Nikon Corporation Type0016 vender unique capabilities

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Nikon Corporation

1. Introduction

This document explains the vendor unique capabilities, which are used by Type0016module
(Type0016.md3, Type0016 module.bundle).

These definition values are defined in Maid3d1.h. Refer to the MAID 3.1 Specification for the details of capabilities.

NOTE) These unique capabilities may have different function at another module.

2. Supported camera

Type0016 module can control D5500, D5600 camera.

3. Vendor Unique Capabilities

The vender unique capabilities that are used by Type0016 module are described as follows.

The under line shows default value.

3.1. ImageSize

This will set the size of image. (Shooting menu)

Capability kNkMAIDCapability_ImageSize

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

L	L(6000*4000)
M	M(4496*3000)
S	S(2992*2000)

The following cases, this Capability cannot be set into.

- When the value of Capability_CompressionLevel is “RAW”
- When the Capability_InfoDisplayErrStatus is True: ON (Error display).
- During movie file recording.

3.2. CompressionLevel

This will select the compression level of a picture. (Shooting Menu)

Capability kNkMAIDCapability_CompressionLevel

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data JPEG Basic,
JPEG Normal,
JPEG Fine,
RAW,
RAW + JPEG Basic,
RAW + JPEG Normal,
RAW + JPEG Fine

The following cases, the module enumerates values which don’t include “RAW”

- When the value of Capability_ ExposureMode is EFFECTS (“Miniature Effect”,

"Selective Color", "Night Vision", "Toy Camera Effect", "Super Vivid", "Pop" or "Photo Illustration").

- When the value of Capability_HDRMode is except 0 (Off).

The following cases, this Capability is read only.

- When the Capability_InfoDisplayErrStatus is True: ON (Error display).
- During movie file recording.

3.3. WBMode

This will select the white balance mode. (Shooting menu)

Capability	kNkMAIDCapability_WBMode
Object types	Source
ulType	kNkMAIDCapType_Enum kNkMAIDArrayType_PackedString
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set
Data	Auto, Incandescent, Fluorescent, Sunny, Flash, Shade, Cloudy, Measure, Use Photo

When the Capability_ExposureMode is set to "twilight" or "candle" in Scene modes, "K" is displayed on the camera body. However, the value of this Capability “Auto” returns.

When the Capability_HDRMode is except “0: Off” and the value of this Capability is “Measure”, “Measure” is not enumerated.

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes (5: [Scene Modes] Auto, 13: [Scene Modes] Auto (flash off), 14: [Scene Modes] SCENE, 17: [Special Effects] EFFECTS).
- When the Capability_InfoDisplayErrStatus is True: ON (Error display).
- During movie file recording.

3.4. Sensitivity

This will select the sensitivity of camera (Shooting menu)

Capability kNkMAIDCapability_Sensitivity

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

Auto
100
125
160
200
250
320
400
500
640
800
1000
1250
1600
2000
2500
3200
4000
5000
6400
8000
10000
12800
16000
20000
25600

When Capability_ExposureMode is set to “Program mode” or “Aperture priority” or “Speed priority”, and “Manual”, “Auto” is not enumerated.

When Capability_ExposureMode is set to “Auto” or “Auto (flash off)” or “Night vision” of Special Effects Modes, the current value is fixed at “Auto”.

By setting Capability_ExposureMode, value range that can be set is limited as follows.

ExposureMode	ISO value range
P,S,A,M	100～25600
Auto, Auto(flash off), Night Vision(EFFECTS)	Auto
Other	Auto, 100～25600

The following cases, this Capability cannot be set into.

- When Capability_ExposureMode is set to “Auto” , “Auto (flash off)” or “Night vision” of Special Effects Modes.
- When the Capability_InfoDisplayErrStatus is True: ON (Error display).

3.5. ResetMenuBank

This will reset the shooting menu. (Shooting menu)

Capability	kNkMAIDCapability_ResetMenuBank
Object types	Source
ulType	kNkMAIDCapType_Process
ulOperations	kNkMAIDCapOperation_Start
Data	None

During movie file recording, this capability cannot be performed.

3.6. WBTuneAuto

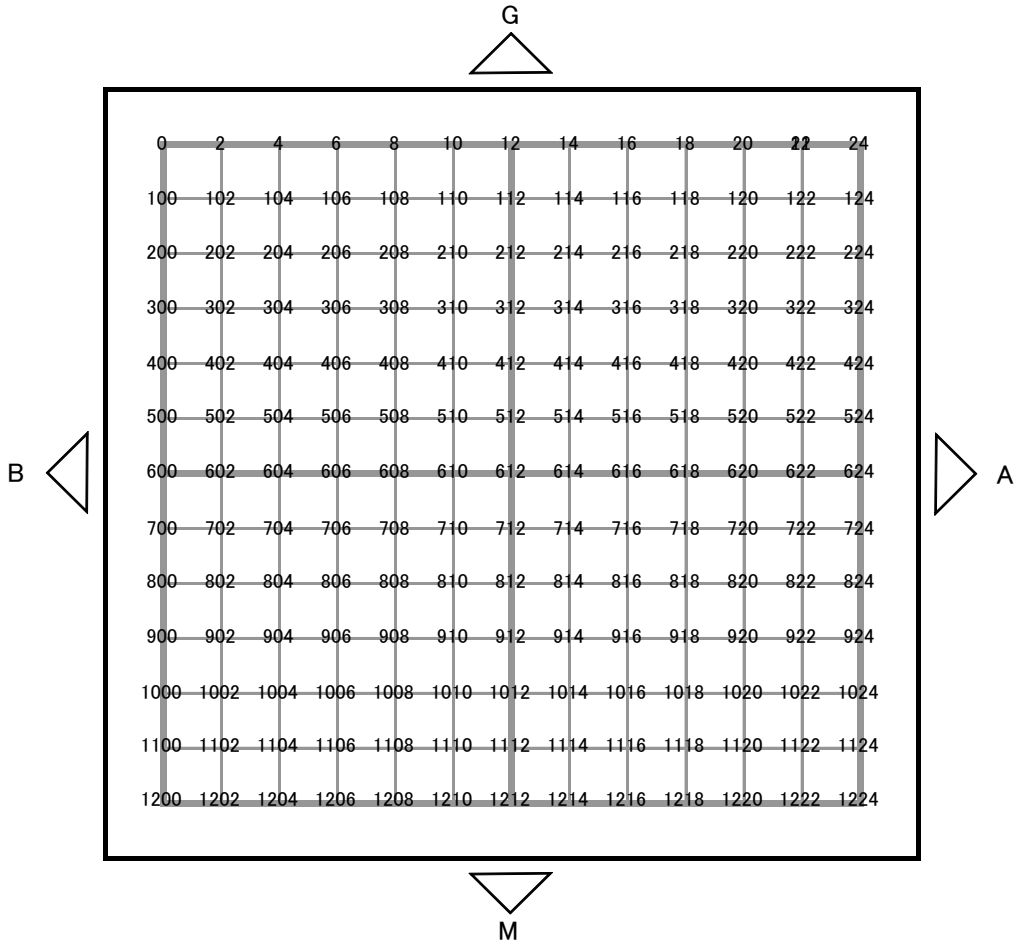
This will set the white balance adjustment when the WBMode is “Auto”. (Shooting menu)

Capability	kNkMAIDCapability_WBTuneAuto
Object types	Source
ulType	kNkMAIDCapType_Range
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	0 to 1224step=1 (Default: 612)

The relationship between white balance adjustment value and the coordinates is shown infollowing figure.

A-B: 0.5step

G-M: 0.25step



The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes (5: [Scene Modes] Auto, 13: [Scene Modes] Auto(flash off), 14: [Scene Modes] SCENE 17: [Special Effects] EFFECTS).
- During movie file recording.

3.7. WBTuneIncandescent

This will set the white balance adjustment when the WBMode is “Incandescent”. (Shooting menu)

Capability	kNkMAIDCapability_WBTuneIncandescent
Object types	Source
ulType	kNkMAIDCapType_Range
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	0 to 1224 step=1 (Default: 612)

The relationship between white balance adjustment value and the coordinates is the same as the figure of Capability_WBTuneAuto.

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes (5: [Scene Modes] Auto, 13: [Scene Modes] Auto(flash off), 14: [Scene Modes] SCENE 17: [Special Effects] EFFECTS).
- During movie file recording.

3.8. WBFluorescentType

This will set the fluorescent type when the WBMode is “Fluorescent”. (Shooting menu)

Capability	kNkMAIDCapability_WBFluorescentType
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkWBFluorescentType 0: Sodium-vapor lamps 1: Warm-white fluorescent 2: White fluorescent 3: Cool-white fluorescent 4: Day white fluorescent 5: Daylight fluorescent 6: High temp.mercury-vapor

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie file recording.

3.9. WBTuneFluorescent

This will set the white balance adjustment when the WBMode is “Fluorescent”. (Shooting menu)

Capability	kNkMAIDCapability_WBTuneFluorescent
Object types	Source
ulType	kNkMAIDCapType_Range
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	0 to 1224step=1　(Default: 612)

The relationship between white balance adjustment value and the coordinates is the same as the figure of Capability_WBTuneAuto.

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie file recording

3.10. WBTuneSunny

This will set the white balance adjustment when the WBMode is “Sunny”. (Shooting menu)

Capability	kNkMAIDCapability_WBTuneSunny
Object types	Source
ulType	kNkMAIDCapType_Range
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	0 to 1224step=1　(Default: 612)

The relationship between white balance adjustment value and the coordinates is the same as the figure of Capability_WBTuneAuto.

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie file recording.

3.11. WBTuneFlash

This will set the white balance adjustment when the WBMode is “Flash”. (Shooting menu)

Capability kNkMAIDCapability_WBTuneFlash
Object types Source
ulType kNkMAIDCapType_Range
ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data 0 to 1224 step=1 (Default: 612)

The relationship between white balance adjustment value and the coordinates is the same as the figure of Capability_WBTuneAuto.

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie file recording.

3.12. WBTuneShade

This will set the white balance adjustment when the WBMode is “Shade”. (Shooting menu)

Capability kNkMAIDCapability_WBTuneShade
Object types Source
ulType kNkMAIDCapType_Range
ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data 0 to 1224step=1 (Default: 612)

The relationship between white balance adjustment value and the coordinates is the same as the figure of Capability_WBTuneAuto.

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie file recording

3.13. WBTuneCloudy

This will set the white balance adjustment when the WBMode is “Cloudy”. (Shooting menu)

Capability	kNkMAIDCapability_WBTuneCloudy
Object types	Source
ulType	kNkMAIDCapType_Range
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	0 to 1224step=1　(Default: 612)

The relationship between white balance adjustment value and the coordinates is the same as the figure of Capability_WBTuneAuto.

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie file recording.

3.14. WBPresetNumber

This will set the preset number referenced by the Capability_WBGainRed, Capability_WBGainBlue. (Shooting menu)

Capability	kNkMAIDCapability_WBPresetNumber
Object types	Source
ulType	kNkMAIDCapType_Enum kNkMAIDArrayType_PackedString
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set
Data	Measure, Use photo

3.15. WBPresetData

This will set the white balance preset data to the camera. (Shooting menu)

Capability	kNkMAIDCapability_WBPresetData
Object types	Source
ulType	kNkMAIDCapType_Generic
ulOperations	kNkMAIDCapOperation_Set
Data	pointer to NkMAIDWBPresetData structure typedef struct tagNkMAIDWBPresetData { ULONG ulPresetNumber;------ (This member is not used) ULONG ulPresetGain;---------- gain value ULONG ulThumbnailSize;----- the thumbnail size set to "pThumbnailData" ULONG ulThumbnailRotate;--- (This member is not used) void* pThumbnailData;--------- the pointer to the thumbnail data to be set. } NkMAIDWBPresetData, FAR* LPNkMAIDWBPresetData;

The client must to set all the member of "NkMAIDWBPresetData" structure without "ulThumbnailRotate". The data which is set is saved to "d-1" data area.

The member "ulThumbnailSize" and "pThumbnailData" of "NkMAIDWBPresetData" structure is used only for kNkMAIDCapOperation_Set.

The red gain value is set to the upper 2 bytes, the blue gain value is set to the lower 2 bytes of "ulPresetGain".

The both of red and blue gain value is expressed by the 8.8 format fixed-point number. (e.g. 1.5 → gain value: 0x0180) The range of gain value is 0 ≤ gain value < 8 (0x0000 -0x07FF).

The thumbnail data set to "pThumbnailData" must be matching the following requirement.

1. Theimage data is JPEG.
2. The size of image is 160 x 120.
3. The quality of image is Fine(1/4 compressed).
4. The size of image is below 13440 bytes.
5. The image cannot include the tag except the following table.

When during movie file recording, this capability cannot be set into.

SOI	Start Of Image
DQT	Define Quantization Table
DHT	Define Huffman Table
SOF	Start of Frame
SOS	Start of Scan
	Entropy Coded Data (JPEG data)
EOI	End Of Image

3.16. WBGainRed

This will get the gain red of white balance preset data selected by the Capability_WBPresetNumber. (Shooting menu)

Capability kNkMAIDCapability_WBGainRed
Object types Source
ulType kNkMAIDCapType_Range
ulOperations kNkMAIDCapOperation_Get
Data Min: 0 Max: 7.9661 (2047/256)
Step: 0.0039 (1/256) (Default: 1)

3.17. WBGainBlue

This will get the gain blue of white balance preset data selected by the Capability_WBPresetNumber. (Shooting menu)

Capability kNkMAIDCapability_WBGainBlue
Object types Source
ulType kNkMAIDCapType_Range
ulOperations kNkMAIDCapOperation_Get
Data Min: 0 Max: 7.9661 (2047/256)
Step: 0.0039 (1/256) (Default: 1)

3.18. ImageColorSpace

This will set color space. (Shooting menu)

Capability	kNkMAIDCapability_ImageColorSpace
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDImageColorSpace 0: sRGB, 1: AdobeRGB

When during movie file recording, this Capability cannot be set into.

3.19. IsoControl

This will set whether auto sensitivity control is used when you take a picture. (Shooting menu)

Capability	kNkMAIDCapability_IsoControl
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	True: used False: not used

When this capability value is set to True, ISO is controlled automatically by the camera in taking picture.

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie file recording

3.20. NoiseReduction

This will set whether noise reduction is used or not used. (Shooting menu)

Capability	kNkMAIDCapability_NoiseReduction
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	True: used False: not used

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Special Effects Modes(Night Vision).
- During movie file recording

3.21. NoiseReductionHighISO

This will set whether noise reduction is used or not used when high ISO. (Shooting menu)

Capability	kNkMAIDCapability_NoiseReductionHighISO
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDNoiseReductionHighISO 0: OFF 1: ON (Normal) 2: ON (High) 3: ON (Low)

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Special Effects Modes(Night Vision).
- During movie file recording

3.22. CompressRAWBitMode

This will select bit depth for RAW(NEF). (Shooting menu)

Capability	kNkMAIDCapability_CompressRAWBitMode
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDCompressRAWBitMode 0: 12-bit 1: 14-bit

When during movie file recording, this Capability cannot be set into.

3.23. PictureControl

This will select Picture Control. (Shooting menu)

Capability	kNkMAIDCapability_PictureControl
ulType	kNkMAIDCapType_Enum kNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set
Data	one of eNkMAIDPictureControl 0: Undefined Picture Control 1: Standard 2: Neutral 3: Vivid 4: Monochrome 5: Portrait 6: Landscape 7: Flat 201 - 209: Custom Picture Control 1 - 9

This capability shows the current selected Picture Control.

When the client sends kNkMAIDCapOperation_GetArray, the module returns the all Picture control enumeration value including unused Custom Picture Control.

The client can know whether the Picture Control is used or not by checking "CustomFlag" in Picture Control Data format.(see Capability_PictureControldata)

When the client sends kNkMAIDCapOperation_Set with unused Picture Control, the module returns kNkMAIDResult_DeviceBusy.

When the Picture Control selected currently is changed, kNkMAIDEvent_CapChangeValueOnly is issued about this capability. And when the content of Picture Control data is changed, kNkMAIDEvent_CapChange is issued about Capability_ChangedPictureControl.

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie file recording
- When the Capability_InfoDisplayErrStatus is True: ON (Error display).

3.24. ChangedPictureControl

This will enumerate the Picture Control item, which is the content, is changed.

Capability	kNkMAIDCapability_ChangedPictureControl
ulType	kNkMAIDCapType_Enum
	kNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
Data	one of eNkMAIDPictureControl

When the Picture Control is modified by the following factor, this capability reports the list of modified Picture Control to the client by kNkMAIDCapOperation_GetArray.

- The Picture Control was changed by edit.
- The Custom Picture Control was saved.
- The Custom Picture Control was deleted.
- The Custom Picture Control was renamed.

The current value of this capability shows the last modified Picture Control.

After the client gets the list of modified Picture Control by kNkMAIDCapOperation_GetArray, the module resets the enumeration data and the current value of this capability will be reset to 0, and the list of modified Picture Control will be deleted.

When the Picture Control is reset, kNkMAIDEvent_CapChange is not issued.

3.25. PictureControlData

This will set the assigned Picture Control data of the first generation. And this will get Picture Control data of the second generation. (Shooting menu)

Capability	kNkMAIDCapability_PictureControlData
Object types	Source
ulType	kNkMAIDCapType_Generic
ulOperations	kNkMAIDCapOperation_Set, kNkMAIDCapOperation_Get kNkMAIDCapOperation_GetDefault
Data	pointer to NkMAIDPicCtrlData structure typedef struct tagNkMAIDPicCtrlData { ULONG ulPicCtrlItem;------ The target Picture Control ULONG ulSize;------The size of Picture Control data (Max: 610 bytes) bool bModifiedFlag; --------Modification flag(false: initial registration, true: edit) void* pData;---------- The pointer of Picture Control data. } NkMAIDPicCtrlData, FAR* LPNkMAIDPicCtrlData;

The range of value sets to "ulPicCtrlItem" is enumerated by Capability_PictureControl.

The following cases, this Capability is read only.

- During movie file recording.

[In case of Set]

In this Capability, Picture Control data of the first generation will be always set.

When the client sends kNkMAIDCapOperation_Set, the client must set the all the member of NkMAIDPicCtrlData.

If "bModifiedFlag" is false (initial registration), the module updates the current value and default value of Picture Control, by the content of "pData". If "bModifiedFlag" is true (edit), the module updates the current value of Picture Control only, by the content of "pData". The limitations at Set are as follows.

- If "ulPicCtrlItem" is Standard(1), Neutral(2), Vivid(3), Monochrome(4), Portrait(5),Landscape(6), bModifiedFlag must be set to true(edit).
- If "ulPicCtrlItem" is Custom Picture Control(201 - 209), the "CustomFlag" of Picture Control data must be set to custom (1).
- □"RegistrationName" will not be used when "ulPicCtrlItem" is Standard(1),

Neutral(2),Vivid(3), Monochrome(4), Portrait(5), Landscape(6).

- If “ulPicCtrlItem” is Neutral(2), Custom Picture Control(201 - 209), the
- “QuickAdjustFlag” of Picture Control data must be set to invalid (0).
- □If “ulPicCtrlItem” is Monochrome(4), “MonochromeFlag” of Picture Control data must be set to monochrome (1). If “ulPicCtrlItem” is not Monochrome(4), “MonochromeFlag” of Picture Control data must be set to color(0).
- When “MonochromeFlag” is changed, bModifiedFlag must be set to false(initial registration).
- If the “QuickAdjustFlag” of Picture Control data is valid (1), the camera determines each setting by referring ”QuickAdjust” of Picture Control data, and does not refer the other settings. If “QuickAdjustFlag” of Picture Control data is invalid (0), the camera determines each setting by referring the other settings, and does not refer ”QuickAdjust” of Picture Control data.
- If “CustomCurveFlag” of picture control data is used (1), the client have to set Custom Picture Control(201 - 209) to “ulPicCtrlItem”.

[In case of Get]

This Capability will get only Picture Control data of the second generation.

When the client sends kNkMAIDCapOperation_Get, the client must set the maximum Picture Control data size, 610, to "ulSize", and set the allocation space for 610 bytes to ”pData”.

The module sets the size of the picture control data actually set to “pData” to “ulSize” when succeeding in acquisition.

It is possible to get Picture Control data about unused Picture Control data.

The client can know whether the Picture Control data is used or not by referring “CustomFlag”. The format of the Picture Control data is shown below.

[Color] First generation

Field	Size (Byte)	Data
PicCtrlItem	1	type of Picture Control 1: Standard 2: Neutral 3: Vivid 4: Monochrome 5: Portrait 6: Landscape In case of Custom Picture Control, set the base Picture Control.
MonochromeFlag	1	Monochrome Flag 0: color 1: monochrome
CustomFlag	1	Custom Flag 0 : Standard 1 : Custom 2 : Unused custom
RegistrationName	20	Registration name of Picture Control The string data is 20 byte fixation, and null terminated. (19 characters in actual.)
QuickAdjustFlag	1	Quick Adjust Flag 0: invalid 1: valid In case of ulPicCtrlItem of NkMAIDPicCtrlData is Neutral or Custom Picture Control, it is 0 fixation.
QuickAdjust	1	Quick Adjust value -2 to +2
Saturation	1	Saturation -3 to +3 -128 is Auto
Hue	1	Hue -3 to +3
Sharpening	1	Sharpening 0 to 9 -128 is Auto

Contrast	1	Contrast -3 to +3 -128 is Auto If CustomCurveData is used, this setting is not referred.
Brightness	1	Brightness -1 to +1 If CustomCurveData is used, this setting is not referred.
CustomCurveFlag	1	Custom Curve Flag 0: No Custom Curve 1: Custom Curve used
CustomCurveData	578	Custom Curve Data This data is not added when there is no Custom Curb. [Header] 64 byte + [LUT] 257x 2 byte = 578 byte Refer to "LUT format" for details.

[Monochrome] First generation

Field	Size (Byte)	Data
PicCtrlItem	1	type of Picture Control 1: Standard 2: Neutral 3: Vivid 4: Monochrome 5: Portrait 6: Landscape In case of Custom Picture Control, set the base Picture Control.
MonochromeFlag	1	Monochrome Flag 0: color 1: monochrome
CustomFlag	1	Custom Flag 0 : Standard 1 : Custom 2 : Unused custom
RegistrationName	20	Registration name of Picture Control The string data is 20 byte fixation, and null terminated. (19 characters in actual.)
FilterEffects	1	Filter Effect

		0: None 1: Yellow 2: Orange 3: Red 4: Green
Toning	1	Toning(ToneColor) 0:B&W 1:Sepia 2:Cyanotype 3:Red 4:Yellow 5:Green 6:Blue Green 7:Blue 8:Purple Blue 9:Red Purple
ToningDensity	1	Toning(Level)(1Step) 1 to 7
Reserve	1	Vacant
Sharpening	1	Sharpening(1Step) 0 to 9 -128 is Auto
Contrast	1	Contrast(1Step) -3 to +3 -128 is Auto If CustomCurveData is used, this setting is not referred.
Brightness	1	Brightness(1Step) -1 to +1 If CustomCurveData is used, this setting is not referred.
CustomCurveFlag	1	Custom Curve Flag 0 : No Custom Curve 1 : Custom Curve used
CustomCurveData	578	Custom Curve Data This data is not added when there is no Custom Curb. [Header] 64 byte + [LUT] 257x 2 byte = 578 byte Refer to "LUT format" for details.

[Color] Second generation

Field	Size (Byte)	Data
PicCtrlItem	1	type of Picture Control 1: Standard 2: Neutral 3: Vivid 4: Monochrome 5: Portrait 6: Landscape In case of Custom Picture Control, set the base Picture Control.
MonochromeFlag	1	Monochrome Flag 0: color 1: monochrome
CustomFlag	1	Custom Flag 0 : Standard 1 : Custom 2 : Unused custom
RegistrationName	20	Registration name of Picture Control The string data is 20 byte fixation, and null terminated. (20 characters in actual.)
QuickAdjustFlag	1	Quick Adjust Flag 0: invalid 1: valid In case of ulPicCtrlItem of NkMAIDPicCtrlData is Neutral or Custom Picture Control, it is 0 fixation.
QuickAdjust	1	Quick Adjust value（1step） -2 to +2
Saturation	1	Saturation（0.25step） -3 to +3 -128 is Auto
Hue	1	Hue（0.25step） -3 to +3
Sharpening	1	Sharpening（0.25step） 0 to 9

		-128 is Auto
Contrast	1	Contrast（0.25step） -3 to +3 -128 is Auto
Brightness	1	Brightness（0.25step） -1.5 to +1.5
Clarity	1	Clarity （0.25step） -5 ～ +5 -128：Auto
CustomCurveFlag	1	Custom Curve Flag（0.25step） 0: No Custom Curve 1: Custom Curve used
CustomCurveData	578	Custom Curve Data This data is not added when there is no Custom Curb. [Header] 64 byte + [LUT] 257x 2 byte = 578 byte Refer to "LUT format" for details.

[Monochrome] Second generation

Field	Size (Byte)	Data
PicCtrlItem	1	type of Picture Control 1: Standard 2: Neutral 3: Vivid 4: Monochrome 5: Portrait 6: Landscape In case of Custom Picture Control, set the base Picture Control.
MonochromeFlag	1	Monochrome Flag 0: color 1: monochrome
CustomFlag	1	Custom Flag 0 : Standard 1 : Custom 2 : Unused custom
RegistrationName	20	Registration name of Picture Control The string data is 20 byte fixation, and null terminated.

		(19 characters in actual.)
FilterEffects	1	Filter Effect 0: None 1: Yellow 2: Orange 3: Red 4: Green
Toning	1	Toning(ToneColor) 0:B&W 1:Sepia 2:Cyanotype 3:Red 4:Yellow 5:Green 6:Blue Green 7:Blue 8:Purple Blue 9:Red Purple
ToningDensity	1	Toning(Level)(0.25step) 1 to 7 When Toning is B&W, this is not referd.
Reserve	1	Vacant
Sharpening	1	Sharpening（0.25step） 0 to 9 -128 is Auto
Contrast	1	Contrast（0.25step） -3 to +3 -128 is Auto
Brightness	1	Brightness（0.25step） -1.5 to +1.5
Clarity	1	Clarity （0.25step） -5 ～ +5 -128：Auto
CustomCurveFlag	1	Custom Curve Flag（0.25step） 0：No Custom Curve 1：Custom Curve used
CustomCurveData	578	Custom Curve Data

		This data is not added when there is no Custom Curb. [Header] 64 byte + [LUT] 257x 2 byte = 578 byte Refer to "LUT format" for details.

I will show below the value to set the format of the picture control data and the value that identifies the camera.

The street below for value settings for each step width.

[In case of step width of 0.25]

Picture Control Format	Value that identifies the camera
-20	-5
-19	-4.75
-18	-4.5
-17	-4.25
-16	-4
-15	-3.75
-14	-3.5
-13	-3.25
-12	-3
-11	-2.75
-10	-2.5
-9	-2.25
-8	-2
-7	-1.75
-6	-1.5
-5	-1.25
-4	-1
-3	-0.75
-2	-0.5
-1	-0.25
0	0
1	0.25
2	0.5
3	0.75
4	1
5	1.25
6	1.5
7	1.75
8	2
9	2.25
10	2.5
11	2.75
12	3
13	3.25
14	3.5
15	3.75
16	4
17	4.25
18	4.5
19	4.75
20	5
21	5.25

22	5.5
23	5.75
24	6
25	6.25
26	6.5
27	6.75
28	7
29	7.25
30	7.5
31	7.75
32	8
33	8.25
34	8.5
35	8.75
36	9

[In case of step width of 1]

Picture Control Format	Value that identifies the camera
-3	-3
-2	-2
-1	-1
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

[LUT format]

LUT data is composed from LUT and LUT header. LUT is 2048 byte 11 bit * 8 bit, LUT header is 64 byte and is used by host. LUT header format is original specification by host, and the camera is not concerned of the content of LUT header. But, the top 2 byte of LUT header is used for camera to judge LUT header exist or not. So, the client has to set LUT header.

Byte	Contents
0, 1	Length(2116)
2, 3	Reserved
4 ～ 67	Lut Header
68	Data0
69	Data1
・・・	
2115	Data2047

[LUT header format]

The content of the LUT header set by the application made of Nikon is shown below as the example.

Byte	contents	Range
1	AriaID (Byte1)	0x49
2	AriaID (Byte2)	0x30
3	Input Minimum (Black Point)	0-255
4	Input Maximum	0-255
5	Output Minimum	0-255
6	Output Maximum	0-255
7	Gamma (integer portion)	0-20
8	Gamma (fractional portion)	0-100
9	Number of Spline Points	2-20
10、11	Splime Point1 (x、y)	0-255、0-255
12、13	Splime Point2 (x、y)	0-255、0-255
・・・		
48、49	Splime Point20 (x、y)	0-255、0-255
50 ～ 64	Reserved	0

3.26. PictureControlDataEx

This will get or set the assigned Picture Control data of the second generation.
(Shooting menu)

Capability	kNkMAIDCapability_PictureControlDataEx
Object types	Source
ulType	kNkMAIDCapType_Generic
ulOperations	kNkMAIDCapOperation_Set, kNkMAIDCapOperation_Get kNkMAIDCapOperation_GetDefault
Data	pointer to NkMAIDPicCtrlData structure typedef struct tagNkMAIDPicCtrlData { ULONG ulPicCtrlItem;------ The target Picture Control ULONG ulSize;----------The size of Picture Control data (Max: 610 bytes) bool bModifiedFlag; ----------Modification flag(false: initial registration, true: edit) void* pData;---------- The pointer of Picture Control data. } NkMAIDPicCtrlData, FAR* LPNkMAIDPicCtrlData;

The range of value sets to “ulPicCtrlItem” is enumerated by Capability_PictureControl.

The following cases, this Capability is read only.

- During movie file recording.

The following cases, refer to Capability_PictureContorolData.

- In case of set
- How to use in case of get
- The format of picture control
- The format of LUT

3.27. GetPicCtrlInfo

This will get the Picture Control information. (Shooting menu)

Capability	kNkMAIDCapability_GetPicCtrlInfo
Object types	Source
ulType	kNkMAIDCapType_Generic
ulOperations	kNkMAIDCapOperation_Get
Data	pointer to NkMAIDGetPicCtrlInfo structure typedef struct tagNkMAIDGetPicCtrlInfo { ULONG ulPicCtrlItem;------The target Picture Control ULONG ulSize;-----The size of Picture Control information (39bytes fixation) void* pData;---------The pointer of Picture Control information. } NkMAIDGetPicCtrlInfo, FAR* LPNkMAIDGetPicCtrlInfo;

The client must set the all the member of NkMAIDGetPicCtrlInfo.

The value range of Picture Control set to “ulPicCtrlItem” is enumerated by Capability_ PictureControl.

The Picture Control information is valid when “ulPicCtrlItem” is color.

If “ulPicCtrlItem” is monochrome or there is no picture control of base, the Picture Control information will be all 0.

The format of the Picture Control information is shown below.

[Picture Control information]

Offset	Size	Field	Data	Description	
0x00	1	ValidFlag	0 : invalid 1 : valid	It shows whether the data valid or invalid. When there is no base Picture Control or when it is monochrome, this value is 0.	
0x01	1	QuickCapa	0x80 : selectable 0x01 : AUTO usable 0x81 : selectable & AUTO usable	Quick Adjust setting.	
0x02	1	SharpenessCapa	0x80 : selectable 0x01 : AUTO usable 0x81 : selectable & AUTO usable	Sharpening setting	
0x03	1	ClarityCapa	0x80 : selectable 0x01 : AUTO usable 0x81 : selectable & AUTO usable	Articulation setting	
0x04	1	ContrastCapa	0x80 : selectable 0x01 : AUTO usable 0x81 : selectable & AUTO usable	Contrast setting	
0x05	1	BrightnessCapa	0x80 : selectable 0x01 : AUTO usable 0x81 : selectable & AUTO usable	Brightness setting	
0x06	1	SaturationCapa	0x80 : selectable 0x01 : AUTO usable 0x81 : selectable & AUTO usable	Saturation setting	
0x07	1	HueCapa	0x80 : selectable 0x01 : AUTO usable 0x81 : selectable & AUTO usable	Hue setting	
0x08	1	DefaultQuickLevel	-2～+2	Quick Adjust default value	
0x09	1	DefaultLevel[0]	0～9	Quick Adjust	Sharpening
0x0A	1		-5～+5		Aarticulation
0x0B	1		-3～+3		Contrast
0x0C	1		-1.5～+1.5		Brightness
0x0D	1		-3～+3		Saturation

0x0E	1		-3～+3	-2	Hue
0x0F	1	DefaultLevel[1]	0～9	Quick Adjust	Sharpening
0x10	1		-5～+5		Aarticulation
0x11	1		-3～+3		Contrast
0x12	1		-1.5～+1.5		Brightness
0x13	1		-3～+3		Saturation
0x14	1		-3～+3	-1	Hue
0x15	1	DefaultLevel[2]	0～+9	Quick Adjust	Sharpening
0x16	1		-5～+5		Aarticulation
0x17	1		-3～+3		Contrast
0x18	1		-1.5～+1.5		Brightness
0x19	1		-3～+3		Saturation
0x1A	1		-3～+3	0	Hue
0x1B	1	DefaultLevel[3]	0～9	Quick Adjust	Sharpening
0x1C	1		-5～+5		Aarticulation
0x1D	1		-3～+3		Contrast
0x1E	1		-1.5～+1.5		Brightness
0x1F	1		-3～+3		Saturation
0x20	1		-3～+3	1	Hue
0x21	1	DefaultLevel[4]	0～+9	Quick Adjust	Sharpening
0x22	1		-5～+5		Aarticulation
0x23	1		-3～+3		Contrast
0x24	1		-1.5～+1.5		Brightness
0x25	1		-3～+3		Saturation
0x26	1		-3～+3	2	Hue

3.28. DeleteCustomPictureControl

This will delete Custom Picture Control. (Shooting menu)

Capability kNkMAIDCapability_DeleteCustomPictureControl

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Set

Data Custom Picture Control Item

When the client set the one of Custom Picture Control enumerated by Capability_PictureControl and executes kNkMAIDCapOperation_Set, the specified Custom Picture Control will be deleted.

This Capability can not set during movie file recording.

3.29. Active_D_Lighting

This will set Active D-Lighting. (Shooting menu)

Capability kNkMAIDCapability_Active_D_Lighting

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of meNkMAIDActive_D_Lighting

0: High
1: Normal
2: Low
3: Off
4: Extra high
5: Auto

The following cases, this Capability can not set.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- When the Capability_InfoDisplayErrStatus is True: ON (Error display).
- During movie file recording.

3.30. ISOAutoShutterTime

This will set the shutter speed when ISO is controlled automatically. (Shooting menu)

Capability kNkMAIDCapability_ISOAutoShutterTime

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDISOAutoShutterTime

Shutter speed	eNkMAIDISOAutoShutterTime
1/2000	23
1/1600	24
1/1250	25
1/1000	26
1/800	27
1/640	28
1/500	29
1/400	30
1/320	31
1/250	13
1/200	14
1/160	15
1/125	0
1/100	16
1/80	17
1/60	1
1/50	19
1/40	18
1/30	2
1/15	3
1/8	4
1/4	5
1/2	6
1	7
2	8

4	9
8	10
15	11
30	12
Auto	32

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie file recording.
- When the Capability_IsoControl is False.

3.31. ISOAutoShutterTimeAutoValue

This will set compensation value when the value of kNkMAIDCapability_ISOAutoShutterTime is “Auto”. (Shooting menu)

Capability kNkMAIDCapability_ISOAutoShutterTimeAutoValue

Object types Source

ulType kNkMAIDCapType_Range

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

Data -2～+2EV(Default value: 0)

The following cases, this Capability is read only.

- When the Capability_IsoControl is False.
- When the value of Capability_ISOAutoShutterTime is except “Auto”.
- During movie file recording.
- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.

3.32. ISOAutoHiLimit

This will set the max sensitivity when ISO is controlled automatically. (Shooting menu)

Capability kNkMAIDCapability_ISOAutoHiLimit

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDISOAutoHiLimit

eNkMAIDISOAutoHiLimit	ISO
0	200
1	400
2	800
3	1600
4	3200
5	6400
8	12800
9	25600

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie file recording.
- When the Capability_IsoControl is False.

3.33. MovieScreenSize

This will set the value “Frame size” of “Movie settings”. (Shooting menu)

Capability kNkMAIDCapability_MovieScreenSize

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDMovieScreenSize3

[In the case of D5500]

eNkMAIDMovieScreenSize3	Content	
	NTSC	PAL
0	1920×1080 60p	1920×1080 50p
1	1920×1080 30p	1920×1080 25p
2	1920×1080 24p	1920×1080 24p
3	1280× 720 60p	1280× 720 50p
4	640× 424 30p	640× 424 25p

[In the case of D5600]

eNkMAIDMovieScreenSize3	Content
0	1920×1080 60p
1	1920×1080 50p
2	1920×1080 30p
5	1920×1080 25p
6	1920×1080 24p
3	1280×720 60p
7	1280×720 50p

When during movie file recording, this Capability is cannot be set into.

3.34. MovieRecMicrophone

This will set the shooting menu, [Movie settings – Microphone]. (Shooting menu)

Capability kNkMAIDCapability_MovieRecMicrophone

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDMovRecMicrophone

0: Auto sensitivity

4: Microphone off

5: Manual sensitivity

The following cases, this Capability is read only.

- During movie file recording.

3.35. MovieRecMicrophoneValue

This will set the microphone sensitivity when the Capability_MovieRecMicrophone is manual sensitivity. (Shooting menu)

Capability	kNkMAIDCapability_MovieRecMicrophoneValue
Object types	Source
ulType	kNkMAIDCapType_Range
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	1 to 20 step=1 (Default: 15)

The following cases, this Capability cannot be set into.

- When the value of Capability_MovieRecMicrophone is not 5 (Manual sensitivity)
- During movie file recording.

3.36. MovieWindNoiseReduction

This will set the shooting menu, [Movie setting – Wind noise reduction]. (Shooting menu)

Capability	kNkMAIDCapability_MovieWindNoiseReduction
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDMovieWindNoiseReduction 0: OFF 1: ON

The following cases, this Capability cannot be set into.

- During movie file recording.
- When having connected the external microphone.

3.37. MovieManualSetting

This will set the shooting menu, [Movie setting – Manual movie settings]. (Shooting menu)

Capability	kNkMAIDCapability_MovieManualSetting
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDMovManualSetting 0 : OFF 1 : ON

When during movie file recording, this Capability cannot be set into.

3.38. MovieImageQuality

This will set the shooting menu, [Movie settings – Movie quality]. (Shooting menu)

Capability	kNkMAIDCapability_MovieImageQuality
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDMovieImageQuality 0: Normal 1: High quality

When during movie file recording, this Capability cannot be set into.

3.39. AutoDistortion

This will set the shooting menu, [Auto distortion control]. (Shooting menu)

Capability	kNkMAIDCapability_AutoDistortion
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDAutoDistortion 0: Off 1: On

The following cases, this Capability cannot be set into.

- During movie file recording.
- When the CPU lens does not attached.
- When the lens unsupported auto distortion control is attached.

3.40. HDRMode

This will set the HDR(high dynamic range). (Shooting menu)

Capability	kNkMAIDCapability_HDRMode
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDHDRMode 0: Off 1: Low 2: Normal 3: High 4: Extra high 5: Auto

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- When the value of Capability_CompressionLevel is “RAW” or “RAW+ JPEG (Basic/Normal/Fine)”.
- When the Capability_EnableBracketing is True (ON).
- When the Capability_InfoDisplayErrStatus is True: ON (Error display).
- During movie file recording.

3.41. SceneMode

This will set the shooting menu, [Scene mode]. (Shooting menu)

Capability	kNkMAIDCapability_SceneMode
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDSceneMode 0: Night Landscape 1: Party/Indoor 2: Beach/Snow 3: Sunset 4: Dusk/Dawn 5: Pet Portrait 6: Candlelight 7: Blossom 8: Autumn Colors 9: Food 13: Portrait 14: Landscape 15: Child 16: Sports 17: Close up 18: Night portrait

The value of this capability selects Scene Modes, when the mode dial is rotated to "SCENE".

The value of Capability_ExposureMode and the value of this capability are the same "Scene Mode".

The Follwing cases, this Capability cannot be set into.

- When the Capability_ExposureMode is not "14: SCENE".
- During movie file recording.

3.42. EffectMode

This will get the shooting menu, [Special Effects]. (Shooting menu)

Capability	kNkMAIDCapability_EffectMode
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDEffectMode 0: Night Vision 2: Miniature Effect 3: Selective Color 4: Silhouette 5: High Key 6: Low Key 7: Toy Camera Effect 9: Super Vivid 10: Pop 11: Photo Illustration

The following cases, this Capability cannot be set into.

- During movie file recording.
- When the Capability_ExposureMode is not “17: EFFECTS”.

3.43. VignetteControl

This will set the Vignette control. (Shooting menu)

Capability	kNkMAIDCapability_VignetteControl
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDVignetteControl 0: High 1: Normal 2: Low 3: Off

The following cases, this Capability cannot be set into.

- During movie file recording.

3.44. AFcPriority

This will get the custom settings menu, [Autofocus – AF-C priority selection].

Capability kNkMAIDCapability_AFcPriority

Object types Source

ulType kNkMAIDCapType_Enum

kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get,

kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set

Data

Focus	"AF-C Focus"
Release	"AF-C Shutter"

When the Capability_LiveViewStatus is 1(ON), this capability is set to read-only.

3.45. AFAreaPoint

This will get the custom settings menu, [Autofocus –Number of focus points].

Capability kNkMAIDCapability_AFAreaPoint

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get,

kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDAFAreaPoint

1: 11 points

2: 39 points

When Capability_LiveViewStatus is 1(On), this capability is set to read-only.

3.46. EVInterval

This will set the EV steps for exposure control.

Capability kNkMAIDCapability_EVInterval
Object types Source
ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString
ulOperations kNkMAIDCapOperation_Get,
kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

1/3 step	"1/3 Step"
1/2 step	"1/2 Step"

When this capability is changed and Capability_BracketingVary is set to AE bracketing, Capability_AEBracketingStep will be set to 1/ EV (3), and Capability_EnableBracketing is set to OFF (False).

The following cases, this Capability cannot be set into.

- During movie file recording.

3.47. BracketingVary

This will select the bracketing variation.

Capability kNkMAIDCapability_BracketingVary
Object types Source
ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString
ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

AE bracketing	"AE Only"
WB bracketing	"White Balance"
ADL bracketing	"ADL bracketing"

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- If the Capability_HDRMode is set to other than "0: Off".
- When the Capability_InfoDisplayErrStatus is True: ON (Error display).

・ During movie recording.

3.48. InternalSplMode

This will show “Flash, Bracketing, Flash cntrl for built-in flash/Optional flash” of Custom Settings.

Capability kNkMAIDCapability_InternalSplMode

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set

Data

TTL mode	“TTL”
Manual luminescence mode	“Manual”
Command mode	“Command”

When the value of Capability_ExternalFlashSort is “3: Not exist” or “4: new communication (without setting display:SB-400)”, if you have installed an external flash commander mode not supported and if new communication (no operation setting display member), the two items of "TTL", "Manual" The value of this property is limited.

The following cases, this Capability cannot be set into.

・ When the Capability_ExposureMode is EFFECTS.
・ During movie recording.

3.49. VideoMode (Only D5500 is supported)

This will set the Video mode.(SETUP)

Capability	kNkMAIDCapability_VideoMode
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDVideoMode 0: NTSC 1: PAL

When during movie file recording, this Capability cannot be set into.

3.50. UserComment

This will set a description of an image. (SETUP)

Capability	kNkMAIDCapability_UserComment
Object types	Source
ulType	kNkMAIDCapType_String
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	String shorter than 36 bytes (not including termination '¥0')

If the client set string longer than 36 bytes, the module uses 36 bytes from the head.

The character, which can be included in the string, is only an ASCII characters in the following table. When the other character is set, the module returns an error(kNkMAIDResult_ValueOutOfBounds).

When during movie file recording, this Capability cannot be set into.

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						

3.51. EnableComment

This will enable to add UserComment to an image file. (SETUP)

Capability	kNkMAIDCapability_EnableComment
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	True: Enable False: Disable

When during movie file recording, this Capability cannot be set into.

3.52. EnableCopyright

This will set whether attach copyright information. (SETUP)

Capability	kNkMAIDCapability_EnableCopyright
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	True: attach False: none

The following cases, this Capability cannot be set into.

- During movie file recording.

3.53. ArtistName

This will set the artist information. (SETUP)

Capability kNkMAIDCapability_ArtistName
Object types Source
ulType kNkMAIDCapType_String
ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data String shorter than 36 bytes (not including termination '/0')

If the client set string longer than 36 bytes, the module uses 36 bytes from the head, and the space (0x20) before termination '¥0' of string will be ignored.
for example.)

ABCD□EFG□□□□□□□□'¥0'

□ shows a space (0x20) , so 8 space is ignored.

The character, which can be included in the string, is only an ASCII 90 characters. (refer to the table in the ShootingBankName.) When the other character is set, the module returns an error (kNkMAIDResult_ValueOutOfBounds).

The following cases, this Capability cannot be set into.

- During movie file recording.

3.54. CopyrightInfo

This will set the copyright information. (SETUP)

Capability kNkMAIDCapability_CopyrightInfo
Object types Source
ulType kNkMAIDCapType_String
ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data String shorter than 54 bytes (not including termination '/0')

If the client set string longer than 54 bytes, the module uses 55 bytes from the head, and the space(0x20) before termination '¥0' of string will be ignored.
for example.)

ABCD□EFG□□□□□□□□'¥0'

□ shows a space (0x20), so 8 spaces are ignored.

The character, which can be included in the string, is only an ASCII 90 characters. (refer to the table in the ShootingBankName.) When the other character is set, the module returns an error (kNkMAIDResult_ValueOutOfBounds).

The following cases, this Capability cannot be set into.

- During movie file recording.

3.55. CameraInclinationMode

This will set whether add or not rotate information to the image file.
(D5500 : SETUP, D5600 : PLAYBACK)

Capability	kNkMAIDCapability_CameraInclinationMode
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	True: Add False: not Add

When the value of this capability is set to False, the Capability_CameraInclination is always zero (Level).

When during movie file recording, this Capability cannot be set into.

3.56. ClockDateTime

This will set the built-in clock of camera. (SETUP)

Capability	kNkMAIDCapability_ClockDateTime
Object types	Source
ulType	kNkMAIDCapType_DateTime
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	kNkMAIDDataType_DateTimePtr [D5500]20150101T000000: 2015/01/01 00:00:00 [D5600]20160101T000000: 2016/01/01 00:00:00

When during movie file recording, this Capability cannot be set into.

3.57. ShutterSpeed

This will set the shutter speed.

Capability	kNkMAIDCapability_ShutterSpeed
Object types	Source
ulType	kNkMAIDCapType_Enum
	kNkMAIDArrayType_PackedString
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
	kNkMAIDCapOperation_Set
Data	Strings of shutter time in second. (e.g.) ”1”, “1/1.3”, “1/1.6”,
	“x 1/250”, “x 1/200”,

The information whether the exposure is over or under can not be acquired by getting only the value of this capability. In the condition that the information of the shutter speed being blinking is acquired form the value of Capability_BlinkingStatus, the exposure is over if the Capability_ShutterSpeed is maximum value. The exposure is under in the same condition if the Capability_ShutterSpeed is minimum value instead.

When the Capability_MovieManualSetting is "1 ON", the value of ExposureMode is “Manual” and running LiveView, the range of values should be changed as follows.

Framerate	Shutter speed
24p、25p、30p	1/4000～1/30
50p、50i	1/4000～1/50
60p、60i	1/4000～1/60

In any of the following, the “Bulb, Time” cannot be set into.

- When the Capability_ExposureMode is not “Manual”.
- When the Capability_HDRMode is not 0 (Off)

The following cases, this Capability cannot be set into.

- When the Capability_ExposureMode is “Program”, “Aperture Priority”, “Scene Mode” or “EFFECTS”.
- When sequence error has occurred.
- When the Capability_RetractableLensWarningStatus is “True: Warning about retraction”.

3.58. FlexibleProgram

This will set the Flexible program value.

Capability kNkMAIDCapability_FlexibleProgram

Object types Source

ulType kNkMAIDCapType_Range

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

Data -5～+5EV（Default value: 0）

The module set the step values same as Capability_EVInterval. When the Capability_EVInterval, Capability_ExposureMode is changed, the capability is set to default(0), and the module sends to the client kMAIDEvent_CapChange or kMAIDEvent_CapChangeValueOnly.

The following cases, ulVisibility of this capability is invalid and this capability is set to read-only.

- When the Capability_ExposureMode is not “Program”.
- When sequence error has occurred.
- When the Capability_RetractableLensWarningStatus is true.

3.59. FocusPreferredArea

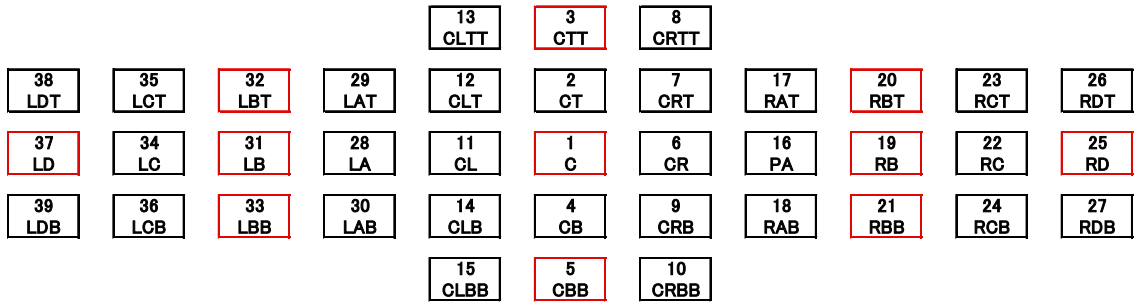
This will select the preferred focus area.

Capability	kNkMAIDCapability_FocusPreferredArea
Object types	Source
ulType	kNkMAIDCapType_Enum
	kNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get,
	kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set
Data	one of eNkMAIDFocusPreferred4
	0 – 39 (default 1)

When the value of this capability is 0, it is shown that the focus point is not decided.

The relationship between focus point and the value of this capability is shown in following figure.

When the Capability_AFAreaPoint is 11 points, the range is 0-11 can be selected by this Capability.



The following cases, this Capability cannot be set into.

- When the Capability_FocusAreaMode is “Auto-area AF”.
- When the value of Capability_LiveViewStatus is 1(ON).

3.60. Aperture

This will set the aperture.

Capability	kNkMAIDCapability_Aperture
Object types	Source
ulType	kNkMAIDCapType_EnumkNkMAIDArrayType_PackedString
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set
Data	String of F value (e.g.) “1.4”, “1.6”, “1.8”...

When aperture is not set to minimum(FEE), this capability is read-only and the string of “FEE” is set. When this capability is “FEE”, the module can’t execute capture-command.

When sequence error has occurred, the ulVisibility of this capability is set to invalid and ulOperations of this capability is set to read-only and the current value is invalid. If the ulOperations is changed, the module sends to the client kMAIDEvent_CapChange.

The information whether the exposure may be over or under can not be acquired by getting only the value of this capability. In the condition that the information of the aperture being blinking is acquired form the value of Capability_BlinkingStatus, the exposure is over if the Capability_ Aperture is minimum value. The exposure is under in the same condition if the Capability_ShutterSpeed is maximum value instead.

In one case of following, this capability cannot be set into.

- In Program, Speed Priority, Scene Mode, or Special Effects Modes, the Capability_ExposureMode is.
- When the lens is not set as the minimum iris diaphragm. (The state of the lens is “FEE”.)
- When a sequence error has occurred
- In the lens case of not equipping.
- When Capability_RetractableLensWarningStatus is “True: Warning about retraction”.

3.61. MeteringMode

This will get the metering mode.

Capability	kNkMAIDCapability_MeteringMode
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDMeteringMode 0: Matrix 1: Center weighted 2: Spot

When the CPU lens is not attached, 1(Center weighted) will be applied for metering mode.

The following cases, this Capability is set to read-only.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- When AE locked.
- During movie file recording.
- When the value of Capability_LiveViewImageZoomRate is not “0: Whole display”.

3.62. ExposureMode

This will select the exposure mode.

Capability	kNkMAIDCapability_ExposureMode
Object types	Source
ulType	kNkMAIDCapType_EnumkNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set
Data	one of eNkMAIDExposureMode 0: Program mode 1: Aperture priority 2: Speed priority 3: Manual 5: [Scene Modes]Auto 13: [Scene Modes] Auto(flash off) 14: [Scene Modes]SCENE Other scenes 17: [Special Effects]EFFECTS

The value of 5, 13 and 14 is called Scene Modes. If [14: SCENE Other scenes] is set, the Scene Modes set by Capability_SceneMode will be used.

If [17: Special Effects] is set, the Special Effects Mode set by Capability_EffectMode will be used.

Shooting mode listed during Live View is composed of “Program mode”, “Aperture priority”, “Speed priority”, and “Manual”.

The following cases, this Capability cannot be set into

- When the Capability_LockCamera is false.
- During movie recording.

3.63. ExposureComp

This will set the exposure compensation value.

Capability kNkMAIDCapability_ExposureComp

Object types Source

ulType kNkMAIDCapType_Range

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

Data -5～+5EV（Default value: 0）

The module sets the step value same as Capability_EVInterval. When the Capability_EVInterval is changed, the module sends to the client kMAIDEvent_CapChange.

If any of the following, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or the value other than "Night Vision" of Special Effects Modes.
- When the Capability_InfoDisplayErrStatus is True (ON).

3.64. ShootingMode

This will set the shooting mode.

Capability kNkMAIDCapability_ShootingMode

Object types Source

ulType kNkMAIDCapType_EnumkNkMAIDArrayType_Unsigned

ulOperations kNkMAIDCapOperation_Get,
kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set

Data one of eNkMAIDShootingMode

0: SingleFrame
1; Continuous L
2: Continuous H
3: Self-timer
5: Quick-response remote (Only D5500 is supported)
6: Delayed remote (Only D5500 is supported)
8: Quiet

If any of the following, the ulOperations cannot be set into.

- When the Capability_InfoDisplayErrStatus is True: ON (Error display).
- During movie file recording.

3.65. ContinuousShootingNum

This will set the number of shots in continuous shooting by host.

Capability	kNkMAIDCapability_ContinuousShootingNum
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set kNkMAIDCapOperation_GetDefault
Data	1 (same as the default value of Capability_RemainContinuousShooting)

The maximum value of this capability is the same as the default value of Capability_RemainContinuousShooting.

When the value of Capability_EnableBracketing is ON and execute bracketing on continuous mode, the client must set the value more than the bracketing number of shot to this capability. But if the client sets the value more than the bracketing number of shot, bracketing will be stop at the setting the bracketing number of shot on continuous mode.

When during movie file recording, this Capability cannot be set into.

3.66. FocusAreaMode

This will select the AF area mode for phase detection on still image shooting.

Capability kNkMAIDCapability_FocusAreaMode

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

9-points dynami-area AF	"Dynamic(9 points)"
Single-point AF	"Single"
Auto-areaAF	"Auto"
3D – tracking	"3D-tracking"
21-points dynami-area AF	"Dynamic(21 points)"
39-points dynami-area AF	"Dynamic(39 points)"

In the following table, the default value is changed by Scene modes or Special Effects Modes.

When the setting of Capability_ExposureMode is changed to Scene Modes or Special Effects Modes, the value of this capability will be changed to each default value.

Capability_ExposureMode Capability_SceneMode Capability_EffectMode	Default
Auto(Scene Modes) Auto(flash off) (Scene Modes) Portrait(Scene Modes) Landscape(Scene Modes) Child(Scene Modes) Night Landscape(SCENE) Party/Indoor(SCENE) Beach/Snow(SCENE) Sunset(SCENE) Dusk/Dawn(SCENE) Blossom(SCENE) Autumn Colors(SCENE) Night Portrait(SCENE) Color Sketch(EFFECTS) Selective Color(EFFECTS) Toy Camera (EFFECTS) Super Vivid(EFFECTS) Pop(EFFECTS) Photo Illustration(EFFECTS)	Auto
Night Vision(EFFECTS)	Single

Miniature Effect(EFFECTS)	(unchangeable)
Close up(Scene Modes) Candlelight(SCENE) Food(SCENE) Silhouette(EFFECTS) High Key(EFFECTS) Low Key(EFFECTS)	Single
Sports(Scene Modes) Pet Portrait(SCENE)	Dynamic(39 points)

When Capability_AFMode is AF-S(0), "3D-tracking" and "Dynamic(9/21/39points)" cannot be set into.

When the value of this capability is "3D-tracking" or "Dynamic(9/21/39points)" and sets the value of Capability_AFMode to AF-S(0), The value of this capability is changed to "Single".

The following cases, this capability cannot be set into.

- When the value of Capability_AFMode is MF (0).
- The CPU lens is not attached.
- When the Capability_ExposureMode is set to Special Effects Modes and the Capability_EffectMode is set to Night Vision or Miniature Effect.
- When the value of Capability_LiveViewStatus is 1(ON).

3.67. EnableBracketing

This will set whether bracketing is active or not.

Capability kNkMAIDCapability_EnableBracketing

Object types Source

ulType kNkMAIDCapType_Boolean

ulOperations kNkMAIDCapOperation_Get,
kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data True: ON False: OFF

When Capability_BracketingVary does not set into WB bracketing or ADL bracketing, and the value of Capability_EVInterval is changed, the value of this capability is changed to False(OFF).

If any of the following, this Capability cannot be set into.

- When the Capability_ExposureMode is Scene Modes or Special Effects Modes.
- When the value of Capability_BracketingVary is “WB bracketing”, and if Capability_CompressionLevel is either ”RAW”, “RAW+JPEG(Basic)”, “RAW+JPEG(Normal)” or “RAW+JPEG(Fine). (The ulVisibility of this capability is set to invalid.)
- When the value of Capability_HDRMode is except 0 (Off).
- During movie file recording.

3.68. AEBracketingStep

This will set the exposure increment for AE, SB, AE/SB bracketing.

Capability kNkMAIDCapability_AEBracketingStep

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_Unsigned

ulOperations kNkMAIDCapOperation_Get,
kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set

Data one of eNkMAIDAEBracketingStep
0: 1/3EV
1: 1/2EV
2: 2/3EV
3: 1EV
4: 1+1/3EV

5: 1+1/2EV

6: 1+2/3EV

7: 2EV

When the Capability_EnableBracketing is ON(true) and the Capability_BracketingVary is “AE bracketing”, this capability is valid.

If any of the following, the ulOperations cannot be set into.

- The Capability_EnableBracketing is not “ON”.
- The Capability_BracketingVary is not “AE bracketing”.
- The Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie file recording.

If the ulVisibility and ulOperations are changed, the module sends to the client kMAIDEvent_CapChange.

EVInterval	AEBracketingStep
1/3EV	1/3EV、2/3EV、1EV、 1+1/3EV、1+2/3EV、2EV
1/2 EV	1/2EV、1EV、1+1/2EV、2EV

3.69. WBBracketingStep

This will set the white balance increment for WB bracketing.

Capability kNkMAIDCapability_WBBracketingStep

Object types Source

ulType kNkMAIDCapType_Enum

kNkMAIDArrayType_Unsigned

ulOperations kNkMAIDCapOperation_Get,

kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set

Data one of eNkMAIDWBBracketingStep

0: 1Step 1: 2Step 2: 3Step

When the Capability_EnableBracketing is ON(true) and the Capability_BracketingVary is “White Balance”, this capability is valid.

If any of the following, the ulOperations cannot be set into.

- The Capability_EnableBracketing is not “ON”.
- The Capability_BracketingVary is not “White Balance”.
- The Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie file recording.

3.70. Bracketing Type

This will select the combination bracketing shots and direction when AE, White balance bracketing.

Capability	kNkMAIDCapability_BracketingType
Object types	Source
ulType	kNkMAIDCapType_Enum
	kNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get,
	kNkMAIDCapOperation_GetArray
Data	one of eNkMAIDBracketingType
	4: Both 3

3.71. ADLBracketingType

This will select the bracketing shots when ADL bracketing.

Capability	kNkMAIDCapability_ADLBracketingType
Object types	Source
ulType	kNkMAIDCapType_Enum
	kNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get,
	kNkMAIDCapOperation_GetArray
Data	one of eNkMAIDADLBracketingType
	0 : 2 shots (Off - UserSettings)

3.72. LiveViewStatus

This will start or stop Live view and show status of Live view.

Capability	kNkMAIDCapability_LiveViewStatus
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDLiveViewStatus 0: OFF 1: ON

When the client start Live view, the client must set the value of this capability to ON(1). And when the client stop Live view, the client must set the value of this capability to OFF(0).

In case of kNkMAIDCapOperation_Get, the value of this capability will show the current status of Live view.

If the client want to get Live view image by Capability_GetLiveViewImage, the client have to set the value of this capability to ON(1) beforehand.

The client have to check this value before closing Source object, and if the value of this capability is ON(1), have to set to OFF(0).

When the Live view is started, the status of camera will be changed to Lock camera internally, but the value of Capability_LockCamera kept the current value.

The client has to check the value of Capability_LiveViewProhibit, and when the value of Capability_LiveViewProhibit is not 0, Live view will not be started.

When the Capability_ExposureMode is Scene Modes or Special Effects Modes, the ulOperations of this capability cannot be set into.

3.73. LiveViewProhibit

This will show the status of Live view prohibition.

Capability kNkMAIDCapability_LiveViewProhibit

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get

Data one of eNkMAIDLiveViewProhibit

The live view prohibition is shown by the OR value of the following definition value.

If non-0, the value of this Capability is prohibited Live view.

value	Conditions prohibited
0x80000000	Exposure Mode is non-P,S,A,M.
0x01000000	When Retractable lens is set, the zoom ring does not extend.
0x00200000	Bulb warning, ShutterSpeed is Time.
0x00100000	Card not formatted.
0x00080000	Card error.
0x00040000	Card protected.(Recording media is “Card” or “Card + SDRAM”)
0x00020000	High temperature.
0x00008000	Capture command is executing.
0x00004000	Recording media is “Card” or “Card + SDRAM” and when no memory card is inserted in the camera, Release locked setting.
0x00000800	Non-CPU lens is attached, and ExposureMode is not Manual or Aperture priority.
0x00000200	TTL error
0x00000100	battery shortage
0x00000020	Aperture ring is not minimum.
0x00000004	Sequence error

3.74. LiveViewImageZoomRate

This will set the zoom rate for Live View image.

Capability	kNkMAIDCapability_LiveViewImageZoomRate
Object types	Source
ulType	kNkMAIDCapType_Enum
	kNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get,
	kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set
Data	one of eNkMAIDLiveViewImageZoomRate
	0: Whole display
	1: 25 %
	2: 33 %
	3: 50 %
	4: 66%
	5: 100 %

When the Live view is started, the value of this capability will be set to default value automatically.

The following cases, the ulVisibility of this capability is invalid and this Capability is set to read-only.

- When the value of Capability_LiveViewStatus is not 1(ON).
- During movie file recording.

3.75. LiveViewImageSize

This will set size of Live View image.

Capability	kNkMAIDCapability_LiveViewImageSize
Object types	Source
ulType	kNkMAIDCapType_Enum
	kNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get,
	kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set
Data	one of eNkMAIDLiveViewImageSize
	1: QVGA
	2: VGA

When during movie file recording, this Capability cannot be set into.

3.76. CameraInclination

This will get inclination of camera.

Capability	kNkMAIDCapability_CameraInclination
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDCameraInclination
	0: Level (included when the inclination cannot be detected)
	1: Grip is top
	2: Grip is bottom
	3: Level (Up Down)

When the Capability_CameraInclinationMode is false, or the camera cannot detect inclination of itself, the value of this capability is zero(Level).

3.77. RemainContinuousShooting

This will get the number of shot that can be recorded on SDRAM or the card in the continuous shooting mode by the command.

Capability	kNkMAIDCapability_RemainContinuousShooting
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault
Data	0 – 100 (Default: 100)

The value of this capability is always under the value of Capability_ShootingLimit.

The value of this capability will be changed by the following setting.

- Capability_ImageSize
- Capability_CompressionLevel
- Capability_HDRMode
- Capability_AutoDistortion
- Capability_NoiseReduction
- Capability_SceneMode

3.78. RemainCountInMedia

This will get the number of shot that can be saved in Card in current image quality.

Capability	kNkMAIDCapability_RemainCountInMedia
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault
Data	0 — 65535 (Default:0)

When a card is not inserted, the value of this capability is 0.

The value of this capability is changed by the setting of camera.

3.79. LockExposure

This will get lock status of auto exposure.

Capability	kNkMAIDCapability_LockExposure
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get
Data	True: Lock　　False: Unlock

3.80. LockFocus

This will get lock status of auto focus.

Capability	kNkMAIDCapability_LockFocus
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get
Data	True: Lock　　False: Unlock

3.81. ExposureStatus

This will get the exposure indicator status of Camera.

Capability	kNkMAIDCapability_ExposureStatus
Object types	Source
ulType	kNkMAIDCapType_Float
ulOperations	kNkMAIDCapOperation_Get
Data	ExposureValue (EV)　step = 1/12 (EV)

3.82. InfoDisplayErrStatus

This will show error display status on the information panel.

Capability	kNkMAIDCapability_InfoDisplayErrStatus
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get
Data	True: ON (Error display) False: OFF

The value of this capability is updated only if the information panel of the camera body is turned on. When the information panel is turned off, the value of this capability is set to OFF (False).

3.83. FocalLength

This will get the focal length of the lens.

Capability	kNkMAIDCapability_FocalLength
Object types	Source
ulType	kNkMAIDCapType_Float
ulOperations	kNkMAIDCapOperation_Get
Data	lfValue (mm)

When a CPU lens is not attached, the value of this capability is set to zero.

3.84. FocusMode

This will get the focus mode.

Capability	kNkMAIDCapability_FocusMode
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get
Data	one of eNkMAIDFocusMode 0: MF 1: AF-S 2: AF-C 3: AF-A 4: AF-F

When the lens is not attached, the value of this capability is always MF.

3.85. BracketingCount

This will get the number of shots on AE bracketing or ADL bracketing.

Capability	kNkMAIDCapability_BracketingCount
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get
Data	[AE Bracketing] 1 – 3
	[ADL Bracketing] 1 – 2

When the Capability_EnableBracketing is true and the value of Capability_BracketingVary is either “AE bracketing” or “ADL bracketing”, this capability is valid. If this capability is invalid, returns zero.

3.86. InternalFlashStatus

This will show the status of Built-in flash.

Capability	kNkMAIDCapability_InternalFlashStatus
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get
Data	one of eNkMAIDInternalFlashStatus
	0: Ready 1:Not Ready 2: Close

3.87. InternalFlashComp

This will set the flash compensation of Built-in flash.

Capability	kNkMAIDCapability_InternalFlashComp
Object types	Source
ulType	kNkMAIDCapType_Range
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	-3～+1 (Default:0)

The module sets the same step value as the value of Capability_EVInterva.

If any of the following, this Capability cannot be set into.

- When Capability_ExposureMode is set to “Auto” , “Auto (flash off)” or Special Effects Modes.
- During movie recording.
- When the value of Capability_HDRMode is except 0 (Off).
- When the Capability_InternalFlashStatus is “Close” and Capability_ExternalFlashStatus is “Not Exist”.
- When Capability_InternalSplMode is “Manual”, Capability_ExternalFlashStatus is “2: Not Exist” and Capability_InternalFlashStatus is expect “2: Close”.
- When Capability_InternalSplMode is “Manual” and Capability_ExternalFlashSort is “4: new communication”.

3.88. ExternalFlashStatus

This will shows the status of External flash.

Capability	kNkMAIDCapability_ExternalFlashStatus
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get
Data	one of eNkMAIDExternalFlashStatus 0: Ready　1: Not Ready　2: Not Exist

3.89. ExternalFlashComp

This will set the flash compensation of the external speedlight.

Capability	kNkMAIDCapability_ExternalFlashComp
Object types	Source
ulType	kNkMAIDCapType_Range
ulOperations	kNkMAIDCapOperation_Get
Data	-3～+3EV (1/6EV step)

This capability is valid when Capability_ExternalNewTypeFlashMode is either iTTL-BL(1), iTTL(2), AA(3) or GN(5).

3.90. ExternalFlashSort

This will get the sort of external speedlight.

Capability kNkMAIDCapability_ExternalFlashSort

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get

Data one of eNkMAIDExternalFlashSort

0: non- communication.
2: new communication (with setting display)
4: new communication (without setting display:SB-400).
3: Not exist.

The camera cannot detect “1: old communication.”, so this capability returns always “0: non- communication.” when an Old communication speedlight is attached.

The relationship of external speedlight type and the speedlight made by Nikon is shown in the following table.

New communication (with setting display)	New communication (without setting display)	Old communication	Non- communication	Not detected
SB-910 SB-900、 SB-800、 SB-700、 SB-600、 SU-800	SB-400 SB-300	SB-80DX、 SB-50DX、 SB-28DX、 SB-28D、 SB-28、 SB-27、 SB-26、 SB-25、 SB-24、	SB-30、 SB-29、 SB-29S、 SB-23、 SB-22、 SB-22S、 SB-21A、 SB-21B、 SB-20、 SB-19、 SB-18、 SB-17、 SB-16A、 SB-16B、 SB-15、 SB-14、 SB-12、 SB-11、 SB-10、 SB-E	SB-9、 SB-8、 SB-7、 SB-6、 SB-5、 SB-4、 SB-3、 SB-2、 SB-1

3.91. ExternalNewTypeFlashMode

This will get flash mode when the Capability_ExternalFlashSort is 2 (new communication (with setting display)) or 4 (new communication (without setting display))

Capability	kNkMAIDCapability_ExternalNewTypeFlashMode
Object types	Source
ulType	kNkMAIDCapType_Enum kNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
Data	one of eNkMAIDExternalNewTypeFlashMode 0: OFF 1: iTTL-BL 2: iTTL 3: AA(Auto aperture) 4: A(Non-TTL auto) 5: GN(Range-priority manual) 6: M(manual) 7: Repeating flash 8: The external speed light, new communication does not exist.

3.92. LensInfo

This will get the focal length and minimum F number.

Capability	kNkMAIDCapability_LensInfo
Object types	Source
ulType	kNkMAIDCapType_String
ulOperations	kNkMAIDCapOperation_Get
Data	(e.g.)”35-70/F3.3-4.5D”

In a following lens type case, a corresponding character string is added.

- In the case of VR type lens,”VR”is added to a head.
- In the case of D type lens,”D” is added to an end.
- In the case of G type lens,”G” is added to an end.
- In the case of E type lens,”E” is added to an end.

3.93. RetractableLensWarningStatus

This will show the status of RetractableLensWarning.

Capability	kNkMAIDCapability_RetractableLensWarningStatus
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault
Data	True: Warning about retraction False: Not warning about retraction

3.94. AFCapture

This will take a picture after auto focus and save an image to specified media.

Capability	kNkMAIDCapability_AFCapture
Object types	Source
ulType	kNkMAIDCapType_Process
ulOperations	kNkMAIDCapOperation_Start

This will take a picture after auto focus. If the Capability_FocusMode is MF (0) or lens is not attached, the camera does shooting immediately without auto focus.

When auto focus failed, whether taking a picture or returning out of focus error, that is depends on the setting of Capability_FocusMode.

When Capability_ShootingMode is CL or CH, Numbers of photo in which a seriography is possible is the smallest number in Capability_ContinuousShootingNum, Capability_RemainContinuousShooting, or the remaining numbers of bracketing shot.

However, when the value of Capability_InternalFlashStatus is "0: Ready" or when the Capability_HDRMode is set up in addition to "0: Off", if the Capability_ShootingMode is set as continuous shooting mode, the same operation as "SingleFrame Mode" is taken.

When Capability_LiveViewStatus is ON(1), the ulVisibility of this capability is invalid and the ulOperations is set to invalid.

When the module prepared to get a main image, the module issues kNkMAIDEvent_AddChild to source object.

The media saved an image is specified by Capability_SaveMedia. When there is not free space in specified media, this capability returns kMAIDResult_MediaFull. And this capability returns kNkMAIDResult_NoMedia when card is under being formatted or no card is inserted.

If any of the following, the ulOperations of this capability cannot be perfotmed.

- When the value of Capability_LiveViewStatus is 1(ON).
- When the Capability_ShutterSpeed is set as “Time”.
- When the Capability_RetractableLensWarningStatus is “True: Warning about retraction”.

3.95. ContrastAF

This will control contrast AF when Live view is executed on Tripod mode.

Capability	kNkMAIDCapability_ContrastAF
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
	one of eNkMAIDContrastAF
	0x00: start AF (effective only as the Set value)
	0x01: stop AF (effective only as the Set value)
	0x10: AF finishes in focus (effective only as the Get value)
	0x11: AF finishes out of focus (effective only as the Get value)
	0x12: It is operating AF (effective only as the Get value)

Contrast AF will start when the client set 0x00 (start AF). And the module will return the response without wait for AF finish.

The client can confirm whether contrast AF finish correctly by getting value of this capability, or referring “focus drive state” of “display information” in Live view image. (please refer NkMAIDCapability_GetLiveViewImage)

When the client wants to stop contrast AF, the client will set 0x01 (stop AF). After contrast AF finish, the module returns response.

The following cases, this capability is invalid and this capability is set to read-only.

- When the CPU lens is not attached.
- When the Capability_FocusMode is “MF”.
- When the value of Capability_LiveViewStatus is 0(OFF).
- When the Capability_RetractableLensWarningStatus is true.

3.96. PreCapture

This will take a picture for presetting white balance.

Capability	kNkMAIDCapability_PreCapture
Object types	Source
ulType	kNkMAIDCapType_Process
ulOperations	kNkMAIDCapOperation_Start
Data	None

If any of the following, the ulOperations of this capability cannot be perfotmed.

- When the Capability_LiveViewStatus is 1(ON).
- When the Capability_ShutterSpeed is set as “Time”.
- When the Capability_RetractableLensWarningStatus is “True: Warning about retraction”.
- When the value of Capability_HDRMode is except 0 (Off).

3.97. MFDriveStep

This will set the driving step of lens for adjusting focus position during live view.

Capability	kNkMAIDCapability_MFDriveStep
Object types	Source
ulType	kNkMAIDCapType_Range
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	driving step (Number of pulses) 1 to 32767

This capability will save the driving step internally, does not send request for adjusting focus position to camera. Capability_MFDrive will send request for adjusting focus position to camera with this capability value actually.

The following cases, the ulVisibility of this capability is invalid and the ulOperations is set to invalid.

- When the value of Capabilty_FocusMode is “MF” or “AF~F”.
- When CPU lens is not attached.
- When the value of Capabilty_LiveViewStatus is “OFF”.

3.98. MFDrive

This will adjust focus position during live view.

Capability	kNkMAIDCapability_MFDrive
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Set
Data	one of eNkMAIDMFDrive
	0: infinity -> close
	1: close -> infinity

This will send request to adjust focus position with the setting of this capability and the step of Capability_MFDriveStep.The module will return response as soon as the camera starts adjusting manual focus position, the module doesn't wait to finish manual focus driving. If manual focus driving reaches the end of focus area, the module will return kNkMAIDResult_MFDriveEnd.

After this capability is executed correctly, the client can confirm whether manual focus driving finish correctly by getting value of this capability, or referring "focus drive state" of "Display information" in Live view image.

The following cases, the ulVisibility of this capability is invalid and the ulOperations is set to invalid.

- When the value of Capabilty_FocusMode is "MF" or "AF~F".
- When CPUlens is not attached.
- When the value of Capabilty_LiveViewStatus is "OFF".

3.99. ContrastAFArea

This will change focus point of contrast AF during live view.

Capability	kNkMAIDCapability_ContrastAFArea
Object types	Source
ulType	kNkMAIDCapType_Point
ulOperations	kNkMAIDCapOperation_Set

Data	struct NkMAIDPoint
	{
	SLONG x; -----Coordinates of X axis
	SLONG y; -----Coordinates of Y axis
	}

This capability set the focus point by using x and y of NkMAIDPoint structure.

The value range of x and y is defined by “total size” of “Display information” in Live view image. (please refer NkMAIDCapability_GetLiveViewImage)

But the range that can be actually set becomes an area where "size of the AF frame" length and breadth size half was subtracted from the length and breadth size of "total size" respectively. When the value that exceeds the range that can be set to x and y is set, the maximum or minimum value will be used as this value.

Even though Capability_FocusMode is 0(MF), or CPU lens is not attached, this capability can be set.

When the Capability_LiveViewStatus is not “1: ON”, this Capability cannot be set into.

3.100. CaptureDustImage

This will take a dust off ref photo and saved to specified media.

Capability kNkMAIDCapability_CaptureDustImage

Object types Source

ulType kNkMAIDCapType_Process

ulOperations kNkMAIDCapOperation_Start

The format type of dust off ref photo is kNkMAIDFileDataType_NDF.

When the client deletes a dust off ref photo by Capability_DeleteDramImage, the client must use Item ID notified by data parameter of kNkMAIDEvent_AddChild as Capability_CurrentItemID. The media saved an image is specified by Capability_SaveMedia. When there is not free space in specified media, this capability returns kMAIDResult_MediaFull. And this capability returns

The following cases, this Capability cannot be performed.

- When the capability_LiveViewStatus is 1 (ON).
- When CPUlens is not attached.
- When the value of Capabilty_ShutterSpeed is “Time”.
- Capabilty_RetractableLensWarningStatus is “True: Warning about retraction”.

3.101. DeleteDramImage

This will delete DRAM image specified by Capability_CurrentItemID.

Capability kNkMAIDCapability_DeleteDramImage

Object types Source

ulType kNkMAIDCapType_Process

ulOperations kNkMAIDCapOperation_Start

The DRAM image to be deleted is specified by Capability_CurrentItemID.

This capability execution timing is limited to the following case.

- After issuing kNkMAIDCapability_Acquire for Image Object, and before issuing kNkMAIDCommand_Close.

The client will issue Capability_Acquire for Image object and cancel Capability_Acquire by kNkMAIDCommand_Abort, and set Capability_CurrentItemID and execute this capability, so, the deletion will be completed.

In case of deletion of RAW+JPEG, if the client executes this capability for JPEG, the both of RAW and Jpeg files will be deleted at the same time.

When the client deletes DRAM image after receiving kNkMAIDEvent_AddChild, the

client must close Item objcet. The module does not close Item object.

This capability is not supported when an image is saved on Crad.

To Delete SDRAM image by this capability is prohibited, when it is applied for either of condition below. In this case, this capability returns kNkMAIDResult_NotSupported.

- When the value of Capability_SaveMedia is “2: Card + SDRAM”.
- When during movie file recording.

3.102. RawJpegImageStatus

This will get whether the image is taken on RAW+JPEG mode.

Capability	kNkMAIDCapability_RawJpegImageStatus
Object types	Image
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get
Data	one of eNkMAIDRawJpegImageStatus 0: Single 1: Raw+JPEG

3.103. CurrentItemID

This will specify the DRAM image operated now.

Capability	kNkMAIDCapability_CurrentItemID
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

Item ID is used as an identifier that specifies the image data in SDRAM.

Item ID is notified by data parameter of kNkMAIDEvent_AddChild.

The value of this capability is referred by Capability_DeleteDramImage.

3.104. GetLiveViewImage

This will get Live view image.

Capability kNkMAIDCapability_GetLiveViewImage

Object types Source

ulType kNkMAIDCapType_Array

kNkMAIDArrayType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray

The client will get the size of Live view image by kNkMAIDCapOperation_Get, and get a actual Live view data by kNkMAIDCapOperation_GetArray.

Every time, the size of Live view image need not be confirmed with kNkMAIDCapOperation_Get in this capability before execution of kNkMAIDCapOperation_GetArray because the specification of Live view image is always fixation.

When the client want to get Live view image with kNkMAIDCapOperation_GetArray, the client must allocate the buffer for the maximum size, and set buffer to kNkMAIDArray.pData, and set allocate size to kNkMAIDArray.ulElements.

After reading preview image, kNkMAIDArray.ulElements will be updated with the actual size of Live view image I, the Live view image will be set to kNkMAIDArray.pData.

When Capability_LiveViewStatus is OFF(0), the ulOperations of this capability is set to read-only, kNkMAIDCapOperation_GetArray is invalid.

If Live view is stopped by camera automatically (including when the live view time limit passes), the module returns kNkMAIDResult_NotLiveView.

Live view image is consisted of “Display information” and “Live view image(JPEG).”

The pixel size of Live view image is different in each Live view data, each detailed information is set to “Display information” area.

Specification of Live view image

image quality	maximum file size
Jpeg Basic	Header size 8 byte 376 byte / Display information 49,920Bbyte / Max Live view image

The format of the Live view image is shown below.

	Display information area size		4Byte	
	Live view image area size		4Byte	
Display information	Attached JPEG image size	Horizontal size	2Byte	JPEG image size is the size that has been set in kNkMAIDCapability_LiveViewImageSize. If during movie recording will change the image size by setting kNkMAIDCapability_MovieScreenSize and kNkMAIDCapability_LiveViewImageSize.
		Vertical size	2Byte	
	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	
	AF frame size	Horizontal size	2Byte	
		Vertical size	2Byte	
	AF frame center coordinates	Horizontal size	2Byte	
		Vertical size	2Byte	
	Reserve		4Byte	
	Reserve		1Byte	
	Rotation direction		1Byte	0: No rotation 1: Rotate counterclockwise 2: Rotate clockwise
	Focus driving status		1Byte	0: Not driving, 1: Driving
	Reserve		1Byte	
	Reserve		4Byte	
	Reserve		2Byte	
	Countdown time		2Byte	Countdown every one second starting from 3600 (one hour) ; countdown starting from thirty seconds with a rise in temperature
	Focusing judgment result		1Byte	0: No information, 1: Not focused, 2: Focused
	AF driving enabled status		1Byte	0: AF driving disabled, 1: AF driving enable
	Reserve		2Byte	

	Reserve			12Byte	Fixed to 0 for D5500
	Remaining time of movie recording			4Byte	From 0 to 1200000 [msec] * It is valid during the movie recording state.
	Movie recording information			1Byte	0: During LV execution 1: During movie recording
	AF mode status of the face detection system			1Byte	0: The face detectionAF is OFF 1: The face detection AF is ON
	The number of persons whose faces are detected by the system			1Byte	From 0 to 35 (Thirty-five is the maximum number of persons for D5500)
	AF area index			1Byte	From 0 to 34 (fixed to 0 for D5500)
	0 ~ 34	AF frame size	Horizonal size	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
			Vertical size	2Byte	
		AF frame center coordinates	Horizonal position	2Byte	
			Vertical position	2Byte	
	Sound level (peak)		L	1Byte	0～14
			R	1Byte	0～14
	Sound level (current value)		L	1Byte	0～14
			R	1Byte	0～14
	Reserve			1Byte	
	Reserve			1Byte	
	Reserve			1Byte	
	Reserve			1Byte	
	Reserve			24Byte	
Live view image	Image data				

3.105. GetVideoImage

This will get Movie image.

Capability kNkMAIDCapability_GetVideoImage

Object types Video

ulType kNkMAIDCapType_Generic

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray

Data pointer to NkMAIDGetVideoImage structure

```
typedef struct tagNkMAIDGetVideoImage
{
ULONG   ulType;------one of eNkMAIDArrayType
ULONG   ulOffset;-----Offset position that begins data acquisition
ULONG   ulReadSize;-----Size of acquired data
ULONG   ulDataSize;-----Size of buffer set to “pData”
LPVOID   pData;---------Pointer to buffer
} NkMAIDGetVideoImage, FAR* LPNkMAIDGetVideoImage;
```

The client will get the size of Movie image by kNkMAIDCapOperation_Get, and get an actual Movie data by kNkMAIDCapOperation_GetArray.

While getting movie data, camera is automatically locked state, and the operation of the camera body is impossible.

"While getting movie data" means, it is the period from the first issued kNkMAIDCapOperation_GetArray, until canceled or until the completion of the all movie data.

[In case of Get]

The data size for the unacquisition is set to kNkMAIDGetVideoImage.ulDataSize.

[In case of GetArray]

When the client want to get Movie image with kNkMAIDCapOperation_GetArray, the client must allocate the buffer for size to be acquired, and set buffer to kNkMAIDGetVideoImage.pData, and set allocate size to kNkMAIDGetVideoImage.ulElements, and set offset position to kNkMAIDGetVideoImage.ulOffset.

After reading, the size of data actually read will be set to kNkMAIDGetVideoImage.ulReadSize and the Movie image will be set to kNkMAIDGetVideoImage.pData.

It is necessary to set “kNkMAIDArrayType_Unsigned” to kNkMAIDGetVideoImage.ulType. When the value that exceeds the size of actual movie data is set, module returns kNkMAIDResult_ValueOutOfBounds.

[Cancel of getting movie data]

To cancel getting movie data, call kNkMAIDCapOperation_GetArray set to 0 to ulDataSize.

In the following cases, getting movie data will be canceled automatically by the camera.

- When the interval is issued kNkMAIDCapOperation_GetArray exceeds about 60 seconds.
- Doing the following operations when "While getting movie data"
    1. Called the Capability other than GetVideoImage.
    2. Inserting or removing the card.

3.106. LockCamera

This will lock camera. When the camera is locked, user can't operate it directly.

Capability	kNkMAIDCapability_LockCamera
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set kNkMAIDCapOperation_GetDefault
Data	True: Lock False: Unlock

When Capability_LiveViewStatus is 1(ON), the ulOperations of this capability is set to read-only.

3.107. CameraType

This will get the camera type.

Capability	kNkMAIDCapability_CameraType
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get
Data	one of eNkMAIDCameraType 0x3C: D5500 0x44: D5600

3.108. LensType

This will get the lens type about CPU lens.

Capability kNkMAIDCapability_LensType

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get

Data one of eNkMAIDLensType

0x00000001: D type

0x00000010: G type

0x00000100: VR

0x00001000: DX

0x00010000: AF-S

0x00100000: Auto distortion control

0x01000000: Retractable lens

0x00000020: E type (Electromagnetism diaphragm)

0x00000040: STM lens

The value of this capability is expressed by the OR value.

When CPU lens is not attached, the module returns 0.

3.109. AFMode

This will set the focus mode for phase detection on still image shooting.

Capability kNkMAIDCapability_AFMode

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault
kNkMAIDCapOperation_Set

Data one of eNkMAIDAFMode

0: AF-S

1: AF-C

2: AF-A

3: MF Fixed

4: MF selected

This capability is affected by setting of Capability_FocusMode on still image shooting, Capability_LensType, Capability_ExposureMode.

When there is a change in the types of values that can be set in this Capability, the module sends to the client kMAIDEvent_CapChange.

The following cases, the ulOperations of this capability is set to read-only.

- Capability_AFMode is MF Fixed(3).
- AF-S lens is not attached.
- Capability_ExposureMode is Special Effects Modes (because Capability_AFMode is set to MF fixed(3))
- When the ulOperations of Capability_LiveViewStatus is ON(1)
- When the Capability_RetractableLensWarningStatus is "True: Warning about Retraction".

Conditions	Shooting mode	AFMode
AF-S lens is not attached.		MF Fixed
AF-S lens is attached＋MF setting (lens settings)		MF Fixed
Retractable lens is attached + RetractableWarning		MF Fixed
AF-S lens is attached＋AF setting (lens settings)	P,S,A,M	AF-S, AF-C, AF-A ,MF selected
AF-S lens is attached＋AF setting (lens settings)	Scene modes effects	AF-A ,MF selected

When the value of Capability_FocusAreaMode is "3D-tracking" or "Dynamic(9/21/39points)", if the value of this capability is set to AF-S(0), the value of Capability_FocusAreaMode is changed into "Single" automatically.

3.110. AFModeAtLiveView

This will set the focus mode of the live view.

Capability	kNkMAIDCapability_AFModeAtLiveView
Object types	Source
ulType	kNkMAIDCapType_Enum
	kNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get,
	kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set
Data	one of eNkMAIDAFModeAtLiveView
	0: AF-S
	2: AF-F
	3: MF fixed (effective only as the Get value)
	4: MF selected

When Capability_ExposureMode is “Miniature”, “Photo Illustration”, “Toy Camera Effect” of Special Effects modes, AF-F does not enumerate.

If any of the following, the ulOperations cannot be set into.

- This capability is MF fixed(3).
- During movie recording.
- Capability_RetractableLensWarningStatus is “True: Warning about retraction”. (because Capability_AFMode is set to MF fixed(3))
- When the value of Capability_LensType is not “0x00010000: AF-S”.

3.111. LiveViewAF

This will set the focus point in live view mode.

Capability kNkMAIDCapability_LiveViewAF

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDLiveViewAF

0: Face priority

1: Wide area

2: Normal area

3: Subject tracking

In the following table, the default value is changed by Scene modes or Special Effects modes.

When the setting of Capability_ExposureMode is changed to Scene Modes or Special Effects modes, the value of this capability will be changed to each default value.

Capability_ExposureMode Capability_SceneMode Capability_EffectMode	default value
Portrait(SceneModes) Landscape(SceneModes) Party/Indoor(SCENE) Beach/Snow(SCENE) Sunset(SCENE) Dusk/Dawn(SCENE) Candlelight(SCENE) Blossom(SCENE) Autumn Colors(SCENE) Night Portrait(SCENE) Child(SceneModes)	0 : Face priority
Auto(Auto/Portrait/ Landscape/Night Portrait*1) Flash Off (Auto/Portrait/ Landscape/Night Portrait*1)	0 : Face priority (unchangeable)
Sports(SceneModes) Night Landscape(SCENE) Pet Portrait(SCENE) Silhouette(EFFECTS) High Key(EFFECTS) Low Key(EFFECTS) Color Sketch(EFFECTS) Selective Color(EFFECTS) Night Vision(EFFECTS) Toy Camera(EFFECTS) Super Vivid (EFFECTS)	1 : Wide area

Pop(EFFECTS) Photo Illustration(EFFECTS)	
Miniature Effect(EFFECTS)	1 : Wide area (unchangeable)
Close Up(SceneModes) Food(SCENE)	2 : Normal area
Auto(Close Up*1) Flash Off(Close Up*1)	2 : Normal area (unchangeable)

*1: The value in parenthesis after “Auto” and “Flash Off” show the value of Capability_AutoSceneModeStatus.

When [3 : Subject tracking] is set while executing a live view, kNkMAIDResult_ValueOutOfBounds is returned.

And, when a live view is begun when [3 : Subject tracking] is set, the value of this capability is automatically changed to [1 : Wide area].

If any of the following, the ulOperations cannot be set into.

- The Capability_ExposureMode is “Auto”, “Flash Off” or “Miniature” of Special Effects modes.
- During movie file recording.

3.112. MovRecInCardStatus

This will start or stop movie recording and show status of movie recording.

Capability	kNkMAIDCapability_MovRecInCardStatus
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDMovRecInCardStatus 0: OFF 1: ON

When the client start movie recording in the card, the client must set the value of this capability to ON(1). And when the client stop movie recording in the card, the client must set the value of this capability to OFF(0).

In case of kNkMAIDCapOperation_Get, the value of this capability will show the current status of movie recording.

This capability is accepted only during Live view execution.

It is recommended to check the value of Capability_MovRecInCardProhibit before issuing this capability. If the Capability_MovRecInCardProhibit is a value other than 0, the client cannot start movie recording.

When the Capability_LiveViewStatus is set to OFF(0), movie recording is automatically stopped by the camera.

Taking a picture of the still picture is prohibited while movie file recording.

The following cases, this Capability cannot be performed.

- When the Capability_LiveViewStatus is “OFF(0)”.

3.113. MovRecInCardProhibit

This will show the status of movie recording prohibition.

Capability kNkMAIDCapability_MovRecInCardProhibit

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get

Data one of eNkMAIDMovRecInCardProhibit

The movie recording prohibition is shown by the OR value of the following definition value. When 0 returns, the status is not movie recording prohibition.

Value	Prohibition condition
0x00001000	During enlarged display of Live view
0x00000800	Card protected
0x00000400	During movie file recording
0x00000200	There is unrecorded image or movie data in the buffer.
0x00000008	No free area in the card
0x00000004	Card not formatted
0x00000002	Card error
0x00000001	No card inserted

This Capability becomes effective only while executing a live view.

When the Capability_LiveViewStatus is OFF(0), the value of this capability is not fixed. Even if a value has been entered, it is not guaranteed.

3.114. SaveMedia

This will set the recording media by shooting, shutter-release button on camera body or Capability_Capture or Capability_AFCapture, Capability_CaptureDustImage.

Capability	kNkMAIDCapability_SaveMedia
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDSaveMedia 0: Card 1: SDRAM 2: Card + SDRAM

When during movie file recording, this Capability cannot be set into.

3.115. BlinkingStatus

This will show the status of the display a shutter speed and an aperture of the camera.

Capability	kNkMAIDCapability_BlinkingStatus
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get
Data	one of eNkMAIDBlinkStatus 0: Both a shutter speed and an aperture are displayed with normal status. 1: Only a shutter speed is displayed with blinking status. 2: Only an aperture is displayed with blinking status. 3: Both a shutter speed and an aperture are displayed with blinking status.

In case of bulb or warning of the time, the value of this Capability is set to 1(flashing only the shutter speed).

3.116. AutoSceneModeStatus

This will show the scene mode which the Automatic Scene Selection selects automatically.

Capability kNkMAIDCapability_AutoSceneModeStatus

Object types Source

ulType kNkMAIDCapType_Enum

kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,

Data

Automatic Scene Selection is invalid.	"Unjudgment"
Auto	"Auto"
Portrait	"Portrait"
Landscape	"Landscape"
Close up	"Closeup"
Night portrait	"NightPortrait "

This capability is valid if the Capability_ExposureMode is either "Auto" or "Flash off" when Capability_LiveViewStatus is ON(1). Other than above conditions, Automatic Scene Selection is invalid, so the value of this capability is set to "Unjudgment".

3.117. ISOControlSensitivity

This capability will show ISO sensitivity which the camera is controlling.

Capability kNkMAIDCapability_ISOControlSensitivity

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get

Data eNkMAIDISOControlSensitivity2

value	ISOControlSensitivity	value	ISOControlSensitivity
100	ISO100	3200	ISO3200
110	ISO110	3600	ISO3600
125	ISO125	4000	ISO4000
140	ISO140	4500	ISO4500
160	ISO160	5000	ISO5000
180	ISO180	5600	ISO5600
200	ISO200	6400	ISO6400
220	ISO220	7200	ISO7200
250	ISO250	8000	ISO8000
280	ISO280	9000	ISO9000
320	ISO320	10000	ISO10000
360	ISO360	11000	ISO11000
400	ISO400	12800	ISO12800
450	ISO450	14400	ISO14400
500	ISO500	16000	ISO16000
560	ISO560	18000	ISO18000
640	ISO640	20000	ISO20000
720	ISO720	22000	ISO22000
800	ISO800	25600	ISO25600
900	ISO900	28800	Hi 0.2
1000	ISO1000	32000	Hi 0.3
1100	ISO1100	36000	Hi 0.5
1250	ISO1250	40000	Hi 0.7
1400	ISO1400	45600	Hi 0.8
1600	ISO1600	51200	Hi 1.0
1800	ISO1800	57600	Hi 1.2
2000	ISO2000	64000	Hi 1.3
2200	ISO2200	72000	Hi 1.5
2500	ISO2500	81200	Hi 1.7
2800	ISO2800	91200	Hi 1.8
-	-	102400	Hi 2.0

3.118. TerminateCapture

This capability will terminate bulb exposure shooting and record to SDRAM the image until stopped bulb.

Capability	kNkMAIDCapability_TerminateCapture
Object types	Source
ulType	kNkMAIDCapType_Generic
ulOperations	kNkMAIDCapOperation_Start
Data	pointer to NkMAIDTerminateCapture structure
	typedef struct tagNkMAIDTerminateCapture
	{
	ULONG ulParameter1;
	ULONG ulParameter2;
	} NkMAIDTerminateCapture, FAR* LPNkMAIDTerminateCapture;

The following cases, this capability cannot be performed.

- During movie file recording.
- When the Capability_ExposureMode is not “3: Manual”.
- When the Capability_ShutterSpeed is not “Bulb”.

3.119. RawJpegTransferStatus

This capability will set the type of SDRAM image which be notified and transmitted to a client, when the value of Capability_SaveMedia is “2: Card + SDRAM” and the value of Capability_CompressionLevel is “RAW + JPEG”.

Capability	kNkMAIDCapability_RawJpegTransferStatus
Object types	Source
ulType	kNkMAIDCapType_ Boolean
ulOperations	kNkMAIDCapOperation_Get,
	kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	True: JPEG only
	False: RAW & JPEG

The following cases, the ulVisibility of this capability is invalid. (The ulOperations can set.)

- When the value of Capability_CompressionLevel is except “RAW + JPEG”.
- When the value of Capability_SaveMedia is except “2: Card + SDRAM”.

This capability is always can be set into but setting change of this capability is taken as prohibition until it receives kNkMAIDEvent_CaptureComplete about SDRAM from the execution start of “Capability_Capture”, “Capability_AFCapture”, and “Capability_CaptureDustImage”

4. Standard Capabilities

4.1. AsyncRate

Capability kNkMAIDCapability_AsyncRate
Object types Module
ulType kNkMAIDArrayType_Unsigned
ulOperations kNkMAIDCapOperation_Get

4.2. ProgressProc

Capability kNkMAIDCapability_ProgressProc
Object types Source, Image, Thumbnail, Video
ulType kNkMAIDCapType_Callback
ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

4.3. EventProc

Capability kNkMAIDCapability_EventProc
Object types Module, Source, Item, Image, Thumbnail, Video
ulType kNkMAIDCapType_Callback
ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

4.4. DataProc

Capability kNkMAIDCapability_DataProc
Object types Image, Thumbnail
ulType kNkMAIDCapType_Callback
ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

4.5. UIRequestProc

Capability kNkMAIDCapability_UIRequestProc
Object types Module
ulType kNkMAIDCapType_Callback
ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

4.6. IsAlive

Capability kNkMAIDCapability_IsAlive
Object types Module, Source, Item, Image, Thumbnail, Video
ulType kNkMAIDCapType_Boolean
ulOperations kNkMAIDCapOperation_Get

4.7. Children

Capability kNkMAIDCapability_Children
Object types Module, Source
ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_Unsigned
ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray

4.8. State

Capability kNkMAIDCapability_State

Not supported

4.9. Name

Capability kNkMAIDCapability_Name
Object types Module, Source, Item, Image, Thumbnail, Video
ulType kNkMAIDCapType_String
ulOperations kNkMAIDCapOperation_Get

The image saved on SDRAM is taken a picture on the mode Capability_SaveMedia is "1:SDRAM", the value of this capability about Item、Image、Thumbnail is "DSC_0000.xxx".

The image saved on SDRAM is taken a picture on the mode Capability_SaveMedia is "2:Card + SDRAM", the value of this capability about Item、Image、Thumbnail is "folder name¥filename.xxx". However, when the image doesn't exist the on the card (For the reasons card was not inserted), "DSC_0000.xxx" is used.

4.10. Description

Capability kNkMAIDCapability_Description

Not supported

4.11. Interface

Capability kNkMAIDCapability_Interface
Object types Source
ulType kNkMAIDCapType_String
ulOperations kNkMAIDCapOperation_Get

4.12. DataTypes

Capability kNkMAIDCapability_DataTypes
Object types Source, Item
ulType kNkMAIDCapType_Unsigned
ulOperations kNkMAIDCapOperation_Get

4.13. DateTime

Capability kNkMAIDCapability_DateTime
Object types Item
ulType kNkMAIDCapType_DateTime
ulOperations kNkMAIDCapOperation_Get

4.14. StoredBytes

Capability kNkMAIDCapability_StoredBytes
Object types Item, Image, Thumbnail, Video
ulType kNkMAIDCapType_Unsigned
ulOperations kNkMAIDCapOperation_Get

4.15. Eject

Capability kNkMAIDCapability_Eject
Not supported

4.16. Feed

Capability kNkMAIDCapability_Feed
Not supported

4.17. Capture

This will take a picture and save the image to specified media.

Capability kNkMAIDCapability_Capture

Object types Source

ulType kNkMAIDCapType_Process

ulOperations kNkMAIDCapOperation_Start

When the Capability_ShootingMode is 1(C) or 2(CH), the number of shots set by the Capability_ContinuousShootingNum is taken on continuous shooting mode.

Number of shots is the smallest in value of the Capability_ContinuousShootingNum or value of the Capability_RemainContinuousShooting or Bracketing Shot is remaining number of frames.

When the Capability_ShootingMode is 4(Mirror up), or movie file recording and Capability_MovieReleaseButton is not Live frame grab, the ulVisibility and ulOperations of this capability is set to invalid.

When image is prepared to acquire, kNkMAIDEvent_Add is issued to source object.

If the client executes this capability while doing Live view, Live view will be stopped by camera, and the camera take a picture with AF position set on Live view without Auto focus.

The media saved an image is specified by Capability_SaveMedia. When there is not free space in specified media, this capability returns kMAIDResult_MediaFull. And this capability returns kNkMAIDResult_NoMedia when card is under being formatted or no card is inserted. This Capability becomes invalid during movie recording.

Bulb exposure shootng can be executed when Capability_LockCamera is true and Capability_ExposureMode is Manual and Capability_ShutterSpeed is buib. The bulb shooting is started by this capability and terminated by Capability_TerminateCapture.

When live frame grab is active, if the Capability_ShootingMode is 1(C) or 2(CH), shooting is possible only one picture.

The following cases, the ulVisibility of this capability is invalid and the ulOperations is set to invalid.

- When the value of Capabilty_ShutterSpeed is “Time”.
- When the value of Capabilty_ RetractableLensWarningStatus is “True”.
- When during movie recording.
- Capability_ShootingMode is Mirror up.

4.18. Mode

Capability kNkMAIDCapability_Mode

Not supported

4.19. Acquire

Capability kNkMAIDCapability_Acquire

Object types Image, Thumbnail

ulType kNkMAIDCapType_Process

ulOperations kNkMAIDCapOperation_Start

When Object types are set to Thumbnail, this Capability may return kNkMAIDResult_NotSupported error.

When it detects the camera's internal image generation, the module starts reading the Image. Then, the module cache inside it.(Look-ahead processing)

Thumbnail obtaining and caching is not performed in the look-ahead processing.

When loading is complete Image, Inside the camera, the entire image data including a Thumbnail will be deleted.

Therefore, if after the completion of the process ahead, was executed this Capability for Thumbnail, this Capability is kNkMAIDResult_NotSupported error.

For reacquisition when the shooting took place at set "RAW + JPEG". If one image data can be transmitted is successfully carried out only image data of the other re-transmission.

4.20. Start

Capability kNkMAIDCapability_Start

Not supported

4.21. Length

Capability kNkMAIDCapability_Length

Not supported

4.22. SampleRate

Capability kNkMAIDCapability_SampleRate

Not supported

4.23. Stereo

Capability kNkMAIDCapability_Stereo

Not supported

4.24. Samples

Capability kNkMAIDCapability_Samples

Not supported

4.25. Filter

Capability kNkMAIDCapability_Filter

Not supported

4.26. Prescan

Capability kNkMAIDCapability_Prescan

Not supported

4.27. AutoFocus

This will execute phase detection AF.

Capability kNkMAIDCapability_AutoFocus

Object types Source

ulType kNkMAIDCapType_Process

ulOperations kNkMAIDCapOperation_Start

The following cases, the ulVisibility of this capability is invalid and the ulOperations is set to invalid.

- When the value of Capability_SpotWBMode is “0(OFF)”.
- When the value of Capabilty_FocusMode is “MF”.
- When CPUlens is not attached.
- When the value of Capability_LiveViewStatus is 1(ON).

4.28. AutoFocusPt

Capability kNkMAIDCapability_AutoFocusPt

Not supported

4.29. Focus

Capability kNkMAIDCapability_Focus

Not supported

4.30. Coords

Capability kNkMAIDCapability_Coords

Not supported

4.31. Resolution

Capability kNkMAIDCapability_Resolution

Not supported

4.32. Preview

Capability kNkMAIDCapability_Preview

Not supported

4.33. Negative

Capability kNkMAIDCapability_Negative

Not supported

4.34. Bits

Capability kNkMAIDCapability_Bits

Not supported

4.35. Planar

Capability kNkMAIDCapability_Planar

Not supported

4.36. Lut

Capability kNkMAIDCapability_Lut

Not supported

4.37. Transparency

Capability kNkMAIDCapability_Transparency

Not supported

4.38. Threshold

Capability kNkMAIDCapability_Threshold

Not supported

4.39. Pixels

Capability kNkMAIDCapability_Pixels

Object types Image, Thumbnail, Video

ulType kNkMAIDCapType_Size

ulOperations kNkMAIDCapOperation_Get

4.40. ForceScan

Capability kNkMAIDCapability_ForceScan

Not supported

4.41. ForcePrescan

Capability kNkMAIDCapability_ForcePrescan

Not supported

4.42. ForceAutoFocus

Capability kNkMAIDCapability_ForceAutoFocus

Not supported

4.43. NegativeDefault

Capability kNkMAIDCapability_NegativeDefault

Not supported

4.44. Firmware

Capability kNkMAIDCapability_Firmware

Not supported

4.45. CommunicationLevel1

Capability kNkMAIDCapability_CommunicationLevel1

Not supported

4.46. CommunicationLevel2

Capability kNkMAIDCapability_CommunicationLevel2

Not supported

4.47. BatteryLevel

Capability kNkMAIDCapability_BatteryLevel

Object types Source

ulType kNkMAIDCapType_Integer

ulOperations kNkMAIDCapOperation_Get

Data 1, 5, 20, 35, 100

Data	Battery Indicator
100	Battery fully charged.
35	Battery partially discharged.
20	Low battery. Ready fully-charged spare battery or prepare to charge battery
5	Battery exhausted. Shutter release disabled. Charge or exchange battery.
1	The monitor does not turn on.

This will show the remains of battery by percent.

When the external power supply is used, this capability returns -1.

4.48. FreeBytes

Not supported

4.49. FreeItems

Not supported

4.50. Remove

Not supported

4.51. FlashMode

Capability kNkMAIDCapability_FlashMode

Object types Source

ulType kNkMAIDCapType_Enum

kNkMAIDArrayType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set,

Data one of eNkMAIDFlashMode, eNkMAIDFlashModeDX2

0: FrontCurtain

1: Rear-curtain sync

2: Slow

3: Red-eye reduction

Flash mode / ExposureMode / SceneMode	Front Curtain	Slow	Rear-curtain sync (Slow rear-curtain sync on P,A)	Red-eye reduction	Slow sync with red-eye reduction	flash off
P, A	●,△	●,△	●,△	●,△	●,△	—
S, M	●,△	—	●,△	●,△	—	—
Auto(Auto/Portrait/Close up) Portrait (Scene modes) Close up (Scene modes) Child (Scene modes) Party / Indoor (SCENE) Pet Portrait (SCENE) Toy camera(EFFECTS) Super Vivid(EFFECTS) Pop(EFFECTS) Photo Illustration(EFFECTS)	●,△	—	—	●,△	—	●
Landscape (Scene modes) Sports (Scene modes) Night Landscape (SCENE) Beach / Snow (SCENE) Sunset (SCENE) Dusk/Dawn (SCENE) Candlelight (SCENE) Blossom (SCENE) Autumn Colors (SCENE) Silhouette (EFFECTS) High Key (EFFECTS) Low Key (EFFECTS) Miniature Effect (EFFECTS) Auto(Landscape)	△	—	—	△	—	●
Night Portrait (SCENE) Auto(Night Portrait)	—	●,△	—	—	●,△	●
Flash Off Selective Color (EFFECTS) Night Vision (EFFECTS)	—	—	—	—	—	●,△

Food（SCENE）	●,△	—	—	—	—	—

●: When Internal speed light is active(=external speed light is not active), it is available.

△: When external speed light is active (=external speed light is attached and power on), it is available.

—: Not supported

Words in parenthesis after "Auto" show the value of Capability_AutoSceneModeStatus.

Auto(Auto) is selected when Live view (still picture) is inactive.

When Capability_ExternalNewTypeFlashMode is (7) "Repeating flash" and Capability_ExposureMode is P, S, A, M, 1 "[Rear-curtain sync" can not be set and 0 "FrontCurtain" will be set.

The following cases, this Capability cannot be set into.

- During movie file recording.
- When the value of Capabilty_HDRMode is except "0: Off".
- Choice if only one.
- When the Capability_ExposureMode is set into "Auto (flash off)", "SCENE(Food)" or Special Effects Modes(Night Vision, Selective Color).

4.52. ModuleType

Capability kNkMAIDCapability_ModuleType
Object types Module
ulType kNkMAIDCapType_Unsigned
ulOperations kNkMAIDCapOperation_Get

4.53. AcquireStreamStart

Capability kNkMAIDCapability_AcquireStreamStart
Not supported

4.54. AcquireStreamStop

Capability kNkMAIDCapability_AcquireStreamStop
Not supported

4.55. AcceptDiskAcquisition

Capability kNkMAIDCapability_AcceptDiskAcquisition
Object types Source
ulType kNkMAIDCapType_Generic
ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

4.56. Version

Capability kNkMAIDCapability_Version
Object types Module
ulType kNkMAIDCapType_Unsigned
ulOperations kNkMAIDCapOperation_Get

4.57. FilmFormat

Capability kNkMAIDCapability_FilmFormat
Not supported

4.58. TotalBytes

Capability kNkMAIDCapability_TotalBytes
Not supported

5. Event

The client can't receive the event as follows while opening item object.

5.1. AddChild

This event will be issued when the child is added under an object.

Event kNkMAIDEvent_AddChild

Object types Module, Source, Item

data parameter Added child ID

When the added child is Item Object, Item ID will be set to the data parameter of call back function.

This event is issued only about the image preserved in SDRAM. The image preserved on the card is not issued.

5.2. RemoveChild

This event will be issued when the child is removed under an object.

Event kNkMAIDEvent_RemoveChild

Object types Module, Source, Item

data parameter Removed child ID

5.3. WarmingUp

Event kNkMAIDEvent_WarmingUp

Not supported

5.4. WarmedUp

Event kNkMAIDEvent_WarmedUp

Not supported

5.5. CapChange

This event will be issued when the information of Capability is changed.

Event kNkMAIDEvent_CapChange

Object types Module, Source, Item

data parameter Capability ID

In the following cases, this event will be issued.

- When the content of structure "NkMAIDCapInfo" of capability was changed.

- When the array data of capability with the type of kNkMAIDCapType_Array was changed.

5.6. OrphanedChildren

Event kNkMAIDEvent_OrphanedChildren

Not supported

5.7. CapChangeValueOnly

This event will be issued when the current value of capability is changed.

Event kNkMAIDEvent_CapChangeValueOnly

Object types Module, Source, Item, Data

data parameter Capability ID

This event will be issued when only the current value of capability is changed (the array data, ulVisibility, ulOperations is not changed).

5.8. CaptureComplete

This will be issued when the acquisition or deletion of all images of which it takes a picture is completed.

Event kNkMAIDEvent_CaptureComplete

Object types Source

data parameter 1 : The all SDRAM images by Capture, AFCapture, CaptureDustImage are finished to read or deleted.
0: The all images by Capture, AFCapture, CaptureDustImage are finished to record in card.

It shows that the all images are finished to record in card or the all SDRAM images were finished to read or deleted.

This event is not issued in case of shooting by shutter-release button.

5.9. AddChildInCard

This event will be issued when the child is added in card.

Event kNkMAIDEvent_AddChildInCard

Object types Item

data parameter Added child ID

When the added child is Item Object, Item ID will be set to the data parameter of call back function.

This event is issued only about the movie data preserved on the card. The still image data preserved on the card is not issued.

5.10. RecordingInterrupted

This will be issued the factor of discontinue when the recording of movie was stopped with error occurring.

Event kNkMAIDEvent_RecordingInterrupted

Object types Source

data parameter 1: Some error.

0: Low access speed card error.

5.11. CapChangeOperationOnly

Operation value or visibility of Capability has changed.

Event kNkMAIDEvent_CapChangeOperationOnly

Object types Module, Source, Item, Data

dataparamater Capability ID

Events to notify (the number of elements in the array, enumeration value configuration, value, etc. has not changed) if only Operation or visibility · Invalid attribute of Capability has changed.

6. Vendor Unique Results

6.1. ApertureFEE

The aperture is not set maximum F number.

Result kNkMAIDResult_ApertureFEE

Command Start

Capability Capture, AFCapture, PreCapture, CaptureDustImage

Explanation If the ExposureMode is set to Program or SpeedPriority and the aperture ring of the lens is not set to maximum F number, the camera cannot execute capture command.

Expected Action The client displays the message to set the aperture to maximum F number and is waiting for next command.

6.2. BufferNotReady

This is not used in the current module.

6.3. NormalTTL

The speedlight is set TTL mode.

Result kNkMAIDResult_NormalTTL

Command Start

Capability Capture

Explanation The camera cannot take a picture when an external speedlight is attached and it is set TTL(measuring through the lens) mode.

Expected Action The client displays the message that the camera cannot take a picture and is waiting for next command.

6.4. MediaFull

There are neither free spaces that can be recorded on the card nor a free space that can be recorded with built-in the camera SDRAM.

Result kNkMAIDResult_MediaFull

Command Start

Capability Capture, AFCapture, CaptureDustImage

Explanation There is no free space at the specified media, so the client can not take a picture.

Expected Action The client displays the message that the camera cannot take a picture and is waiting for next command.

6.5. InvalidMedia

It shows that the client can not take a picture because recording media is broken.

Result kNkMAIDResult_InvalidMedia

Command Start

Capability Capture, AFCapture, CaptureDustImage

Explanation When Capability_SaveMedia is "Card" or "Card + SDRAM" it shows the client can not take a picture because the card is broken.

Expected Action The client displays the message that the camera cannot take a picture and is waiting for next command.

6.6. EraseFailure

This is not used in the current module.

6.7. CameraNotFound

The module did not find a camera on the bus.

Result kNkMAIDResult_CameraNotFound

Command The commands need access to the camera. (most of the commands for the Source, the Item or the Data object.)

Explanation The camera was disconnected. If the client sends Async command to the Module object at intervals, it can tell that the camera is reconnected by AddChild event.

Expected Action The client displays the message that the camera was disconnected and is waiting for next command.

6.8. BatteryDontWork

The main battery in the camera is used up.

Result kNkMAIDResult_BatteryDontWork

Command Start

Capability Capture, AFCapture, CaptureDustImage, PreCapture

Explanation The camera cannot take a picture because of the battery.

Expected Action The client displays the message that the camera cannot take a picture and suggests changing battery.

6.9. ShutterBulb

The exposure time is set to Bulb.

Result kNkMAIDResult_ShutterBulb

Command Start

Capability Capture, AFCapture, CaptureDustImage

Explanation The camera cannot execute capture command if the Capability_ShutterSpeed is set to bulb.

Expected Action The client displays the message that the camera cannot take a picture and is waiting for next command.

6.10. OutOfFocus

Auto focus operation is failed.

Result kNkMAIDResult_OutOfFocus

Command Start

Capability Capture, AutoFocus, AFCapture, CheckContrastAF

Explanation When the Capability_FocusMode is AF-S(1) and auto focus operation is failed, the camera cannot take a picture. Then this error is returned for the start of Capability_Capture or Capability_AFCapture.
In case of the Capability_AutoFocus and Capability_CheckContrastAF, this error will be returned when auto focus is failed.

Expected Action The client displays the message that the camera is out of focus and is waiting for next command.

6.11. Protected

This is not used in the current module.

6.12. FileExists

This is not used in the current module.

6.13. SharingViolation

This is not used in the current module.

6.14. DataTransFailure

An error occurred while data transference.

Result kNkMAIDResult_DataTransFailure

Command Start, Async

Capability Acquire

Explanation If this error occurs while the client read an image from DRAM, it will lose the image.

Expected Action The client aborts the data transference.

6.15. SessionFailure

The module cannot open source object because the camera cannot open more session.

Result kNkMAIDResult_SessionFailure

Command Open

Capability -

Explanation The camera can open 1 session. If the client tries to open more source object, the module returns this error.

Expected Action The client displays an error message and is waiting for next command.

6.16. FileRemoved

This is not used in the current module.

6.17. BusReset

This command was aborted because bus-reset occurred.

Result kNkMAIDResult_BusReset

Command any command

Capability any capability

Explanation If bus-reset occurred, the command, which the module is executing, is aborted. Then the module returns this result for the command.

Expected Action The client sends the command again.

6.18. NonCPULens

This is not used in the current module.

6.19. ReleaseButtonPressed

This is not used in the current module.

6.20. BatteryExhausted

This is not used in the current module.

6.21. CaptureFailure

The camera failed in measuring value for white balance preset data.

Result kNkMAIDResult_CaptureFailure

Command Start

Capability PreCapture

Explanation When it fails in white balance measurement(Capability_PreCapture), this error is returned.

Expected Action The client displays the message to take a picture again and is waiting for next command.

6.22. InvalidString

This is not used in the current module.

6.23. NotInitialized

This is not used in the current module.

6.24. CaptureDisable

This is not used in the current module.

6.25. DeviceBusy

A camera did not receive a command.

Result kNkMAIDResult_DeviceBusy

Command any command

Capability any capability

Explanation Since a camera is in the state where the command is not receivable, when it is not able to perform, this error returns.

Expected Action This command is sent again or a display of a user interface is returned to the state before command execution.

6.26. CaptureDustFailure

The camera failed in taking a dust off ref photo.

Result kNkMAIDResult_CaptureDustFailure

Command Start

Capability CaptureDustImage

Explanation When it fails in taking a dust off ref photo(Capability_CaptureDustImage), this error is returned.

Expected Action Do nothing.

6.27. ICADown

Enumeration of device can not be done correctly because ICA does not work on Mac OS X.

Result kNkMAIDResult_ICADown

Command EnumChildren

Capability Children

Explanation This error is returned when enumeration of device can not be done correctly because ICA does not work. This error code is used only on Mac OS X.

Expected Action The client aborts the command and capability of device search. The client displays the message that the camera must be powered off and client application needs to restart.

6.28. NotLiveView

Live view was automatically stopped by the factor of the camera. (Included the case of that the live view time limit passed.)

Result kNkMAIDResult_NotLiveView

Command Start, Set

Capability GetLiveViewImage

Explanation Wen live view was automatically stopped by the factor of the camera (Include the case of that the live view time limit passed.), this error is returned.

Expected Action The client displays an error message and is waiting for next command.

6.29. MFDriveEnd

The focus position reached the end of focus area in manual focus.

Result kNkMAIDResult_MFDriveEnd

Command Set

Capability MFDrive

Explanation When the focus position reached the end of focus area by Capability_MFDrive, this error is returned.

Expected Action The client displays an error message and is waiting for next command.

6.30. UnformattedMedia

It shows that the client can not take a picture because the card is unformatted.

Result kNkMAIDResult_UnformattedMedia

Command Start

Capability Capture, AFCapture, CaptureDustImage

Explanation When Capability_SaveMedia is "Card" or "Card + SDRAM" it shows the client can not take a picture because the card is unformatted.

Expected Action The client displays the message that the camera cannot take a picture and is waiting for next command.

6.31. MediaReadOnly

It shows that the client can not take a picture because the card is protected.

Result kNkMAIDResult_MediaReadOnly

Command Start

Capability Capture, AFCapture, CaptureDustImage

Explanation When Capability_SaveMedia is "Card" or "Card + SDRAM" it shows the client can not take a picture because the card is protected.

Expected Action The client displays the message that the camera cannot take a picture and is waiting for next command.

6.32. BulbReleaseBusy

It shows during bulb exposure shooting.

Result kNkMAIDResult_BulbReleaseBusy

Command Start, Set

Capability Capture

Explanation It shows during bulb exposure shooting

Expected Action If bulb exposure shooting started by Capability_Capture,

kNkMAIDResult_BulbReleaseBusy will be returned until bulb exposure shooting is terminated.

6.33. DuringUpdate

Is not used in the current module.

7. kNkMAIDDataObjType_Video

Capability for which data object type kNkMAIDDataObjType_Video can be used by this module applies to the content described in not the MAID3.1 rule but this document.

8. Capability table that can be set during live view photography, movie live view, movie recording.

The following table shows the capabilities that can be set during live view.

The capabilities not shown in the table can not be set during live view and Operation is set to read only.

The fields marked with "*" represent that this capability is read only under certain conditions. (For details, please refer each capability fields.)

Capability	Live View	Movie file Recording
ImageSize	○*	×
CompressionLevel	○*	×
WBMode	○*	×
Sensitivity	○*	×
ResetMenuBank	○	×
WBTuneAuto	○*	×
WBTuneIncandescent	○*	×
WBFluorescentType	○*	×
WBTuneFluorescent	○*	×
WBTuneSunny	○*	×
WBTuneFlash	○*	×
WBTuneShade	○*	×
WBTuneCloudy	○*	×
WBPresetNumber	○*	×
WBPresetData	○	×
WBGainRed	--	--
WBGainBlue	--	--
ImageColorSpace	○	×
IsoControl	○*	×
NoiseReduction	○*	×
NoiseReductionHighISO	○*	×
CompressRAWBitMode	○	×
PictureControl	○*	×
PictureControlData	○	×
PictureControlDataEx	○	×

GetPicCtrlInfo	--	--
DeleteCustomPictureControl	○	×
Active_D_Lighting	○*	×
ISOAutoShutterTime	○*	×
ISOAutoShutterTimeAutoValue	○*	×
ISOAutoHiLimit	○*	×
MovieScreenSize	○	×
MovieRecMicrophone	○	×
MovieRecMicrophoneValue	○*	×
MovieWindNoiseReduction	○*	×
MovieManualSetting	○	×
MovieImageQuality	○	×
AutoDistortion	○*	×
HDRMode	○*	×
SceneMode	○*	×
EffectMode	○*	×
VignetteControl	○	×
AFcPriority	×	×
AFAreaPoint	×	×
EVInterval	○	×
BracketingVary	○*	×
InternalSplMode	○*	×
VideoMode	○	×
UserComment	○	×
EnableComment	○	×
EnableCopyright	○	×
ArtistName	○	×
CopyrightInfo	○	×
CameraInclinationMode	○	×
ClockDateTime	○	×
ShutterSpeed	○*	○*
FlexibleProgram	○*	○*
FocusPreferredArea	×	×
Aperture	○*	○*
MeteringMode	○*	×

ExposureMode	○*	×
ExposureComp	○*	○*
ShootingMode	○*	×
ContinuousShootingNum	○	×
FocusAreaMode	×	×
EnableBracketing	○*	×*
AEBracketingStep	○*	×
WBBracketingStep	○*	×
BracketingType	--	--
ADLBracketingType	--	--
LiveViewStatus	○*	○
LiveViewProhibit	--	--
LiveViewImageZoomRate	○	×
LiveViewImageSize	○	×
CameraInclination	--	--
RemainContinuousShooting	--	--
RemainCountInMedia	--	--
LockExposure	--	--
LockFocus	--	--
ExposureStatus	--	--
InfoDisplayErrStatus	--	--
FocalLength	--	--
FocusMode	--	--
BracketingCount	--	--
InternalFlashStatus	--	--
InternalFlashComp	○*	×
ExternalFlashStatus	--	--
ExternalFlashComp	--	--
ExternalFlashSort	--	--
ExternalNewTypeFlashMode	--	--
LensInfo	--	--
RetractableLensWarningStatus	--	--
AFCapture	×	×
ContrastAF	○*	○*
PreCapture	×	×

MFDriveStep	○*	○*
MFDrive	○*	○*
ContrastAFArea	○	○
CaptureDustImage	×	×
DeleteDramImage	○*	×
RawJpegImageStatus	--	--
CurrentItemID	○	○
GetLiveViewImage	--	--
GetVideoImage	--	--
LockCamera	×	×
CameraType	--	--
LensType	--	--
AFMode	×	×
AFModeAtLiveView	○*	×
LiveViewAF	○*	×
MovRecInCardStatus	○	○
MovRecInCardProhibit	--	--
SaveMedia	○	×
BlinkingStatus	--	--
AutoSceneModeStatus	--	--
ISOControlSensitivity	--	--
TerminateCapture	○*	×
RawJpegTransferStatus	○	○
AsyncRate	--	--
ProgressProc	○	○
EventProc	○	○
DataProc	○	○
UIRequestProc	○	○
IsAlive	--	--
Children	--	--
State	--	--
Name	--	--
Description	--	--
Interface	--	--
DataTypes	--	--

DateTime	--	--
StoredBytes	--	--
Eject	--	--
Feed	--	--
Capture	○*	×
Mode	--	--
Acquire	○	○
Start	--	--
Length	--	--
SampleRate	--	--
Stereo	--	--
Samples	--	--
Filter	--	--
Prescan	--	--
AutoFocus	×	×
AutoFocusPt	--	--
Focus	--	--
Coords	--	--
Resolution	--	--
Preview	--	--
Capability	--	--
Negative	--	--
Bits	--	--
Planar	--	--
Lut	--	--
Transparency	--	--
Threshold	--	--
Pixels	--	--
ForceScan	--	--
ForcePrescan	--	--
ForceAutoFocus	--	--
NegativeDefault	--	--
Firmware	--	--
CommunicationLevel1	--	--
CommunicationLevel2	--	--

BatteryLevel	--	--
FreeBytes	--	--
FreeItems	--	--
Remove	--	--
FlashMode	○*	×
ModuleType	--	--
AcquireStreamStart	--	--
AcquireStreamStop	--	--
AcceptDiskAcquisition	--	--
Version	--	--
FilmFormat	--	--
TotalBytes	--	--

9. Histry

- Rev.2.0 December 9, 2016
  - Added informations about D5600.
    - 2. Supported camera
    - 3.33. MovieScreenSize
    - 3.49. VideoMode
    - 3.55. CameraInclinationMode
    - 3.56. ClockDateTime
    - 3.64. ShootingMode
    - 3.107. CameraType
    - 3.108. LensType
    - 4.51. FlashMode

- Rev.1.1 November 13, 2015
  - Changed the description of the following capability.
    - 3.99. ContrastAFArea

- Rev.1.0 October 31. 2014 First version