Type0009 vender unique capabilities

Version 1.0.0 Revision 1.0
November 22, 2012
Nikon Corporation

1. Introduction

This document explains the vendor unique capabilities, which are used by Type0009 module (Type0009.md3, Type0009 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

Type0009 module can control D5200 camera.

3. Vendor Unique Capabilities

The vender unique capabilities that are used by Type0009 module are described as follows.

The under lines show 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	<u>L(6000*4000)</u>
M	M(4496*3000)
S	S(2992*2000)

※ These following cases, the ulOperations cannot be set into.

- When the Capability_CompressionLevel is setting “RAW”.
- When kNkMAIDCapability_InfoDisplayErrStatus is True (Error display).
- During movie 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

If any of the following, the module does not enumerate values which include “RAW”.

- The Capability_ExposureMode is “Miniature”, “Color sketch”, “Selective color” or “Night vision” of Special Effects modes.
- kNkMAIDCapability_HDRMode is not 0(Off).

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

- kNkMAIDCapability_InfoDisplayErrStatus is “True (Error display)”
- During movie 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.

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

- The Capability_ExposureMode is Scene Modes or Special Effects Modes.
- kNkMAIDCapability_InfoDisplayErrStatus is “True (Error display)”
- During movie 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,
Hi-0.3, Hi-0.7, Hi-1.0, Hi-2.0

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～Hi-2.0
Auto, Auto(flash off), Night Vision(EFFECTS)	Auto
Other	Auto, 100～Hi-2.0

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

- The Capability_ExposureMode is “Auto” or “Auto (flash off)” or “Night vision” of Special Effects Modes.
- kNkMAIDCapability_InfoDisplayErrStatus is “True (Error display)”
- During movie recording.

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

When Capability_LiveViewStatus is 1(On), the ulVisibility of this capability is invalid and Error to set ulVisibility for this feature is disabled.

3.6. WBTuneAuto

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

Capability kNkMAIDCapability_WBTuneAuto

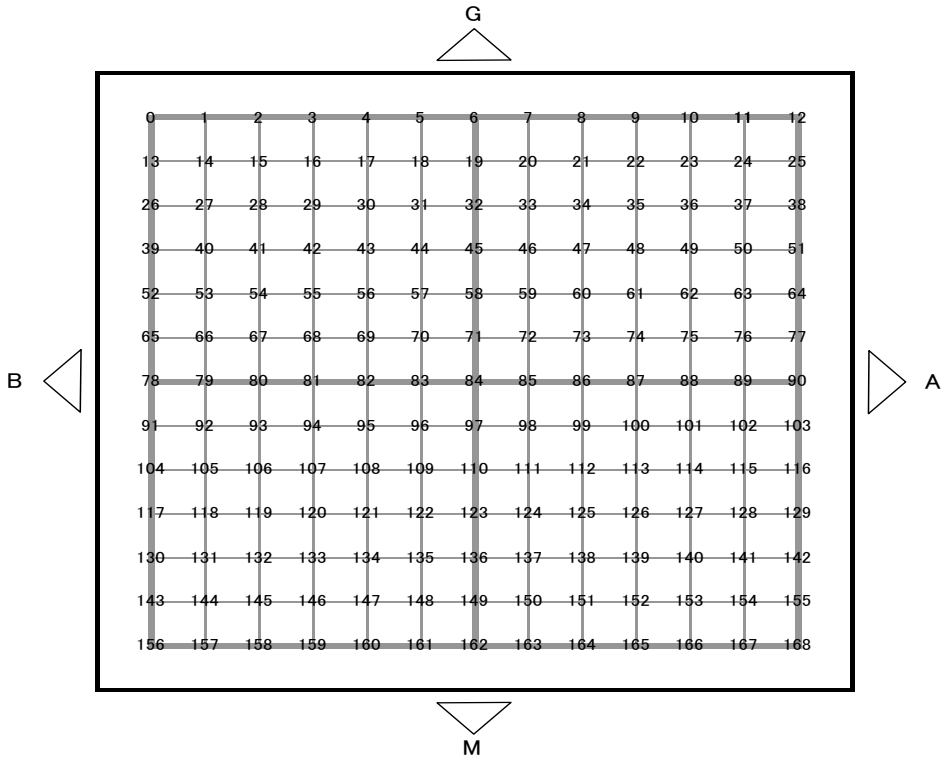
Object types Source

ulType kNkMAIDCapType_Range

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

Data 0 to 168 step=1 (Default: 84)

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



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

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 168 step=1 (Default: 84)

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

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

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

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

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 168 step=1 (Default: 84)

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

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

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 168 step=1 (Default: 84)

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

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

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 168 step=1 (Default: 84)

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

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

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 168 step=1 (Default: 84)

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

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

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 168 step=1 (Default: 84)

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

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

3.14. WBPresetNumber

This will set the preset number referenced by the Capability_PreCapture, 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

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

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 "ulPresetNumber". 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 are expressed by the 8.8 format fixed-point number. (e.g. 1.5 → gain value:0x0180) The range of gain value is $0 \leq$ gain value < 8 (0x0000 - 0x07FF).

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

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

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 recording, the ulOperations of 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.

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

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

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

- The Capability_ExposureMode is “Night vision” of Special Effects modes.
- During movie 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)

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

- When the Capability_ExposureMode is “Night vision” of Special Effects modes.
- During movie recording.

3.22. 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
	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.

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

- The Capability_ExposureMode is Scene Modes or Special Effects Modes.
- kNkMAIDCapability_InfoDisplayErrStatus is “True (Error display)”
- During movie recording.

3.23. 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.

3.24. PictureControlData

This will get or edit or resist Picture Control data; (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: 609 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.

When during movie recording, the ulOperations of this capability cannot be set into.

[In case of 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]

When the client sends kNkMAIDCapOperation_Get, the client must set the maximum Picture Control data size, 609, to "ulSize", and set the allocation space for 609 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]

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, and if kNkMAIDCapability_Active_D_Lighting is not set to [3. off], this setting is not used.

Brightness	1	Brightness -1 to +1 If CustomCurveData is used, this setting is not referred, and if kNkMAIDCapability_Active_D_Lighting is not set to [3. off], this setting is not used.
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. If kNkMAIDCapability_Active_D_Lighting is not [3. off], this setting is not used.

[Monochrome]

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) 1 to 7
Reserve	1	vacant
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, and if kNkMAIDCapability_Active_D_Lighting is not set to [3. off], this setting is not used.
Brightness	1	Brightness -1 to +1 If CustomCurveData is used, this setting is not referred, and if kNkMAIDCapability_Active_D_Lighting is not set to [3. off], this setting is not used.
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. If kNkMAIDCapability_Active_D_Lighting is not [3. off], this setting is not used.

[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

3.25. 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 (48bytes 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	SharpeningCapa	0x80 : selectable 0x01 : AUTO usable 0x81 : selectable & AUTO usable	Sharpening setting	
0x03	1	ContrastCapa	0x80 : selectable 0x01 : AUTO usable 0x81 : selectable & AUTO usable	Contrast setting	
0x04	1	BrightnessCapa	0x80 : selectable 0x01 : AUTO usable 0x81 : selectable & AUTO usable	Brightness setting	
0x05	1	SaturationCapa	0x80 : selectable 0x01 : AUTO usable 0x81 : selectable & AUTO usable	Saturation setting	
0x06	1	HueCapa	0x80 : selectable 0x01 : AUTO usable 0x81 : selectable & AUTO usable	Hue setting	
0x07	1	Reserved	0	Reserved	
0x08	1	DefaultQuickLevel	-2 to +2	Quick Adjust default value	
0x09	1	ContrastGridPos[0]	0 to 14	Contrast	Y coordinates in grid at value –3.
0x0A	1	ContrastGridPos[1]	0 to 14		Y coordinates in grid at value –2.
0x0B	1	ContrastGridPos[2]	0 to 14		Y coordinates in grid at value –1.
0x0C	1	ContrastGridPos[3]	0 to 14		Y coordinates in grid at value 0.
0x0D	1	ContrastGridPos[4]	0 to 14		Y coordinates in grid at value +1.
0x0E	1	ContrastGridPos[5]	0 to 14		Y coordinates in grid at value +2.
0x0F	1	ContrastGridPos[6]	0 to 14		Y coordinates in grid at value +3.
0x10	1	SaturationGridPos[0]	0 to 14	Saturation	X coordinates in grid at value –3.
0x11	1	SaturationGridPos[1]	0 to 14		X coordinates in grid at value –2.
0x12	1	SaturationGridPos[2]	0 to 14		X coordinates in grid at value –1.
0x13	1	SaturationGridPos[3]	0 to 14		X coordinates in grid at value 0.
0x14	1	SaturationGridPos[4]	0 to 14		X coordinates in grid at value +1.
0x15	1	SaturationGridPos[5]	0 to 14		X coordinates in grid at value +2.
0x16	1	SaturationGridPos[6]	0 to 14		X coordinates in grid at value +3.

0x17	1		0 to 9	Quick Adjust	Sharpening
0x18	1		-3 to +3		Contrast
0x19	1	DefaultLevel[0]	-1 to +1		Brightness
0x1A	1		-3 to +3		Saturation
0x1B	1		-3 to +3	-2	Hue
0x1C	1		0 to 9	Quick Adjust	Sharpening
0x1D	1		-3 to +3		Contrast
0x1E	1	DefaultLevel[1]	-1 to +1		Brightness
0x1F	1		-3 to +3		Saturation
0x20	1		-3 to +3	-1	Hue
0x21	1		0 to 9	Quick Adjust	Sharpening
0x22	1		-3 to +3		Contrast
0x23	1	DefaultLevel[2]	-1 to +1		Brightness
0x24	1		-3 to +3		Saturation
0x25	1		-3 to +3	0	Hue
0x26	1		0 to 9	Quick Adjust	Sharpening
0x27	1		-3 to +3		Contrast
0x28	1	DefaultLevel[3]	-1 to +1		Brightness
0x29	1		-3 to +3		Saturation
0x2A	1		-3 to +3	1	Hue
0x2B	1		0 to 9	Quick Adjust	Sharpening
0x2C	1		-3 to +3		Contrast
0x2D	1	DefaultLevel[4]	-1 to +1		Brightness
0x2E	1		-3 to +3		Saturation
0x2F	1		-3 to +3	2	Hue

3.26. 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.

3.27. 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 eNkMAIDActive_D_Lighting

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

When the Capability_ExposureMode is Scene Modes or Special Effects Modes, or kNkMAIDCapability_InfoDisplayErrStatus is "True (Error display)" or during movie recording, the ulOperations of this capability is set to read-only.

3.28. 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

Threshold	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
Auto	32

When the Capability_ExposureMode is Scene Modes or Special Effects Modes or during movie recording or the Capability_IsoControl is False, the ulOperations of this capability cannot be set into.

3.29. ISOAutoShutterTimeAutoValue

This will set the adjustment value when kNkMAIDCapability_ISOAutoShutterTime set to "Auto". (Shooting menu)

Capability kNkMAIDCapability_ISOAutoShutterTimeAutoValue

Object types Source

ulType kNkMAIDCapType_Range

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

Data -2～+2EV（Default value: 0）

The Capability setting is available only if it meets all of the following conditions.

- The Capability_IsoControl is ON.
- The Capability_ISOAutoShutterTime set to "Auto".
- Not recording movie.

3.30. 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
6	Hi-1.0
7	Hi-2.0

When the Capability_ExposureMode is Scene Modes or Special Effects Modes or Capability_ISOControl is False or during movie recording, the ulOperations of this capability cannot be set into.

3.31. MovieScreenSize

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

Capability kNkMAIDCapability_MovieScreenSize

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDMovieScreenSize3

Default Value :0

eNkMAIDMovieScreenSize3	kNkMAIDCapability_VideoMode	
	NTSC	PAL
0	1920×1080 60i	1920×1080 50i
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

When during Live View, the ulOperations of this capability cannot be set into.

3.32. MovieRecMicrophone

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

Capability kNkMAIDCapability_MovieRecMicrophone

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDMovRecMicrophone

0: Microphone sensitivity Auto (A)

4: Not recorded

5: Manual

When during movie recording, the ulOperations of this capability cannot be set into.

3.33. MovieRecMicrophoneValue

This will set the Microphone sensitivity when the Capability_MovieRecMicrophone set to “Manual”. (Shooting menu)

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

When the Capability_MovieRecMicrophone is set to a value other than “5:Manual” or during movie recording, the ulOperations of this capability cannot be set into.

3.34. MovieManualSetting

This will set the shooting menu, [Movie setting – Manual movie settings Indicator]. (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 recording, the ulOperations of this capability cannot be set into.

3.35. MovieImageQuality

This will set the shooting menu, [Movie setting – 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: High Quality 1: Normal

When during movie recording, the ulOperations of this capability cannot be set into.

3.36. 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

When the lens is not CPU or does not support distortion control or during movie recording, the ulOperations of this capability cannot be set into.

3.37. HDRMode

This will set the shooting menu, [HDR (High Dynamic Range) - HDR]. (Shooting menu)

Capability	kNkMAIDCapability_HDRMode
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDHDRMode2 0: Off 1: Low 2: Normal 3: High 4: Extra high 5: Auto

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

- The Capability_ExposureMode is Scene Modes or Special Effects Modes.
- kNkMAIDCapability_CompressionLevel is "RAW" or "RAW+JPEG(Basic/Normal/Fine)".
- kNkMAIDCapability_EnableBracketing is "True:ON".
- kNkMAIDCapability_InfoDisplayErrStatus is "True (Error display)".
- During movie recording.

3.38. 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 18: Night portrait

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

This capability supports set command only when the value of Capability_ExposureMode is set to [14: SCENE Other scenes]. When the value of Capability_ExposureMode is set to the value other than [14: SCENE Other scenes] or during movie recording, the ulOperations of this capability cannot be set into.

3.39. 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 eNkMAIDSceneMode 0: Night Vision 1: Color Sketch 2: Miniature Effect 3: Selective Color 4: Silhouette 5: High Key 6: Low Key

The value of this capability selects Special Effects Modes, when the mode dial is rotated to "EFFECTS".

When during movie recording, the ulOperations of this capability cannot be set into.

3.40. ResetCustomSetting

This will reset the custom settings. (CSM menu R)

Capability	kNkMAIDCapability_ResetCustomSetting
Object types	Source
ulType	kNkMAIDCapType_Process
ulOperations	kNkMAIDCapOperation_Start
Data	None

If during movie recording, it is an error if you execute this Capability.

3.41. AFcPriority

This will get the cusom settings menu, [Autofocus – AF-C priority selection]. (CSM menu a1)

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), the ulOperations of this capability is set to read-only.

3.42. AFAreaPoint

This will get the cusom settings menu, [Autofocus –Number of focus points]. (CSM menu a2)

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), the ulOperations of this capability is set to read-only.

3.43. AFSubLight

This will set whether the built-in AF-assist illuminator lights or not. (CSM menu a3)

Capability kNkMAIDCCapability_AFSubLight

Object types Source

ulType kNkMAIDCapType_Boolean

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set,
kNkMAIDCapOperation_GetDefault

Data True: On False: Off

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

- When the Capability_ExposureMode is Scene Modes (Landscape,Sports ,Night ,Landscape, Beach/Snow, Sunset, Dusk/Dawn, Pet Portrait), or "Miniature" or "Night vision" of Special Effects modes.
- The Capability_LiveViewStatus is 1(On).

3.44. EVInterval

This will set the EV steps for exposure control. (CSM menu b1)

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).

When during movie recording, the ulOperations of this capability cannot be set into.

3.45. NumberingMode

This will select a Numbering Mode. (CSM menu d4)

Capability kNkMAIDCapability_NumberingMode

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

OFF	"Normal filename assignment"
ON	"Sequential filename assignment "

When during movie recording, the ulOperations of this capability cannot be set into.

3.46. ResetFileNumber

This resets the number of the file, which will be stored in CF/SD card. (CSM menu d4)

Capability kNkMAIDCapability_ResetFileNumber

Object types Source

ulType kNkMAIDCapType_Process

ulOperations kNkMAIDCapOperation_Start

Data None

If during movie recording, it is an error if you execute this Capability.

3.47. ExposureDelay

This will set exposure delay mode. (CSM menu d5)

Capability kNkMAIDCapability_ExposureDelay

Object types Source

ulType kNkMAIDCapType_Boolean

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set,
kNkMAIDCapOperation_GetDefault

Data True: ON False: OFF

When during movie recording, the ulOperations of this capability cannot be set into.

3.48. BracketingVary

This will select the bracketing variation.(CSM menu e2)

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"

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

- The Capability_ExposureMode is Scene Modes or Special Effects Modes.
- If the Capability_HDRMode is set to other than "0:Off".
- kNkMAIDCapability_InfoDisplayErrStatus is "True (Error display)"
- During movie recording.

3.49. ShootNoCard

This will set disable to shoot when a card is not install. (CSM menu f4)

Capability kNkMAIDCapability_ShootNoCard

Object types Source

ulType kNkMAIDCapType_Boolean

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
kNkMAIDCapOperation_GetDefault

Data True: Enable to shoot False: Disable

When during movie recording, the ulOperations of this capability cannot be set into.

3.50. VideoMode

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 recording, the ulOperations of this capability cannot be set into.

3.51. 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 recording, the ulOperations of 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						

3.52. 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 recording, the ulOperations of this capability cannot be set into.

3.53. CameraInclinationMode

This will set whether add or not rotate information to the image file. (SETUP)

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 recording, the ulOperations of this capability cannot be set into.

3.54. 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

When during movie recording, the ulOperations of this capability cannot be set into.

3.55. 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”,

When the Capability_ExposureMode is set to “Program” or “Aperture Priority” or Scene Modes or Special Effects Modes, this capability is set to read-only.

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.

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", 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

3.56. 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.

When the Capability_ExposureMode is not “Program” or sequence error has occurred, the ulVisibility of this capability is invalid and the ulOperations of this capability is set to read-only and the current value is invalid.

3.57. FocusPreferredArea

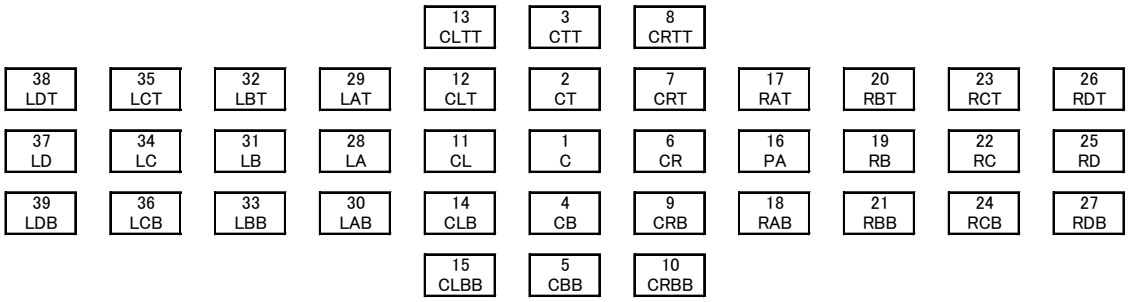
This will select the preferred focus area.

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 0)

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.



When the Capability_FocusAreaMode is Auto-area AF, or the Capability_LiveViewStatus is 1(ON), the ulOperations of this capability cannot be set into.

3.58. Aperture

This will set the aperture.

Capability	kNkMAIDCapability_Aperture
Object types	Source
ulType	kNkMAIDCapType_Enum
	kNkMAIDArrayType_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 CPU lens is not attached, this capability returns aperture of the Capability_F0Manual setting. If the Capability_F0Manual is set to “N/A”, returns zero.

When the Capability_ExposureMode is set to “Program” or “Speed Priority” or Scene Modes or Special Effects Modes, this capability is set to read-only.

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.

3.59. 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 Live view is executed, the change of this capability value is not applied, and the change is applied after Live view finished. When AE locked and Capability_ExposureMode is Scene Modes or Special Effects Modes or during movie recording, the ulOperations of this capability cannot be set into. When the CPU lens is not attached, the operations of this capability are set to read-only and the visibility is set to invalid.

If the Operations are changed, the module sends kMAIDEvent_CapChange to the client.

3.60. ExposureMode

This will select the exposure mode.

Capability	kNkMAIDCapability_ExposureMode
Object types	Source
ulType	kNkMAIDCapType_Enum
	kNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
	kNkMAIDCapOperation_Set
Data	one of eNkMAIDExposureMode2
	0: Program mode
	1: Aperture priority
	2: Speed priority
	3: Manual
	5: [Scene Modes]Auto
	6: [Scene Modes]Portrait
	7: [Scene Modes]Landscape
	8: [Scene Modes]Closeup
	9: [Scene Modes]Sports
	12: [Scene Modes]Child
	13: [Scene Modes] Auto(flash off)
	14: [Scene Modes]SCENE Other scenes
	17: [Special Effects]EFFECTS

This capability can be set when Capability_LockCamera is true.

The value, from 5 to 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.

When the value of kNkMAIDCapability_LiveViewStatus is ON, [Scene Modes] (5-14) and [17: Special Effects] isn't included in the array data.

When during movie recording, the ulOperations of this capability cannot be set into.

3.61. 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.

When the Capability_ExposureMode is Scene Modes or the value other than "Night Vision" of Special Effects Modes, the ulOperations of this capability cannot be set into.

3.62. ShootingMode

This will set the shooting mode.

Capability kNkMAIDCapability_ShootingMode

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_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
6: Delayed remote
8: Quiet

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

- kNkMAIDCapability_InfoDisplayErrStatus is "True (Error display)"
- During movie recording.

3.63. 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 – 100 (Default 1)

The maximum value of this capability corresponds with 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.
The actual number of shot on continuous mode will affect by the setting of Capability_SaveMedia.
When during movie recording, the ulOperations of this capability cannot be set into.

Capability_SaveMedia	The actual number of shot on continuous mode
0 : Card	The minimum number among the below. ・The value of this capability ・Capability_RemainContinuousShooting, ・The remain of Capability_BracketingType(while bracketing shooting)
1 : SDRAM	The minimum number among the below. ・The value of this capability、 ・Capability_RemainContinuousShooting, ・The remain of Capability_BracketingType(while bracketing shooting)
2 : Card + SDRAM	The minimum number among the below. ・The value of this capability、 ・Capability_RemainContinuousShooting, ・Capability_RemainCountInMedia, ・The remain of Capability_BracketingType(while bracketing shooting)

3.64. 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)	Auto
Night Vision(EFFECTS) Miniature Effect(EFFECTS)	Single (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".

When the Capability_AFMode is MF(0), or the CPU lens is not attached, or the Capability_ExposureMode is set to Special Effects Modes and the Capability_EffectMode is set to Night Vision or Miniature Effect, or the Capability_LiveViewStatus is 1(ON), the ulOperations of this capability cannot be set into.

3.65. 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 F alse(OFF).

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

- The Capability_ExposureMode is Scene Modes or Special Effects Modes.
- When the value of Capability_BracketingVary is "WB bracketing" 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.)
- kNkMAIDCapability_HDRMode is set to a value other than "0:Off".
- During movie recording.

3.66. 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 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

3.67. 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 recording.

3.68. BracketingType

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

3.69. 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)

3.70. 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 execution of Capability_AFCapture, Capability_PreCapture, Capability_CaptureDustImage, and Capability_LockCamera is prohibited while Live view is executing.

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.

3.71. 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.
0x00200000	Bulb warning
0x00100000	Card not formatted.
0x00080000	Card error.
0x00040000	Card protected.
0x00020000	High temperature.
0x00008000	Capture command is executing. ■ Recording media is “Card” The while until receiving kNkMAIDEvent_CaptureComplete(data=0). ■ Recording media is “SDRAM” The while until receiving kNkMAIDEvent_CaptureComplete(data=1). ■ Recording media is “Card+SDRAM” The while until receiving kNkMAIDEvent_CaptureComplete (data=0) and kNkMAIDEvent_CaptureComplete (data=1).
0x00004000	Recording media is “Card” or “Card + SDRAM” and when no memory card is inserted in the camera, Release locked setting.
0x00001000	There is image in camera SDRAM.
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.
0x00000010	All button pushed error.
0x00000004	Sequence error

3.72. 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: 66.7 % 5: 100 %

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

This capability is valid when the value of Capability_LiveViewStatus is ON(1). When Capability_LiveViewStatus is not ON(1) or during movie recording, the ulVisibility of this capability is invalid and ulOperations of this capability is set to read-only.

3.73. 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 equivalent 2: VGA equivalent

When during movie recording, the ulOperations of this capability cannot be set into.

3.74. 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).

3.75. 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 – 96 (Default: 96)

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_CompressionLevel
- Capability_ImageSize
- Capability_NoiseReduction
- Capability_HDRMode
- Capability_AutoDistortion
- Capability_SceneMode

3.76. 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.

3.77. 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

3.78. 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

3.79. 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)

3.80. 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).

3.81. 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.

3.82. 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.

3.83. 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 Capability_BracketingVary is either “AE bracketing” or “ADL bracketing”, this capability is valid. If this capability is invalid, returns zero.

3.84. 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

3.85. 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.

When the Capability_InternalFlashStatus is “Close” and Capability_ExternalFlashStatus is “Not Exist”, this capability is set to read-only.

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

- The Capability_ExposureMode is Scene Modes or Special Effects Modes.
- During movie recording.

3.86. 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

3.87. 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).

3.88. ExternalFlashSort

This will get the sort of external speedlight.

Capability kNkMAIDCapability_ExternalFlashSort

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get

Data

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-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

3.89. 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.

3.90. 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 the case of D type, G type, and VR lens, "D", "G", and "VR" are added to an end.

3.91. 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 continuous shooting mode is set, the number of shots set by the Capability_ ContinuousShootingNum 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.

3.92. 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.

This capability is valid when Capability_FocusMode isn’t MF(0) and CPU lens is attached and also Capability_LiveViewStatus is ON(1).

3.93. PreCapture

This will take a picture for presetting white balance.

Capability kNkMAIDCapability_PreCapture

Object types Source

ulType kNkMAIDCapType_Process

ulOperations kNkMAIDCapOperation_Start

Data None

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

3.94. MFDriveStep

This will set the driving step of lens for adjusting focus position when Live view is executed on Tripod mode.

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.

This capability is valid when Capability_FocusMode isn't MF(0) or AF-F(4) and CPU lens is attached and also Capability_LiveViewStatus is ON(1). Otherwise the ulVisibility and ulOperations of this capability is set to invalid.

3.95. MFDrive

This will adjust focus position when live view executed on Tripod mode.

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 dr iving finish correctly by getting value of this capability, or referring "focus drive state" of "Display information" in Live view image. (please refer NkMAIDCapability_GetLiveViewIm age)

This capability is valid when Capability_FocusMode isn't MF(0) or AF-F(4) and CPU lens is attached and also Capability_LiveViewStatus is ON(1).

3.96. ContrastAFArea

This will change focus point of contrast AF when Live view is executed on Tripod mode.

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.

This capability is valid when Capability_LiveViewStatus is ON(1).

3.97. 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 lens is not attached or Capability_LiveViewStatus is ON(1), the ulVisibility and ulOperations of this capability is invalid.

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_CurrentPreviewID.

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.

3.98. 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.

- The value of Capability_SaveMedia is “2: Card + SDRAM”.
- The value of Capability_SaveMedia is “2: Card + SDRAM”, and it has not completed to read all SDRAM image, after Capability_Capture or Capability_AFCapture or Capability_CaptureDustImage is executed.

3.99. 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

3.100. 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.

3.101. 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 45Kbyte / 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

		Vertical size	2Byte	display area size when the image is not enlarged.
	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	
	Selected focus area		1Byte	0 ～ 39
	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 D5200
	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 D5200)
	AF area index		1Byte	From 0 to 34 (fixed to 0 for D5200)
	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
		AF frame size Vertical size	2Byte	
		AF frame center coordinates Horizonal position	2Byte	
		AF frame center coordinates 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		26Byte	
Live view image	Image data			

Here is a list of correspondence during movie recording by Capability_MovieScreenSize and Capability_LiveViewImageSize "Attached JPEG image size".

No	LiveViewImageSize	MovieScreenSize	Attached JPEG image size
1	QVGA equivalent	1920x1080 60i/50i	320x180
2		1920x1080 30p/25p	320x212
3		1920x1080 24p/24p	320x212
4		1280x720 60p/50p	320x212
5		640x424 30p/25p	320x212
6	VGA equivalent	1920x1080 60i/50i	640x360
7		1920x1080 30p/25p	640x424
8		1920x1080 24p/24p	640x424
9		1280x720 60p/50p	640x424
10		640x424 30p/25p	640x424

3.102. 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 2 seconds.
- Doing the following operations when "While getting movie data"
  1. Called the Capability other than GetVideoImage.
  2. Inserting or removing the card.

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

3.104. CameraType

This will get the camera type.

Capability	kNkMAIDCapability_CameraType
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get
Data	one of eNkMAIDCameraType
	0x34: D5200

3.105. 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

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

When CPU lens is not attached, the module returns 0

3.106. 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))
- During Live view.

Conditions	Shooting mode	AFMode
AF-S lens is not attached.		MF Fixed
AF-S lens is attached＋MF setting (lens settings)		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.

3.107. 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”, “Color sketch” 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.

3.108. 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)	1 : Wide area
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_ValueOut OfBounds 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 recording.

3.109. 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 recording.

3.110. 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.

3.111. 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 recording, the ulOperations of this capability cannot be set into.

3.112. 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.

When this capability is changed, kNkMAIDEvent_CapChange is issued to the client.

3.113. 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".

3.114. 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;---------- Set to 0
  ULONG ulParameter2;---------- Set to 0
} NkMAIDTerminateCapture, FAR* LPNkMAIDTerminateCapture;
```

Only when Exposure mode is set to "Manual" and ShutterSpeed is set to “Bulb”, Start can be performed.

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¥file name.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 Continuous(1), the number of shots set by the Capability_ContinuousShootingNum is taken on continuous shooting mode.

When main image is prepared, kNkMAIDEvent_AddChild 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 only can be executed when Capability_ExposureMode is “Manual”.

The bulb shooting is started by this capability and terminated by Capability_TerminateCapture.

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 caches 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, this Capability for Thumbnail will return kNkMAIDResult_NotSupported error if after the completion of the process ahead.

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

When Capability_FocusMode is MF, or a CPU lens is not attached, or Capability_LiveViewStatus is 1(ON), the ulVisibility and the ulOperations of this capability is invalid.

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

4: Slow sync with red-eye reduction

5: Slow rear-curtain sync

262 : Flash Off

Flash mode / ExposureMode / SceneMode	FrontCurtain	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) Color Sketch (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)	△	—	—	△	—	●
Flash Off Selective Color (EFFECTS) Night Vision (EFFECTS)	—	—	—	—	—	●,△
Food (SCENE)	●,△	—	—	—	—	—
Night Portrait(SCENE)	—	●,△	—	—	●,△	●
Auto(Landscape)	△	—	—	△	—	●
Auto(Night Portrait)	—	●△	—	—	●△	●

●: 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.

When the build-in flash and external flash are invalid, the ulVisibility of this capability is invalid and the ulOperations is set to read-only and the current value is invalid.

When the Capability_HDRMode is not OFF(0) or a selectable item is only one or during movie recording, the ulOperations of this capability cannot be set into.

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. (Including in case of shooting by shutter-release button.)

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.

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.

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_ShutterSpeedis 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. (include the case of that the live view time limit passed.)

Result	kNkMAIDResult_NotLiveView
Command	Start, Set
Capability	GetLiveViewImage
Explanation	When 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

This 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 setting during Live View or during movie recording.

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

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 Recording
ImageSize	○*	×
CompressionLevel	○*	×
WBMode	○*	×
Sensitivity	○*	×
WBTuneAuto	○*	×
WBTuneIncandescent	○*	×
WBFluorescentType	○*	×
WBTuneFluorescent	○*	×
WBTuneSunny	○*	×
WBTuneFlash	○*	×
WBTuneShade	○*	×
WBTuneCloudy	○*	×
WBPresetNumber	○*	×
WBPresetData	○	○
ImageColorSpace	○	×
IsoControl	○*	×
NoiseReduction	○*	×
NoiseReductionHighISO	○	×
PictureControl	○	×
PictureControlData	○	×
DeleteCustomPictureControl	○	○
Active_D_Lighting	○*	×
ISOAutoShutterTime	○*	×
ISOAutoShutterTimeAutoValue	○*	×
ISOAutoHiLimit	○*	×
MovieScreenSize	×	×
MovieRecMicrophone	○	×
MovieRecMicrophoneValue	○	×
MovieManualSetting	○	×
MovieImageQuality	○	×

AutoDistortion	○*	×
HDRMode	○*	×
SceneMode	○*	×
EffectMode	○*	×
ResetCustomSetting	○	×
EVInterval	○	×
NumberingMode	○	×
ResetFileNumber	○	×
ExposureDelay	○	×
BracketingVary	○*	×
ShootNoCard	○	×
VideoMode	○	×
UserComment	○	×
EnableComment	○	×
CameraInclinationMode	○	×
ClockDateTime	○	×
ShutterSpeed	○*	○*
FlexibleProgram	○	○
Aperture	○*	○*
MeteringMode	○*	×
ExposureMode	○*	×
ExposureComp	○*	○*
ShootingMode	○*	×
ContinuousShootingNum	○	×
EnabelBracketing	○*	×*
AEBracketingStep	○*	×
WBBracketingStep	○*	×
LiveViewStatus	○	○
LiveViewImageZoomRate	○*	×
LiveViewImageSize	○	×
InternalFlashComp	○*	×
ContrastAF	○	○
MFDriveStep	○	○
MFDrive	○	○
ContrastAFArea	○	○
CurrentItemID	○	○
AFMode	×.	×
AFModeAtLiveView	○*	×
LiveViewAF	○*	×
MovRecInCardStatus	○	○

SaveMedia	○	×
Capture	○	×
FlashMode	○*	×

9. History

- Rev.1.0 November 22, 2012 First version