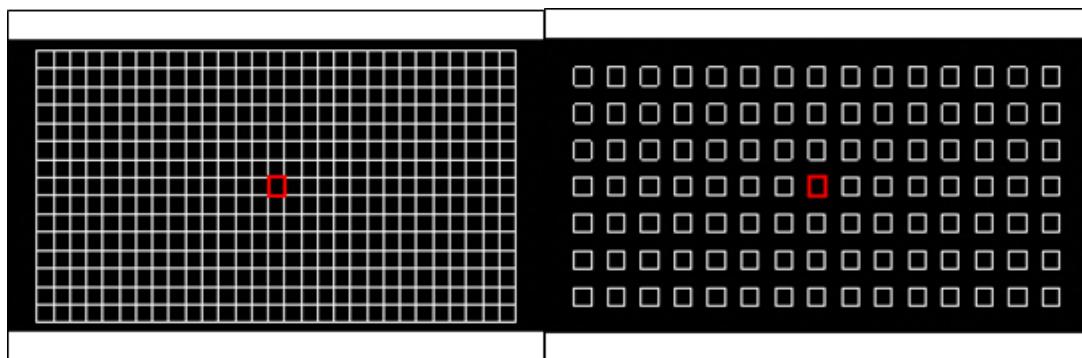
Indicates "Autofocus – Number of focus points" in the custom setting menu.

○ Property Details

If the selected focus point is not included in the skip when the focus points are switched from all points to skip, the selected focus point is changed automatically.

A change pattern of focus points is shown below.

The focus points on the left figure (All points) are changed to the focus points on the right figure (Skip).



○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	All points
1	Skip

6.5.4.7 FocusAreaSelect

○ Property Specifications

Property Code	0xD04F
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [No wrap]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Autofocus – Focus point wrap-around" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	No wrap
1	Wrap

6.5.4.8 LowLightAF

○ Property Specifications

Property Code	0xD17A
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Autofocus – Low light AF" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.4.9 ExposureEVStep

○ Property Specifications

Property Code	0xD056
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [1/3 step]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Metering/exposure – EV steps for exposure cntrl" in the custom setting menu.

○ Property Details

If the value of PropertyValue is changed, the AEBracketingStep property (subsection 6.5.8.2) is set to 1 EV and the AEBracketingPattern property (subsection 6.5.8.3) is set to [0 image].

○ Property Value

The valid PropertyValue are shown below.

Property Value	Description
0	1/3 step
1	1/2 step
2	1 step

6.5.4.10 CenterWeightedExRange

○ Property Specifications

Property Code	0xD059
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	1 [Φ12 mm]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Metering/exposure – Center-weighted area" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Average
1	Φ12 mm

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.4.11 ExposureBaseCompMatrix

○ Property Specifications

Property Code	0xD05A
DataType	INT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [0.0 EV]
Property Value	From -6 [-1.0 EV] to +6 [+1.0 EV]

○ Property Outline

Indicates "Metering/exposure – Fine-tune optimal exposure - Matrix metering" in the custom setting menu.

6.5.4.12 ExposureBaseCompCenter

○ Property Specifications

Property Code	0xD05B
DataType	INT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [0.0 EV]
Property Value	From -6 [-1.0 EV] to +6 [+1.0 EV]

○ Property Outline

Indicates "Metering/exposure – Fine-tune optimal exposure - Center-weighted metering" in the custom setting menu.

6.5.4.13 ExposureBaseCompSpot

○ Property Specifications

Property Code	0xD05C
DataType	INT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [0.0 EV]
Property Value	From -6 [-1.0 EV] to +6 [+1.0 EV]

○ Property Outline

Indicates "Metering/exposure – Fine-tune optimal exposure - Spot metering" in the custom setting menu.

6.5.4.14 ExposureBaseCompHighlight

○ Property Specifications

Property Code	0xD239
DataType	INT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [0.0 EV]
Property Value	From -6 [-1.0 EV] to +6 [+1.0 EV]

○ Property Outline

Indicates "Metering/exposure – Fine-tune optimal exposure - Highlight-weighted metering" in the custom setting menu.

6.5.4.15 CSpeedLow

○ Property Specifications

Property Code	0xD068
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	6 [3 fps]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates “Shooting/display – Continuous shooting speed – Continuous low-speed” in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
4	5 fps
5	4 fps
6	3 fps
7	2 fps
8	1 fps

6.5.4.16 BurstMaxNumber**O Property Specifications**

Property Code	0xD069
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	200 [200 frames]
Property Value	From 1 [One frame] to 200 [200 frames]

O Property Outline

Indicates "Shooting/display – Max. continuous release" in the custom setting menu.

6.5.4.17 **ExposureDelay**

○ **Property Specifications**

Property Code	0xD06A
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ **Property Outline**

Indicates “Shooting/display – Exposure delay mode” in the custom setting menu.

○ **Property Value**

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	3 s
2	2 s
3	1 s
4	0.5 s
5	0.2 s

6.5.4.18 ElectronicFrontCurtainShutter

○ Property Specifications

Property Code	0xD20D
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	2 [Auto]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Shooting/display – Shutter" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Mechanical shutter
1	Electronic front curtain shutter
2	Auto

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The LiveViewPhotography property (subsection 6.5.2.66) is set to [On].</p>

6.5.4.19 NumberingMode

○ Property Specifications

Property Code	0xD06C
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	1 [On]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Shooting/display – File number sequence" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On
2	Reset (for setting only)

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The HDRMode property (subsection 6.5.2.62) is set to [On].

6.5.4.20 ApplyLiveViewSetting

○ Property Specifications

Property Code	0xD17B
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	1 [On]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Shooting/display – Apply settings to live view" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

6.5.4.21 DetectionPeaking

○ Property Specifications

Property Code	0xD1B9
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates “Peaking – Peaking detection” in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	Low
2	Normal
3	High

6.5.4.22 FlashSyncSpeed

○ Property Specifications

Property Code	0xD074
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	1 [1/200 s]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates “Bracketing/flash – Flash sync speed” in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	1/200 s (auto FP)
1	1/200 s
2	1/160 s
3	1/125 s
4	1/100 s
5	1/80 s
6	1/60 s

6.5.4.23 FlashSlowSpeedLimit

○ Property Specifications

Property Code	0xD075
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [1/60 s]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates “Bracketing/flash – Flash shutter speed” in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	1/60 s
1	1/30 s
2	1/15 s
3	1/8 s
4	1/4 s
5	1/2 s
6	1 s
7	2 s
8	4 s
9	8 s
10	15 s
11	30 s

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.4.24 ExposureCompFlashUsed

○ Property Specifications

Property Code	0xD118
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Entire frame]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Bracketing/flash – Exposure comp. for flash" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Entire frame
1	Background only

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.4.25 SelectBracketChangeFactor

○ Property Specifications

Property Code	0xD079
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Flash/speed]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates “Bracketing/flash – Auto bracketing (mode M)” in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Flash/speed
1	Flash/speed/aperture
2	Flash/aperture
3	Flash only

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.4.26 BracketingOrder

○ Property Specifications

Property Code	0xD07A
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [[0] -> [-] -> [+]]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Bracketing/flash – Bracketing order" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	[0] -> [-] -> [+]
1	[-] -> [0] -> [+]

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.4.27 TVLockSetting

○ Property Specifications

Property Code	0xD112
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Controls – Shutter spd & aperture lock – Shutter speed lock" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is not set to [S] or [M].</p> <p>An error or warning is displayed on shutter speed or aperture value display. (Which one of the shutter speed or aperture value display turns off is the target.)</p> <p>Card unformatted error.</p> <p>The firmware update failed with the lens mounted.</p>

6.5.4.28 AVLockSetting

○ Property Specifications

Property Code	0xD113
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Controls – Shutter spd & aperture lock – Aperture lock" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is not set to [S], [A] or [M].</p> <p>An error or warning is displayed on shutter speed or aperture value display. (Which one of the shutter speed or aperture value display turns off is the target.)</p> <p>Card unformatted error.</p> <p>The firmware update failed with the lens mounted.</p>

6.5.4.29 MovieReleaseButton

○ Property Specifications

Property Code	0xD197
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	0 [Take photos]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Movie – Assign custom button – Shutter button" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Take photos
1	Record movies

6.5.4.30 MovieAfSpeed

○ Property Specifications

Property Code	0xD17C
DataType	INT8
Description form	Range
Get / Set	Get / Set
Default Value	0
Property Value	From -5[Low speed] to 5[High speed]

○ Property Outline

Indicates "Movie – AF speed" in the custom setting menu.

6.5.4.31 MovieAfSpeedWhenToApply

○ Property Specifications

Property Code	0xD17D
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	0 [Always]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Movie – AF speed – When to apply" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Always
1	Only while recording

6.5.4.32 MovieAfTrackingSensitivity

○ Property Specifications

Property Code	0xD17E
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	4
Property Value	From 1 [High sensitivity] to 7 [Low sensitivity]

○ Property Outline

Indicates "Movie – AF tracking sensitivity" in the custom setting menu.

6.5.4.33 HighlightBrightness

○ Property Specifications

Property Code	0xD1DF
DataType	UINT16
Description form	Enumeration
Get / Set	Get / Set
Default Value	0x00F8 [248]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Movie – Highlight - Brightness setting on the highlight" in the custom setting menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x00B4	180
0x00BF	191
0x00CA	202
0x00D5	213
0x00E0	224
0x00EB	235
0x00F8	248
0x00FF	255

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The DetectionPeaking property (subsection 6.5.4.21) is set to anything other than [Off].</p>

6.5.5 Vendor (Setup Menu)

6.5.5.1 ImageSensorCleaning

○ Property Specifications

Property Code	0xD08F
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	2 [Clean at shutdown]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the setting of “Clean image sensor – Clean at startup/shutdown” in the setup menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Cleaning off
1	Reserved
2	Clean at shutdown

6.5.5.2 CommentString

○ Property Specifications

Property Code	0xD090
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	NULL (0x00) 0 character
Property Value	(Depends on the user setting)

○ Property Outline

Indicates "Image comment" in the setup menu.

○ Property Details

The PropertyValue is an optional string of 36 characters (not including the null character).

When the comment is not set in the camera, the length of the string is 0 (not including the null character).

The camera does not send the DevicePropChanged event (subsection 6.4.1.6) even if the PropertyValue is changed.

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.

6.5.5.3 **EnableComment**

○ **Property Specifications**

Property Code	0xD091
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Not attached]
Property Value	Refer to Property Value in this subsection.

○ **Property Outline**

Indicates "Image comment – Attach comment" in the setup menu.

○ **Property Value**

The valid PropertyValues are shown below.

Property Value	Description
0	Not attached
1	Attached

6.5.5.4 ArtistV

○ Property Specifications

Property Code	0xD072
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	NULL (0x00) 0 character
Property Value	(Depends on the user setting)

○ Property Outline

Indicates "Artist" in the setup menu.

○ Property Details

The PropertyValue is an optional string of 36 characters or shorter (not including the null character).

If the artist is not set in the camera, the value is zero length string (not including the null character).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made as shown below and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 36 characters is set.

6.5.5.5 CopyrightV

○ Property Specifications

Property Code	0xD073
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	NULL (0x00) 0 character
Property Value	(Depends on the user setting)

○ Property Outline

Indicates "Copyright" in the setup menu.

○ Property Details

The PropertyValue is an optional string of 54 characters or shorter (not including the null character).

If the copyright is not set in the camera, the value is zero length string (not including the null character).

For the characters that can be input (ASCII code), refer to subsection 10.1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_DeviceProp_Format	A string exceeding 54 characters is set.

6.5.5.6 EnableCopyright

○ Property Specifications

Property Code	0xD053
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Not attached]
Property Value	(Depends on the user setting)

○ Property Outline

Indicates "Copyright information– Attach copyright information" in the setup menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Not attached
1	Attached

6.5.5.7 ManualSettingLensNo**O Property Specifications**

Property Code	0xD093
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [No.1]
Property Value	From 0 [No. 1] to 19 [No. 20]

O Property Outline

Indicates "Non-CPU lens data – Lens number" in the setup menu.

6.5.5.8 FmmManualSetting

○ Property Specifications

Property Code	0xD02E
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Not set]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Non-CPU lens data – Focal length (mm)" in the setup menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
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

6.5.5.9 F0ManualSetting

○ Property Specifications

Property Code	0xD02F
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Not set]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Non-CPU lens data – Maximum aperture" in the setup menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
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

6.5.5.10 External Recording Control

○ Property Specifications

Property Code	0xD1DE
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "HDMI – External recording control" in the setup menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

6.5.5.11 EnableShutter

○ Property Specifications

Property Code	0xD08A
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Enable release]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Slot empty release lock" in the setup menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Enable release
1	Release locked

6.5.5.12 MovieLogSetting

○ Property Specifications

Property Code	0xD0BF
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "HDMI – N-log setting" in the setup menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On (Card recording not possible)

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The HDMIOutputDataDepth property (subsection 6.5.5.13) is set to [8 bits].

6.5.5.13 **HDMIOutputDataDepth**

○ **Property Specifications**

Property Code	0xD0CC
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	0 [8 bits]
Property Value	Refer to Property Value in this subsection.

○ **Property Outline**

Indicates “HDMI – Output data depth” in the setup menu.

○ **Property Value**

The valid PropertyValues are shown below.

Property Value	Description
0	8 bits
1	10 bits

6.5.5.14 SaveFocusPosition

○ Property Specifications

Property Code	0xD0CD
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the setting of “Save focus position” in the setup menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

6.5.6 Vendor (Power Supply)

6.5.6.1 ExternalDC-IN

○ Property Specifications

Property Code	0xD101
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Not connected]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the AC adapter connection status.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Not connected
1	Connected

6.5.7 Vendor (Camera Information)

6.5.7.1 UserMode

○ Property Specifications

Property Code	0xD0FC
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	19 [P]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates [User mode] set in the camera.

○ Property Details

This property specifies the shooting mode when the ExposureProgramMode property (subsection 6.5.1.11) is set to [U1/U2/U3].

If the ExposureProgramMode property is set to [U1], this property specifies the shooting mode for U1. If [U2] is set, this property specifies the shooting mode for U2. If [U3] is set, this property specifies the shooting mode for U3.

If any value other than [User mode] is set, the value of this property is not guaranteed.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
19	P
20	S
21	A
22	M
23	AUTO

6.5.7.2 Orientation

○ Property Specifications

Property Code	0xD10E
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Landscape or not fixed]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the orientation information.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Landscape or not fixed
1	Portrait (grip side upward)
2	Portrait (grip side downward)
3	Landscape (upside down)

6.5.7.3 Recording Media

○ Property Specifications

Property Code	0xD10B
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Card]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the recording destination of the images captured by using the shutter-release button of the camera.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Card
1	SDRAM
2	Card and SDRAM

6.5.7.4 ExposureRemaining

○ Property Specifications

Property Code	0xD1F1
DataType	UINT32
Description form	Range
Get / Set	Get
Default Value	0 [0 frames]
Property Value	0 [0 frames] to 4294967295 [4294967295 frames]

○ Property Outline

Indicates the number of frames that can be recorded on the card.

○ Property Details

The value changes depending on the setting of the camera. When a card is not inserted in the camera, it should be 0 frames.

Even if the total exceeds 4294967295 frames, the value of PropertyValue is set to 4294967295.

6.5.7.5 ContinuousShootingCount

○ Property Specifications

Property Code	0xD1B4
DataType	UINT16
Description form	Range
Get / Set	Get
Default Value	360 [360 frames]
Property Value	From 0 [0 frames] to 360 [360 frames]

○ Property Outline

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 6.5.7.3).

○ Property Details

The number of continuous shooting frames changes depending on the following setting values on the camera.

Set contents	Property
Image quality mode	CompressionSetting property (subsection 6.5.1.3)
Image size	ImageSize property (subsection 6.5.1.2)
Long exposure noise reduction	NoiseReduction property (subsection 6.5.2.53)
High ISO noise reduction	NoiseReductionHilso property (subsection 6.5.2.54)
HDR	HDRMode property (subsection 6.5.2.62)
Max. continuous release	BurstMaxNumber property (subsection 6.5.4.16)
Choose image area	CaptureAreaCrop property (subsection 6.5.2.2)
NEF (RAW) recording – Compression Type	RawCompressionType property (subsection 6.5.2.4)
NEF (RAW) recording – NEF (RAW) bit depth	RawCompressionBitMode property (subsection 6.5.2.5)
Silent shooting	LiveViewPhotography property (subsection 6.5.2.66)
Photo/Movie switching lever	LiveViewSelector property (subsection 6.5.12.8)

6.5.7.6 MovieRecFrameCount

○ Property Specifications

Property Code	0xD1B7
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	50 [50 frames]
Property Value	From 0 [0 frames] to 50 [50 frames]

○ Property Outline

Indicates the number of frames that can be recorded in photo shooting during recording movie.

6.5.7.7 AE Lock Status

○ Property Specifications

Property Code	0xD105
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Lock released]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the AE lock status.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Lock released
1	Locked

6.5.7.8 AFLockStatus

○ Property Specifications

Property Code	0xD104
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Lock released]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the AF lock status.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Lock released
1	Locked

6.5.7.9 FVLockStatus

○ Property Specifications

Property Code	0xD106
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Lock released]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the FV lock status.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Lock released
1	Locked

6.5.7.10 ShutterSpeed

○ Property Specifications

Property Code	0xD100
DataType	UINT32
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	(Minimum value in the setting range)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates "Shutter speed" that is set in the camera.

For the shutter speed during movie live view, the MovieShutterSpeed property (subsection 6.5.12.10) should be used.

○ Property Details

This property can handle the 1/1000 or low shutter speed in addition to the ExposureTime property (subsection 6.5.1.10).

The enumerated values and the change factor are the same as that of the ExposureTime property except for the flash shooting synchronization speed.

The flash shooting synchronization speed is set to 0xFFFFFFFF. It is not the shutter speed specified in the flash shooting synchronization speed of the ExposureTime property.

○ Property Value

The valid PropertyValues are shown below. (Excluding bulb shooting, flash shooting synchronization speed, and time shooting)

Property Value	Description
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

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is not set to [S] or [M].</p> <p>The WarningStatus property (subsection 6.5.7.19) is [Sequence error] or [Minimum aperture warning].</p> <p>TVLockSetting property (subsection 6.5.4.27) is set to [On].</p> <p>The RetractableLensWarning property (subsection 6.5.10.9) is [(Retractable lens warning) On].</p> <p>Bulb shooting or time shooting is set when the ExposureProgramMode property (subsection 6.5.1.11) is [S].</p> <p>Bulb shooting or time shooting is set when the HDRMode property (subsection 6.5.2.62) is set to [On].</p>

6.5.7.11 FlexibleProgram

○ Property Specifications

Property Code	0xD109
DataType	INT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [0.0 EV]
Property Value	From -30 [-5 EV] to +30 [+5 EV]

○ Property Outline

Indicates the program shift value in units of 1/6 EV.

○ Property Details

When the value of the ExposureProgramMode property (subsection 6.5.1.11) 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 6.5.4.9).

ExposureEVStep	StepSize
0 (1/3 EV)	2
1 (1/2 EV)	3
2 (1 EV)	6

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than [P].</p> <p>The RetractableLensWarning property (subsection 6.5.10.9) is [(Retractable lens warning) On].</p>

6.5.7.12 ISOControlSensitivity

○ Property Specifications

Property Code	0xD0B5
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	100 [ISO 100]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates ISO sensitivity that is controlled by the camera.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description	Property Value	Description
32	Lo1.0	6400	ISO6400
40	Lo0.7	7200	ISO7200
45	Lo0.5	8000	ISO8000
50	Lo0.3	9000	ISO9000
56	ISO56	10000	ISO10000
64	ISO64	11000	ISO11000
72	ISO72	12800	ISO12800
80	ISO80	14400	ISO14400
90	ISO90	16000	ISO16000
100	ISO100	18000	ISO18000
110	ISO110	20000	ISO20000
125	ISO125	22000	ISO22000
140	ISO140	25600	ISO25600
160	ISO160	28800	Hi0.2
180	ISO180	32000	Hi0.3
200	ISO200	36000	Hi0.5
220	ISO220	40000	Hi0.7
250	ISO250	45600	Hi0.8
280	ISO280	51200	Hi1.0
320	ISO320	57600	Hi1.2
360	ISO360	64000	Hi1.3
400	ISO400	72000	Hi1.5
450	ISO450	81200	Hi1.7
500	ISO500	91200	Hi1.8
560	ISO560	102400	Hi2.0
640	ISO640		
720	ISO720		
800	ISO800		
900	ISO900		
1000	ISO1000		
1100	ISO1100		
1250	ISO1250		
1400	ISO1400		
1600	ISO1600		
1800	ISO1800		
2000	ISO2000		
2200	ISO2200		
2500	ISO2500		
2800	ISO2800		
3200	ISO3200		
3600	ISO3600		
4000	ISO4000		
4500	ISO4500		
5000	ISO5000		
5600	ISO5600		

6.5.7.13 ExposureDisplayStatus

○ Property Specifications

Property Code	0xD1B0
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Normal]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the display status of the shutter speed and the aperture value in the camera.

○ Property Details

It is 1 (only shutter speed is blinking) during bulb/time warning.

○ Property Value

The valid PropertyValues are shown below.

		Shutter speed	
		Normal	Blinking
Aperture value	Normal	0	1
	Blinking	2	3

6.5.7.14 **ExposureIndicateStatus**

○ **Property Specifications**

Property Code	0xD1B1
DataType	INT8
Description form	Range
Get / Set	Get
Default Value	0 [0.0 EV]
Property Value	From -60 [-10 EV] to +60 [+10 EV]

○ **Property Outline**

Indicates the display value of the indicator in units of 1/6 EV.

When the ExposureIndicateLightup property (subsection 6.5.7.15) is [Off], the value of PropertyValue is not fixed.

6.5.7.15 **ExposureIndicateLightup**

○ **Property Specifications**

Property Code	0xD1B3
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [On]
Property Value	Refer to Property Value in this subsection.

○ **Property Outline**

Indicates the indicator display On/Off.

○ **Property Value**

The valid PropertyValues are shown below.

Property Value	Description
0	On
1	Off

6.5.7.16 AngleLevel

○ Property Specifications

Property Code	0xD067
DataType	INT32
Description form	None
Get / Set	Get
Default Value	0 [Horizontal]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the level angle information of the camera.

○ Property Details

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 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 camera does not send a DevicePropChanged event (subsection 6.4.1.6).

○ Property Value

The valid PropertyValue are shown below.

Property Value	Description
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.

6.5.7.17 AngleLevelPitching

○ Property Specifications

Property Code	0xD07D
DataType	INT32
Description form	None
Get / Set	Get
Default Value	0 [Horizontal]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the level angle information (pitching) of the camera.

○ Property Details

The valid angle information is shown below.

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 60.0	0.0
	Down	0.0, from 359.9999847412109375 to 300.0	
Landscape (upside down)	Up	From 180.0 to 120.0	180.0
	Down	From 180.0 to 240.0	

The angle information is displayed in green when it is horizontal in the 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 the PropertyValue is changed, the camera does not send a DevicePropChanged event (subsection 6.4.1.6).

○ Property Value

The valid PropertyValues are shown below.

PropertyValue	Description
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.

6.5.7.18 AngleLevelYawing

○ Property Specifications

Property Code	0xD07E
DataType	INT32
Description form	None
Get / Set	Get
Default Value	0 [Horizontal]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the level angle information (yawing) of the camera.

○ Property Details

The valid angle information is shown below.

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 60.0	0.0
	Down	0.0, from 359.9999847412109375 to 300.0	
Portrait (grip side downward)	Up	From 180.0 to 120.0	180.0
	Down	From 180.0 to 240.0	

The angle information is displayed in green when it is horizontal in the 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 the PropertyValue is changed, the camera does not send a DevicePropChanged event (subsection 6.4.1.6).

○ Property Value

The valid PropertyValues are shown below.

PropertyValue	Description
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.

6.5.7.19 WarningStatus

○ Property Specifications

Property Code	0xD102
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0 [No warning]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the camera warning information.

○ Property Value

The valid PropertyValues are shown below.

When the PropertyValue is a value other than 0, the release is locked.

Bit	Description	Type
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	Reserved	0: Invalid, 1: Valid
Bit14	Reserved	0: Invalid, 1: Valid
Bit13	Reserved	0: Invalid, 1: Valid
Bit12	Reserved	0: Invalid, 1: Valid
Bit11	Reserved	0: Invalid, 1: Valid
Bit10	Reserved	0: Invalid, 1: Valid
Bit9	Reserved	0: Invalid, 1: Valid
Bit8	Shooting error	0: Invalid, 1: Valid
Bit7	Reserved	0: Invalid, 1: Valid
Bit6	Bulb warning	0: Invalid, 1: Valid
Bit5	Minimum aperture warning	0: Invalid, 1: Valid
Bit4	Reserved	0: Invalid, 1: Valid
Bit3	Reserved	0: Invalid, 1: Valid
Bit2	Reserved	0: Invalid, 1: Valid
Bit1	Battery exhausted	0: Invalid, 1: Valid
Bit0	Sequence error	0: Invalid, 1: Valid

6.5.7.20 InfoDisplayErrorStatus

○ Property Specifications

Property Code	0xD1B2
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the error display status of the INFO display on the monitor.

○ Property Details

The error display conditions indicated by this property are as shown in the table below.

Name	Timing for starting message of errors and warning	Finish timing
Release sequence error	After the release sequence is completed	Generation cause released
Card access error	When the card is inserted or the card is accessed	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
Card write-protected & not-formatted warning	When a card is inserted with the recording destination set to "Card (Card and SDRAM)" or when the recording destination is set to "Card (Card and SDRAM)" while a card is inserted	Generation cause released
Card not-formatted warning	Same as the above	Generation cause released
Card write-protected warning	Same as the above	Generation cause released
Battery exhausted (shutter release disabled) warning	After the shutter-release button is pressed fully	Generation cause released

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

6.5.7.21 MovieRecProhibitionCondition

○ Property Specifications

Property Code	0xD0A4
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x00000000
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the movie recording prohibition condition.

○ Property Details

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.

○ Property Value

The valid PropertyValue are shown below.

The PropertyValue takes the following values in the bit assignment. (1: Valid, 0: Invalid)

Bit	Description
From Bit17 to Bit31	Reserved
Bit16	In the case of waiting for synchronous recording by the external recorder and no card inserted during remote live view.
Bit15	The MovieLogOutput property (subsection 6.5.7.23) is set to [On] and the ExternalRecordingControl property (subsection 6.5.5.10) is set to [Off] or during remote live view.
Bit14	The camera is not in the application mode.
Bit13	During live view photography
Bit12	During enlarged display of live view
Bit11	Reserved
Bit10	During movie recording
Bit9	There are images or movies not recorded in the buffer.
Bit8	Reserved
Bit7	Reserved
Bit6	Reserved
Bit5	Reserved
Bit4	Reserved
Bit3	No free area in the card
Bit2	Card not formatted
Bit1	Card access error
Bit0	No card inserted When waiting for synchronous recording by the external recorder, zero (invalid) is always set.

6.5.7.22 ActiveFolder

○ Property Specifications

Property Code	0xD15B
DataType	UINT16
Description form	Range
Get / Set	Get
Default Value	100
Property Value	From 100 to 999

○ Property Outline

Indicates the folder number of the recording location.

6.5.7.23 MovieLogOutput

○ Property Specifications

Property Code	0xD0BB
DataType	UINT8
Description form	Enumeration
Get / Set	Get
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the state of N-log control in the camera.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off (Not outputting)
1	On (Outputting)

6.5.8 Vendor (Bracketing)

6.5.8.1 EnableBracketing

○ Property Specifications

Property Code	0xD0C0
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the status of bracketing.

○ Property Details

If the value of the ExposureEVStep property (subsection 6.5.4.9) is changed with the BracketingType property (subsection 6.5.2.61) set to [AE & flash], [AE only], or [Flash only], the PropertyValue is set to [Off].

When the LiveViewSelector property (subsection 6.5.12.8) is set to [Movie live view], bracketing shooting is not performed even if this property is set to [On].

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The HDRMode property (subsection 6.5.2.62) is [On].
	The BracketingType property (subsection 6.5.2.61) is set to [WB bracketing] and the CompressionSetting property (subsection 6.5.1.3) is set to [RAW] or [RAW + JPEG].
	The LiveViewPhotography property (subsection 6.5.2.66) is set to [On] and the BracketingType property (subsection 6.5.2.61) is set to [Flash only].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.8.2 AEBracketingStep

○ Property Specifications

Property Code	0xD0C1
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	3 [1 EV]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the step range of AE bracketing.

○ Property Details

When the value of the ExposureEVStep property (subsection 6.5.4.9) is changed, the PropertyValue is set to 1 EV.

When the BracketingType property (subsection 6.5.2.61) is set to [WB bracketing] or [ADL bracketing], the value of PropertyValue is not fixed.

The value of PropertyValue changes depending on the value of the ExposureEVStep property (subsection 6.5.4.9).

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description	ExposureEVStep		
		1/3 EV	1/2 EV	1 EV
0	1/3EV	✓	-	-
1	1/2EV	-	✓	-
2	2/3EV	✓	-	-
3	1EV	✓	✓	✓
4	2EV	✓	✓	✓
5	3EV	✓	✓	✓

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The BracketingType property (subsection 6.5.2.61) is set to [WB bracketing] or [ADL bracketing].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The HDRMode property (subsection 6.5.2.62) is [On].
	The LiveViewPhotography property (subsection 6.5.2.66) is set to [On] and the BracketingType property (subsection 6.5.2.61) is set to [Flash only].

6.5.8.3 AEBracketingPattern

○ Property Specifications

Property Code	0xD0C2
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	4 [3 images (normal, under and over)]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the compensation direction and the number of images to be captured for AE bracketing.

○ Property Details

When the value of the ExposureEVStep property (subsection 6.5.4.9) is changed, the PropertyValue is set to [0 image].

When the BracketingType property (subsection 6.5.2.61) is set to [WB bracketing] or [ADL bracketing], the value of PropertyValue is not fixed.

○ Property Value

The valid PropertyValue are shown below.

Property Value	Description
0	2 images (normal and under)
1	2 images (normal and over)
2	3 images (normal and 2 unders)
3	3 images (normal and 2 overs)
4	3 images (normal, under and over)
5	5 images (normal, 2 unders and 2 overs)
6	7 images (normal, 3 unders and 3 overs)
7	9 images (normal, 4 unders and 4 overs)
8	0 image

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The BracketingType property (subsection 6.5.2.61) is set to [WB bracketing] or [ADL bracketing].</p> <p>When the AEBracketingStep property (subsection 6.5.8.2) is set to [2EV] or [3EV], [7 images (normal, 3 unders and 3 overs)] or [9 images (normal, 4 unders and 4 overs)] is set.</p> <p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The HDRMode property (subsection 6.5.2.62) is [On].</p> <p>The LiveViewPhotography property (subsection 6.5.2.66) is set to [On] and the BracketingType property (subsection 6.5.2.61) is set to [Flash only].</p>

6.5.8.4 AEBracketingCount

○ Property Specifications

Property Code	0xD0C3
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	1
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the number of the image (nth image) to be captured next for AE bracketing and ADL bracketing.

○ Property Details

When the EnableBracketing property (subsection 6.5.8.1) is set to [Off] and the BracketingType property (subsection 6.5.2.61) is set to [WB bracketing], the value of PropertyValue is not fixed.

○ Property Value

The valid PropertyValue are shown below.

Property Value	Description
From 1 to 9	AE bracketing
From 1 to 5	ADL bracketing

6.5.8.5 WBBracketingStep

○ Property Specifications

Property Code	0xD0C4
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	0 [1 EV]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the step range for WB bracketing.

○ Property Details

When the BracketingType property (subsection 6.5.2.61) is set to anything other than [WB bracketing], the value of PropertyValue is not fixed.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	1 EV
1	2 EV
2	3 EV

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The BracketingType property (subsection 6.5.2.61) is set to anything other than [WB bracketing].
	The CompressionSetting property (subsection 6.5.1.3) is set to [RAW] or [RAW + JPEG].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The HDRMode property (subsection 6.5.2.62) is [On].

6.5.8.6 WBBracketingPattern

○ Property Specifications

Property Code	0xD0C5
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	4 [3 images (normal, under and over)]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the compensation direction and the number of images to be captured for WB bracketing.

○ Property Details

When the BracketingType property (subsection 6.5.2.61) is set to anything other than [WB bracketing], the value of PropertyValue is not fixed.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	2 images (normal and under)
1	2 images (normal and over)
2	3 images (normal and 2 unders)
3	3 images (normal and 2 overs)
4	3 images (normal, under and over)
5	5 images (normal, 2 unders and 2 overs)
6	7 images (normal, 3 unders and 3 overs)
7	9 images (normal, 4 unders and 4 overs)
8	0 image

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The BracketingType property (subsection 6.5.2.61) is set to anything other than [WB bracketing].
	The CompressionSetting property (subsection 6.5.1.3) is set to [RAW] or [RAW + JPEG].
	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.
	The HDRMode property (subsection 6.5.2.62) is [On].

6.5.8.7 ADLBracketingPattern

○ Property Specifications

Property Code	0xD0C6
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	0 [Two shots (Off -> User setting)]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the number of images to be captured for ADL bracketing.

○ Property Details

When the BracketingType property (subsection 6.5.2.61) is set to anything other than [ADL bracketing], the value of PropertyValue is not fixed.

○ Property Value

The valid PropertyValue are shown below.

Property Value	Description
0	2 shots (Off -> User setting)
1	3 shots (Off -> Low -> Normal)
2	4 shots (Off -> Low -> Normal -> High)
3	5 shots (Off -> Low -> Normal -> High -> Extra high)
4	0 image

* For the user setting, the setting value of the Active-D-Lighting property (subsection 6.5.2.52) should be used.

When the Active-D-Lighting property is set to [Off], [Auto] is used.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The BracketingType property (subsection 6.5.2.61) is set to anything other than [ADL bracketing].</p> <p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The HDRMode property (subsection 6.5.2.62) is [On].</p>

6.5.8.8 ADLBracketingStep

○ Property Specifications

Property Code	0xD0C7
DataType	UINT8
Description form	Range
Get / Set	Get, Get / Set
Default Value	0 [Auto]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the selected ADL with ADL bracketing set to two shots.

○ Property Details

When the BracketingType property (subsection 6.5.2.61) is set to anything other than [ADL bracketing], the value of PropertyValue is not fixed.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Auto
1	Low
2	Normal
3	High
4	Extra high

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The BracketingType property (subsection 6.5.2.61) is set to anything other than [ADL bracketing].</p> <p>The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.</p> <p>The HDRMode property (subsection 6.5.2.62) is [On].</p>

6.5.9 Vendor (External Flash)

6.5.9.1 ExternalSpeedLightExist

○ Property Specifications

Property Code	0xD120
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Not mounted]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the mounting status of the external flash.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Not mounted
1	Mounted

6.5.9.2 ExternalSpeedLightSort

○ Property Specifications

Property Code	0xD122
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Noncommunication]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the communication status of the external flash.

○ Property Details

When the ExternalSpeedLightExist property (subsection 6.5.9.1) 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 11.6).

○ Property Value

The valid PropertyValue are shown below.

Property Value	Description
0	Noncommunication
1	Reserve
2	New-type communication (with the operating and setting section)
3	New-type communication (without the operating and setting section)

6.5.9.3 ExternalSpeedLightStatus

○ Property Specifications

Property Code	0xD121
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Not charged]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the charge status of the external flash.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Not charged
1	Ready

*When the ExternalSpeedLightExist property (subsection 6.5.9.1) is set to [Not mounted], the value of PropertyValue is not fixed.

6.5.9.4 NewExternalSpeedLightMode

○ Property Specifications

Property Code	0xD125
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the flash mode of the external flash (new-type communication).

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	i-TTL balanced fill flash
2	i-TTL fill flash
3	Auto aperture
4	Non-TTL auto
5	Distance-priority manual
6	Manual
7	Multi-flash

*When the ExternalSpeedLightExist property (subsection 6.5.9.1) is set to [Not mounted], the value of PropertyValue is not fixed.

*When the ExternalSpeedLightSort property (subsection 6.5.9.2) is set to anything other than [New-type communication], the value of PropertyValue is not fixed.

6.5.9.5 FlashCompensation

○ Property Specifications

Property Code	0xD124
DataType	INT8
Description form	Range
Get / Set	Get
Default Value	0 [0.0 EV]
Property Value	From -18 [-3.0 EV] to +18 [+3.0 EV]

○ Property Outline

Indicates the flash compensation value in units of 1/6 EV.

○ Property Details

When the ExternalSpeedLightExist property (subsection 6.5.9.1) is set to [Not mounted], the value of PropertyValue is not fixed.

When the ExternalSpeedLightSort property (subsection 6.5.9.2) 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 6.5.9.2) and the NewExternalSpeedLightMode property (subsection 6.5.9.4) 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 balanced fill flash i-TTL fill flash Auto aperture Distance-priority manual

6.5.9.6 ExternalSpeedLightMultiFlashMode

○ Property Specifications

Property Code	0xD12D
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Stand-alone flash]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the commander mode of the external flash.

○ Property Details

When the ExternalSpeedLightExist property (subsection 6.5.9.1) is set to [Not mounted], the value of PropertyValue is not fixed.

When the ExternalSpeedLightSort property (subsection 6.5.9.2) is set to anything other than [New-type communication], the value of PropertyValue is not fixed.

○ Property Value

The valid PropertyValue are shown below.

Property Value	Description
0	Stand-alone flash (Commander mode is invalid or not supported)
1	Other flash units (Commander mode is valid)

6.5.9.7 SBWirelessMode

○ Property Specifications

Property Code	0xD1E2
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0 [Stand-alone flash]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the wireless setting of the external flash.

○ Property Details

The supported property values change depending on the type of the flash attached to the camera or whether the wireless communication accessory is equipped or not. If there's no value supported, the property value is not fixed.

If the supported property values change, it is informed by the DevicePropChanged event (subsection 6.4.1.6).

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Stand-alone flash
1	Other flash units (Radio)
2	Other flash units (Optical)
3	Other flash units (Optical + Radio)

6.5.9.8 SBWirelessMultipleFlashMode

○ Property Specifications

Property Code	0xD1E3
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0 [Group flash units]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the flash mode of the external multiple flash.

○ Property Details

The supported property values change depending on the type of the flash attached to the camera or whether the wireless communication accessory is equipped or not. If there's no value supported, the property value is not fixed.

When the SBWirelessMode property (subsection 6.5.9.7) is [Other flash units (Optical + Radio)], this property is fixed to [Group flash units].

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Group flash units
1	Quick wireless lighting
2	Repeating

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The value of the SBWirelessMode property (subsection 6.5.9.7) is [Stand-alone flash].

6.5.9.9 SBUsableGroup

○ Property Specifications

Property Code	0xD1E4
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x00000000
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the available group of the external flash.

○ Property Details

The property value is the logical OR of the SBGroupIDs for available groups.

If the property value is zero, any group cannot be used.

For the details of SBGroupID, refer to subsection 7.6

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x00000000	Cannot be used
Other than 0x00000000	Logical OR of the available SBGroupID

6.5.9.10 WirelessCLSEntryMode

○ Property Specifications

Property Code	0xD1E5
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0 [Pairing mode]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the setting of “Remote (WR) setting – Link mode” in the setup menu.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Pairing mode
1	PIN code mode

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The wireless remote controller is not installed. The installed wireless remote controller doesn't support the radio-controlled AWL.

6.5.9.11 SBPINCode

○ Property Specifications

Property Code	0xD1E6
DataType	UINT32
Description form	Range
Get / Set	Get, Get / Set
Default Value	0
Property Value	From 0 to 9999

○ Property Outline

Indicates the PIN code of “Remote (WR) setting – Link mode” in the setup menu.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The wireless remote controller is not installed.</p> <p>The installed wireless remote controller doesn't support the radio-controlled AWL.</p>

6.5.9.12 RadioMultipleFlashChannel

○ Property Specifications

Property Code	0xD1E7
DataType	UINT8
Description form	None
Get / Set	Get
Default Value	0
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the communication channel of the wireless remote controller.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
5	5CH
10	10CH
15	15CH

6.5.9.13 OpticalMultipleFlashChannel

○ Property Specifications

Property Code	0xD1E8
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	1 [CH]
Property Value	From 1 to 4 [CH]

○ Property Outline

Indicates the channel of the optical communication to the external flash.

If the channel of the optical communication is not fixed, this property returns 0xFF as an invalid value.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The value of the SBWirelessMode property (subsection 6.5.9.7) is [Stand-alone flash] or [Other flash units (Radio)].</p> <p>The flash supporting the SB control is not attached.</p>

6.5.9.14 FlashRangeDisplay

○ Property Specifications

Property Code	0xD1E9
DataType	UINT8
Description form	Enumeration
Get / Set	Get
Default Value	0 [meter]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the unit of distance for the setting of the external flash.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Meter
1	Feet

6.5.9.15 AllTestFiringDisable

○ Property Specifications

Property Code	0xD1EA
DataType	UINT8
Description form	None
Get / Set	Get
Default Value	0 [Enable firing]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the disabled state for the all test firing of the external flash.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Enable firing
Other than 0	Disable firing

6.5.9.16 SBSettingMemberLock

○ Property Specifications

Property Code	0xD1EC
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	0 [Unlock]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the lock state of the dials and the buttons on the external flash.

○ Property Details

The camera sets the default value when the external flash is disconnected from the camera or the session to the camera terminates.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Unlock
1	Lock

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The ExternalSpeedLightExist property (subsection 6.5.9.1) is set to [Not mounted].

6.5.9.17 SBIntegrationFlashReady

○ Property Specifications

Property Code	0xD1ED
DataType	UINT8
Description form	Enumeration
Get / Set	Get
Default Value	0 [Uncharged]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the information about the ready state of the external flash displayed in the flash info of the INFO display.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Uncharged
1	Ready

6.5.10 Vendor (Lens)

6.5.10.1 LensSort

○ Property Specifications

Property Code	0xD0E1
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	1 [CPU lens mounted]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the mounting status of the CPU lens.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Not mounted (lens not mounted or non-CPU lens mounted)
1	CPU lens mounted

6.5.10.2 **LensTypeML**

○ **Property Specifications**

Property Code	0xD0E7
DataType	UINT64
Description form	None
Get / Set	Get
Default Value	0
Property Value	Refer to Property Value in this subsection.

○ **Property Outline**

Indicates information on the ML lens.

The LensTypeF property (subsection 6.5.10.3) becomes effective only when the mount adapter of this property is valid.

○ **Property Value**

The valid PropertyValues are shown below. It is invalid when bit is 0, and valid when it is 1.

Bit	Description
From Bit8 to Bit63	Reserved
Bit7	Lens whose automatic distortion correction is always effective.
Bit6	Lens supporting automatic distortion correction
Bit5	DX lens (Lens for Nikon digital cameras)
Bit4	VR lens (with anti-vibration mechanism)
From Bit1 to Bit3	Reserved
Bit0	Mount adapter

6.5.10.3 **LensTypeF**

○ **Property Specifications**

Property Code	0xD0E2
DataType	UINT64
Description form	None
Get / Set	Get
Default Value	1 [D-type lens]
Property Value	Refer to Property Value in this subsection.

○ **Property Outline**

Indicates information on the F-CPU lens.

When the mount adapter is set to invalid in the LensTypeML property (subsection 6.5.10.2), the value of this property is fixed to zero.

○ **Property Value**

The valid PropertyValues are shown below. It is invalid when bit is 0, and valid when it is 1.

Bit	Description
From Bit9 to Bit63	Reserved
Bit8	STM lens
Bit7	E-type lens (electromagnetic diaphragm)
Bit6	Retractable lens
Bit5	Lens supporting automatic distortion correction
Bit4	AF-S lens
Bit3	DX lens (Lens for Nikon digital cameras)
Bit2	VR lens (with anti-vibration mechanism)
Bit1	G-type lens (without aperture dial)
Bit0	D-type lens (with distance encoder)

6.5.10.4 LensID

○ Property Specifications

Property Code	0xD0E0
DataType	UINT16
Description form	None
Get / Set	Get
Default Value	0
Property Value	(Depends on the lens type)

○ Property Outline

Indicates the ID of the CPU lens.

○ Property Details

The value of PropertyValue indicates an ID (2Byte).

When the value of the LensSort property (subsection 6.5.10.1) is set to [Not mounted], the value of PropertyValue is fixed to zero.

6.5.10.5 LensFocalMin

○ Property Specifications

Property Code	0xD0E3
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	5000 [50 mm]
PropertyValue	(Depends on the lens type)

○ Property Outline

Indicates the focal length at the Wide-end with the CPU lens mounted.

○ Property Details

The value of PropertyValue should be a hundred times the focal length (mm).

When the value of the LensSort property (subsection 6.5.10.1) is set to [Not mounted], the value of PropertyValue is not fixed.

6.5.10.6 LensFocalMax

○ Property Specifications

Property Code	0xD0E4
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	5000 [50 mm]
PropertyValue	(Depends on the lens type)

○ Property Outline

Indicates the focal length at the Tele-end with the CPU lens mounted.

○ Property Details

The value of PropertyValue should be a hundred times the focal length (mm).

When the value of the LensSort property (subsection 6.5.10.1) is set to [Not mounted], the value of PropertyValue is not fixed.

6.5.10.7 LensApertureMin

○ Property Specifications

Property Code	0xD0E5
DataType	UINT16
Description form	None
Get / Set	Get
Default Value	140 [F 1.4]
PropertyValue	(Depends on the lens type)

○ Property Outline

Indicates the maximum aperture value at the Wide-end with the CPU lens mounted.

○ Property Details

The value of PropertyValue should be a hundred times the maximum aperture value.

When the value of the LensSort property (subsection 6.5.10.1) is set to [Not mounted], the value of PropertyValue is not fixed.

6.5.10.8 LensApertureMax

○ Property Specifications

Property Code	0xD0E6
DataType	UINT16
Description form	None
Get / Set	Get
Default Value	1600 [F16]
PropertyValue	(Depends on the lens type)

○ Property Outline

Indicates the maximum aperture value at the Tele-end with the CPU lens mounted.

○ Property Details

The value of PropertyValue should be a hundred times the maximum aperture value.

When the value of the LensSort property (subsection 6.5.10.1) is set to [Not mounted], the value of PropertyValue is not fixed.

6.5.10.9 RetractableLensWarning

○ Property Specifications

Property Code	0xD09C
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the retractable lens warning condition.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	(Retractable lens warning) Off
1	(Retractable lens warning) On

6.5.11 Vendor (USB)

6.5.11.1 USBSpeed

○ Property Specifications

Property Code	0xD10C
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	2 [Super-Speed]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the maximum data transfer speed of USB.

When the Super-Speed is not selected, the property value is High-Speed.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Reserved
1	High-Speed
2	Super-Speed

6.5.11.2 ConnectionPath

○ Property Specifications

Property Code	0xD12E
DataType	UINT8
Description form	Enumeration
Get / Set	Get
Default Value	0 [USB]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the connection path for PTP communication.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	USB
1	Wireless Transmitter
2	Built-in Wi-Fi

6.5.12 Vendor (Live View)

6.5.12.1 CameraLiveViewStatus

○ Property Specifications

Property Code	0xD1B8
DataType	UINT8
Description form	Enumeration
Get / Set	Get
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the status of the live view in the camera.

○ Property Details

This property is set to “On” when live view is active.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

6.5.12.2 RemoteLiveViewStatus

○ Property Specifications

Property Code	0xD1A2
DataType	UINT8
Description form	Range
Get / Set	Get
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the status of the remote live view.

○ Property Details

This property is set to “On” when the StartLiveView command is executed.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Off
1	On

6.5.12.3 LiveViewImageStatus

○ Property Specifications

Property Code	0xD1BB
DataType	UINT8
Description form	Enumeration
Get / Set	Get
Default Value	0 [Live view image is not available]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the status of the live view image acquired by the GetLiveViewImage command.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Live view image is not available.
1	Live view image is available.

6.5.12.4 LiveViewImageSize

○ Property Specifications

Property Code	0xD1AC
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	2 [Equivalent to VGA]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the size of the live view image acquired by the GetLiveViewImage command.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
1	Equivalent to QVGA (up to 320x240)
2	Equivalent to VGA (up to 640x480)
3	Equivalent to XGA (up to 1024x768)

6.5.12.5 LiveViewImageCompression

○ Property Specifications

Property Code	0xD1BC
DataType	UINT8
Description form	Enumeration
Get / Set	Get / Set
Default Value	0 [Basic – Size priority]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the quality of the live view image acquired by the GetLiveViewImage command.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Basic – Size priority
1	Basic – Quality priority
2	Normal – Size priority
3	Normal – Quality priority
4	Fine – Size priority
5	Fine – Quality priority

6.5.12.6 LiveViewZoomArea

○ Property Specifications

Property Code	0xD1BD
DataType	UINT16
Description form	Enumeration
Get / Set	Get / Set
Default Value	0 [Entire display]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the zoom-area of the live view image.

○ Property Details

Available property value changes depending on the display device on the camera. If you set a value that is not supported on the display device, it is changed to another area that has the same magnification.

When switching the image monitor and the electronic viewfinder during zoom preview, the area before switching is maintained as the current value.

If you change the value of PropertyValue, a certain amount of time is required until the changed contents are reflected in the live view image that can be acquired by the GetLiveViewImage command.

○ Property Value

The valid PropertyValue are shown below.

Property Value	Display device		Description
	Image monitor	Electronic viewfinder	
0	✓	✓	Entire display
512	✓	-	Zoom area: 512x 342 Magnification: Zoom-in (200%)
640	-	✓	Zoom area: 640x 426 Magnification: Zoom-in (200%)
1024	✓	-	Zoom area: 1024x 682 Magnification: Equal (100%)
1280	-	✓	Zoom area: 1280x 854 Magnification: Equal (100%)
2048	✓	-	Zoom area: 2048x1364 Magnification: Zoom-out (50%)
2560	-	✓	Zoom area: 2560x1706 Magnification: Zoom-out (50%)

The magnification is the magnification relative to the size of the display device.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	512 or 640 was set in the spot WB acquisition standby state. The area in which the vertical and horizontal sizes are larger than the image size (*) was set. * Refer to LiveViewObject DataSet for the size of the display information.
Not_LiveView	The camera is performing shooting. The property was set in a state other than during live view.

6.5.12.7 LiveViewProhibitionCondition

○ Property Specifications

Property Code	0xD1A4
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x00000000
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the live view prohibition condition. If there is any prohibition factor in this property, the StartLiveView command must not be issued. If the StartLiveView command is issued and the live view is started when there is any prohibition factor in this property, the operation is not guaranteed.

○ Property Value

The valid PropertyValues are shown below.

Bit	Description	Type
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	The live view cannot be started when the temperature rises.	0: Invalid, 1: Valid
Bit16	Reserved	0: Invalid, 1: Valid
Bit15	Reserved	0: Invalid, 1: Valid
Bit14	Reserved	0: Invalid, 1: Valid
Bit13	Reserved	0: Invalid, 1: Valid
Bit12	Reserved	0: Invalid, 1: Valid
Bit11	Reserved	0: Invalid, 1: Valid
Bit10	Reserved	0: Invalid, 1: Valid
Bit9	Reserved	0: Invalid, 1: Valid
Bit8	Battery exhausted	0: Invalid, 1: Valid
Bit7	Reserved	0: Invalid, 1: Valid
Bit6	Reserved	0: Invalid, 1: Valid
Bit5	Reserved	0: Invalid, 1: Valid
Bit4	Reserved	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.

6.5.12.8 LiveViewSelector

○ Property Specifications

Property Code	0xD1A6
DataType	UINT8
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0 [Live view photography]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the state of live view mode.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0	Live view photography
1	Movie live view

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The camera is in the PC camera mode.

6.5.12.9 MovieFnumber

○ Property Specifications

Property Code	0xD1A9
DataType	UINT16
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	The minimum value of the enumeration
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the aperture value that is used for movie live view.

○ Property Details

When the LensSort property (subsection 6.5.10.1) is [Not mounted], the enumeration cannot be created. Therefore the number of enumeration values shall be 1 and the enumeration value, the DefaultValue, and the PropertyValue shall be the same value. The value shall be 1 EV except the maximum aperture value.

When the F0ManualSetting property (subsection 6.5.5.9) is [Not set], the PropertyValue shall be 0.

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.

If movie live view is not performed, the number of enumeration values shall be 1 and the enumeration value, the DefaultValue, and the PropertyValue shall be 0 because the value is not fixed.

○ Property Value

When the ExposureProgramMode property (subsection 6.5.1.11) is M or A, the PropertyValue is set to the value of the Fnumber property (subsection 6.5.1.5) just before the start of movie live view.

When the ExposureProgramMode property (subsection 6.5.1.11) is other than M or A, the PropertyValue is set to a value depending on the camera.

The PropertyValue should be a hundred times the aperture value.

The PropertyValue changes depending on the value of the ExposureEVStep property (subsection 6.5.4.9).

The setting range of PropertyValue changes depending on the lens and the magnification setting.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The value of the ExposureProgramMode property (subsection 6.5.1.11) is not [A] or [M].
	The value of the LensSort property (subsection 6.5.10.1) is [Not mounted].
	The WarningStatus property (subsection 6.5.7.19) is [Sequence error].
	The RetractableLensWarning property (subsection 6.5.10.9) is [(Retractable lens warning) On].
	An aperture value error.
	The movie live view is not executed.

6.5.12.10 MovieShutterSpeed

○ Property Specifications

Property Code	0xD1A8
DataType	UINT32
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	The minimum value of the enumeration
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the shutter speed that is used for movie live view.

○ Property Details

The enumerated values change depending on the values of the ExposureEVStep property (subsection 6.5.4.9), the ExternalSpeedLightExist property (subsection 6.5.9.1), and the MovieRecordScreenSize property (subsection 6.5.3.3).

The limit of the shutter speed that can be used in low speed changes depending on the setting of the movie frame rate.

The relationship between each frame rate and the limit of the shutter speed that can be used in low speed is shown below.

Movie frame rate	Shutter speed limit value
120fps	1/125
100fps	1/100
60fps	1/60
50fps	1/50
30fps	1/30
25fps	1/25
24fps	1/25

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

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
Upper 2 bytes	Numerator of the shutter speed
Lower 2 bytes	Denominator of the shutter speed

*(Example) Shutter speed 1/250 sec.: PropertyValue = 0x000100FA

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The movie live view is not executed.
	The value of the ExposureProgramMode property (subsection 6.5.1.11) is anything other than M.
	The WarningStatus property (subsection 6.5.7.19) is [Sequence error] or [Minimum aperture warning].
	The RetractableLensWarning property (subsection 6.5.10.9) is [(Retractable lens warning) On].

6.5.12.11 MovieExposureBiasCompensation

○ Property Specifications

Property Code	0xD1AB
DataType	INT16
Description form	Enumeration
Get / Set	Get, Get / Set
Default Value	0 [0.0 EV]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the compensation value of the exposure compensation that is used for movie live view.

○ Property Value

The valid PropertyValues are shown below.

The value of PropertyValue changes depending on the value of the ExposureEVStep property (subsection 6.5.4.9).

Property Value	Description	ExposureEVStep		
		1/3 step	1/2 step	1 step
+3000	+3.0 EV	✓	✓	✓
+2666	+2.7 EV	✓	-	-
+2500	+2.5 EV	-	✓	-
+2333	+2.3 EV	✓	-	-
+2000	+2.0 EV	✓	✓	✓
+1666	+1.7 EV	✓	-	-
+1500	+1.5 EV	-	✓	-
+1333	+1.3 EV	✓	-	-
+1000	+1.0 EV	✓	✓	✓
+666	+0.7 EV	✓	-	-
+500	+0.5 EV	-	✓	-
+333	+0.3 EV	✓	-	-
0	0.0 EV	✓	✓	✓
-333	-0.3 EV	✓	-	-
-500	-0.5 EV	-	✓	-
-666	-0.7 EV	✓	-	-
-1000	-1.0 EV	✓	✓	✓
-1333	-1.3 EV	✓	-	-
-1500	-1.5 EV	-	✓	-
-1666	-1.7 EV	✓	-	-
-2000	-2.0 EV	✓	✓	✓
-2333	-2.3 EV	✓	-	-
-2500	-2.5 EV	-	✓	-
-2666	-2.7 EV	✓	-	-
-3000	-3.0 EV	✓	✓	✓

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The value of the ExposureProgramMode property (subsection 6.5.1.11) is [Auto]. The movie live view is not executed.

6.5.13 Vendor (Picture Control)

6.5.13.1 ActivePicCtrlItem

○ Property Specifications

Property Code	0xD200
DataType	UINT16
Description form	Enumeration
Get / Set	Get / Set
Default Value	8 [Auto]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the picture control item whose setting is currently valid.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
1	Standard
2	Neutral
3	Vivid
4	Monochrome
5	Portrait
6	Landscape
7	Flat
8	Auto
101	Dream
102	Morning
103	Pop
104	Sunday
105	Somber
106	Drama
107	Silence
108	Bleach
109	Melancholic
110	Pure
111	Denim
112	Toy
113	Sepia
114	Blue
115	Red
116	Pink
117	Charcoal
118	Graphite
119	Binary
120	Carbon
From 201 to 209	Custom picture control (from 1 to 9)

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_Status	Setting to an unregistered area was performed for the custom picture control.
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

6.5.13.2 MovieActivePicCtrlItem

○ Property Specifications

Property Code	0xD237
DataType	UINT16
Description form	Enumeration
Get / Set	Get / Set
Default Value	100 [Same as photo settings]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the picture control item whose setting is currently valid in the movie shooting menu.

○ Property Details

When the property value is set to [Same as photography setting], the picture control specified by ActivePicCtrlItem (6.5.13.1) is used.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
1	Standard
2	Neutral
3	Vivid
4	Monochrome
5	Portrait
6	Landscape
7	Flat
8	Auto
100	Same as photography setting
101	Dream
102	Morning
103	Pop
104	Sunday
105	Somber
106	Drama
107	Silence
108	Bleach
109	Melancholic
110	Pure
111	Denim
112	Toy
113	Sepia
114	Blue
115	Red
116	Pink
117	Charcoal
118	Graphite
119	Binary
120	Carbon
From 201 to 209	Custom picture control (from 1 to 9)

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Invalid_Status	Setting to an unregistered area was performed for the custom picture control.
Access_Denied	The ExposureProgramMode property (subsection 6.5.1.11) is set to anything other than PSAM.

	The MovieLogOutput property (subsection 6.5.7.23) is set to [On].
--	---

6.5.14 Vendor (Application Mode)

6.5.14.1 ApplicationMode

○ Property Specifications

Property Code	0xD1F0
DataType	UINT8
Description form	Range
Get / Set	Get / Set
Default Value	0 [Off]
Property Value	Refer to Property Value in this subsection.

○ Property Outline

Indicates the status of the application mode.

○ Property Details

When the PropertyValue is set to [On], the camera shifts to the application mode.
Refer to "Application Mode" (subsection 2.4).

○ Property Value

The valid PropertyValue are shown below.

PropertyValue	Description
0	Off
1	On

6.5.15 Vendor (MTP)

6.5.15.1 SessionInitiatorVersionInfo

○ Property Specifications

Property Code	0xD406
DataType	String
Description form	None
Get / Set	Get / Set
Default Value	“Windows/6.0.5330.0 MTPClassDriver/6.0.5330.0” [Session initiator version information character string]
Property Value	(Depends on the camera setting)

○ Property Outline

Indicates the version information of the host in open session.

○ Property Details

The PropertyValue should be a PTP string of 255 characters or shorter.
(HTTP 1.1 spec (RFC 2068) User Agent string format)

6.5.15.2 PerceivedDeviceType

○ Property Specifications

Property Code	0xD407
DataType	UINT32
Description form	None
Get / Set	Get
Default Value	0x00000001 [Digital still camera]
Property Value	0x00000001 [Digital still camera]

○ Property Outline

Indicates the type of the device.

6.5.15.3 UseDeviceStageFlag

○ Property Specifications

Property Code	0xD303
DataType	UINT8
Description form	None
Get / Set	Get
Default Value	0x01 [On]
Property Value	0x01 [On]

○ Property Outline

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.

6.6 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.

Object Code	Description	Reference item
0xDC01	StorageID	6.6.1.1
0xDC02	ObjectFormat	6.6.1.2
0xDC03	ProtectionStatus	6.6.1.3
0xDC04	ObjectSize	6.6.1.4
0xDC07	ObjectFilename	6.6.1.5
0xDC08	DateCreated	6.6.1.6
0xDC09	DateModified	6.6.1.7
0xDC0B	ParentObject	6.6.1.8
0xDC0D	Hidden	6.6.1.9
0xDC41	PersistentUniqueObjectIdentifier	6.6.1.10
0xDC44	Name	6.6.1.11
0xDC81	RepresentativeSampleFormat	6.6.2.1
0xDC82	RepresentativeSampleSize	6.6.2.2
0xDC83	RepresentativeSampleHeight	6.6.2.3
0xDC84	RepresentativeSampleWidth	6.6.2.4
0xDC86	RepresentativeSampleData	6.6.2.5
0xDC87	Width	6.6.3.1
0xDC88	Height	6.6.3.2
0xDC8A	Rating	6.6.3.3
0xDCD3	ImageBitDepth	6.6.3.4
0xDC89	Duration	6.6.4.1
0xDE93	SampleRate	6.6.4.2
0xDE94	NumberOfChannels	6.6.4.3
0xDE97	Scan Type	6.6.4.4
0xDE9A	AudioBitRate	6.6.4.5
0xDE9B	VideoFourCCCode	6.6.4.6
0xDE9C	VideoBitRate	6.6.4.7

6.6.1 Object Information

6.6.1.1 StorageID

○ Property Specifications

Property Code	0xDC01
DataType	UINT32
Get / Set	Get
Default Value	0x00010001
Group Code	0x00000001
Form Flag	0x00 (None)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

This indicates the StorageID of the object. (It is the same value as that of the first field of the ObjectInfo data set.)

It is applied to the objects of all the formats supported by the camera.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x00010001	Main slot
0x00020001	Secondary slot

6.6.1.2 ObjectFormat

○ Property Specifications

Property Code	0xDC02
DataType	UINT16
Get / Set	Get
Default Value	0x3000
Group Code	0x00000001
Form Flag	0x00 (None)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

This indicates the ObjectFormatCode of the object. (It is the same value as that of the second field of the ObjectInfo data set.)

It is applied to the objects of all the formats supported by the camera.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x3000	Undefined
0x3001	Association
0x3002	Script
0x300D	MOV Apple QuickTime Video Format(H.264/AVC)
0x3800	Unknown Image Object
0x3801	EXIF/JPEG
0x380D	TIFF
0xB982	MP4 Container

6.6.1.3 ProtectionStatus

○ Property Specifications

Property Code	0xDC03
DataType	UINT16
Get / Set	Get
Default Value	0x0000
Group Code	0x00000001
Form Flag	0x02 (Enumeration)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

This indicates the protection status of the object. (It is the same value as that of the third field of the ObjectInfo data set.)

It is applied to the objects of all the formats supported by the camera.

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x0000	Protection is not set.
0x0001	Protection is set.

6.6.1.4 **ObjectSize**

○ **Property Specifications**

Property Code	0xDC04
DataType	UINT64
Get / Set	Get
Default Value	0x0000000000000000
Group Code	0x00000001
Form Flag	0x00 (None)
Property Value	(Object size)

○ **Property Outline**

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.)

It is applied to the objects of all the formats supported by the camera.

6.6.1.5 ObjectFilename

○ Property Specifications

Property Code	0xDC07
DataType	String
Get / Set	Get
Default Value	0x00 (Null)
Group Code	0x00000001
Form Flag	0x05 (RegEx)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

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.)

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.

○ Property Value

The valid PropertyValues 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}

6.6.1.6 DateCreated

○ Property Specifications

Property Code	0xDC08
DataType	String
Get / Set	Get
Default Value	0x00 (Null)
Group Code	0x00000001
Form Flag	0x03 (DateTime)
Property Value	(Date and time of object creation)

○ Property Outline

This indicates a string that shows the date and time of object creation. (It is the same value as that of the seventeenth field of the ObjectInfo data set.)

It is applied to the objects of all the formats supported by the camera.

6.6.1.7 DateModified

○ Property Specifications

Property Code	0xDC09
DataType	String
Get / Set	Get
Default Value	0x00 (Null)
Group Code	0x00000001
Form Flag	0x03 (DateTime)
Property Value	(Date and time of object update)

○ Property Outline

This indicates a string that shows the date and time of object update. (It is the same value as that of the eighteenth field of the ObjectInfo data set.)

It is applied to the objects of all the formats supported by the camera.

6.6.1.8 ParentObject

○ Property Specifications

Property Code	0xDC0B
DataType	UINT32
Get / Set	Get
Default Value	0x00000000
Group Code	0x00000001
Form Flag	0x00 (None)
Property Value	(ObjectHandle of the parent object of the specified object)

○ Property Outline

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.)

It is applied to the objects of all the formats supported by the camera.

6.6.1.9 Hidden

○ Property Specifications

Property Code	0xDC0D
DataType	UINT16
Get / Set	Get
Default Value	0x0000
Group Code	0x00000001
Form Flag	0x02 (Enumeration)
Property Value	(Hidden attribute of the object)

○ Property Outline

This indicates a hidden attribute of the object.

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)
0x380D	TIFF
0xB982	MP4 Container

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x0000	Displayed object
0x0001	Hidden object

6.6.1.10 PersistentUniqueObjectIdentifier

○ Property Specifications

Property Code	0xDC41
DataType	UINT128
Get / Set	Get
Default Value	0x00^16
Group Code	0x00000001
Form Flag	0x00 (None)
Property Value	(Object-specific identifier)

○ Property Outline

This indicates an object-specific identifier (PUOID).

It is applied to the objects of all the formats supported by the camera.

The generation rule of the PUUID is shown below.

0 through 3	4 through 15
ObjectHandle (4Byte)	Reserved (0)

6.6.1.11 Name

○ Property Specifications

Property Code	0xDC44
DataType	String
Get / Set	Get
Default Value	0x00 (Null)
Group Code	0x00000001
Form Flag	0x00 (None)
Property Value	(File name of an object)

○ Property Outline

This indicates an optional string that shows a file name of an object. (It should be the same value as that of ObjectFilename.)

It is applied to the objects of all the formats supported by the camera.

6.6.2 Thumbnail

6.6.2.1 RepresentativeSampleFormat

○ Property Specifications

Property Code	0xDC81
DataType	UINT16
Get / Set	Get
Default Value	0x3000
Group Code	0x00000001
Form Flag	0x02 (Enumeration)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

This indicates the ObjectFormatCode of the thumbnail image.

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)
0x380D	TIFF
0xB982	MP4 Container

○ Property Value

The valid PropertyValues are shown below.

PropertyValue	Setting
0x3000	Undefined
0x3808	JFIF
0x380D	TIFF

6.6.2.2 RepresentativeSampleSize

○ Property Specifications

Property Code	0xDC82
DataType	UINT32
Get / Set	Get
Default Value	0x00000000
Group Code	0x00000001
Form Flag	0x01 (Range)
Property Value	From 0 to 0x00010000

○ Property Outline

This indicates the size of the thumbnail in bytes.
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)
0x380D	TIFF
0xB982	MP4 Container

6.6.2.3 RepresentativeSampleHeight

○ Property Specifications

Property Code	0xDC83
DataType	UINT32
Get / Set	Get
Default Value	0x00000000
Group Code	0x00000001
Form Flag	0x01 (Range)
Property Value	From 0 to 120

○ Property Outline

This indicates the height of the thumbnail in pixels.
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)
0x380D	TIFF
0xB982	MP4 Container

6.6.2.4 RepresentativeSampleWidth

○ Property Specifications

Property Code	0xDC84
DataType	UINT32
Get / Set	Get
Default Value	0x00000000
Group Code	0x00000001
Form Flag	0x01 (Range)
Property Value	From 0 to 160

○ Property Outline

This indicates the width of the thumbnail in pixels.
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)
0x380D	TIFF
0xB982	MP4 Container

6.6.2.5 Representative Sample Data

○ Property Specifications

Property Code	0xDC86
DataType	AUINT8
Get / Set	Get
Default Value	0x00000000
Group Code	0xFFFFFFFF
Form Flag	0x06 (ByteArray)
Property Value	From 0 to 0x00010000

○ Property Outline

This indicates the thumbnail data.

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)
0x380D	TIFF
0xB982	MP4 Container

6.6.3 Image Information

6.6.3.1 Width

○ Property Specifications

Property Code	0xDC87
DataType	UINT32
Get / Set	Get
Default Value	0x00000000
Group Code	0x00000001
Form Flag	0x01 (Range)
Property Value	From 0 to 10000

○ Property Outline

This indicates the width of the object in pixels.

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)
0x380D	TIFF
0xB982	MP4 Container

6.6.3.2 Height

○ Property Specifications

Property Code	0xDC88
DataType	UINT32
Get / Set	Get
Default Value	0x00000000
Group Code	0x00000001
Form Flag	0x01 (Range)
Property Value	From 0 to 10000

○ Property Outline

This indicates the height of the object in pixels.
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)
0x380D	TIFF
0xB982	MP4 Container

6.6.3.3 Rating

○ Property Specifications

Property Code	0xDC8A
DataType	UINT16
Get / Set	Get
Default Value	0x0000
Group Code	0x00000001
Form Flag	0x01 (Range)
Property Value	From 0 to 100

○ Property Outline

This indicates the rating of the object.

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)
0x380D	TIFF
0xB982	MP4 Container

○ Property Value

The valid PropertyValues are shown below.

Property Value	Rating setting
0x0000	None
0x0001	★
0x0019	★★
0x0032	★★★
0x004B	★★★★
0x0063	★★★★★

6.6.3.4 ImageBitDepth

○ Property Specifications

Property Code	0xDCD3
DataType	UINT32
Get / Set	Get
Default Value	0x0000000C
Group Code	0x00000001
Form Flag	0x02 (Enumeration)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

This indicates the bit depth of the object.

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x3800	Unknown Image Object
0x3801	EXIF/JPEG
0x380D	TIFF

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x0000000C	12bit
0x0000000E	14bit
0x00000018	24bit

6.6.4 Movie Information

6.6.4.1 Duration

○ Property Specifications

Property Code	0xDC89
DataType	UINT32
Get / Set	Get
Default Value	0x00000000
Group Code	0x00000001
Form Flag	0x01 (Range)
Property Value	From 0 to 0x001B773F (1799999msec)

○ Property Outline

This indicates the length of the object in msec.

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format(H.264/AVC)
0xB982	MP4 Container

6.6.4.2 SampleRate

○ Property Specifications

Property Code	0xDE93
DataType	UINT32
Get / Set	Get
Default Value	0x00000000
Group Code	0x00000001
Form Flag	0x02 (Enumeration)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

This indicates the sample rate of the object.

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format(H.264/AVC)
0xB982	MP4 Container

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x00000000	0 Hz (no sound)/Unknown
0x00002EE0	12.000 Hz
0x00005DC0	24.000 Hz
0x0000BB80	48.000 Hz

6.6.4.3 NumberOfChannels

○ Property Specifications

Property Code	0xDE94
DataType	UINT16
Get / Set	Get
Default Value	0x0000
Group Code	0x00000001
Form Flag	0x02 (Enumeration)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

This indicates the number of channels of the object.

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format(H.264/AVC)
0xB982	MP4 Container

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x0000	Unused (no sound)/Unknown
0x0001	Monaural (1ch)
0x0002	Stereo (2ch)

6.6.4.4 ScanType

○ Property Specifications

Property Code	0xDE97
DataType	UINT16
Get / Set	Get
Default Value	0x0000
Group Code	0x00000001
Form Flag	0x02 (Enumeration)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

This indicates the scan type of the object.

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format (H.264/AVC)
0xB982	MP4 Container

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x0000	Unused

6.6.4.5 AudioBitRate

○ Property Specifications

Property Code	0xDE9A
DataType	UINT32
Get / Set	Get
Default Value	0x00000000
Group Code	0x00000001
Form Flag	0x01 (Range)
Property Value	From 0x00000000 (No sound/Unknown) to 0x00177000

○ Property Outline

This indicates the audio bit rate of the object.

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format(H.264/AVC)
0xB982	MP4 Container

6.6.4.6 VideoFourCCCode

○ Property Specifications

Property Code	0xDE9B
DataType	UINT32
Get / Set	Get
Default Value	0x61766331
Group Code	0x00000001
Form Flag	0x02 (Enumeration)
Property Value	Refer to Property Value in this subsection.

○ Property Outline

This indicates the FourCC code for the video codec.

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format (H.264/AVC)
0xB982	MP4 Container

○ Property Value

The valid PropertyValues are shown below.

Property Value	Description
0x61766331	“avc1”

6.6.4.7 VideoBitRate

○ Property Specifications

Property Code	0xDE9C
DataType	UINT32
Get / Set	Get
Default Value	0x00000000
Group Code	0x00000001
Form Flag	0x01 (Range)
Property Value	From 0x00000000 (Unknown) to 0x30000000

○ Property Outline

This indicates the number of bits of the object processed per sec.

The PropertyValue should be a value obtained by multiplying the maximum number of bytes per sec. of the object by 8 (bit).

It is applied to the objects of the following formats.

ObjectFormatCode	Description
0x300D	MOV Apple QuickTime Video Format (H.264/AVC)
0xB982	MP4 Container

6.7 SBAttributeCode

The flash has various peculiar information. The various metadata for the flash can be handled by operating the flash attributes. Each flash attribute has corresponding SBAttrID and SBGroupAttrID.

The camera supports the following SBAttrID and SBGroupAttrID.

SBAttrID	Description	Reference
0x1001	SBName	6.7.1.1
0x1002	SBGroupID	6.7.1.2
0x1003	SBStatus	6.7.1.3
0x1005	SBTestFlashDisable	6.7.1.4

SBGroupAttrID	Description	Reference
0x4001	SBGroupFlashMode	6.7.2.1
0x4002	SBGroupFlashCompensation	6.7.2.2
0x4003	SBGroupFlashRatio	6.7.2.3
0x4004	SBGroupFlashLevel	6.7.2.4
0x4005	SBGroupFlashRange	6.7.2.5
0x4006	SBGroupRepeat	6.7.2.6
0x4007	SBGroupRepeatCount	6.7.2.7
0x4008	SBGroupRepeatInterval	6.7.2.8
0x4009	SBGroupValid	6.7.2.9

6.7.1 SBAttribute

6.7.1.1 SBName

○ Attribute Specifications

SBAttrID	0x1001
DataType	String
Get / Set	Get / Set
Default Value	“Noused”
FormFlag	None
Attribute Value	(SB model name / nickname)

○ Attribute Outline

This indicates the string to express the name or the nickname of the remote flash.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The movie live view is being performed.

6.7.1.2 SBGroupID

○ Attribute Specifications

SBAttrID	0x1002
DataType	SBGroupID
Get / Set	Get
Default Value	0x00000000
FormFlag	Enumeration
Attribute Value	Refer to Attribute Value in this subsection.

○ Attribute Outline

This indicates the SBGroupID of the flash.

○ Attribute Value

For the AttributeValue, refer to the SBGroupID (subsection 7.6).

6.7.1.3 SBStatus

○ Attribute Specifications

SBAttrID	0x1003
DataType	UINT8
Get / Set	Get
Default Value	0x01
FormFlag	None
Attribute Value	Refer to Attribute Value in this subsection.

○ Attribute Outline

This indicates the ready state of the remote flash.

○ Attribute Details

When getting this attribute with specifying the master flash, the GetSBAttrDesc and the GetSBAttrValue commands respond Invalid_Parameter.

Use the ExternalSpeedLightStatus property (subsection 6.5.9.3) to get the ready state of the master flash.

○ Attribute Value

The valid AttributeValues are shown below.

Attribute Value	Description
From Bit3 to Bit7	(Reserved)
Bit2	High temperature error
Bit1	Battery warning
Bit0	Ready

6.7.1.4 SBTestFlashDisable

○ Attribute Specifications

SBAttrID	0x1005
DataType	UINT8
Get / Set	Get
Default Value	0
FormFlag	None
Attribute Value	Refer to Attribute Value in this subsection.

○ Attribute Outline

This indicates the disabled state for the test firing of the flash.

○ Attribute Value

The valid AttributeValues are shown below.

Attribute Value	Description
0	Enable firing
Other than 0	Disable firing

6.7.2 SBGroupAttribute

6.7.2.1 SBGroupFlashMode

○ Attribute Specifications

SBGroupAttrID	0x4001
DataType	UINT8
Get / Set	Get / Set
Default Value	The default value differs depending on the flash group.
FormFlag	Enumeration
Attribute Value	Refer to Attribute Value in this subsection.

○ Attribute Outline

This indicates the flash mode of the flash group.

○ Attribute Value

The valid AttributeValues are shown below.

Attribute Value	Description
0	Off
1	[TTL-BL] i-TTL balanced fill flash *
2	[TTL] i-TTL fill flash
3	[AA] Auto aperture
4	[A] Non-TTL auto *
5	[GN] Distance-priority manual *
6	[M] Manual
7	[RPT] Repeating flash *

* This can be used on the case of the stand-alone flash or the main flash.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The flash group that cannot be used was specified. (The specified group is not in the values of the SBUsableGroup (subsection 6.5.9.9).)</p> <p>The value of the SBWirelessMode property (subsection 6.5.9.7) is anything other than [Stand-alone flash] and the value of the SBWirelessMultipleFlashMode property (subsection 6.5.9.8) is [Repeating].</p>

* Except that the value of the SBWirelessMode property (subsection 6.5.9.7) is anything other than [Stand-alone flash] and the value of the SBWirelessMultipleFlashMode property (subsection 6.5.9.8) is [Quick wireless lighting].

6.7.2.2 SBGroupFlashCompensation

○ Attribute Specifications

SBGroupAttrID	0x4002
DataType	INT8
Get / Set	Get, Get / Set
Default Value	0 [0.0EV]
FormFlag	Range
Attribute Value	From -18[-3.0EV] to +18[+3.0EV]

○ Attribute Outline

This indicates the flash group compensation value in units of 1/6 EV.

When the attached flash does not support this function, the value of this attribute is not fixed.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The flash group that cannot be used was specified. (The specified group is not in the values of the SBUsableGroup (subsection 6.5.9.9).)</p> <p>The value of the SBGroupFlashMode property (subsection 6.7.2.1) for the specified flash group is [Off], [Manual] or [Repeating flash].</p> <p>The value of the SBWirelessMode property (subsection 6.5.9.7) is anything other than [Stand-alone flash] and the value of the SBWirelessMultipleFlashMode property (subsection 6.5.9.8) is [Repeating].</p>

* Except that the value of the SBWirelessMode property (subsection 6.5.9.7) is anything other than [Stand-alone flash] and the value of the SBWirelessMultipleFlashMode property (subsection 6.5.9.8) is [Quick wireless lighting].

6.7.2.3 SBGroupFlashRatio

○ Attribute Specifications

SBGroupAttrID	0x4003
DataType	UINT8
Get / Set	Get, Get / Set
Default Value	7 [1:1]
FormFlag	Enumeration
Attribute Value	Refer to Attribute Value in this subsection.

○ Attribute Outline

This indicates the ratio of the flash group.

○ Attribute Value

The valid AttributeValues are shown below.

When the attached flash does not support this function, the value of this attribute is not fixed.

Attribute Value	Description
0	1:--
1	8:1
2	6:1
3	4:1
4	3:1
5	2:1
6	1.5:1
7	1:1
8	1:1.5
9	1:2
10	1:3
11	1:4
12	1:6
13	1:8
14	--:1

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The value of the SBWirelessMode property (subsection 6.5.9.7) is [Stand-alone flash].</p> <p>The value of the SBWirelessMultipleFlashMode property (subsection 6.5.9.8) is other than [Quick wireless lighting].</p>

6.7.2.4 SBGroupFlashLevel

○ Attribute Specifications

SBGroupAttrID	0x4004
DataType	UINT8
Get / Set	Get, Get / Set
Default Value	The default value differs depending on the flash mode.
FormFlag	Enumeration
Attribute Value	Refer to Attribute Value in this subsection.

○ Attribute Outline

This indicates the flash level of the flash group.

○ Attribute Value

The valid AttributeValues are shown below.

Attribute Value	Description
1	1/1(Full)
2	1/1 – 0.3(Full - 1/3 step)
3	1/1 – 0.7(Full - 2/3 step)
4	1/2
5	1/2 – 0.3
6	1/2 – 0.7
7	1/4
8	1/4 – 0.3
9	1/4 – 0.7
10	1/8
11	1/8 – 0.3
12	1/8 – 0.7
13	1/16
14	1/16 – 0.3
15	1/16 – 0.7
16	1/32
17	1/32 – 0.3
18	1/32 – 0.7
19	1/64
20	1/64 – 0.3
21	1/64 – 0.7
22	1/128
23	1/128 – 0.3
24	1/128 – 0.7
25	1/256

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
	The flash group that cannot be used was specified. (The specified group is not in the values of the SBUsableGroup (subsection 6.5.9.9).)
Access_Denied	The value of the SBWirelessMode property (subsection 6.5.9.7) is [Stand-alone flash] and the value of the SBGroupFlashMode property (subsection 6.7.2.1) for the master flash is not [Off], [Manual] or [Repeating flash].
	The value of the SBGroupFlashMode property (subsection 6.7.2.1) is other than [Manual].

* Except that the value of the SBWirelessMode property (subsection 6.5.9.7) is anything other than [Stand-alone flash] and the value of the SBWirelessMultipleFlashMode property (subsection 6.5.9.8) is [Quick wireless lighting] or [Repeating].

6.7.2.5 SBGroupFlashRange

○ Attribute Specifications

SBGroupAttrID	0x4005
DataType	UINT32
Get / Set	Get, Get / Set
Default Value	13 [2.0[m]/6.6[ft]]
FormFlag	Enumeration
Attribute Value	Refer to Attribute Value in this subsection.

○ Attribute Outline

This indicates the distance of the flash group.

○ Attribute Value

The valid AttributeValues are shown below.

When the attached flash does not support this function, the value of this attribute is not fixed.

Attribute Value	Description	Attribute Value	Description
0	0.3[m]/1.0[ft]	17	3.2[m]/10[ft]
1	0.4[m]/1.3[ft]	18	3.6[m]/12[ft]
2	0.5[m]/1.7[ft]	19	4.0[m]/13[ft]
3	0.6[m]/2.0[ft]	20	4.5[m]/15[ft]
4	0.7[m]/2.3[ft]	21	5.0[m]/17[ft]
5	0.8[m]/2.6[ft]	22	5.6[m]/19[ft]
6	0.9[m]/2.9[ft]	23	6.3[m]/21[ft]
7	1.0[m]/3.3[ft]	24	7.1[m]/23[ft]
8	1.1[m]/3.7[ft]	25	8.0[m]/26[ft]
9	1.3[m]/4.1[ft]	26	9.0[m]/29[ft]
10	1.4[m]/4.6[ft]	27	10[m]/33[ft]
11	1.6[m]/5.2[ft]	28	11[m]/37[ft]
12	1.8[m]/5.8[ft]	29	13[m]/42[ft]
13	2.0[m]/6.6[ft]	30	14[m]/47[ft]
14	2.2[m]/7.4[ft]	31	16[m]/52[ft]
15	2.5[m]/8.3[ft]	32	18[m]/59[ft]
16	2.8[m]/9.3[ft]	33	20[m]/66[ft]

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The group of the master flash is invalid in the SBUsableGroup property (subsection 6.5.9.9).
	The value of the SBWirelessMode property (subsection 6.5.9.7) is other than [Stand-alone flash].
	The value of the SBGroupFlashMode property (subsection 6.7.2.1) for the master flash is other than [Distance-priority manual].

6.7.2.6 SBGroupRepeat

○ Attribute Specifications

SBGroupAttrID	0x4006
DataType	UINT8
Get / Set	Get, Get / Set
Default Value	The default value differs depending on the flash group.
FormFlag	Enumeration
Attribute Value	Refer to Attribute Value in this subsection.

○ Attribute Outline

This indicates the repeat setting of the flash group.

○ Attribute Value

The valid AttributeValues are shown below.

When the attached flash does not support this function, the value of this attribute is not fixed.

Attribute Value	Description
0	Off
1	On

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	<p>The flash group that cannot be used was specified. (The specified group is not in the values of the SBUsableGroup (subsection 6.5.9.9).)</p> <p>The value of the SBWirelessMode property (subsection 6.5.9.7) is anything other than [Stand-alone flash] and the value of the SBWirelessMultipleFlashMode property (subsection 6.5.9.8) is not [Repeating].</p> <p>The value of the SBUsableGroup property (subsection 6.5.9.9) is zero (Cannot be used).</p>

6.7.2.7 SBGroupRepeatCount

○ Attribute Specifications

SBGroupAttrID	0x4007
DataType	UINT8
Get / Set	Get, Get / Set
Default Value	10
FormFlag	Range
Attribute Value	From 2 to 90

○ Attribute Outline

This indicates the firing count of the flash group.

When the attached flash does not support this function, the value of this attribute is not fixed.

○ Attribute Details

The upper limit of the attribute value varies depending on the setting of the flash level and frequency. If the upper limit value varies, it is informed by the SBGroupAttrChanged event (subsection 6.4.2.12).

The number from 2 to 10 and the even number over 10 can be set.

When the odd number from 10 to 90 was set, it is converted to the even number by adding 1.

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The value of the SBWirelessMode property (subsection 6.5.9.7) is [Stand-alone flash] and the group of the master flash is invalid in the SBUsableGroup property (subsection 6.5.9.9).
	The value of the SBWirelessMode property (subsection 6.5.9.7) is anything other than [Stand-alone flash] and the value of the SBWirelessMultipleFlashMode property (subsection 6.5.9.8) is not [Repeating].
	The value of the SBWirelessMode property (subsection 6.5.9.7) is [Stand-alone flash] and the value of the SBGroupFlashMode property (subsection 6.7.2.1) for the master flash is not [Repeating flash].
	The value of the SBUsableGroup property (subsection 6.5.9.9) is zero (Cannot be used).

6.7.2.8 SBGroupRepeatInterval

○ Attribute Specifications

SBGroupAttrID	0x4008
DataType	UINT16
Get / Set	Get, Get / Set
Default Value	9[10Hz]
FormFlag	Enumeration
Attribute Value	Refer to Attribute Value in this subsection.

○ Attribute Outline

This indicates the repeat interval of the flash group.

○ Attribute Value

The valid AttributeValues are shown below.

When the attached flash does not support this function, the value of this attribute is not fixed.

AttributeValue	Description
0	1Hz
1	2Hz
2	3Hz
3	4Hz
4	5Hz
5	6Hz
6	7Hz
7	8Hz
8	9Hz
9	10Hz
10	20Hz
11	30Hz
12	40Hz
13	50Hz
14	60Hz
15	70Hz
16	80Hz
17	90Hz
18	100Hz

○ Response Code

When the value is set under the following conditions, an error response is made and the value cannot be set.

Response Code	Description
Access_Denied	The value of the SBWirelessMode property (subsection 6.5.9.7) is [Stand-alone flash] and the group of the master flash is invalid in the SBUsableGroup property (subsection 6.5.9.9).
	The value of the SBWirelessMode property (subsection 6.5.9.7) is anything other than [Stand-alone flash] and the value of the SBWirelessMultipleFlashMode property (subsection 6.5.9.8) is not [Repeating].
	The value of the SBWirelessMode property (subsection 6.5.9.7) is [Stand-alone flash] and the value of the SBGroupFlashMode property (subsection 6.7.2.1) for the master flash is not [Repeating flash].
	The value of the SBUsableGroup property (subsection 6.5.9.9) is zero (Cannot be used).

6.7.2.9 SBGroupValid

○ Attribute Specifications

SBGroupAttrID	0x4009
DataType	UINT8
Get / Set	Get
Default Value	0
FormFlag	None
Attribute Value	Refer to Attribute Value in this subsection.

○ Attribute Outline

This indicates the valid state of the flash group.

○ Attribute Value

The valid AttributeValues are shown below.

AttributeValue	Description
0	Invalid group
Other than 0	Valid group

7 Data Type

7.1 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

7.2 Character String Format

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)

7.3 Date Format

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.

7.4 Array Format

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

7.5 SBHandle

The SBHandle is used for identifying the flashes (the internal flash, external flash or other flash units) connected to the camera.

The SBHandle takes an unsigned 32-bit value, and the unique number is assigned to each flash.

7.6 SBGroupID

The SBGroupID is the ID number for identifying the flash group.

SBGroupID	Description
0x00000001	Master flash
0x00000002	Group A
0x00000004	Group B
0x00000008	Group C
0x00000010	Group D
0x00000020	Group E
0x00000040	Group F

8 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 unsigned 32 bits. A unique value is set for the ObjectHandle indicating each object. The specified ObjectHandle is fixed in one session.

8.1 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.

8.2 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.

8.3 Addition of the ObjectHandle

The camera acts as shown below when an object is newly added to the card during one session.

No.	Description
1	In accordance with the ObjectHandle format defined in this section, 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.

9 DataSet

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.

9.1 DeviceInfo DataSet

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	Description
StandardVersion	The highest version of the standard that can support the device.
VendorExtensionID	The vendor extension ID used by the device.
VendorExtensionVersion	The vendor-specific version number of extensions that are supported.
VendorExtensionDesc	An optional string used to hold a human-readable description of the VendorExtensionID.
FunctionalMode	An optional field used to hold the functional mode.
OperationsSupported	An array of OperationCodes supported by the camera.
EventsSupported	An array of EventCodes supported by the camera.
DevicePropertiesSupported	An array of DevicePropCodes supported by the camera.
CaptureFormats	An array of ObjectFormatCodes that can be created by the camera with InitiateCapture.
ImageFormats	An array of ObjectFormatCodes supported by the camera.
Manufacture	An optional human-readable string used to indicate the device manufacturer.
Model	An optional human-readable string used to indicate the device name.
DeviceVersion	An optional human-readable string used to indicate the version of the device.
SerialNumber	An optional human-readable string used to indicate the serial number of the camera.

Field	Size (Byte)	Data	DataType	Description
StandardVersion	2	0x0064		Version 1.00
VendorExtensionID	4	0xFFFFFFFF		-
VendorExtensionVersion	2	0x006E		Version 1.10
VendorExtensionDesc	69	0x22 0x4D00 0x6900 0x6300 0x7200 0x6F00 0x7300 0x6F00 0x6600 0x7400 0x2E00 0x6300 0x6F00 0x6D00 0x2F00 0x4400 0x6500 0x7600 0x6900 0x6300 0x6500 0x5300	String	UNICODE character string "Microsoft.com/DeviceServices: 1.0"

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		0x6500 0x7200 0x7600 0x6900 0x6300 0x6500 0x7300 0x3A00 0x2000 0x3100 0x2E00 0x3000 0x0000		
FunctionalMode	2	0x0000		Normal mode
OperationsSupported	156	0x0000004C 0x1001 0x1002 0x1003 0x1004 0x1005 0x1006 0x1007 0x1008 0x1009 0x100A 0x100B 0x100E 0x100F 0x1014 0x1015 0x1016 0x101B 0x90C0 0x90C1 0x90C2 0x90C3 0x90C4 0x90C7 0x90C8 0x90C9 0x90CA 0x90CB 0x90CC 0x90CD 0x90CE 0x90CF 0x9201 0x9202 0x9203 0x9204 0x9205 0x9206 0x9207 0x9209 0x920A 0x920B 0x920C 0x920F 0x9400 0x9402 0x9403 0x9404 0x9405 0x9406 0x940C 0x9414 0x9415	Array OperationCode supported by the camera This varies depending on whether the connection destination is MTP or not. MTP: 0x100C Not supported 0x100D Not supported Other than MTP: 0x9801 Not supported 0x9802 Not supported 0x9803 Not supported 0x9805 Not supported	

		0x9416 0x9417 0x9418 0x9419 0x941A 0x941B 0x941C 0x9420 0x9421 0x9423 0x9424 0x9425 0x9426 0x9428 0x9431 0x9432 0x9520 0x9521 0x9522 0x9523 0x9801 0x9802 0x9803 0x9805		
EventsSupported	54	0x00000019 0x4001 0x4002 0x4003 0x4004 0x4005 0x4006 0x4007 0x4008 0x4009 0x400A 0x400C 0x400D 0xC101 0xC102 0xC105 0xC108 0xC10A 0xC10B 0xC10C 0xC10E 0xC120 0xC121 0xC122 0xC123 0xC700	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	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 6.2.2.1).

		0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0xXX00 0x0000		
--	--	--	--	--

9.2 StorageInfo DataSet

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	Description
StorageType	Indicates the type of the card. Removable Ram is set.
FilesystemType	Indicates the filesystem of the card. It conforms to the DCF.
AccessCapability	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	Indicates the capacity of the card. It depends on the card used.
FreeSpaceInBytes	Indicates the free space in the card. It depends on the card used and the space that is currently used.
FreeSpaceInImages	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	Indicates a human-readable text description of the card. This field is not used for the camera.
VolumeLabel	Indicates the volume label of the card. It is described in a human-readable character string (Unicode character string).

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

9.3 ObjectInfo DataSet

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.

Field	Description
StorageID	Indicates the StorageID of the card.
ObjectFormat	Indicates the ObjectFormatCode of the object.
ProtectionStatus	Indicates the protection status of the object.
ObjectCompressedSize	Indicates the size of the object in bytes. 0xFFFFFFFF for over 4GB.
ThumbFormat	Indicates the ObjectFormat of the thumbnail.
ThumbCompressedSize	Indicates the size of the thumbnail in bytes.
ThumbPixWidth	Indicates the thumbnail width in pixels.
ThumbPixHeight	Indicates the thumbnail height in pixels.
ImagePixWidth	Indicates the image width in pixels.
ImagePixHeight	Indicates the image height in pixels.
ImageBitDepth	Indicates the bit depth of the image.
ParentObject	Indicates the ObjectHandle of the parent object of this object.
AssociationType	Indicates the association type. It is used for the object of the association type.
AssociationDesc	Indicates the descriptor parameter of the association. It is not used in the camera.
SequenceNumber	Indicates the component of the association. It is not used in the camera.
Filename	Indicates an optional character string showing the file name of the object.
CaptureDate	Indicates the character string showing the date and time of object creation.
ModificationDate	Indicates the character string showing the date and time of object modification. When the object does not have a date and time of modification, the same date and time as that of the object creation is stored.
Keywords	Indicates the character string showing the image-related keyword. It is not used in the camera.

9.3.1 Directory/Virtual Association DataSet

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
AssociationType	2	0x0001		GenericFolder
AssociationDesc	4	0x00000000		-
SequenceNumber	4	0x00000000		-
Filename			String	Unicode character string
CaptureDate			String	Date and time of capture (Unicode character string) (Not used for the virtual association)
ModificationDate			String	Date and time of modification (Unicode character string) (Not used for the virtual association)
Keywords	1	0x00		-

9.3.2 Image File DataSet

Field	Size (Byte)	Data	DataType	Description
StorageID	4	StorageID		StorageID SDRAM image: 0x00000000
ObjectFormat	2			0x3000 (Undefined) 0x3801 (EXIF) 0x380D (TIFF)
ProtectionStatus	2			0x0001 (with protection setting), 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\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 and time of capture (Unicode character string)
ModificationDate			String	Date and time of modification (Unicode character string)
Keywords	1	0x00		-

9.3.3 Script File DataSet

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	Date and time of creation (Unicode character string)
ModificationDate			String	Date and time of modification (Unicode character string)
Keywords	1	0x00		-

9.3.4 Movie File DataSet

Field	Size (Byte)	Data	DataType	Description
StorageID	4	StorageID		StorageID Image: 0x00000000
ObjectFormat	2			0x300D (MOV)
ProtectionStatus	2			0x0001 (with protection setting) 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 and time of capture (Unicode character string)
ModificationDate			String	Date and time of modification (Unicode character string)
Keywords	1	0x00		-

9.4 DevicePropDesc DataSet

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	Description
DevicePropCode	Indicates DevicePropCode of the property.
DataType	Indicates the data type of the property.
GetSet	Indicates the access attribute of the property.
Factory Default Value	Indicates the default value of the property.
Current Value	Indicates the current value of the property.
FormFlag	Indicates the property description data set.

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 7.1).
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.

9.5 ObjectPropDesc DataSet

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	Description	
ObjectPropertyCode	Indicates ObjectPropCode of the property.	
DataType	Indicates the data type of the property.	
GetSet	Indicates the access attribute of the property.	
Default Value	Indicates the default value of the property.	
Group Code	Indicates the search group of the property.	
FormFlag	Indicates the property description data set.	

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 7.1).
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 0xFF: 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.

9.6 Property Description DataSet

The property description data set is set in the FORM field of the DevicePropDesc data set and the ObjectPropDesc data set.

9.6.1 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

9.6.2 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.

9.6.3 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

9.6.4 Fixed-Length Array Form

Field	Size (Byte)	Description
Length	2	It is an unsigned 16-bit integer and indicates the number of array elements.

9.6.5 Regular Expression Form

Field	Size (Byte)	Description
RegEx	DTS	It indicates the regular expression for creating the PropertyValue correctly.

9.6.6 Byte String Form

Field	Description
MaxLength	It indicates the maximum length of the byte string.

9.6.7 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.)

9.7 LiveViewObject DataSet

9.7.1 No Version

	Field		Size	Description
	Display information area size		4Byte	
	Live view image area size		4Byte	
Display information	Live view image Image size	Horizontal size Vertical size	2Byte 2Byte	The size set in the LiveViewImageSize property becomes the image size.
	Whole size	Horizontal size Vertical size	2Byte 2Byte	Standard of the coordinates
	Display area size	Horizontal size Vertical size	2Byte 2Byte	The whole size is equal to the display area size when the image is not enlarged.
	Display center coordinates	Horizontal size Vertical size	2Byte 2Byte	
	AF frame size	Horizontal size Vertical size	2Byte 2Byte	
	AF frame center coordinates	Horizontal size Vertical size	2Byte 2Byte	
	Reserved		4Byte	
	Selected focus area		1Byte	From 0 to 51
	Rotation		1Byte	0: Off, 1: Rotate counterclockwise, 2: Rotate clockwise, 3: Upside down
	Focus driving status		1Byte	0: Not driving, 1: Driving
	Reserved		1Byte	
	Reserved		4Byte	
	Reserved		2Byte	
	Countdown time		2Byte	Countdown every one second starting from 3600 (one hour); countdown starting from thirty seconds with a rise in temperature
	Focusing judgement result		1Byte	0: No information, 1: Not focused, 2: Focused
	AF driving enabled status		1Byte	0: AF driving disabled, 1: AF driving enabled
	Reserved		2Byte	
	Level angle information	Rolling Pitching Yawing	4Byte 4Byte 4Byte	
	Remaining time of movie recording		4Byte	From 0 to 1799999 [msec] * It is valid during the movie recording state.
	Movie recording information		1Byte	0: During LV execution 1: During movie recording
	Face detection AF mode state		1Byte	0: Face detection AF is not set. 1: Face /Eye /Animal detection AF is set.
	The number of persons whose faces are detected		1Byte	From 0 to 35
	Selected face index		1Byte	From 0 to 34
	0 to 34	AF frame size AF frame center coordinates	Horizontal size Vertical size Horizontal position Vertical position	2Byte 2Byte 2Byte 2Byte Area of the AF frame size and the AF frame center coordinates for thirty-five persons (4 Byte + 4 Byte) x 35 persons; 280 Byte in total
	Sound indicator (peak value)	L R	1Byte 1Byte	From 0 to 14 From 0 to 14
	Sound indicator (current value)	L R	1Byte 1Byte	From 0 to 14 From 0 to 14

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	Reserved	1Byte	
	Reserved	1Byte	
	Reserved	1Byte	
	Spot WB condition	1Byte	0: Off 1: On standby (not acquired) 2: During acquisition operation 3: On standby (acquisition success) 4: On standby (acquisition failure)
	Reserved	24Byte	
Live view image	Image data		

The data specifications for LiveViewObject (No Version) are shown below.

No.	Description
1	The size of the display information is 376Byte.
2	When the electronic VR is ON, the image is 90% of angle of view.

Refer to the following property about the value for virtual horizon.

No.	Description
1	AngleLevel property (subsection 6.5.7.16)
2	AngleLevelPitching property (subsection 6.5.7.17)
3	AngleLevelYawing property (subsection 6.5.7.18)

The details of the case in which the face detection AF mode state is set to “1: Face /Eye /Animal detection AF is set” are shown below.

No.	Description
1	Even if the number of persons whose faces are detected is zero, the face detection AF mode state is set to “1: Face (Eye/Animal) detection AF is set”.
2	The focusing judgement result is set to a value other than “0: No information” for one second when the camera is in focus.
3	The AF frame size and the AF frame center coordinates for face detection are used.

9.7.2 With Version

	Field		Size	Description	
Display information	Version		2Byte	Major version (0x01)	
			2Byte	Minor version (0x00)	
	Reserved		4Byte		
	Display information area size		4Byte		
	Live view image area size		4Byte		
	Whole size	Horizontal size	2Byte	Standard of the coordinates	
		Vertical size	2Byte		
	Display area size	Horizontal size	2Byte	The whole size is equal to the display area size when the image is not enlarged.	
		Vertical size	2Byte		
	Display center coordinates	Horizontal size	2Byte		
		Vertical size	2Byte		
	Live view image Image size	Horizontal size	2Byte	The size set in the LiveViewImageSize property becomes the image size.	
		Vertical size	2Byte		
	Live view image Quality		1Byte	The quality is set in the LiveViewImageCompression property.	
	Reserved		7Byte		
	AF driving enabled status		1Byte	0: AF driving disabled, 1: AF driving enabled	
	Focus driving status		1Byte	0: Not driving, 1: Driving	
	Focusing judgement result		1Byte	0: No information, 1: Not focused, 2: Focused	
	AF mode state		1Byte	0: Other 1: Face /Eye /Animal detection AF 2: Auto-area AF	
	AF area number		1Byte	From 0 to 42 (The number of faces when using face-priority AF)	
	Selected face index		1Byte	From 0 to 34	
	Tracking state		1Byte	0: Waiting 1: Targeting 2: Tracking	
	Reserved		1Byte		
From 0 to 41	AF frame size	Horizontal size	2Byte	Region of the AF frame size and the AF frame center coordinates for 42 areas.	
		Vertical size	2Byte		
	AF frame center coordinates	Horizontal size	2Byte		
		Vertical size	2Byte		
Remaining time of movie recording			4Byte	From 0 to 1799999 [msec] * It is valid during the movie recording state.	
Sound indicator (peak value)	L	1Byte	From 0 to 14		
		1Byte	From 0 to 14		
Sound indicator (current value)	L	1Byte	From 0 to 14		
		1Byte	From 0 to 14		
Movie recording information			1Byte	0: During LV execution 1: During movie recording	
State of synchronous recording by the external recorder *1			1Byte	0: Synchronous recording cannot be performed 1: Synchronous recording standby (Synchronous recording can be performed but does not start)	

			2: Synchronous recording is being performed
Reserved	1Byte		
Time code status	1Byte	0: Off, 1: On	
Time code count	1Byte	Hour	
	1Byte	Minute	
	1Byte	Second	
	1Byte	Frame	
Countdown time	2Byte	Countdown every one second starting from 3600 (one hour) ; countdown starting from thirty seconds with a rise in temperature	
Spot WB condition	1Byte	0: Off 1: On standby (not acquired) 2: During acquisition operation 3: On standby (acquisition success) 4: On standby (acquisition failure)	
Rotation	1Byte	0: Off, 1: Rotate counterclockwise, 2: Rotate clockwise, 3: Upside down	
Level angle information	Rolling	4Byte	
	Pitching	4Byte	
	Yawing	4Byte	
Using white balance for live view photography *1	1Byte	0: Off 1: On	
Reserved	95Byte		
Live view image	Image data		

*1 Grayed out items are reserved in this camera and the value is fixed to zero.

The data specifications for LiveViewObject (With Version) are shown below.

No.	Description
1	The size of the display information is 5121Byte.
2	When the electronic VR is ON, the image is 90% of angle of view.

The values of AF frame size and AF frame center coordinates are shown below.

No.	Description
1	The AF frame size and the AF frame center coordinates for the number of [AF area number] are valid.

Refer to the following property about the value for virtual horizon.

No.	Description
1	AngleLevel property (subsection 6.5.7.16)
2	AngleLevelPitching property (subsection 6.5.7.17)
3	AngleLevelYawing property (subsection 6.5.7.18)

The details of the case in which the AF mode state is set to "1: Face /Eye /Animal detection AF" are shown below.

No.	Description
1	Even if the AF area number (the number of persons whose faces are detected) is zero, the AF mode state is set to "1: Face (Eye/Animal) detection AF".
2	The focusing judgement result is set to a value other than "0: No information" for one second when the camera is in focus.

9.8 PictureControl DataSet

PictureControl DataSet is sent by operation of SetPicCtrlData command or GetPicCtrlData command.

PictureControl DataSet indicates information about a picture control.

Field	Size	Reference
BasePictureControl	2	9.8.1
RegistrationName	20	9.8.2
ApplyLevel	1	9.8.3
QuickSharpFlag	1	9.8.4
QuickSharp	1	9.8.5
Sharpening	1	9.8.6
MiddleRangeSharpening	1	9.8.7
Clarity	1	9.8.8
Contrast	1	9.8.9
Brightness	1	9.8.10
Saturation	1	9.8.11
Hue	1	9.8.12
FilterEffects	1	9.8.13
Toning	1	9.8.14
ToningDensity	1	9.8.15
CustomCurveFlag	1	9.8.16
CustomCurveData	0 or 578	9.8.17

The values for Sharpening, MiddleRangeSharpening, Clarity, Contrast, Brightness, Saturation, Hue and ToningDensity are shown below.

Value	Description
-128	Auto
-N	$-N \times 0.25$
	...
-1	-0.25
0	0
1	0.25
	...
N	$N \times 0.25$

9.8.1 BasePictureControl

These are the types of picture controls on which the custom picture control is based.
If the picture control is pre-installed, this indicates the picture control.

The value is zero for unused custom picture control.

Value	Description
1	Standard
2	Neutral
3	Vivid
4	Monochrome
5	Portrait
6	Landscape
7	Flat
8	Auto
101	Dream
102	Morning
103	Pop
104	Sunday
105	Somber
106	Drama
107	Silence
108	Bleach
109	Melancholic
110	Pure
111	Denim
112	Toy
113	Sepia
114	Blue
115	Red
116	Pink
117	Charcoal
118	Graphite
119	Binary
120	Carbon

9.8.2 RegistrationName

This is the registration name of picture control.
The size is fixed to 20Bytes (ASCII: 19Bytes + NULL).

9.8.3 ApplyLevel

This is the degree of control for picture control.

Value	Description
0	0
10	10
20	20
30	30
40	40
50	50
60	60
70	70
80	80
90	90
100	100

Available values for each picture control are shown below.

Auto	Standard Vivid Portrait Landscape Neutral Flat	Monochrome	Dream Morning Pop Sunday	Somber Drama Silence Bleach Melancholic Pure Denim Toy	Sepia Blue Red Pink	Charcoal Graphite Binary Carbon
0				0 10 20 30 40 50 60 70 80 90 100		

9.8.4 QuickSharpFlag

This is the state of the quick sharpening control for a picture control.

If QuickSharpFlag is set to [Valid] when setting a picture control, the values of Sharpening, MiddleRangeSharpening and Clarity are ignored.

Value	Description
0	Invalid
1	Valid

9.8.5 QuickSharp

This is the quick sharpening control for a picture control.

Value	Description
-128	Auto
-2	-2
-1	-1
0	0
1	1
2	2

Available values for each picture control are shown below.

If QuickSharpFlag is set to [Invalid] when setting a picture control, [Auto] cannot be set.

Auto	Standard Vivid Portrait Landscape Neutral Flat	Monochrome	Dream Morning Pop Sunday	Somber Drama Silence Bleach Melancholic Pure Denim Toy	Sepia Blue Red Pink	Charcoal Graphite Binary Carbon
From -2 to 2	-128 From -2 to 2		From -2 to 2			

9.8.6 Sharpening

This is the sharpening control for a picture control.

Available values for each picture control are shown below.

Auto	Standard Vivid Portrait Landscape Neutral Flat	Monochrome	Dream Morning Pop Sunday	Somber Drama Silence Bleach Melancholic Pure Denim Toy	Sepia Blue Red Pink	Charcoal Graphite Binary Carbon
-8 -4 0 4 8	-128 (When QuickSharp is set to [Auto]) From -12 to 36					

9.8.7 MiddleRangeSharpening

This is the middle-range sharpening control for a picture control.

Available values for each picture control are shown below.

Auto	Standard Vivid Portrait Landscape Neutral Flat	Monochrome	Dream Morning Pop Sunday	Somber Drama Silence Bleach Melancholic Pure Denim Toy	Sepia Blue Red Pink	Charcoal Graphite Binary Carbon
-8 -4 0 4 8	-128 (When QuickSharp is set to [Auto]) From -20 to 20					

9.8.8 Clarity

This is the clarity control for a picture control.

Available values for each picture control are shown below.

Auto	Standard Vivid Portrait Landscape Neutral Flat	Monochrome	Dream Morning Pop Sunday	Somber Drama Silence Bleach Melancholic Pure Denim Toy	Sepia Blue Red Pink	Charcoal Graphite Binary Carbon
-8 -4 0 4 8	<p>-128 (When QuickSharp is set to [Auto]) From -20 to 20</p>					

9.8.9 Contrast

This is the contrast control for a picture control.

Available values for each picture control are shown below.

Auto	Standard Vivid Portrait Landscape Neutral Flat	Monochrome	Dream Morning Pop Sunday	Somber Drama Silence Bleach Melancholic Pure Denim Toy	Sepia Blue Red Pink	Charcoal Graphite Binary Carbon
-8 -4 0 4 8	<p>-128 From -12 to 12</p>		<p>From -12 to 12</p>			

9.8.10 Brightness

This is the brightness control for a picture control.

Available values for each picture control are shown below.

Auto	Standard Vivid Portrait Landscape Neutral Flat	Monochrome	Dream Morning Pop Sunday	Somber Drama Silence Bleach Melancholic Pure Denim Toy	Sepia Blue Red Pink	Charcoal Graphite Binary Carbon
0	From -6 to 6		0			

9.8.11 Saturation

This is the saturation control for a picture control.

Available values for each picture control are shown below.

Auto	Standard Vivid Portrait Landscape Neutral Flat	Monochrome	Dream Morning Pop Sunday	Somber Drama Silence Bleach Melancholic Pure Denim Toy	Sepia Blue Red Pink	Charcoal Graphite Binary Carbon
-8 -4 0 4 8	-128 From -12 to 12	0	From -12 to 12	0		

9.8.12 Hue

This is the hue control for a picture control.

Available values for each picture control are shown below.

Auto	Standard Vivid Portrait Landscape Neutral Flat	Monochrome	Dream Morning Pop Sunday	Somber Drama Silence Bleach Melancholic Pure Denim Toy	Sepia Blue Red Pink	Charcoal Graphite Binary Carbon
0	From -12 to 12	0	From -12 to 12	0		

9.8.13 FilterEffects

This is the filter effect for a picture control.

Value	Description
0	Off
1	Yellow
2	Orange
3	Red
4	Green

Available values for each picture control are shown below.

Auto	Standard Vivid Portrait Landscape Neutral Flat	Monochrome	Dream Morning Pop Sunday	Somber Drama Silence Bleach Melancholic Pure Denim Toy	Sepia Blue Red Pink	Charcoal Graphite Binary Carbon
0	From 0 to 4	0	From 0 to 4			

9.8.14 Toning

This is the toning control for a picture control.

If toning can be selected and toning is set to [B&W] when setting a picture control, the value of ToningDensity is ignored.

Value	Description
0	B&W
1	Sepia
2	Cyanotype
3	Red
4	Yellow
5	Green
6	Blue Green
7	Blue
8	Purple Blue
9	Red Purple

Available values for each picture control are shown below.

Auto	Standard Vivid Portrait Landscape Neutral Flat	Monochrome	Dream Morning Pop Sunday	Somber Drama Silence Bleach Melancholic Pure Denim Toy	Sepia Blue Red Pink	Charcoal Graphite Binary Carbon
0	From 0 to 9			0	From 0 to 9	

9.8.15 ToningDensity

This is the toning (density) control for a picture control.

Available values for each picture control are shown below.

Auto	Standard Vivid Portrait Landscape Neutral Flat	Monochrome	Dream Morning Pop Sunday	Somber Drama Silence Bleach Melancholic Pure Denim Toy	Sepia Blue Red Pink	Charcoal Graphite Binary Carbon
0	From 0 to 28			0	From 0 to 28	

9.8.16 CustomCurveFlag

This is the state of custom curve for a picture control.
[Valid] is available only for a custom picture control.

Value	Description
0	Invalid
1	Valid

9.8.17 CustomCurveData

This is the custom curve data for a picture control.
The data format for a custom curve is described in LUT Format (subsection 9.8.17.1).
If the CustomCurveFlag is set to [Invalid], this is not used.

9.8.17.1 LUT Format

The LUT data consists of the header (64 bytes) for use on the host and following 514 bytes (2 bytes x 257 points) lut data. The header format is specified by the host (The stored location for such as the line point of the LUT to be sent, the data for reproducing the LUT at the time of reading). The camera does not care about the header contents. However, since 2 bytes of the header is used for judging whether header data is present on the camera, it is necessary to set data in the header.

The LUT format is as follows.

Byte	Description
From 0 to 63	Lut Header
64, 65	Data0
66, 67	Data1
	...
576, 577	Data256

As an example of the Lut header, the contents of the header set by the application made by Nikon are shown below.

Byte	Description	Range
1	ID (Byte1)	0x49
2	ID (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

9.9 PictureControlCapability DataSet

The PictureControlCapability DataSet is sent by operation of GetPicCtrlCapability command.
The PictureControlCapability DataSet indicates information about the function of a picture control.

Field	Size	Data	Description
ApplyLevelCapability	1		Apply level: Selectability and availability of AUTO
QuickSharpCapability	1		Quick sharpening: Selectability and availability of AUTO
SharpeningCapability	1		Sharpening: Selectability and availability of AUTO
MiddleRangeSharpening Capability	1		Middle range sharpening: Selectability and availability of AUTO
ClarityCapability	1		Clarity: Selectability and availability of AUTO
ContrastCapability	1		Contrast: Selectability and availability of AUTO
BrightnessCapability	1	0x00: Not selectable 0x80: Selectable 0x01: AUTO is available 0x81: Selectable and AUTO is available	Brightness: Selectability and availability of AUTO
SaturationCapability	1		Saturation: Selectability and availability of AUTO
HueCapability	1		Hue: Selectability and availability of AUTO
FilterEffectsCapability	1		Filter effect: Selectability and availability of AUTO
ToningCapability	1		Toning: Selectability and availability of AUTO
ToningDensityCapability	1		Toning (density): Selectability and availability of AUTO
DefaultQuickSharpLevel	1	QuickSharp (9.8.5)	The default value of QuickSharp
DefaultLevel[0]	3	DefaultLevel (9.9.1)	QuickSharp -2
DefaultLevel[1]	3		QuickSharp -1
DefaultLevel[2]	3		QuickSharp 0
DefaultLevel[3]	3		QuickSharp +1
DefaultLevel[4]	3		QuickSharp +2

9.9.1 DefaultLevel

The information for the default level used in the PictureControlCapability DataSet is shown below.

Field	Size	Reference
Sharpening	1	9.8.6
MiddleRangeSharpening	1	9.8.7
Clarity	1	9.8.8

9.10 SBAttributeDesc DataSet

The SBAttributeDesc data set is sent by the operation of the GetSBAttrDesc command or GetSBGroupAttrDesc command.

The SBAttributeDesc data set is used to indicate the information of the flash attribute.

The details of the SBAttributeDesc data set are shown below.

Field	Size (Byte)	DataType	Description
AttributID	2	UINT16	SBAttrID or SBGroupAttrID
DataType	2	UINT16	Data type of the attribute The value varies depending on the attribute. Refer to DataTypeCode (subsection 7.1).
GetSet	1	UINT8	Availability of Get and Set operations. 0x00: Only Get operation is available (Get) 0x01: Get and Set operations are available (Get / Set)
DefaultValue	DTS	DTS	The default value in the camera The value varies depending on the attribute.
CurrentValue	DTS	DTS	The current value in the camera The value varies depending on the attribute.
FormFlag	1	UINT8	Type of the data set descriptor 0x00: None 0x01: Range 0x02: Enumeration
FORM	DTS	DTS	The value in the field depends on FormFlag field. If FormFlag is 0, this field doesn't exist.

9.11 SBAttributeDescList DataSet

The SBAttributeList data set is sent by the operation of the GetSBAttrValue command, the SetSBAttrValue command, the GetSBGroupAttrValue command or the SetSBGroupAttrValue command.

The SBAttributeList data set is used to indicate the list of the current values of the flash attribute.

The details of the SBAttributeList data set are shown below.

Field	Size (Byte)	DataType or DataSet	Description
NumberOfElements	4	UINT32	The number of attributes in the list.
Element1 AttributeDesc	DTS	Refer to SBAttributeDesc (subsection 9.10)	SBAttributeDesc for element 1
Element2 AttributeDesc	DTS	Refer to SBAttributeDesc (subsection 9.10)	SBAttributeDesc for element 2
...			
ElementN AttributeDesc	DTS	Refer to SBAttributeDesc (subsection 9.10)	SBAttributeDesc for element N

9.12 SBAttribute DataSet

The SBAttribute data set is sent by the operation of the GetSBAttrValue command, the SetSBAttrValue command, the GetSBGroupAttrValue command or the SetSBGroupAttrValue command.

The SBAttribute data set is used to indicate the current values of the flash attribute.

The details of the SBAttribute data set are shown below.

Field	Size (Byte)	DataType	Description
AttributeID	2	UINT16	SBAttrID or SBGroupAttrID
DataType	2	UINT16	Data type of the attribute The value varies depending on the attribute. Refer to DataTypeCode (subsection 7.1).
CurrentValue	DTS	DTS	The current value in the camera The value varies depending on the attribute.

9.13 SBAttributeList DataSet

The SBAttributeList data set is sent by the operation of the GetSBAttrValue command, the SetSBAttrValue command, the GetSBGroupAttrValue command or the SetSBGroupAttrValue command.

The SBAttributeList data set is used to indicate the list of the current values of the flash attribute.

The details of the SBAttributeList data set are shown below.

Field	Size (Byte)	DataType or DataSet	Description
NumberOfElements	4	UINT32	The number of attributes in the list.
Element1 Attribute	DTS	Refer to SBAttribute (subsection 9.12)	SBAttribute for element 1
Element2 Attribute	DTS	Refer to SBAttribute (subsection 9.12)	SBAttribute for element 2
...			
ElementN Attribute	DTS	Refer to SBAttribute (subsection 9.12)	SBAttribute for element N

10 Data Format

10.1 ASCII Codes

For the property related to the comment of the camera, 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						

In addition to the above characters, following five characters can be used in the `CommentString` property (subsection 6.5.5.2), `ArtistV` property (subsection 6.5.5.4) and `CopyrightV` property (subsection 6.5.5.5).

¥	^	'		~
---	---	---	--	---

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

11 Appendices

11.1 Properties Affected by Mounting the CPU Lens

The following properties are affected by mounting the CPU lens.

Property	Reference
LensSort	6.5.10.1
Fnumber	6.5.1.5
FocalLength	6.5.1.6
LensTypeML	6.5.10.2
LensTypeF	6.5.10.3
LensID	6.5.10.4
LensFocalMin	6.5.10.5
LensFocalMax	6.5.10.6
LensApertureMin	6.5.10.7
LensApertureMax	6.5.10.8
MovieFnumber	6.5.12.9

11.2 Properties Affected by Mounting the External Flash

Property	External flash mounted		External flash not mounted
	New-type communication	Noncommunication	
ExternalSpeedLightExist	Mounted	Mounted	Not mounted
ExternalSpeedLightSort	New-type communication	Noncommunication	Not fixed
ExternalSpeedLightStatus	Valid	Valid	Not fixed
NewExternalSpeedLightMode	Valid	Not fixed	Not fixed
FlashCompensation	Valid/Not fixed	Not fixed	Not fixed
ExposureTime	Bulb ~ (*1) (*2)	Bulb ~ (*1)	Bulb ~ 1/8000
ShutterSpeed	Bulb ~ (*1) (*2)	Bulb ~ (*1)	Bulb ~ 1/8000

*1: Flash shooting synchronization speed

*2: Speed limit of the external flash

11.3 Properties Affected by the Shooting Mode

Property	Shooting mode			
	M	P	A	S
ExposureProgramMode	M	P	A	S
Fnumber	Get / Set (*1)	Get	Get / Set (*1)	Get
ExposureTime	Get / Set	Get	Get	Get / Set (*2)
ShutterSpeed	Get / Set	Get	Get	Get / Set
FlexibleProgram	Not fixed	Get / Set	Not fixed	Not fixed

*1: Setting is disabled when a lens other than the CPU lens is mounted.

*2: Setting is disabled with Bulb.

11.4 Properties Affected by Time Zone

The UTC is retained in the camera. When displaying the time on the menu or getting/setting the DateTime property, "Time zone" and "Daylight saving time" in the camera are considered.

When getting the DateTime property, the calculated value shown below is passed to the host.

Time in the camera + Time zone difference + Daylight saving 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
Time zone	UTC+9 (Tokyo, Seoul)
Daylight saving time	Off

When the DateTime property is set, the value calculated as shown below is set in the camera.

Time set by the host - Time zone difference - Daylight saving time

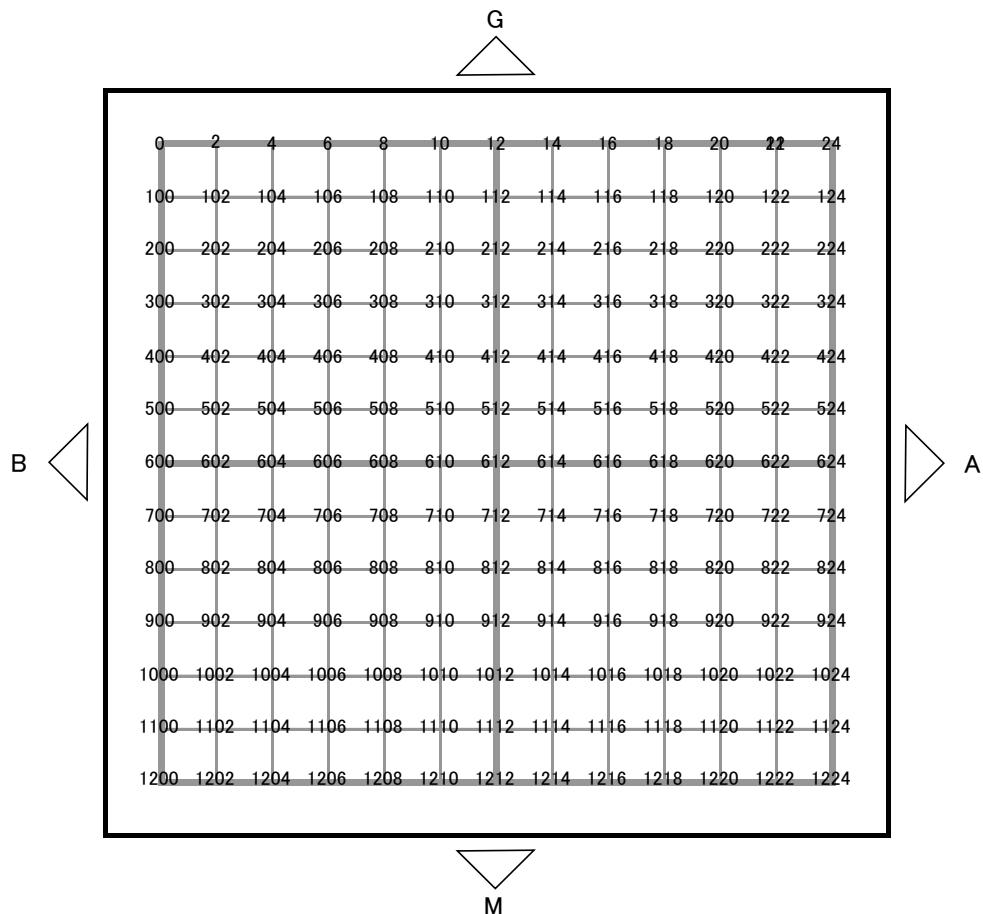
When the camera settings are as shown in the table below and the time set by the host is "2006/06/01 13:00:00", the calculation is "13:00:00 - 09:00 - 0:00" and the time setting in the camera is "2006/06/01 04:00:00".

Time zone	UTC+9 (Tokyo, Seoul)
Daylight saving time	Off

11.5 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.

On the A-B axis: in steps of 0.5, on the G-M axis: in steps of 0.25



11.6 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	Noncommunication	Mounting not detected
SB-5000	SB-500	SB-80DX	SB-30	SB-9
SB-910	SB-400	SB-50DX	SB-29	SB-8
SB-900	SB-300	SB-28DX	SB-29S	SB-7
SB-800		SB-28D	SB-23	SB-6
SB-700		SB-28	SB-22	SB-5
SB-600		SB-27	SB-22S	SB-4
SU-800		SB-26	SB-21A	SB-3
		SB-25	SB-21B	SB-2
		SB-24	SB-20	SB-1
			SB-19	
			SB-18	
			SB-17	
			SB-16A	
			SB-16B	
			SB-15	
			SB-14	
			SB-12	
			SB-11	
			SB-10	
			SB-E	

*For old-type communication and noncommunication, mounting is not detected in the camera.

11.7 Command Release Operation

The operation by the command release is described in this subsection.

11.7.1 Continuous Shooting

The number of images that can be captured continuously by the continuous shooting is the smallest number among the following property combination.

Property	Card	SDRAM	Card and SDRAM
BurstNumber (subsection 6.5.1.16)	✓	✓	✓
ContinuousShootingCount (subsection 6.5.7.5)	✓	✓	✓

The availability of the continuous shooting in the release mode of StillCaptureMode (subsection 6.5.1.15) is described below.

Release mode	BurstNumber	Description
Single frame	Invalid	Only one image can be captured.
Continuous high-speed shot Continuous low-speed shot Continuous high-speed shot (Extension)	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 when the internal flash is enabled or the HDR mode is set.
Self-timer	Invalid	Only one image can be captured. StillCaptureMode is temporarily set to the single frame when release.

11.7.2 AF Operation

AF is performed in accordance with the setting of the FocusMode property (subsection 6.5.1.7).

If the out-of-focus status occurs with the following settings when the continuous release is started, the continuous shot operation is canceled.

No.	Description
1	The FocusMode property (subsection 6.5.1.7) is [Continuous AF] and the focus priority is selected in AF-C mode.

11.7.3 Preset WB acquisition

During live view photography, the preset WB acquisition is performed with release sequence.

Refer to InitiateCaptureReclnMedia command about the preset measurement release.

During movie live view, it is the same as the spot WB acquisition.

Refer to StartSpotWb command.

11.7.4 Event on the Release Operation

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

The new object addition event includes the ObjectHandle indicating the new object that is created. If two or more new objects are created, the new object addition event is issued two or more times.

When all the new objects that can be acquired are recorded, the camera issues the capturing completion event to the host to inform that the acquisition of all the new objects is completed.

The new object addition event and the capturing completion event vary depending on the recording destination. The following table shows the correspondence of the destination to the event.

Recording destination	New object addition event	Capturing completion event
Card	ObjectAdded	CaptureComplete
SDRAM	ObjectAddedInSdram	CaptureCompleteInSdram
Card and SDRAM	ObjectAdded and ObjectAddedInSdram	CaptureComplete and CaptureCompleteInSdram

When the recording destination is set to [Card and SDRAM], the order of issuing the new object addition event is not decided and the events are issued in order of completing image recording.

The capturing completion event is issued in the same way; the event of the recording destination in which acquisition of all the new objects is completed first, is issued first.

11.7.5 Recovery from the Sequence Error

When the Bit0 of the WarningStatus property (subsection 6.5.7.19) is set to 1 [Sequence error] and the release operation is performed by the command, the sequence error is cancelled if the sequence error can be recovered. When it is cancelled, the release is not started and the command is terminated.

11.7.6 Silent Shooting

If the LiveViewPhotography property is set to [On] during live view photography, the silent shooting is performed.

The number of images that can be captured continuously by the silent shooting is the least number among the following values:

- The value of the BurstNumber property (subsection 6.5.1.16).
- The value of the ContinuousShootingCount property (subsection 6.5.7.5).