Type0003 vender unique capabilities

Version. 1.0.0 Rev.1.0
April 13, 2009
Nikon Corporation

1. Introduction

This document explains the capabilities, which are used by Type0003 module (Type0003.md3, Type0003 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

This module supports D90, D5000.

3. Vendor Unique Capabilities

The vender unique capabilities that are used by Type0003 module is described as follows.

The under line shows default value.

D90 and D5000 will be the same specification, if there are no special explanations.

- DIP

  In this document, the exposure mode other than P, S, A, M are called “DIP” in D90.

- Scene Modes

  In this document, the exposure mode other than P, S, A, M, and the SCENE set by Capability_SceneMode are called “Scene Modes” in D5000.

3.1. ImageSize

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

Capability kNkMAIDCapability_ImageSize

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

L	L(4288*2848)
M	M(3216*2136)
S	S(2144*1424)

When Capability_CompressionLevel is "RAW", the ulVisibility of this capability is invalid and the ulOperations is set to read-only and the current value is invalid.

[D5000] If the client sets the value while the camera shows error or warning, the module returns kNkMAIDResult_ValueOutOfBounds.

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

This capability value does not mean current setting value, but means current control value. If [+ NEF (RAW)] function is active, this capability will returns [RAW+XXX].

[D5000] If the client sets the value while the camera shows error or warning, the module returns kNkMAIDResult_ValueOutOfBounds.

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

string	D90	D5000
Auto	●	●
Incandescent	●	●
Fluorescent	●	●
Sunny	●	●
Flash	●	●
Shade	●	●
Cloudy	●	●
Preset1	●	---
Preset2	●	---
Preset3	●	---
Preset4	●	---
Preset5	●	---
Color Temperature	●	---
Measure	---	●
Use photo	---	●

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

[D5000] When Capability_ExposureMode and Capability_SceneMode are Candlelight (SCENE), or Dusk/Dawn(SCENE), the value of this capability will be Auto though camera information display shows “K”.

If the client sets the value while the camera shows error or warning, the module returns kNkMAIDResult_ValueOutOfBounds.

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, LO-1, LO-0.7, LO-0.3, 200, 250, 320,400, 500, 640, 800, 1000, 1250,1600, 2000, 2500, 3200, Hi-0.3, Hi-0.7, Hi-1.0

When Capability_ExposureMode is set to Program mode, Aperture priority, Speed priority, Manual, “Auto” cannot be selected.

[D5000] If the client sets the value while the camera shows error or warning, the module returns kNkMAIDResult_ValueOutOfBounds.

3.5. WBTuneAuto

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

Capability kNkMAIDCapability_WBTuneAuto

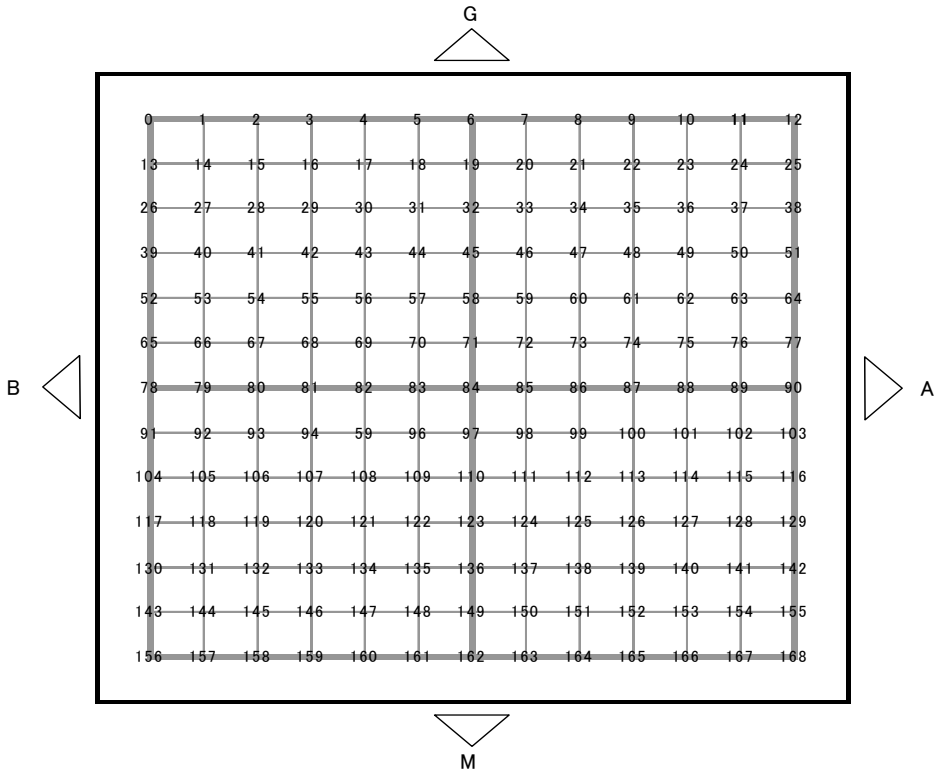
Object types Source

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, as shown in following figure.



When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.6. 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 while balance adjustment value and the coordinates is the same as the figure of Capability_WBTuneAuto.

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only

3.7. 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 DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.8. 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 while balance adjustment value and the coordinates is the same as the figure of Capability_WBTuneAuto.

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.9. 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 while balance adjustment value and the coordinates is the same as the figure of Capability_WBTuneAuto.

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.10. 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 while balance adjustment value and the coordinates is the same as the figure of Capability_WBTuneAuto.

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.11. 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 while balance adjustment value and the coordinates is the same as the figure of Capability_WBTuneAuto.

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.12. 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 while balance adjustment value and the coordinates is the same as the figure of Capability_WBTuneAuto.

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.13. WBTuneColorTemp（D90 only）

This will set the color temperature when the WBMode is “Color Temperature”. (shooting menu)

Capability kNkMAIDCapability_WBTuneColorTemp

Object types Source

ulType kNkMAIDCapType_Enum

kNkMAIDArrayType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set

Data one of eNkMAIDWBTuneColorTemp (Default: 5000K)

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

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.14. WBTuneColorAdjust（D90 only）

This will set the white balance adjustment when the WBMode is “Color Temperature”. (shooting menu)

Capability kNkMAIDCapability_WBTuneColorAdjust

Object types Source

ulType kNkMAIDCapType_Range

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

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

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

If the value of color temperature is set under 2500K, or over 10000K by this capability and Capability_WBTuneColorTemp, the camera returns kNkMAIDResult_DeviceBusy.

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.15. WBTunePreset1（D90 only）

This will set the white balance adjustment when the WBMode is “Preset1”. (shooting menu)

Capability kNkMAIDCapability_WBTunePreset1

Object types Source

ulType kNkMAIDCapType_Range

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

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

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

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.16. WBTunePreset2（D90 only）

This will set the white balance adjustment when the WBMode is “Preset2”. (shooting menu)

Capability kNkMAIDCapability_WBTunePreset2

Object types Source

ulType kNkMAIDCapType_Range

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

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

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

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.17. WBTunePreset3（D90 only）

This will set the white balance adjustment when the WBMode is “Preset3”. (shooting menu)

Capability kNkMAIDCapability_WBTunePreset3

Object types Source

ulType kNkMAIDCapType_Range

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

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

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

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.18. WBTunePreset4（D90 only）

This will set the white balance adjustment when the WBMode is “Preset4”. (shooting menu)

Capability kNkMAIDCapability_WBTunePreset4

Object types Source

ulType kNkMAIDCapType_Range

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

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

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

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.19. WBTunePreset5（D90 only）

This will set the white balance adjustment when the WBMode is “Preset5”. (shooting menu)

Capability kNkMAIDCapability_WBTunePreset5

Object types Source

ulType kNkMAIDCapType_Range

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

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

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

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.20. WBPresetNumber

This will set the preset number referenced by the Capability_PreCapture(D90 only), 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 [D90] Preset 1, Preset 2, Preset 3, Preset 4, Preset 5
[D5000] Measure, Use photo

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.21. WBPresetName（D90 only）

This will set the name of white balance preset data. (shooting menu)

Capability	kNkMAIDCapability_WBPresetName
Object types	Source
ulType	kNkMAIDCapType_String kNkMAIDCapType_Array
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetArray
Data	NkMAIDArray

When the client sends to the module kNkMAIDCapOperation_GetArray, the module set string array of the name of white balance preset data to “NkMAIDArray.pData” in order of preset1-5.

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 90 characters.(refer to the table in the ShootingBankName.) When the other character is set, the module returns an error(kNkMAIDResult_ValueOutOfBounds).

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.22. 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;------ preset number (D90 only)
    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;
```

[D90] When the client sends kNkMAIDCapOperation_Set to the module, the client must to set all the member of "NkMAIDWBPresetData" structure without "ulThumbnailRotate".

When the client sends kNkMAIDCapOperation_Get to the module, the client must set "ulPresetNumber", and the module sets the gain value to "ulPresetGain" correspondence with the number of "ulPresetNumber".

[D5000] The client must to set all the member of "NkMAIDWBPresetData" structure without "ulPresetNumber". The preset data will be saved to d1-data(Measure).

[common] 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 8.8 format fixed-point number expresses the both of red and blue gain value. (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 match 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

3.23. 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)

3.24. 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)

3.25. 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

3.26. 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, the camera in taking picture controls ISO value automatically.

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.27. 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 (Default: False)

3.28. 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)

3.29. 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
	101～104 : Option Picture Control 1 - 4
	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 Option Picture Control and 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.

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only, and the picture control setting will be changed for each DIP mode automatically.

[D5000] If the client sets the value while the camera shows error or warning, the module returns kNkMAIDResult_ValueOutOfBounds.

3.30. 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 Option or Custom Picture Control was saved.
- The Option or Custom Picture Control was deleted.
- The Option or 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.

3.31. PictureControlData

This will get or edit or registers 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: 609bytes)
    bool    bModifiedFlag; ------------Modification flag
                                        (false: initial registration,   true: edit)
    void*   pData;---------------------- The pointer of Picture Control data.
} NkMAIDPicCtrlData, FAR* LPNkMAIDPicCtrlData;;
```

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”. But “ulPicCtrlItem” is Standard(1), Neutral(2), Vivid(3), Monochrome(4), Portrait(5), Landscape(6) Option Picture Control(101-104), bModifiedFlag must be set to true(edit).

When “MonochromeFlag” is changed, bModifiedFlag must be set to false(initial registration).

When the client sets Custom Picture Control item to “ulPicCtrlItem”, “CustomFlag” of the 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 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 “ulPicCtrlItem” is Neutral(2), Custom Picture Control(201 - 209), the client must set picture control data that QuickAdjustFlag is invalid (0).

When the client sets picture control data that CustomCurveFlag is used (1), “ulPicCtrlItem” have to be set to “Custom Picture Control(201 - 209)”.

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”.

Capability_PictureControl enumerates the value range of Picture Control set to “ulPicCtrlItem”. 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 (D90 only) 6: Landscape (D90 only) 101 – 104 : Option Picture Control 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 (D90 only) 6: Landscape (D90 only) 101 – 104 : Option Picture Control 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 514 byte 15 bit * 257 point, 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 have to set LUT header.

Byte	contents
0 - 63	Lut Header
64, 65	Data0
66, 67	Data1
…	
576, 577	Data256

[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

3.32. 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.

Capability_PictureControl enumerates the value range of Picture Control set to "ulPicCtrlItem".

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	SharpenningCapa	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.

3.33. 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.

3.34. 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 DIP or Scene Modes, the ulOperations of this capability is set to read-only.

[D5000] If the client sets the value while the camera shows error or warning, the module returns kNkMAIDResult_ValueOutOfBounds.

3.35. ISOAutoShutterTime

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

Capability kNkMAIDCapability_ISOAutoShutterTime

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDISOAutoShutterTime

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

When the Capability_ExposureMode is DIP or Scene Modes or Capability_ISOControl is False, the ulOperations of this capability is set to read-only.

3.36. 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

1: ISO400

2: ISO800

3: ISO1600

4: ISO3200

6: Hi-1

When the Capability_ExposureMode is DIP or Scene Modes, or Capability_ISOControl is False, the ulOperations of this capability is set to read-only.

3.37. MovieScreenSize

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

Capability kNkMAIDCapability_MovieScreenSize

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDMovieScreenSize

0: QVGA (320 x 216)

1: VGA (640 x 424)

2: 720p (1280 x 720)

3.38. MovieVoice

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

Capability kNkMAIDCapability_MovieVoice

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDMovieVoice

0: Off

1: On

3.39. AutoDistortion（D5000 only）

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

3.40. SceneMode（D5000 only）

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 10 : Silhouette 11 : High Key 12 : Low Key

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]. When the value of Capability_ExposureMode is set to the value other than [14: SCENE], the operations of this capability set to read-only.

3.41. ResetCustomSetting

This will reset the custom settings, which is selected by Capability_CustomSettings. (CSM menu R)

Capability	kNkMAIDCapability_ResetCustomSetting
Object types	Source
ulType	kNkMAIDCapType_Process
ulOperations	kNkMAIDCapOperation_Start
Data	None

3.42. FocusAreaMode

This will select the AF area mode. (CSM menu a1)

Capability kNkMAIDCapability_FocusAreaMode

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

AF-area mode	Data
Dynamic area	"Dynamic"
Single point (default for D90)	"Single"
Auto-area (default for D5000)	"Auto"
3D-tracking (11 points)	"3D-tracking (11 points)"

In the following table, the default value is changed by DIP mode(D90) or Scene modes(D5000). When the setting of Capability_ExposureMode is changed to DIP mode or Scene Modes, the value of this capability will be changed to each default value.

Capability_ExposureMode Capability_SceneMode	Default value
Landscape (D5000 only) Close up Night Landscape (SCENE) Beach/Snow (SCENE) Sunset.(SCENE) Dusk/Dawn (SCENE) Candlelight (SCENE) Blossom (SCENE) Autumn Colors (SCENE) Food (SCENE) Silhouette (SCENE) High Key (SCENE) Low Key (SCENE)	Single point
Sports Pet Portrait (SCENE)	Dynamic area
Landscape (D90 only) DIP mode other than the above.(D90) or Scene Modes other than the above.(D5000)	Auto-area

[common] When Capability_AFMode is AF-S(0), "3D-tracking (11 points)" cannot be set into. When the value of this capability is "3D-tracking (11 points)" and sets the value of Capability_AFMode to AF-S(0), The value of this capability is changed to "Dynamic".

[D90] When the Capability_FocusMode is MF(0), or the CPU lens is not attached, this capability is set into "Single" and the ulOperations is read-only.

[D5000] When the Capability_FocusMode is MF(0), or the lens is not AF-S lens, or a AF-S lens set to MF, this capability is set into "Single" and the ulOperations is read-only.

If the client sets the value while the camera shows error or warning, the module returns kNkMAIDResult_ValueOutOfBounds.

3.43. FocusAreaFrame（D90 only）

This will set a normal or wide focus zone for the center focus point. (CSM menu a2)

Capability	kNkMAIDCapability_FocusAreaFrame
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDFocusAreaFrame 0: Normal frame 1: Wide frame

3.44. AFSubLight

This will set whether the built-in AF-assist illuminator lights or not.

(CSM menu [D90] a3　[D5000] a2)

Capability	kNkMAIDCapability_AFSubLight
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	True: On　　False: Off (But in case of the value of Capability_ExposureMode is Landscape(7), Sports(9), Night Landscape(SCENE), Beach/Snow(SCENE), Sunset (SCENE), Dusk/Dawn(SCENE), Pet Portrait(SCENE), the default value is False.)

When the Capability_ExposureMode is Landscape(7), Sports(9), Night Landscape(SCENE), Beach/Snow(SCENE), Sunset (SCENE), Dusk/Dawn(SCENE), Pet Portrait(SCENE), the ulOperations of this capability is set to read-only.

3.45. FocusAreaLED（D90 only）

This will set how focus points are illuminated in the viewfinder. (CSM menu a4)

Capability	kNkMAIDCapability_FocusAreaLed
Object types	Source
ulType	kNkMAIDCapType_Enum kNkMAIDArrayType_PackedString
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray, kNkMAIDCapOperation_Set
Data	Auto, Off, On

3.46. AFAreaSelector（D90 only）

This will set that AF area selector motion is circular or not. (CSM menu a5)

Capability kNkMAIDCapability_AFAreaSelector

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

No wrap	"Normal"
Wrap	"Cyclic"

3.47. VerticalAfButton（D90 only）

This will set the role played by the AE-L/AF-L button on the optional MB-D80 multi-power battery pack. (CSM menu a6)

Capability kNkMAIDCapability_VerticalAfButton

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

Menu	Data
AF-ON	"AF-ON"
AE-L/AF-L	"AE-L/AF-L"
AE-L	"AE Lock"
AE-L (Hold)	"AE Lock and Hold"
AF-L	"AF-L"
FV Lock	"FV Lock"
FP-ON	"Focus point selection"
AE-L/AF-L/FP-ON	"AE-L/AF-L Focus point selection"
AE-L/FP-ON	"AE Lock Focus point selection"
AF-L/FP-ON	"AF Lock Focus point selection"
AF-ON/FP-ON	"AF-ON Focus point selection"

3.48. LiveViewAF

This will set the focus point in live view mode. (CSM menu [D90] a7 [D5000] a3)

Capability kNkMAIDCapability_LiveViewAF

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDLiveViewAF

eNkMAIDLiveViewAF	D90	D5000
0 : Face priority	●	●
1 : Wide area	●	●
2 : Normal area	●	●
3 : Subject tracking	---	●

In the following table, the default value is changed by DIP mode(D90) or Scene modes(D5000). When the setting of Capability_ExposureMode is changed to DIP mode or Scene Modes, the value of this capability will be changed to each default value.

Capability_ExposureMode Capability_SceneMode	Default value
Auto (D5000 only) Portrait Night Portrait Child	0 : Face priority
Close Up Food(SCENE)	2 : Normal area
Auto(D90 only) DIP mode other than the above.(D90) or Scene modes other than the above.(D90)	1 : Wide area

It is possible to change the value of this capability.

[D5000] When [3 : Subject tracking] is set while executing a live view, kNkMAIDResult_ValueOutOfBounds is returned.

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

When [3 : Subject tracking] is set when Capability_PictureControl is set to monochrome or monochrome base, kNkMAIDResult_ValueOutOfBounds is returned. And, when Capability_PictureControl is set to monochrome or monochrome base when [3 : Subject tracking] is set, the value of this capability is automatically changed to [1 : Wide area].

3.49. RangeFinderSetting (D5000 only)

This will choose whether the viewfinder shows a scale for focus. (CSM menu a4)

Capability kNkMAIDCapability_RangeFinderSetting

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDRangeFinderSetting

0: OFF

1: ON

3.50. EVInterval

This will set the EV interval of the Capability_ShutterSpeed, Capability_Aperture, Capability_FlexibleProgram, Capability_ExposureComp, Capability_InternalFlashComp, Capability_AEBracketingStep.

(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, AE & Flash bracketing, Flash bracketing, Capability_EnableBracketing is set to OFF (False).

3.51. EasyExposureCompMode（D90 only）

This will set easy exposure compensation. ((CSM menu b2)

Capability kNkMAIDCapability_EasyExposureCompMode

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set,
kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDEasyExposureCompMode
0: Off
1: On

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

The relationship between this capability and Capability_FinderISODisplay is exclusion. So, when the value of Capability_FinderISODisplay is set to “Show ISO sensitivity”, the value of this capability will be changed to “Off”.

3.52. CWMeteringDiameter（D90 only）

This will select the center weighted metering diameter. (CSM menu b3)

Capability kNkMAIDCapability_CWMeteringDiameter

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

ϕ 6mm	“6 mm”
ϕ 8mm	“8 mm”
ϕ 10mm	“10 mm”

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.53. ExpBaseMatrix（D90 only）

This will set the exposure base when the metering mode is matrix. (CSM menu b4)

Capability kNkMAIDCapability_ExpBaseMatrix

Object types Source

ulType kNkMAIDCapType_Range

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

Data -1 - +1EV (1/6EV step) (Default : 0)

3.54. ExpBaseCenter（D90 only）

This will set the exposure base when the metering mode is center weighted. (CSM menu b4)

Capability	kNkMAIDCapability_ExpBaseCenter
Object types	Source
ulType	kNkMAIDCapType_Range
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	-1 - +1EV (1/6EV step)　(Default：0)

3.55. ExpBaseSpot（D90 only）

This will set the exposure base when the metering mode is spot. (CSM menu b4)

Capability	kNkMAIDCapability_ExpBaseSpot
Object types	Source
ulType	kNkMAIDCapType_Range
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	-1 - +1EV (1/6EV step)　(Default：0)

3.56. AELockonRelease

This will set to activate AE Lock or not when shutter button lightly pressed. (CSM menu c1)

Capability	kNkMAIDCapability_AELockonRelease
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	True: On　<u>False: Off</u>

3.57. AutoOffTimer（D5000 only）

This will choose how long before the monitor turns off and the camera enters stand-by. (CSM menu c2)

Capability	kNkMAIDCapability_AutoOffTimer
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDAutoOffTimer 0：Short 1：Normal 2：Long 3：Custom

When the value of this capability set to [3：Custom], the operations of these capabilities, Capability_LimitImageDisplay、 Capability_ImageConfirmTime、 Capability_AutoOffDelay, changed to read-only.

Capability_AutoOffTimer	0：Short	1：Normal	2：Long
Capability_LimitImageDisplay	8 seconds	12 seconds	20 seconds
Capability_ImageConfirmTime	4 seconds	4 seconds	20 seconds
Capability_AutoOffDelay	4 seconds	8 seconds	1 minute

3.58. AutoOffDelay

This will set time delay for auto meter switch-off. (CSM menu c2)

Capability kNkMAIDCapability_AutoOffDelay

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

time	string	D90	D5000
4s	"4 seconds"	●	●
6s	"6 seconds"	●	---
8s	"8 seconds"	●	●
16s	"16 seconds"	●	---
20s	"20 seconds"	---	●
30s	"30 seconds"	●	---
1min	"1 minute"	●	●
5 min	"5 minutes"	●	---
10 min	"10 minutes"	●	---
30 min	"30 minutes"	●	●

[D5000] When Capability_AutoOffTimer is not [3 : Custom], the operation of this capability will be set to read-only.

3.59. SelfTimerDuration

This will set self-timer duration. (CSM menu c3)

Capability kNkMAIDCapability_SelfTimerDuration

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

2s	"2 seconds"
5s	"5 seconds"
10s	"10 seconds"
20s	"20 seconds"

3.60. SelfTimerShootNum

This will set the number of photographs taken in self-timer mode. (CSM menu c3)

Capability kNkMAIDCapability_SelfTimerShootNum

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set,
kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDSelfTimerShootNum

0 : 1

1 : 2

2 : 3

3 : 4

4 : 5

5 : 6

6 : 7

7 : 8

8 : 9

3.61. ImageConfirmTime

This will choose how long images are displayed in the monitor after shooting.
(CSM menu [D90] c4 . [D5000] c2)

Capability kNkMAIDCapability_ImageConfirmTime

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

time	string	D90	D5000
4s	"4 seconds"	●	●
8s	"8 seconds"	---	●
10s	"10 seconds"	●	---
20s	"20 seconds"	●	●
1min	"1 minute"	●	●
5 min	"5 minutes"	●	---
10 min	"10 minutes"	●	●

[D5000] When Capability_AutoOffTimer is not [3 : Custom], the operation of this capability will be set to read-only.

3.62. AutoOffPhoto（D90 only）

This will choose how long images are displayed in the monitor on playback. (CSM menu　c4)

Capability kNkMAIDCapability_AutoOffPhoto

Object types Source

ulType kNkMAIDCapType_Enum

kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,

kNkMAIDCapOperation_Set

Data

4s	“4 seconds”
10s	“10 seconds”
20s	“20 seconds”
1 min	“1 minute”
5 min	“5 minutes”
10 min	“10 minutes”

3.63. LimitImageDisplay（D5000 only）

This will choose how long the monitor remains on for menus and playback. (CSM menu c2)

Capability kNkMAIDCapability_LimitImageDisplay

Object types Source

ulType kNkMAIDCapType_Enum

kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,

kNkMAIDCapOperation_Set

Data 8 seconds

12 seconds

20 seconds

1 minute

10 minutes

When Capability_AutoOffTimer is not [3：Custom], the operation of this capability will be set to read-only.

3.64. AutoOffMenu（D90 only）

This will select the time of menu display. (CSM menu c4)

Capability kNkMAIDCapability_AutoOffMenu

Object types Source

ulType kNkMAIDCapType_Enum

kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,

kNkMAIDCapOperation_Set

Data

4 s	“4 seconds”
10 s	“10 seconds”
20 s	“20 seconds”
1 min	“1 minute”
5 min	“5 minutes”
10 min	“10 minutes”

3.65. AutoOffInfo（D90 only）

This will select the time of shooting info display. (CSM menu c4)

Capability kNkMAIDCapability_AutoOffInfo

Object types Source

ulType kNkMAIDCapType_Enum

kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,

kNkMAIDCapOperation_Set

Data

4 s	“4 seconds”
10 s	“10 seconds”
20 s	“20 seconds”
1 min	“1 minute”
5 min	“5 minutes”
10 min	“10 minutes”

3.66. RemoteTimer

This will set the length of time wait for a signal from the remote.

(CSM menu [D90] c5　[D5000] c4)

Capability kNkMAIDCapability_RemoteTimer

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set

Data one of eNkMAIDRemoteTimer

0: 1 min

1: 5 min

2: 10 min

3: 15 min

3.67. BeepEx

This will set the pitch of the beep. (CSM menu d1)

Capability kNkMAIDCapability_BeepEx

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDBeepEx

eNkMAIDBeepEx	D90	D5000
0: High	---	●
1: Low	---	●
2: OFF	●	●
3: ON	●	---

3.68. FinderMode

This will set whether grid is display or not. (CSM menud2)

Capability kNkMAIDCapability_FinderMode

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetArray

Data Grid Off,　Grid On

3.69. FinderISODisplay

[D90] This will set the value of [Shooting/display – ISO display and adjustment]

[D5000] This will set the value of [Shooting/display – ISO display]

(CSM menu d3)

Capability kNkMAIDCapability_FinderISODisplay

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDFinderISODisplay

eNkMAIDFinderISODisplay	D90	D5000
0 : Show ISO sensitivity	●	●
1 : Show ISO/Easy ISO	●	---
2 : Off (Show frame count)	●	●

[D90] The relationship between this capability and Capability_EasyExposureCompMode is exclusion. So, when the value of Capability_EasyExposureCompMode is set to "On", the value of this capability will be changed to "Off (Show frame count)"

3.70. WarningDisp（D90 only）

This will set whether display or not warning icon in viewfinder. (CSM menu d4)

Capability kNkMAIDCapability_WarningDisp

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDWarningDisp

0: On

1: Off

3.71. ScreenTips（D90 only）

This will set whether to display descriptions for items selected in the Quick settings display when they are selected. (CSM menu d5)

Capability kNkMAIDCapability_ScreenTips

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDScreenTips

0: On

1: Off

3.72. ShootingSpeed（D90 only）

This will set the frame rate for continuous low-speed(CL). (CSM menu d6)

Capability kNkMAIDCapability_ShootingSpeed

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

4 fps	“4 frames / second”
3 fps	“3 frames / second”
2fps	“2 frames / second”
1 fps	“1 frames / second”

3.73. NumberingMode

This will select a Numbering Mode. (CSM menu [D90] d7 [D5000] 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 ”

3.74. ResetFileNumber

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

Capability kNkMAIDCapability_ResetFileNumber

Object types Source

ulType kNkMAIDCapType_Process

ulOperations kNkMAIDCapOperation_Start

Data None

3.75. InfoDispSetting（D90 only）

This will select whether to use automatically white letters when the subject is dark. (CSM menu d8)

Capability	kNkMAIDCapability_InfoDispSetting
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDInfoDispSetting 0: Auto 1: Manual (Dark on light) 2: Manual (Light on dark)

3.76. LCDBackLight（D90 only）

This will set whether to use LCD illuminator or not when the each button is pressed. (CSM menu d9)

Capability	kNkMAIDCapability_LCDBackLight
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	True: On　False: Off

3.77. ExposureDelay

This will set exposure delay mode. (CSM menu [D90] d10　[D5000] d5)

Capability	kNkMAIDCapability_ExposureDelay
Object types	Source
ulType	kNkMAIDCapType_Boolean
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	True: ON　False: OFF

3.78. DateImprintSetting (D5000 only)

This will set the setting of date and time imprinting. (CSM menu　d6)

Capability	kNkMAIDCapability_DateImprintSetting
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDDateImprintSetting 0: Off 1: Date 2: Date and time 3: Date counter

When the target date is not registered to DateCounterData and [3: Date counter] is set, kNkMAIDResult_DeviceBusy will be returned.

3.79. DateCounterSelect (D5000 only)

This will choose the date when [3: Date counter] is selected in Capability_DateImprintSetting. (CSM menu　d6)

Capability	kNkMAIDCapability_DateCounterSelect
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDDateCounterSelect 0: 1 1: 2 2: 3

When the data of date set by Capability_DateCounterData is ”00000000”, kNkMAIDResult_DeviceBusy will be returned.

3.80. DateCounterData (D5000 only)

This will register a date when [3: Date counter] is selected in Capability_DateImprintSetting.

(CSM menu d6)

Capability	kNkMAIDCapability_DateCounterData
Object types	Source
ulType	kNkMAIDCapType_String
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	"YYYYMMDDYYYYMMDDYYYYMMDD[null]"

- "YYYY" shows year, "MM" shows month, "DD" shows day,
- The data is ASCII string set by the style of "YYYYMMDD", and is set sequential from 1st to 3rd , and the end of data is terminated with null.
- The valid data range is "00000000", and from "19100101" to "20991231".

When a data is set to "00000000", it is assumed there is no change.

When the 1st date is "00000000", 2nd and 3rd date is not "00000000", kNkMAIDResult_DeviceBusy will be returned. There is no way to clear date setting.

3.81. DateCounterDispSetting (D5000 only)

This will choose display options when [3: Date counter] is selected in Capability_DateImprintSetting.

(CSM menu d6)

Capability	kNkMAIDCapability_DateCounterDispSetting
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault, kNkMAIDCapOperation_Set
Data	one of eNkMAIDDateCounterDispSetting 0: Number of days 1: Years and days 2: Years, months, and days

3.82. LiveViewScreenDispSetting（D5000 only）

This will choose the information shown in the live view display. (CSM menu d7)

Capability kNkMAIDCapability_LiveViewScreenDispSetting

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDLiveViewScreenDispSetting

The following definition value is combined with OR and set.

The value of default is 0x0000000F. (The all of display setting is ON)

eNkMAIDLiveViewScreenDispSetting	Display setting
0x00000008	Show shooting info
0x00000004	Framing grid
0x00000002	Hide indicators
0x00000001	Show indicators

When the value of this capability is 0, kNkMAIDResult_ValueOutOfBounds will be returned.

3.83. RecommendFlashDisp（D90 only）

This will set the flash warning. (CSM menu d11)

Capability kNkMAIDCapability_RecommendFlashDisp

Object types Source

ulType kNkMAIDCapType_Boolean

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data True: ON False: OFF (Default: True)

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.84. CellKind（D90 only）

This will specify the type of AA size battery when using MB-D10 battery pack. (CSM menu d12)

Capability kNkMAIDCapability_CellKind

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDCellKind

0: AA alkaline

1: AA Ni-MH

2: AA lithium

3: AA Ni-Mn

3.85. FlashSlowLimit（D90 only）

This will set the lowest shutter speed on shooting with speed light. (CSM menu e1)

Capability kNkMAIDCapability_FlashSlowLimit

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

1/60 s	“1/60 sec”
1/30 s	“1/30 sec”
1/15 s	“1/15 sec”
1/8 s	“1/8 sec”
1/4 s	“1/4 sec”
1/2 s	“1/2 sec”
1 s	“1 sec”
2 s	“2 sec”
4 s	“4 sec”
8 s	“8 sec”
15 s	“15 sec”
30 s	“30 sec”

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.86. InternalSplMode

This will set the flash mode for Built-in flash, or external speed light, which is new type, supporting communication, without setting display. (for example : SB-400)

(CSM menu [D90] e2　[D5000] e1)

Capability kNkMAIDCapability_InternalSplMode

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

	string	D90	D5000
TTL	"TTL"	●	●
Manual	"Manual"	●	●
Repeating flash	"Repeating Flash"	●	---
Commander mode	"Command"	●	---

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

[D90] When powered external speed light, which is new, type, supporting communication, without setting display (for example : SB-400) is attached, the value of this capability is limited to 2 items, "TTL" and "Manual".

3.87. InternalSplValue

This will set the flash power when flash mode is Manual for Built-in flash or external speed light, which is new type, supporting communication, without setting display. (for example : SB-400) (CSM menu [D90] e2 [D5000] e1)

Capability kNkMAIDCapability_InternalSplValue

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDInternalSplValue

eNkMAIDInternalSplValue	value	D90	D5000
0	Full	●	●
8	1/1.3	●	---
9	1/1.7	●	---
1	1/2	●	●
10	1/2.5	●	---
11	1/3.2	●	---
2	1/4	●	●
12	1/5	●	---
13	1/6.4	●	---
3	1/8	●	●
14	1/10	●	---
15	1/13	●	---
4	1/16	●	●
16	1/20	●	---
17	1/25	●	---
5	1/32	●	●
18	1/40	●	---
19	1/50	●	---
6	1/64	●	---
20	1/80	●	---
21	1/100	●	---
7	1/128	●	---

This capability is used when Capability_InternalSplMode is ”Manual”.

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.88. InternalSplMRPTValue（D90 only）

This will set the flash power when Built-in flash mode is Repeating Flash. (CSM menu e2)

Capability	kNkMAIDCapability_InternalSplMRPTValue
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDInternalSplMRPTValue 0: 1/4 1: 1/8 2: 1/16 3: 1/32 4: 1/64 5: 1/128

This capability is used when Capability_InternalSplMode is " Repeating Flash"

When the Capability_ExposureMode is DIP, or the external speed light, which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only.

3.89. InternalSplMRPTCount（D90 only）

This will set the flash times when Built-in flash mode is Repeating Flash. (CSM menu e2)

Capability kNkMAIDCapability_InternalSplMRPTCount

Object types Source

ulType kNkMAIDCapType_Enum

kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray

kNkMAIDCapOperation_Set,

Data one of eNkMAIDInternalSplMRPTCount

eNkMAIDInternalSplMRPTCount	Times	eNkMAIDInternalSplMRPTCount	Times
0	2	7	9
1	3	8(Default)	10
2	4	9	15
3	5	10	20
4	6	11	25
5	7	12	30
6	8	13	35

The value of this capability is affected by the setting of Capability_InternalSplMRPTValue as the following table, but the contents of array data will not be changed.

Capability_InternalSplMRPTValue	Capability_InternalSplMRPTCount
0: 1/4	0
1: 1/8	0 - 3
2: 1/16	0 - 8
3: 1/32	0 - 9
4: 1/64	0 - 11
5: 1/128	0 - 13

When the Capability_ExposureMode is DIP, or the external speed light which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only.

3.90. InternalSplMRPTInterval（D90 only）

This will set the flash frequency when Built-in flash mode is Repeating Flash. (CSM menu e2)

Capability kNkMAIDCapability_InternalSplMRPTInterval

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDInternalSplMRPTInterval

eNkMAIDInternalSplMRPTInterval	Frequency	eNkMAIDInternalSplMRPTInterval	Frequency
0	1	7	8
1	2	8	9
2	3	9(Default)	10
3	4	10	20
4	5	11	30
5	6	12	40
6	7	13	50

When the Capability_ExposureMode is DIP, or the external speed light which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only.

3.91. InternalSplCommandChannel（D90 only）

This will set the channel when Built-in flash mode is Commander mode. （CSM menu e2 ）

Capability kNkMAIDCapability_InternalSplCommandChannel

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDInternalSplCommandChannel

0：1 ch

1：2 ch

2：3 ch

3：4 ch

When the Capability_ExposureMode is DIP, or the external speed light which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only.

3.92. InternalSplCmdSelfMode（D90 only）

This will set the Built-in flash mode when Built-in flash mode is Commander mode.

(CSM menu e2)

Capability	kNkMAIDCapability_InternalSplCmdSelfMode
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDInternalSplCmdSelfMode 0: TTL 1: Manual 2: Off

When the Capability_ExposureMode is DIP, or the external speed light which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only.

3.93. InternalSplCmdSelfComp（D90 only）

This will set the Built-in flash compensation when Built-in flash mode is Commander mode and Capability_InternalSplCmdSelfMode is “TTL”. （CSM menu e2）

Capability kNkMAIDCapability_InternalSplCmdSelfComp

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDInternalSplCmdSelfComp

eNkMAIDInternalSplCmdSelfComp	Comp.
0	-3.0
1	-2.7
2	-2.3
3	-2.0
4	-1.7
5	-1.3
6	-1.0
7	-0.7
8	-0.3
9(Default)	0
10	+0.3
11	+0.7
12	+1.0
13	+1.3
14	+1.7
15	+2.0
16	+2.3
17	+2.7
18	+3.0

This capability is used when Capability_InternalSplCmdSelfMode is ”TTL”.

When the Capability_ExposureMode is DIP, or the external speed light which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only.

3.94. InternalSplCmdSelfValue（D90 only）

This will set the Built-in flash power when Built-in flash mode is Commander mode and Capability_InternalSplCmdSelfMode is “Manual”.

(CSM menu e2)

Capability kNkMAIDCapability_InternalSplCmdSelfValue

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDInternalSplCmdSelfValue

eNkMAIDInternalSplCmdSelfValue	value	eNkMAIDInternalSplCmdSelfValue	value
0 (Default)	1/1	15	1/13
8	1/1.3	4	1/16
9	1/1.7	16	1/20
1	1/2	17	1/25
10	1/2.5	5	1/32
11	1/3.2	18	1/40
2	1/4	19	1/50
12	1/5	6	1/64
13	1/6.4	20	1/80
3	1/8	21	1/100
14	1/10	7	1/128

This capability is used when Capability_InternalSplCmdSelfMode is ” Manual”.

When the Capability_ExposureMode is DIP, or the external speed light which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only.

3.95. InternalSplCmdGroupAMode（D90 only）

This will set the flash mode of Group A when Built-in flash mode is Commander mode.

(CSM menu e2)

Capability kNkMAIDCapability_InternalSplCmdGroupAMode

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDInternalSplCmdGroupMode

0 : TTL

1 : AA

2 : Manual

3 : Off

When the Capability_ExposureMode is DIP, or the external speed light which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only..

3.96. InternalSplCmdGroupAComp（D90 only）

This will set the flash compensation of Group A when Built-in flash mode is Commander mode and Capability_InternalSplCmdGroupAMode is “TTL” or “AA”.

(CSM menu e2)

Capability kNkMAIDCapability_InternalSplCmdGroupAComp

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDInternalSplCmdGroupComp

eNkMAIDInternalSplCmdComp	Comp.	eNkMAIDInternalSplCmdComp	Comp.
0	-3.0	10	+0.3
1	-2.7	11	+0.7
2	-2.3	12	+1.0
3	-2.0	13	+1.3
4	-1.7	14	+1.7
5	-1.3	15	+2.0
6	-1.0	16	+2.3
7	-0.7	17	+2.7
8	-0.3	18	+3.0
9(Default)	0		

This capability is used when Capability_InternalSplCmdGroupAMode is ” TTL” or “AA”.

When the Capability_ExposureMode is DIP, or the external speed light which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only.

3.97. InternalSplCmdGroupAValue（D90 only）

This will set the flash power of Group A when Built-in flash mode is Commander mode and Capability_InternalSplCmdGroupAMode is “Manual” (CSM menu e2)

Capability kNkMAIDCapability_InternalSplCmdGroupAValue

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDInternalSplCmdGroupValue

eNkMAIDInternalSplCmdGroupValue	value	eNkMAIDInternalSplCmdGroupValue	value
0 (Default)	1/1	15	1/13
8	1/1.3	4	1/16
9	1/1.7	16	1/20
1	1/2	17	1/25
10	1/2.5	5	1/32
11	1/3.2	18	1/40
2	1/4	19	1/50
12	1/5	6	1/64
13	1/6.4	20	1/80
3	1/8	21	1/100
14	1/10	7	1/128

This capability is used when Capability_InternalSplCmdGroupAMode is ”Manual”.

When the Capability_ExposureMode is DIP, or the external speed light which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only.

3.98. InternalSplCmdGroupBMode（D90 only）

This will set the flash mode of Group B when Built-in flash mode is Commander mode. (CSM menu e2)

Capability kNkMAIDCapability_InternalSplCmdGroupBMode

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDInternalSplCmdGroupMode

0 : TTL

1 : AA

2 : Manual

3 : Off

When the Capability_ExposureMode is DIP, or the external speed light which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only.

3.99. InternalSplCmdGroupBComp（D90 only）

This will set the flash compensation of Group B when Built-in flash mode is Commander mode and Capability_InternalSplCmdGroupBMode is “TTL” or “AA”. (CSM menu e2)

Capability kNkMAIDCapability_InternalSplCmdGroupComp

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDInternalSplCmdGroupComp

eNkMAIDInternalSplCmdComp	Comp.	eNkMAIDInternalSplCmdComp	Comp.
0	-3.0	10	+0.3
1	-2.7	11	+0.7
2	-2.3	12	+1.0
3	-2.0	13	+1.3
4	-1.7	14	+1.7
5	-1.3	15	+2.0
6	-1.0	16	+2.3
7	-0.7	17	+2.7
8	-0.3	18	+3.0
9(Default)	0		

This capability is used when Capability_InternalSplCmdGroupBMode ”TTL” or ”AA”.

When the Capability_ExposureMode is DIP, or the external speed light which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only.

3.100. InternalSplCmdGroupBValue（D90 only）

This will set the flash power of Group B when Built-in flash mode is Commander mode and Capability_InternalSplCmdGroupBMode is “Manual”. (CSM menu e2)

Capability kNkMAIDCapability_InternalSplCmdGroupBValue

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDInternalSplCmdGroupValue

eNkMAIDInternalSplCmdGroupValue	value	eNkMAIDInternalSplCmdGroupValue	value
0 (Default)	1/1	15	1/13
8	1/1.3	4	1/16
9	1/1.7	16	1/20
1	1/2	17	1/25
10	1/2.5	5	1/32
11	1/3.2	18	1/40
2	1/4	19	1/50
12	1/5	6	1/64
13	1/6.4	20	1/80
3	1/8	21	1/100
14	1/10	7	1/128

This capability is used when Capability_InternalSplCmdGroupBMode is ”Manual”.

When the Capability_ExposureMode is DIP, or the external speed light which is new type, supporting communication, without setting display. (for example : SB-400) is attached, the ulOperations of this capability is set to read-only.

3.101. ModelingOnPreviewButton（D90 only）

This will set whether modeling flash activates or not in case of preview button is pressed. (CSM menu e3)

Capability kNkMAIDCapability_ModelingOnPreviewButton

Object types Source

ulType kNkMAIDCapType_Boolean

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault

Data True: ON False: OFF

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.102. BracketingVary

This will select the bracketing variation. (CSM menu [D90] e4 [D5000] e2)

Capability kNkMAIDCapability_BracketingVary

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

	string	D90	D5000
AE only	"AE Only"	●	●
Flash only	"Flash Only"	●	---
AE & flash	"AE & Flash"	●	---
WB bracketing	"White Balance"	●	●
ADL bracketing	"ADL bracketing"	●	●

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

[D5000] If the client sets the value while the camera shows error or warning, the module returns kNkMAIDResult_ValueOutOfBounds.

3.103. AutoFPShoot（D90 only）

This will set Auto FP setting. (CSM menu e5)

Capability kNkMAIDCapability_AutoFPShoot

Object types Source

ulType kNkMAIDCapType_Boolean

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set,
kNkMAIDCapOperation_GetDefault

Data True: ON False: OFF

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.104. BracketingOrder（D90 only）

This will select the bracketing order. (CSM menu e6)

Capability kNkMAIDCapability_BracketingOrder

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

MTR > under > over	"Same as Auto Bracketing"
Under > MTR > over	"Negative to Positive"

This capability setting doesn't influence ADL bracketing order.

When Capability_BracketingVary is "ADL bracketing", shooting was done always 2 times, and bracketing order is 1. ADL Off, 2. current ADL setting (if current setting is off, auto is used).

When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.105. IlluminationSetting（D90 only）

This will set the function of the illuminator switch. (CSM menu f1)

Capability kNkMAIDCapability_IlluminationSetting

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set,
kNkMAIDCapOperation_GetDefault

Data one of eNkMAIDIlluminationSetting
0： LCD backlight On/Off
1: LCD backlight and information display On/Off

3.106. CenterButtonOnShooting（D90 only）

This will set the function to the center button of the multi selector on shooting. (CSM menu f2)

Capability kNkMAIDCapability_CenterButtonOnShooting

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

	String data
Select center focus point	"Reset to Center"
Highlight active focus point	"Display Selected Area"
Not used	"Not used"

3.107. SelectFUNC

This will set the function be assigned to FUNC. button. (CSM menu [D90] f3 [D5000] f1)

Capability kNkMAIDCapability_SelectFUNC

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

	string	D90	D5000
FV lock	"FV Lock"	●	---
Flash off	"Disable SB flash"	●	---
Center-weighted (*1)	"Metering Matrix"	●	---
Center-weighted (*1)	"Metering Center Weighted"	●	---
Spot metering (*1)	"Metering Spot"	●	---
Access top item in My Menu	"Access top item in MY MENU"	●	---
+ NEF (RAW)	"+ NEF (RAW)"	●	●
Framing grid	"Framing grid"	●	---
AF-area mode	"AF-area mode"	●	---
Center focus point	"Center focus point"	●	---
Self-timer	"Self-timer"	---	●
Release mode	"Release mode"	---	●
Image quality/size	"Image quality/size"	---	●
ISO sensitivity	"ISO sensitivity"	---	●
White balance	"White balance"	---	●
Active D-Lighting	"Active D-Lighting"	---	●
Auto bracketing	"Auto bracketing"	---	●

[D90] When the Capability_ExposureMode is DIP, the above value (*1) signed cannot be set.

3.108. AEAFLockButton

This will set the function of AE/AF lock button. (CSM menu [D90] f4 [D5000] f2)

Capability kNkMAIDCapability_AEAFLockButton

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDArrayType_PackedString

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
kNkMAIDCapOperation_Set

Data

Menu	String	D90	D5000
FV lock	"FV Lock"	●	---
AE-L/AF-L	"AE Lock and AF Lock"	●	●
AE-L	"AE Lock Only"	●	●
AE-L(Hold)	"AE Lock and Hold"	●	●
AF-L	"AF Lock only"	●	●
AF-ON	"AF-ON"	●	●

3.109. CommandDialDirection

This will set the direction of command dials. (CSM menu [D90] f5 [D5000] f3)

Capability kNkMAIDCapability_CommandDialDirection

Object types Source

ulType kNkMAIDCapType_Boolean

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set,
kNkMAIDCapOperation_GetDefault

Data True: Normal False: Reverse

3.110. ExchangeDials (D90 only)

This will exchange functions for main and sub command dials. (CSM menu f5)

Capability kNkMAIDCapability_ExchangeDials

Object types Source

ulType kNkMAIDCapType_Boolean

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set,
kNkMAIDCapOperation_GetDefault

Data True: exchange False: not exchange (Default: False)

3.111. EnableCommandDialOnEx（D90 only）

This will set whether the command dials is used or not during playback or when menus are displayed. (CSM menu f5)

Capability	kNkMAIDCapability_EnableCommandDialOnPlaybackEx
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDEnableCommandDialOnPlaybackEx 0: OFF 1: ON 2: ON（image review excluded）

3.112. ShootNoCard

This will set disable to shoot when a SD card is not install. (CSM menu [D90] f6 [D5000] f4)

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

3.113. IndicatorDisplay

This will set the direction of the plus and the minus to the indicator display.

(CSM menu [D90] f7 [D5000] f5)

Capability	kNkMAIDCapability_IndicatorDisplay
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set, kNkMAIDCapOperation_GetDefault
Data	one of eNkMAIDIndicatorDisplay 0 : + 0 - 1 : - 0 +

3.114. 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. When the other character is set, the module returns an error(kNkMAIDResult_ValueOutOfBounds).

3.115. 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

3.116. 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).

3.117. 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

3.118. 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.) “Lo”, … ”1”, “1/1.3”, “1/1.6”, …”Hi” , “x 1/250”, “x 1/200”

When the Capability_ExposureMode is set to “Program” or “Aperture Priority” or DIP mode, or Scene 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.

When the Capability_ExposureMode is set to “Program” or “Aperture Priority”, if the camera cannot set proper exposure time because a subject is too bright, the module points to “Hi”. Similarly, if a subject is too dark and the Capability_InternalFlashStatus is “Close” and Capability_ExternalFlashStatus is “Not Exist”, the module points to “Lo”.

When the Capability_InternalFlashStatus is “Close” and Capability_ExternalFlashStatus is “Not Exist”, the maximum shutter speed value is limited to the Capability_FlashSyncTime setting, The array data is changed.

When the Capability_ExposureMode is set to “Program”, “Aperture priority”, the minimum shutter speed value is limited to the Capability_FlashSlowLimit setting. When the array data is changed , the module sends to the client kMAIDEvent_CapChange.

3.119. FlexibleProgram

This will set the Flexible program value.

Capability	kNkMAIDCapability_FlexibleProgram
Object types	Source
ulType	kNkMAIDCapType_Range
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set
Data	-5 to +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.

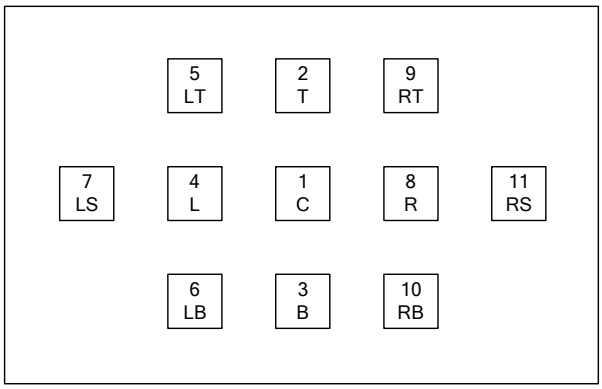
3.120. FocusPreferredArea

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 eNkMAIDFocusPreferred 3
	0 - 11(default 0)

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

When Capability_FocusAreaMode is “Auto” or Capability_LiveViewStatus is ON(1), the ulOperations of this capability is set to read-only.



3.121. 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 attatched, 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 DIP mode, or Scene 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.

When the Capability_ExposureMode is set to “Speed Priority”, if the camera cannot set proper aperture value because a subject is too bright, the module points to “Hi”. Similarly, if a subject is too dark and the Capability_InternalFlashStatus is “Close” and Capability_ExternalFlashStatus is “Not Exist”, the module points to “Lo”.

3.122. 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 DIP, or Scene Modes, the operations of this capability is set to read-only. When the CPU lens is not attached, the operations of this capability is set to read-only, the visibility is set to invalid.

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

3.123. 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 eNkMAIDExposureMode

eNkMAIDExposureMode	D90	D5000
0: Program mode	●	●
1: Aperture priority	●	●
2: Speed priority	●	●
3: Manual	●	●
5: Auto	●	●
6: Portrait	●	●
7: Landscape.	●	●
8: Close Up	●	●
9: Sports	●	●
10: Night Portrait	●	●
12: Child	---	●
13: flash off	●	●
14: SCENE	---	●

When CPU lens is not attached, the array data includes only Aperture priority and Manual.

When the array data is updated, the module sends kMAIDEvent_CapChange to the client.

This capability can be set when Capability_LockCamera is true.

[D90] The value, from 5 to 13 is called DigitalImageProgram(DIP).

[D5000] The value, from 5 to 14 is called Scene Modes. If [14: SCENE] is set, the Scene Mode set by Capability_SceneMode will be used.

3.124. 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 DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.125. 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

eNkMAIDShootingMode	D90	D5000
0: SingleFrame	●	●
1: [D90] Continuous low speed [D5000] Continuous	●	●
2: Continuous high speed	●	---
3: Self-timer	●	●
5: Quick-response remote	●	●
6: Delayed remote	●	●
8: Quiet shutter-release	---	●

When the client changes the value of this capability while executing live view, the shooting mode is changed without stop live view. If the ulVisibility and ulOperations are changed, the module sends to the client kMAIDEvent_CapChange.

3.126. 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 - 99 (Default 1)

The actual number of shot that can be taken in a continuous shooting mode is the minimum value of this capability or Capability_RemainContinuousShooting.

When it meets all the following requirements, it is necessary to set the value of this Capability to 1.

- Capability_ShootingMode is 1 or 2.
- Capability_EnableBracketing is ON(true).
- Capability_BracketingVary is “White Balance”.

3.127. 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 the Capability_BracketingVary is ”WhiteBalance” and the Capability_CompressionLevel is ”RAW”, “RAW+JPEG(Basic)” ,“RAW+JPEG(Normal)”, “RAW+JPEG(Fine), the ulVisibility of this capability is set to invalid and ulOperations of this capability is set to read-only.

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

The ulOperations of this capability is changed, the module sends to the client kMAIDEvent_CapChange.

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.128. 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

eNkMAIDAEBracketingStep
0: 1/3EV
1: 1/2EV
2: 2/3EV
3: 1EV
4: 1 1/3 EV
5: 1 1/2 EV
6: 1 2/3 EV
7: 2 EV

When the Capability_EnableBracketing is ON(true) and the Capability_BracketingVary is “AE Only”, “Flash Only”, “AE & Flash”, this capability is valid. Other than the above, the ulVisibility of this capability is set to invalid and ulOperations of this capability is set to read-only.

The Capability_EVInterval setting as following table affects the array data.

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 1/3 EV、1 2/3 EV。2EV
1/2 EV	1/2EV、1EV、1 1/2EV、2EV

When the value of Capability_EVInterval is changed, this capability is changed to 1EV(3).

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.129. 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. Other than the above, the ulVisibility of this capability is set to invalid and ulOperations of this capability is set to read-only.

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

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

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.130. BracketingType（D90 only）

This will select the combination bracketing shots and direction.

Capability	kNkMAIDCapability_BracketingType
Object types	Source
ulType	kNkMAIDCapType_Enum
	kNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
	kNkMAIDCapOperation_Set
Data	One of eNkMAIDBracketingType
	0: Minus_2
	1: Plus_2
	4: Both_3

When the Capability_EnableBracketing is OFF(false) or Capability_BracketingType is "ADL bracketing", the ulVisibility of this capability is set to invalid and ulOperations of this capability is set to read-only.

When Capability_BracketingVary is "ADL bracketing", shooting was done always 2 times, and bracketing order is 1.ADL Off, 2.Current ADL setting (if current ADL setting is off(3), auto(6) is used).When the Capability_ExposureMode is DIP, the ulOperations of this capability is set to read-only.

3.131. 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 have to check the value of Capability_LiveViewProhibit, and when the value of Capability_LiveViewProhibit is not 0, Live view will not be started.

3.132. 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. When 0 returns, the status is not Live view prohibition.

value	prohibition condition
0x00000800	Non-CPU lens is attached, and ExposureMode is not Manual.
0x00000400	The setting by Aperture ring is valid.
0x00000200	TTL error
0x00000100	battery shortage
0x00000080	Mirror up
0x00000040	Shutter bulb
0x00000020	Aperture ring is not minimum.
0x00000010	All button pushed error.
0x00000004	Sequence error
0x00000001	Recording media is CF/SD card

When the value of this capability is not 0, it shows the status of Live view prohibition.

When the value of Capability_ApertureDial is True and the CPU lens with aperture ring is attached, “The setting by Aperture ring is valid. ”(0x00000400) will be set.

When the CPU lens with aperture ring is attached and aperture ring is not minimum, regardless of Capability_ApertureDial setting, “Aperture ring is not minimum.”(0x00000020) will be set.

When the value of Capability_BatteryLevel is 1, “battery shortage”(0x00000100) will be set.

3.133. LiveViewImageZoomRate

This will set the zoom rate for Live liew image.

Capability kNkMAIDCapability_LiveViewImageZoomRate

Object types Source

ulType kNkMAIDCapType_Enum
kNkMAIDCapType_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), and when Capability_LiveViewStatus is not ON(1), the ulVisibility of this capability is set to read-only.

3.134. 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 0(Level).

3.135. RemainCotinuousShooting

This will get the number of shot that can be taken in current image quality on a continuous shooting mode.

Capability kNkMAIDCapability_RemainContinuousShooting
Object types Source
ulType kNkMAIDCapType_Unsigned
ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetDefault
Data 0 - 99 (Default: 99)

The following setting will change the value of this capability.

- Capability_CompressionLevel
- Capability_ImageSize
- Capability_JpegCompressionPolicy
- Capability_Active_D_Lighting
- Capability_NoiseReduction
- Capability_NoiseReductionHighISO
- Capability_AutoDistortion

If the current value is changed because of the above capability setting, the module sends to the client kMAIDEvent_CapChangeValueOnly.

3.136. 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

3.137. 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

3.138. LockFV（D90 only）

This will get the status of FV lock.

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

3.139. ExposureStatus

This will get the exposure indicator status of Camera.

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

When the Capability_ExposureMode is set to “Program”, this capability returns exposure compensation. When the Capability_ExposureMode is set to “Manual” (without in case of ShutterSpeed is Bulb) returns the exposure value how under- or over-exposed at current settings.

When the Capability_ExposureMode is set to “Shutter priority” or “Aperture priority”, this capability returns exposure compensation in case of proper exposure, but returns the exposure value how under- or over-exposed at current settings in case of not proper exposure.

3.140. 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

3.141. FocalLength

This will get the focal length of the lens.

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

When a CPU lens is not attached, the value of this capability is set to 0.

3.142. 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

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

3.143. BracketingCount

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

Capability	kNkMAIDCapability_BracketingCount
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get
Data	[AE Bracketing] 1 - 9
	[ADL Bracketing] 1, 2

When the Capability_EnableBracketing is ON(true) and the Capability_BracketingVary is “AE Only” or ” Flash Only” or ” AE & Flash”, “ADL bracketing”, this capability is valid. If this capability is invalid, returns 0.

3.144. USBSpeed

This will get USB transfer speed on current connected.

Capability	kNkMAIDCapability_USBSpeed
Object types	Source
ulType	kNkMAIDCapType_Enum
	kNkMAIDArrayType_Unsigned
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray,
Data	one of eNkMAIDUSBSpeed
	0: Full Speed 1: High Speed

3.145. 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

3.146. 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 to +1 (Default:0)

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

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

The flash compensation of Built-in flash is actually used when Capability_InternalFlashStatus is not "Close" and Capability_InternalSplMode is "TTL" or when Capability_ExternalFlashStatus is not "Not Exist" and Capability_ExternalNewTypeFlashMode is iTTL-BL(1), iTTL(2), AA(3).

When the Capability_ExposureMode is DIP or Scene Modes, the ulOperations of this capability is set to read-only.

3.147. 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

3.148. ExternalFlashComp

This will set the flash compensation of the external speed light.

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

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

3.149. ExternalFlashSort

This will get the sort of external speed light.

Capability	kNkMAIDCapability_ExternalFlashSort
Object types	Source
ulType	kNkMAIDCapType_Unsigned
ulOperations	kNkMAIDCapOperation_Get
Data	one of eNkMAIDExternalFlashSort 0: The external speed light is not supporting communication. 2: The external speed light is new type and supporting communication with setting display. 4: The external speed light is new type and supporting communication without setting display (for example : SB-400). 3 : The external speed light does not exist.

"The external speed light is old type and supporting communication" is not supported in this module, and if that is attached, the value of this capability will be set to 0.

3.150. ExternalNewTypeFlashMode

This will get flash mode when the Capability_ExternalFlashSort is “The external speed light is new type and supporting communication with setting display”(2) or “The external speed light is new type and supporting communication without setting display”(4).

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 is new type and supporting communication does not exist.

When the value of Capability_ExternalFlashSort is “The external speed light is new type and supporting communication without setting display”(4), the value of this capability is changed by Capability_InternalSplMode setting.

3.151. 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.

3.152. AFCapture

This will take a picture after auto focus.

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 Capability_FocusMode is AF-A, the camera decides which focus mode of AF-C or AF-S will be used.

[D90] When auto focus failed and Capability_FocusMode is AF-S (1), the camera does not take a picture. But when auto focus failed and Capability_FocusMode is AF-C (2), the camera take a picture.

[D5000] When auto focus failed and Capability_FocusMode is AF-S (1), the camera does not take a picture and returns Out of Focus error.

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 preview image, the module issues kNkMAIDEvent_AddPreviewImage.

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

3.153. ContrastAF

This will control contrast AF when Live view is executed.

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 finish in focus (effective only as the Get value)

0x11 : AF finish 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)

3.154. 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.

3.155. MFDriveStep

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

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) and CPU lens is attached and also Capability_LiveViewStatus is ON(1).

3.156. MFDrive

This will adjust focus position when live view executed.

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 that manual focus driving finishes correctly by referring "focus drive state" of "Display information" in Live view image. (please refer NkMAIDCapability_GetLiveViewImage)

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

3.157. ContrastAFArea

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

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).

3.158. CaptureDustImage

This will take a dust off ref photo.

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.

About dust off ref photo, there is no preview image, so kNkMAIDEvent_AddPreviewImage is not issued.

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.

3.159. DeleteDramImage

This will delete DRAM image specified by Capability_CurrentPreviewID.

Capability kNkMAIDCapability_DeleteDramImage

Object types Source

ulType kNkMAIDCapType_Process

ulOperations kNkMAIDCapOperation_Start

The DRAM image to be deleted is specified by Capability_CurrentPreviewID.

This capability execution timing is limited to the following 2 cases.

1. Before receiving kNkMAIDEvent_AddChild
2. After issuing kNkMAIDCapability_Acquire for Image Object, and before issuing kNkMAIDCommand_Close

In case of 1, the client sets Capability_CurrentPreviewID and executes this capability, the deletion will be completed.

In of 2, the client will issue Capability_Acquire for Image object and cancel Capability_Acquire by kNkMAIDCommand_Abort, and set Capability_CurrentPreviewID and execute this capability, so, the deletion will be completed.

In case of RAW+JPEG, kNkMAIDEvent_AddPreviewImage is issued only for JPEG image. that is not issued for RAW image.

About dust off ref photo and RAW file of RAW+JPEG, there is no preview image, so kNkMAIDEvent_AddPreviewImage is not issued. But the client can delete the DRAM image by using Item ID notified by data parameter of kNkMAIDEvent_AddChild.

When the client deletes DRAM image after receiving kNkMAIDEvent_AddChild, the client must close Item objcet. The module does not close Item object.

[About RAW+JPEG deletion]

If the client executes kNkMAIDCapability_DeleteDramImage for JPEG before receiving kNkMAIDEvent_AddChild of JPEG, the both of RAW and JPEG files will be deleted at the same time. But, if the client executes kNkMAIDCapability_DeleteDramImage for JPEG after receiving kNkMAIDEvent_AddChild of JPEG, whether the both of RAW and JPEG files will be deleted or only JPEG will be deleted is according to timing.

Whether ItemID is a fragment of RAW+JPEG or not can be judged according to the value of ItemID. The definition of ItemID is on the table as follows.

<table>
<tr><td colspan="32">bit</td></tr>
<tr><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td colspan="5">Format</td><td>RAW+JPEG</td><td>3</td><td colspan="24">ImageNo</td></tr>
</table>

Field	Description
Format	The quality of image 1 : RAW 5 : JPEG
RAW+JPEG	A fragment of RAW+JPEG or not 0 : Single 1 : A fragment of RAW+JPEG
ImageNo	Image sequential number (1 to16777216)

Example) The ItemID of RAW+JPEG, in case of ImageNo = 1.

JPEG = 0x2F000001

RAW = 0x0F000001

3.160. 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

3.161. CurrentPreviewID

This will specify the DRAM image operated now.

Capability kNkMAIDCapability_CurrentPreviewID

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

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

Preview ID is notified by data parameter of kNkMAIDEvent_AddPreviewImage.

In case of image data to which kNkMAIDEvent_AddPreviewImage is not issued, RAW of RAW+JPEG and dust off ref photo, the client uses Item ID notified by data parameter of kNkMAIDEvent_AddChild as Item ID.

Capability_GetPreviewImageLow, Capability_GetPreviewImageNormal, Capability_DeleteDramImage refer the value of this capability.

3.162. GetPreviewImageLow

This will get the quality low preview image about specified DRAM image.

Capability kNkMAIDCapability_GetPreviewImageLow

Object types Source

ulType kNkMAIDCapType_Array
kNkMAIDArrayType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray

The image data to be acquired is specified with Capability_CurrentPreviewID. A dust off ref photo and a RAW file of RAW+JPEG does not support preview image, this capability will be error.

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

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

When the client wants to get preview 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, the preview image will be set to kNkMAIDArray.pData.

The pixel size of the preview image will be maximum pixel size or less.

Specification of image quality low preview image

maximum pixel size	image quality	maximum file size
576 x 376	Jpeg Basic	32768 Byte

The format of the preview image is shown below.

Display information	image pixel size	X size	2Byte	
		Y size	2Byte	
	focus point		1Byte	0 - 51
	direction of rotation		1Byte	0:none 1:counterclockwise 2:clockwise
	quality of image		1Byte	0:RAW+FINE 1:RAW+NORMAL 2:RAW+BASIC 3:RAW 4:TIFF 5:JPEG-FINE 6:JPEG-NORMAL 7:JPEG-BASIC
	crop mode		1Byte	0:FX 2:DX 3:5:4
	type of AF		1Byte	0:phase detection AF 1:contrast AF
	focus information according to control area		8Byte	If the focus point is in focus, it sets 1, if the focus point out of focus, it sets 0 to each bit 0-50. The focus point is shown at "2.120.FocusPreferredArea". Please refer to following figure, "focus
	focus informaton		1Byte	0:out of focus, 1:in focus
	AF area size	X size	2Byte	
		Y size	2Byte	
	contrast AF evaluation position	coordinates	2Byte	
		Y coordinates	2Byte	
	contrast AF evaluation area	X coordinates	2Byte	
		Y coordinates	2Byte	
	reserved		2Byte	
Preview image	image data			

focus information according to control area format

Bit	7	6	5	4	3	2	1	0
1 byte	8	7	6	5	4	3	2	1
2 byte	16	15	14	13	12	11	10	9
3 byte	24	23	22	21	20	19	18	17
4 byte	32	31	30	29	28	27	26	25
5 byte	40	39	38	37	36	35	34	33
6 byte	48	47	46	45	44	43	42	41
7 byte						51	50	49
8 byte								

3.163. GetPreviewImageNormal

This will get the quality normal preview image about specified DRAM image.

Capability kNkMAIDCapability_GetPreviewImageNormal

Object types Source

ulType kNkMAIDCapType_Array

kNkMAIDArrayType_Unsigned

ulOperations kNkMAIDCapOperation_Get, kNkMAIDCapOperation_GetArray

The image data to be acquired is specified with Capability_CurrentPreviewID. A dust off ref photo and a RAW file of RAW+JPEG does not support preview image, this capability will be error.

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

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

When the client wants to get preview 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, the preview image will be set to kNkMAIDArray.pData.

The pixel size of the preview image will be maximum pixel size or less.

Specification of image quality normal preview image.

maximum pixel size	image quality	maximum file size
1600 x 1200	Jpeg Basic	288256 Byte

The format of the preview image is same as in case of Capability_GetPreviewImageLow.

3.164. 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 wants 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, 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	128 bytes / Display information + 900Kbytes / Max Live view image

The format of the Live view image is shown below.

Display information	appending JPEG image size		horizontal size	2Byte	when expanding, the size is 640x480 fix. when non expanding, the size is 640x480 or less.(depend on crop mode)
			Vertical size	2Byte	
	total size		horizontal size	2Byte	Standard of coordinates
			Vertical size	2Byte	
	display area size		horizontal size	2Byte	When non-expanding, it becomes whole size = display area size.
			Vertical size	2Byte	
	display center coordinate		horizontal position	2Byte	
			Vertical position	2Byte	
	size of AF frame(*1)		horizontal size	2Byte	
			Vertical size	2Byte	
	AF frame center coordinates(*1)		horizontal position	2Byte	
			Vertical position	2Byte	
	Reserve			4Byte	
	selected focus point			1Byte	always 0
	direction of rotation			1Byte	0:none 1:counterclockwise 2:clockwise
	focus drive state			1Byte	0 : not driving 1 : driving
	Reserve			1Byte	
	shutter speed			4Byte	upper 2 byte : numerator lower 2 byte : denominator
	aperture			2Byte	Aperture = F number*100
	count down time			2Byte	It counts down from 3600(For one hour) every second.(It counts down by the rise in heat for 30 seconds.)
	focus result			1Byte	0 : no information 1 : out of focus 2 : in focus
	state that AF can be driven			1Byte	0 : AF drive impossibility. 1 : AF drive possible
	Reserve			2Byte	
	Vertual horison angle information			4Byte	always 0
	Face priority AF mode			1Byte	0 : Face priority AF is not active. 1 : Face priority AF is active.
	Reserve			1Byte	
	the number of face detection			1Byte	0 – 5 (Max : 5)
	AF area index			1Byte	always 0
	0 | 4	size of AF frame	horizontal size	2Byte	the size of AF frame and the AF frame center coordinates of five, (4byte + 4byte) * 5 = total 40 byte
			Vertical size	2Byte	
		AF frame center coordinates	horizontal position	2Byte	
			Vertical position	2Byte	
	Reserve			36Byte	
	Live view image data				

When “Face priority AF mode” is “Face priority AF is active”(1)

- If there is no detection of face, “Face priority AF is active”(1) will be set to.
- The value other than “no information”(0) will be set into “focus result” for 1 minute after a camera is in focus.
- The value of the field where (*1) is recorded in the table is not guaranteed, because “size of AF frame” and “AF frame center coordinates” for face priority AF will be used. However, if there is no face detection, AF mode is set to wide area automatically, and the value of the field (*1) is guaranteed.

3.165. 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.

3.166. CameraType

This will get camera type.

Capability kNkMAIDCapability_CameraType

Object types Source

ulType kNkMAIDCapType_Unsigned

ulOperations kNkMAIDCapOperation_Get

Data one of eNkMAIDCameraType
0x28 : D90
0x29 : D5000

3.167. 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

eNkMAIDLensType	Definition	D90	D5000
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.

3.168. AFMode

This will set AF mode.

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

[D90] This capability is affected by the setting of Capability_FocusMode, Capability_LockCamera.When the current value of this capability is 3(MF fixed),the ulOperations of this capability is set to read-only.

the setting of AF mode switch	LockCamera	AFMode
MF setting or a CPU lens is not attached		MF fixed
AF setting (a CPU lens is attached)	ON	AF-S, AF-C, AF-A , MF selected
	OFF	AF-S, AF-C, AF-A

[D5000] This capability is affected by the setting of Capability_FocusMode, Capability_ExposureMode. When the current value of this capability is 3(MF fixed),the ulOperations of this capability is set to read-only.

the setting of AF mode at information display	AFMode
MF setting (included a AF-S lens is attached with MF setting) or a AF-S lens is not attached	MF fixed
AF setting, and P,S,A,M (a AF-S lens is attached)	AF-S, AF-C, AF-A , MF selected
AF setting and Scene Modes (a AF-S lens is attached)	AF-A , MF selected

[common] When the value of this capability is AF-S(0), it is impossible to set the value of Capability_FocusAreaMode to “3D-tracking (11 points)”.
When the value of Capability_FocusAreaMode is “3D-tracking (11 points)”, if the value of this capability is set to AF-S(0), the value of Capability_FocusAreaMode is changed into “Dynamic” automatically.

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
ulType	kNkMAIDCapType_Callback
ulOperations	kNkMAIDCapOperation_Get, kNkMAIDCapOperation_Set

4.3. EventProc

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

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
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 SDRAM.

Capability kNkMAIDCapability_Capture
Object types Source
ulType kNkMAIDCapType_Process
ulOperations kNkMAIDCapOperation_Start

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

When preview image about shooting image is prepared, kNkMAIDEvent_AddPreviewImage is issued by module. And when main image is prepared, kNkMAIDEvent_Add is issued to source object.

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

4.18. Mode

Capability kNkMAIDCapability_Mode

Not supported.

4.19. Acquire

Capability kNkMAIDCapability_Acquire
Object types Image, Thumbnail
ulType kNkMAIDCapType_Process
ulOperations kNkMAIDCapOperation_Start

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

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

This will show the remain of battery by percent.

Capability kNkMAIDCapability_BatteryLevel

Object types Source

ulType kNkMAIDCapType_Integer

ulOperations kNkMAIDCapOperation_Get

[D90] The camera returns the 6 kind of value, 1, 20, 40, 60, 80, 100. When the value of this capability is 1, the current camera status will be set to the prohibition of taking a picture, and the value of Capability_LiveViewProhibit is set to "battery shortage"(0x00000100).

[D5000] The camera returns the 5 kind of value, 0, 5, 20, 35, 100. When the value of this capability is 5, the current camera status will be set to the prohibition of taking a picture, and the value of Capability_LiveViewProhibit is set to "battery shortage"(0x00000100).

Property Value	Warning level
0	TFT monitor display disabled.
5	Shutter-release disabled.
20	Change battery
35	Battery low
100	Battery full

[common] 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

ExposureMode \ Flash mode	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 Portrait Close Up Child Party/Indoor (SCENE) Pet Portrait (SCENE)	●,△	—	—	●,△	—	●
Landscape Sports Night Landscape (SCENE) Beach/Snow (SCENE) Sunset SCENE) Dusk/Dawn (SCENE) Candlelight (SCENE) Blossom (SCENE) Autumn Colors SCENE) Silhouette (SCENE) High Key (SCENE) Low Key (SCENE)	△	—	—	△	—	●
flash off	—	—	—	—	—	●,△
Food (SCENE)	●,△					—
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

In case of Capability_ExternalNewTypeFlashMode is "Repeating flash" (7) and Capability_ExposureMode is P,S,A,M, Rear-curtain sync (1) cannot be set and FrontCurtain(7) will be set.

When Capability_ExposureMode is P,S,A,M and internal and external flash is not active, the ulOperations of this capability is set to read-only.

[D90] When internal speed light is active and Capability_ExposureMode is “Landscape.”(7), or “Sports”(9), or “flash off”(13), the ulOperations of this capability is set to read-only.

[D5000] When internal speed light is active and Capability_ExposureMode is “Landscape.”(7), or “Sports”(9), or “flash off”(13), Night Landscape (SCENE), or Beach/Snow (SCENE)、or Sunset (SCENE)、or Dusk/Dawn (SCENE)、or Candlelight (SCENE)、or Blossom (SCENE)、or Autumn Colors (SCENE), or Silhouette (SCENE)、or High Key (SCENE)、or Low Key (SCENE)の場合 the ulOperations of this capability is set to read-only.

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 a 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 Item ID is same as Preview ID indicated by kNkMAIDEvent_AddPreviewImage.

5.2. RemoveChild

This event will be issued when the child is removed under a 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. AddPreviewImage

This will be issued when the preview image can be acquired.

Event kNkMAIDEvent_AddPreviewImage

Object types Source

data parameter Preview ID

This event notifies that the client can get the preview image about taking a picture on DRAM.

When the client take a picture on "RAW + JPEG(XXX)" mode, the preview event is issued only for JPEG image. Preview image event is not issued for RAW image and for a dust off ref photo.

Preview ID will be set to the data parameter of call back function. The data type of Preview ID is ULONG.

Item object will not be created when this event is issued, so client can't open Item Object with Preview ID. The client can open Item Object after the kNkMAIDEvent_AddImage event reception.

5.9. CaptureComplete

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

Event kNkMAIDEvent_CaptureComplete

Object types Source

data parameter None (always 0)

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

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	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

Free area of DRAM in the camera is not enough for taking a picture.

Result	kNkMAIDResult_BufferNotReady
Command	Start
Capability	Capture, AFCapture, CaptureDustImage
Explanation	The Image data is temporarily stored in the DRAM until it is transferred to the SD card or the host computer. While continuous shooting, the camera cannot take a picture if the DRAM is full.
Expected Action	The client sends capture command again or displays the message that the camera cannot take a picture.

6.3. NormalTTL

The speed light is set TTL mode.

Result	kNkMAIDResult_NormalTTL
Command	Start
Capability	Capture
Explanation	The camera cannot take a picture when an external speed light 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

This is not used in the current module

6.5. InvalidMedia

This is not used in the current module

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	In case of Capability_Capture or Capability_AFCapture, this error will be returned when auto focus operation is failed and the camera cannot take a picture.. 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 cannot 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 cannot 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.