DCAM-API

Property Reference

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HAMAMATSU

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INTRODUCTION

This manual describes the DCAM-API specification used to operate digital cameras manufactured by HAMAMATSU (hereafter referred to simply as “digital cameras”). The DCAM-API software development kit is referred to as the “SDK”. The DCAM-API driver that controls the digital cameras is referred to as the “module”.

The SDK consists of source code for sample applications that show how to access DCAM-API. SDK users are free to use this software in any way they like, such as partially modifying source codes and creating completely separate programs.

This SDK is designed to be particularly easy to understand. For this reason, the number of functions has been limited to a minimum, and the function calling formats are written in the C programming language.

An extended function is also defined which advanced integrators can control the additional functionality of a digital camera and/or the specific interface it can use.

Numeric values appearing in this text may differ depending on the digital camera used to capture images. Numeric values should be regarded simply as guides, and not as exact values.

OVERVIEW

DCAM-API "Property"

Several functions have been added for property in DCAM-API for version 3.0. The word "property" refers to a device parameter. Your application software programs can get, set and/or query device parameters with these new functions.

Each property has a unique ID and every property value is handled as double floating value even if it is an integer on the device.

Each property has its own attributes, minimum, maximum, stepping and/or default values and their own name. Some properties are enumerative types and their values also have associated text. We call such text as value text.

Value Types

There are three types of property values: MODE, LONG and REAL. These values are operated with 64bit double float variables. However, LONG and MODE are regarded as 32bit signed integer internally where as REAL is regarded as a 64bit float decimal. The LONG and REAL types are numerical values. The MODE type is not a numerical value but DCAM-API regards it as integer with unique IDs. Every MODE has text for each assigned value. Some LONG and REAL properties also have text.

DCAM-API defines the following flags

MODE	DCAMPROP_TYPE_MODE
LONG	DCAMPROP_TYPE_LONG
REAL	DCAMPROP_TYPE_REAL

The application can distinguish each value type with DCAMPROP_TYPE_MASK from the *attribute* member of **DCAM_PROPERTYATTR** structure. The application can also distinguish which property has the value text by using the DCAMPROP_ATTR_HASVALUETEXT flag.

For example,
DCAM_IDPROP_BINNING property is DCAMPROP_TYPE_MODE.
DCAM_IDPROP_TRIGGERTIMES property is DCAMPROP_TYPE_LONG.
DCAM_IDPROP_EXPOSURETIME property is DCAMPROP_TYPE_REAL.

Every property value on the device is associated with one of these three types. However, the property value type maybe changed in a future version of DCAM-API. The application should not assume the property value type and it should check the *attribute* member of **DCAM_PROPERTYATTR** structure for the value type to ensure compatibility.

The application can check the default value and range of each property. These are also included in **DCAM_PROPERTYATTR** structure.

Attributes

Each property has attributes. Each attribute indicates the characteristic of the property.

You can see following attributes in attribute member of DCAM_PROPERTYATTR structure.

READABLE	The value of this property can be read by the application
WRITABLE	The value of this property can be changed by the application
AUTOROUNDING	The property value will be changed if application does not set an accurate value. The module will usually round-up to the next valid value or round-down if the value is bigger than maximum. A MODE property will never have this attribute.
STEPPING_INCONSISTENT	The stepping value of this property is not consistent throughout its range
VOLATILE	The value of this property may be changed manually and/or automatically by the device
INFLUENTIAL	This property can automatically adjust another property when changed
DATASTREAM	Changing the value of this property will affect the data stream
ACCESSREADY	The value of this property may be read or changed during READY state. If the property does not have this attribute and you access it during READY state, DCAM returns the error DCAMERR_ACCESSDENY.
ACCESSBUSY	The value of this property may be read or changed during BUSY state. If the property does not have this attribute and you access it during BUSY state, DCAM returns the error DCAMERR_ACCESSDENY.

You can see following attributes in attribute2 member of DCAM_PROPERTYATTR structure.

ARRAYBASE	Some parameters are plural. For example MULTILINE requires several VPOS and VSIZE to specify each region. DCAM calls such mechanism as ARRAY. The top of element in an ARRAY has ARRAYBASE flag.
ARRAYELEMENT	When the property is one of element of ARRAY, it has ARRAYELEMENT flag

The application can get these attributes by using the **dcam_getpropertyattr()** function with **DCAM_PROPERTYATTR** structure. DCAM-API defines following flags.

In *attribute* member,

READABLE	DCAMPROP_ATTR_READABLE
WRITABLE	DCAMPROP_ATTR_WRITABLE
VOLATILE	DCAMPROP_ATTR_VOLATILE
INFLUENTIAL	DCAMPROP_ATTR_INFLUENTIAL
STEPPING_INCONSISTENT	DCAMPROP_ATTR_STEPPING_INCONSISTENT
AUTOROUNDING	DCAMPROP_ATTR_AUTOROUNDING
DATASTREAM	DCAMPROP_ATTR_DATASTREAM
ACCESSREADY	DCAMPROP_ATTR_ACCESSREADY
ACCESSLOCKED	DCAMPROP_ATTR_ACCESSLOCKED

In *attribute2* member,

ARRAYBASE	DCAMPROP_ATTR2_ARRAYBASE
ARRAYELLEMENT	DCAMPROP_ATTR2_ARRAYELEMENT

Property attributes are usually independent from the device but some devices may have different attributes from others. The application should never assume that a property attribute is the same between different camera models. For example, DCAM_IDPROP_SENSORTEMPERATURETARGET is readable and writable in some cameras, but in other cameras, this property is read-only.

Property Group (TBD:future)

DCAM-API 3.1 has many properties and this sometimes makes it hard to find out the properties which users want to control. This situation can also be a problem for the application developer.

DCAM-API 3.1 categorizes all properties into several groups. Neither the application nor the user needs to regard for these property groups, but they can be useful to understand each property and their relationship. The property groups are especially useful for applications that use enumerating functions.

DCAM-API 3.1 currently defines following groups and will expand this list when new devices with new property groups are developed.

SENSOR MODE	DCAMPROP_GROUP_SENSORMODE
TRIGGER	DCAMPROP_GROUP_TRIGGER
MECHANICAL SHUTTER	DCAMPROP_GROUP_MSHUTTER
EXPOSURE	DCAMPROP_GROUP_EXPOSURE
LIGHT MODE	DCAMPROP_GROUP_LIGHTMODE
SENSITIVITY	DCAMPROP_GROUP_SENSITIVITY
SENSOR COOLER	DCAMPROP_GROUP_SENSORCOOLER
READOUT SPEED	DCAMPROP_GROUP_READOUTSPEED
READOUT AREA	DCAMPROP_GROUP_READOUTAREA
CONTRAST ENHANCE	DCAMPROP_GROUP_CONTRASTENHANCE
COLOR BALANCE	DCAMPROP_GROUP_COLORBALANCE
ALU	DCAMPROP_GROUP_ALU
FRAME BUNDLE	DCAMPROP_GROUP_FRAMEBUNDLE
OUTPUT TRIGGER	DCAMPROP_GROUP_OUTPUTTRIGGER
TIMING INFORMATION	DCAMPROP_GROUP_SYNCTIMING
IMAGE INFORMATION	DCAMPROP_GROUP_IMAGEINFO
SYSTEM	DCAMPROP_GROUP_SYSTEM

Functions

There are eight new functions for property. The **dcam_getpropertyattr()** function gives the information of a property with **DCAM_PROPERTYATTR** structure. The **dcam_getpropertyvalue()** and **dcam_setpropertyvalue()** functions get and set the value of the property. The **dcam_setgetpropertyvalue()** function sets a value then gets the actual value of the property. The **dcam_querypropertyvalue()** function can return the value without setting the property when the application sets the value. And also it can get the next and prior value from a value. The **dcam_getnextpropertyid()** function gives all property IDs that the device supports. This can also enumerate properties that are updated when a property is changed. The **dcam_getpropertyname()** function gives the text of a property. And the **dcam_getpropertyvaluetext()** function with **DCAM_PROPERTYVALUETEXT** structure gives the text of a specified value of a property.

VALUE

Maximum, Minimum, Step and Default

Most properties have default values and value range limitations. The DCAMPROP_ATTR_HASRANGE flag in the *attribute* member of the **DCAM_PROPERTYATTR** structure indicates that *valuemax* and *valuemin* are valid members. The DCAMPROP_ATTR_HASSTEP flag indicates *valuestep* is a valid member and the DCAMPROP_ATTR_HASDEFAULT flag indicates *valuedefault* is a valid member.

The *valuemax* and *valuemin* members determine the minimum and maximum values that the property can be set to. These values affect the range of the values that can be read and the range that the property can be set.

The *valuestep* member is the value between two settable values. For example, if the property value can be set 3200 and 5100, the *valuestep* will be 1900.

The *valuedefault* member indicates the value which is set at initialization.

ATTRIBUTES - BASIC

READABLE, WRITABLE, read-only, write-only

Every property has its own readable and/or writable attributes. These attributes are indicated by the DCAMPROP_ATTR_READABLE and DCAMPROP_ATTR_WRITABLE flags in the *attribute* member of the **DCAM_PROPERTYATTR** structure.

If the *attribute* member has both DCAMPROP_ATTR_READABLE and DCAMPROP_ATTR_WRITABLE flags, the **dcam_getpropertyvalue()**, **dcam_setpropertyvalue()**, **dcam_setgetpropertyvalue()** and **dcam_querypropertyvalue()** functions can be used with this property.

If the *attribute* member only has DCAMPROP_ATTR_READABLE flag, the property can use the **dcam_getpropertyvalue()** function.

If the *attribute* member has only DCAMPROP_ATTR_WRITABLE flag, the property can use the **dcam_setpropertyvalue()** function.

AUTOROUNDING

Some properties allow the application to set inaccurate values, for example DCAM_IDPROP_EXPOSURETIME. In these cases, the DCAM module automatically rounds up to the next available value. If the value is greater than the maximum value, the maximum value will be set. The **dcam_getpropertyvalue()** function can be called after setting an auto-rounding value to confirm the new value. The **dcam_setgetpropertyvalue()** function can also be used to set a new value and then get the actual set value the property was set to.

The **dcam_querypropertyvalue()** function is also useful to get the actual set values without setting the new value.

STEPPING_INCONSISTENT

Some properties do not have a consistent stepping for its full range. In these cases, the application can get next or previous value by using the **dcam_querypropertyvalue()** function. This function can return the next value without setting a new value. If the property does not have the AUTOROUNDING attribute, the application has to use an accurate value when setting a new value otherwise an error will be generated.

For example, some devices support DCAM_IDPROP_BINNING_HORZ and can be set to 1, 2, 4, or 8. The *valuestep* member of the **DCAM_PROPERTYATTR** structure is set to 1 even though 1 is not the stepping value throughout the binning range. This value represents the minimum possible stepping throughout the range. The DCAMPROP_ATTR_STEPPING_INCONSISTENT flag is included in the *attribute* member to notify the application of this inconsistency.

VOLATILE

Some properties may be changed unexpectedly, e.g. DCAM_IDPROP_SENSITIVITYMODE. In case of the EB-CCD, there is a high voltage protection mechanism. If the sensor detects a strong light, the high voltage protection mechanism shuts off the intensifier to protect it from damage. The DCAM_IDPROP_SENSITIVITYMODE property will be DCAMPROP_SENSITIVITYMODE__OFF automatically.

DCAM-API currently has no way to notify when this happens so the application should use care when using VOLATILE properties.

DATASTREAM

Some properties affect the data stream e.g. DCAM_IDPROP_BINNING, DCAM_IDPROP_SUBARRAYMODE, DCAM_IDPROP_COLORTYPE, etc. Any property that affects the data stream will likely change the data size and/or type. Be sure to check these values after changing these properties.

ACCESSREADY

Some properties can not be accessed during READY state, e.g. DCAM_IDPROP_BINNING, DCAM_IDPROP_SUBARRAYMODE, DCAM_IDPROP_COLORTYPE, etc. A property with the ACCESSREADY flag can be read or changed during READY state. If the application attempts to access properties that do not have the ACCESSREADY flag during READY state, DCAM will return a DCAMERR_ACCESSDENY error.

ACCESSBUSY

Some properties can not be accessed during BUSY state, e.g. DCAM_IDPROP_SYSTEM_ALIVE. A property with the ACCESSBUSY flag can be read or changed during BUSY state. If the application attempts to access properties that do not have the ACCESSBUSY flag during BUSY state, DCAM will return a DCAMERR_ACCESSDENY error.

ATTRIBUTE - ADVANCED

UPDATED

Some properties may be changed when other properties are changed. For example, DCAM_IDPROP_EXPOSURETIME may be changed when DCAM_IDPROP_BINNING is changed. In this case, the application would have to check the value if necessary, but this kind of relation is different between each devices. So DCAM-API provides how to enumerate the updated properties.

This flag will be set not only value also minimum, maximum, step, attributes and so on.

See Sample – Enumerate value of UPDATED properties.

CHANNEL

DCAM-API 3.1 defines the new keyword CHANNEL which represents the color bands. B/W cameras have 1 channel. Color cameras have 3 channels.

If the device is capable of controlling each channel, the application can get, set and/or query the value of each channel. For example, the C7780 color camera can independently set the exposure times of the three color channels with DCAM_IDPROP_EXPOSURETIME. To set each channel, the application can use following macros.

DCAM_IDPROP_CHANNEL_R_(DCAM_IDPROP_EXPOSURETIME) is the exposure time of red channel.

DCAM_IDPROP_CHANNEL_G_(DCAM_IDPROP_EXPOSURETIME) is the exposure time of green one.

DCAM_IDPROP_CHANNEL_B_(DCAM_IDPROP_EXPOSURETIME) is the exposure time of blue one.

The above IDs are CHANNEL IDs. Other IDs like DCAM_IDPROP_EXPOSURETIME are GENERAL IDs. When setting new values, GENERAL IDs are superior to CHANNEL IDs. While individual CHANNEL values are set independently of the other channels, when a GENERAL value is set, all channels of that ID are set to that same value. The following table is a sample sequence of settings and results.

property ID to set	Value	R	G	B
Before setting	-	n/a	n/a	n/a
DCAM_IDPROP_EXPOSURETIME	0.11	**0.11**	**0.11**	**0.11**
DCAM_IDPROP_CHANNEL_R_(DCAM_IDPROP_EXPOSURETIME)	0.12	**0.12**	0.11	0.11
DCAM_IDPROP_CHANNEL_G_(DCAM_IDPROP_EXPOSURETIME)	0.13	0.12	**0.13**	0.11
DCAM_IDPROP_EXPOSURETIME	0.14	**0.14**	**0.14**	**0.14**
DCAM_IDPROP_CHANNEL_B_(DCAM_IDPROP_EXPOSURETIME)	0.15	0.14	0.14	**0.15**

See Sample – Control Each Channel value

VIEW

DCAM-API 3.1 defines a new keyword VIEW which represents the image sensor heads. If the device has more than one image sensor head, DCAM_IDPROP_NUMBEROF_VIEW will have the value of the number of sensor heads available.

The application can control individual views similar to how it controls individual channels. If the device has both multiple channels and views, the channel has priority and the index is packed. The Following are theoretical examples.

Sample. ORCA-D2 has dual sensors in a head..

DCAM_IDPROP_EXPOSURETIME

This controls all exposure time

DCAM_IDPROP_EXPOSURETIME + DCAM_IDPROP__VIEW * 1

This controls exposure time of first sensor

DCAM_IDPROP_EXPOSURETIME +DCAM_IDPROP__VIEW * 2

This controls exposure time of second sensor

When setting new values, VIEW IDs are superior to PLANE IDs, CHANNEL IDs are superior to VIEW IDs, and GENERAL IDs are superior to VIEW IDs. Following table is a sample sequence of setting and result.

property ID to set	Value	View 1	View 2
Before setting	-	n/a	n/a
DCAM_IDPROP_EXPOSURETIME	0.11	**0.11**	**0.11**
DCAM_IDPROP_EXPOSURETIME + DCAM_IDPROP__VIEW * 1	0.12	**0.12**	0.11
DCAM_IDPROP_EXPOSURETIME + DCAM_IDPROP__VIEW * 2	0.13	0.12	**0.13**
DCAM_IDPROP_EXPOSURETIME	0.14	**0.14**	**0.14**

RATIO

Certain properties that support multiple channels will also support RATIO. RATIO is the relative value for each channel and it is useful when locking relative values between each channel.

Properties that have RATIO control capability will have the DCAMPROP_ATTR_HASRATIO flag in the *attribute* member of **DCAM_PROPERTYATTR** structure.

The property ID can be used with DCAM_IDPROP_RATIO to control the ratio as in the examples below.

Sample 3 CCD camera

DCAM_IDPROP_EXPOSURETIME
this controls all channel exposure time by second.

DCAM_IDPROP_CHANNEL_R_(DCAM_IDPROP_EXPOSURETIME)
this controls red exposure time by second.

DCAM_IDPROP_CHANNEL_G_(DCAM_IDPROP_EXPOSURETIME)
this controls green exposure time by second.

DCAM_IDPROP_CHANNEL_B_(DCAM_IDPROP_EXPOSURETIME)
this controls blue exposure time by second.

DCAM_IDPROP_EXPOSURETIME_RATIO this controls all channel exposure time ratio.

DCAM_IDPROP_CHANNEL_R_(DCAM_IDPROP_EXPOSURETIME_RATIO)
this controls red channel exposure time ratio.

DCAM_IDPROP_CHANNEL_G_(DCAM_IDPROP_EXPOSURETIME_RATIO)
this controls green channel exposure time ratio.

DCAM_IDPROP_CHANNEL_B_(DCAM_IDPROP_EXPOSURETIME_RATIO)
this controls blue channel exposure time ratio.

DCAM-API calls the IDs with RATIO as RATIO ID. RATIO IDs are inferior to GENERAL IDs and CHANNEL IDs. The following table is a sample sequence of settings and results. When the application sets 1 to DCAM_IDPROP_EXPOSURETIME_RATIO, all the channel exposure time ratio values are set to 1 so the DCAM_IDPROP_EXPOSURETIME value is used in all channels.

property id to set	Value	R	G	B	R rel	G rel	B rel
Before setting	-	n/a	n/a	n/a	1	1	1
DCAM_IDPROP_EXPOSURETIME	0.05	**0.05**	**0.05**	**0.05**	1	1	1
DCAM_IDPROP_CHANNEL_R_(DCAM_IDPROP_EXPOSURETIME)	0.06	**0.06**	0.05	0.05	**1.2**	1	1
DCAM_IDPROP_CHANNEL_G_(DCAM_IDPROP_EXPOSURETIME_RATIO)	1.4	0.06	**0.07**	0.05	1.2	**1.4**	1
DCAM_IDPROP_EXPOSURETIME	0.05	**0.05**	**0.05**	**0.05**	**1**	**1**	1
DCAM_IDPROP_CHANNEL_R_(DCAM_IDPROP_EXPOSURETIME_RATIO)	1.2	**0.06**	0.05	0.05	**1.2**	1	1
DCAM_IDPROP_CHANNEL_G_(DCAM_IDPROP_EXPOSURETIME_RATIO)	1.4	0.06	**0.07**	0.05	1.2	**1.4**	1
DCAM_IDPROP_EXPOSURETIME	0.1	**0.12**	**0.14**	**0.1**	1.2	1.4	1

After setting a RATIO value, setting a new GENERAL value will not change the RATIO values. However, if you set a CHANNEL value and then set a new GENERAL value, all of the RATIO values will be reset to 1.

ARRAY

Some devices have plural similar parameters. For example, SENSOR_MODE__MULTILINE requires several regions where the device outputs with vertical fully binning. Each region requires VPOS as start position of vertical binning and VSIZE as number of binning lines. And there is a property which indicates the number of enabled regions. DCAM calls such mechanism as ARRAY.

DCAM calls each member of the property of ARRAY as ELEMENT. The property id of ELEMENT can be calculated by following equation.

iProp_ArrayBase + iPropStep_Element * N

iProp_ArrayBase and *iPropStep_Element* are the member of **DCAM_PROPERTYATTR** structure. You can get these values by the **dcam_getpropertyattr()** function.

And you can get the property id which is ARRAYBASE by the **dcam_getnextpropertyid()** function but not which has only ELEMENT attribute.

The property which indicates the number of enabled ELEMENT, it has HASARRAY attribute. This property should have READABLE attribute at least. If the device can control this number, this property also has WRITABLE attribute.

INITIALIZE IMPROPER

Almost properties are initialized with default value at dcam_open() function. But there are some exceptions. For example, sensor cooling parameters are not changed because some devices require a few minutes to reach stable sensor temperature. The DCAM application should not set values into these properties unconsciously.

To know which one is so, DCAMPROP_ATTR2_INITIALIZEIMPROPER is defined. This value is set in attribute2 member in DCAM_PROPERTYATTR structure. We recommend your application checks this flag and if exist, does not set any value unconsciously.

FUNCTION

Value text

Some properties have text for each value of the property. All MODE properties and some LONG and REAL properties use text for each value. These properties have the DCAMPROP_ATTR_HASVALUETEXT flag in the *attribute* member of **DCAM_PROPERTYATTR** structure.

See Sample – Enumerate Value Text

Enumeration

An application program generally would use fixed properties. However, some applications would want to support every available property for each device even if the details of the properties are unknown.

DCAM-API provides the functionality to dynamically determine all of the supported properties for applications that require this level of control. The **dcam_getnextpropertyid()** function provides the way to enumerate all supported, updated and/or volatile property IDs. It can also enumerate all property IDs that it may be affected before changing the property value.

There are two enumeration methods. The first method is used for enumeration of supported, updated or volatile properties. You call the **dcam_getnextpropertyid()** function with property ID 0 with the option DCAM_OPTION_SUPPORTED, DCAM_OPTION_UPDATED or DCAM_OPTION_VOLATILE. This function will return with the next property ID you requested. If the **dcam_getnextpropertyid()** function fails or returns 0 property, then there are no more property IDs.

The other enumeration method is used for influential and alternative properties. This method uses a loop with DCAM_OPTION_NEXT multiplied by index. In the loop, you have to set original property ID before calling the **dcam_getnextpropertyid()** function every time.

Please see following samples
Enumerate supported properties
Enumerate value of VOLATILE properties
Enumerate value of UPDATED properties
Enumerate value of INFLUENTIAL properties

PROPERTY GROUP

Trigger properties

Trigger properties control the synchronization for capturing images.

The trigger source can be set by the DCAM_IDPROP_TRIGGERSOURCE property. DCAMPROP_TRIGGERSOURCE_INTERNAL refers to the camera free-run mode. Setting the source to DCAMPROP_TRIGGERSOURCE_EXTERNAL allows you to set synchronization from an external trigger source. DCAMPROP_TRIGGERSOURCE_SOFTWARE refers to a third mode where the application can fire the trigger from the software to control synchronization.

There are three types of triggers: Edge, Level, and Pulse. In Edge trigger mode, the trigger timing specifies the beginning of an exposure. In Level trigger mode, the device uses the trigger active period to determine the length of the exposure. In Pulse mode, the active period is the time between two or more pulses. These trigger types can be selected using the DCAM_IDPROP_TRIGGERACTIVE property.

The DCAM_IDPROP_TRIGGERPOLARITY property can be used to choose the active level of an external trigger. The DCAM_IDPROP_TRIGGER_CONNECTOR property can be used to choose the external trigger input connector.

HAMAMATSU prepares several trigger modes. The DCAM_IDPROP_TRIGGER_MODE property can be used to choose following modes.

NORMAL	DCAMPROP_TRIGGER_MODE__NORMAL
PIV	DCAMPROP_TRIGGER_MODE__PIV
START	DCAMPROP_TRIGGER_MODE__START: In this mode, the device waits a trigger and after detecting of the trigger, the device will run as like as Internal Trigger mode but this property keeps “START” value.

The DCAM_IDPROP_TRIGGERTIMES property is a parameter that is necessary for some modes.

TRIGGER SOURCE & ACTIVE	Internal	Software			External		
TRIGGER MODE		Edge	Level	Pulse	Edge	Level	Pulse
NORMAL	OK	OK	OK	Few	OK	OK	Few
PIV	NG	OK	None	None	OK	None	None
START	NG	OK	NG	NG	OK	NG	NG

OK: The combination is supported.
NG: The combination is not defined in DCAM-API.
Few: The combination is defined but a few cameras support.
None: The combination can be defined but no cameras support it.

Advanced Trigger properties

DCAM supports not only GLOBAL SHUTTER sensor but also ROLLING SHUTTER one. GLOBAL SHUTTER means the timing of starting and stopping EXPOSURE for all sensor pixels are same timing. ROLLING SHUTTER means the timing is vertically rolling. CCD always has GLOBAL SHUTTER. Some CMOS sensors have both timing, and others only have ROLLING SHUTTER.

When a camera with ROLLING SHUTTER type of sensor supports trigger mode, a trigger can start EXPOSURE or READOUT but it is for the top line on the sensor. The timing for second and lower lines are following. So if you set EDGE trigger mode, then fire a trigger, the top line will start soon but the bottom line will start with one frame reading out time delay. DCAM_IDPROP_TRIGGGER_GLOBALEXPOSURE indicates this difference between GLOBAL and ROLLING SHUTTER type. If the sensor is running with GLOBAL SHUTTER, the value is DCAMPROP_TRIGGGER_GLOBALEXPOSURE__ALWAYES and in case of ROLLING, the value is DCAMPROP_TRIGGGER_GLOBALEXPOSURE__DELAYED.

You can know when GLOBAL EXPOSURE starts on ROLLING SHUTTER type of sensor with DCAM_IDPROP_TIMING_GLOBALEXPOSUREDELAY. The value unit is second.

On the other hand, some camera supports advanced trigger feature. When you choose this mode, camera is running in fastest speed internally and remembers the last image. When a trigger comes, then stops reading after current frame, and starts reading again after user selected time, then output data with summing these two readouts. In this case, the output data include the exposure before coming trigger, but surely all pixels are exposed from trigger coming timing. So if you are using a camera with a strobe then this feature is useful. DCAM calls this functionality as GLOBAL EXPOSURE EMULATION. To choose this mode, you set DCAMPROP_TRIGGGER_GLOBALEXPOSURE__EMULATE to DCAM_IDPROP_TIMING_GLOBALEXPOSUREDELAY.

And one more thing, this situation can also happen in SYNCREADOUT and START trigger mode. From the specification, GLOBAL EXPOSURE EMULATION is not useful. Therefore DCAM_IDPROP_TIMING_GLOBALEXPOSUREDELAY is not EFFECTIVE in these trigger mode. But the fist trigger is not different from others. In case of SYNCREADOUT trigger mode, usually the first trigger will abandon exposure before trigger. But user may want to get the image exposed between dcam_capture() to the first trigger. To get such image, DCAM_IDPROP_FIRSTTRIGGER_BEHAVIOR is defined. When this value is DCAMPROP_FIRSTTRIGGER_BEHAVIOR__STARTEXPOSURE, the camera starts EXPOSURE, and it is DCAMPROP_FIRSTTRIGGER_BEHAVIOR__STARTREADOUT, camera starts READOUT by the first trigger. This property is also EFFECTIVE for START trigger mode if the camera supports.

Above two properties are optional so you can set them independently from other trigger properties. These two properties automatically become EFFECTIVE.

Exposure time properties

The DCAM_IDPROP_EXPOSURETIME property controls exposure time of the camera. For cameras that have multiple channels, the exposure for each channel can be controlled individually. These cameras that have multiple channels can also be controlled using the DCAM_IDPROP_EXPOSURETIME_RATIO property.

Anti-blooming properties

Some devices support the ability to enable and disable anti-blooming. It can be controlled using the DCAM_IDPROP_LIGHTMODE property. When set to DCAMPROP_LIGHTMODE_HIGHLIGHT, the anti-blooming function is enabled. When it is DCAMPROP_LIGHTMODE_LOWLIGHT, anti-blooming function is disabled.

Sensitivity properties

The DCAM_IDPROP_SENSITIVITY property can refer to either the amplifier on the image sensor or a front-end device. Image Intensifier, EB-CCD and EM-CCD cameras have the capability to control the amplifier on the image sensor.

It is necessary for the application to check both DCAM_IDPROP_SENSITIVITY and DCAM_IDPROP_SENSITIVITY2 properties if it supports sensitivity because some systems use the EB-CCD camera with an image intensifier. Before starting capture, the application should turn the DCAM_IDPROP_SENSITIVITYMODE property on because some sensitivity devices have VOLATILE attributes to protect from strong light. When supporting both sensitivity properties, the property DCAM_IDPROP_SENSITIVITY2_MODE is set to DCAMPROP_SENSITIVITY2_MODE__INTERLOCK by default. This allows it to automatically turn on and off when DCAM_IDPROP_SENSITIVITYMODE is changed.

DCAM_IDPROP_PHOTONIMAGING is another sensitivity property that is useful in low light imaging.

Sensor temperature properties

HAMAMATSU provides many types of cooled CCD cameras. These include air-cooled, water-cooled, liquid nitrogen cooled, etc. The DCAM_IDPROP_SENSORCOOLER property can enable or disable the cooler function. The default value will vary for each cooling system so this value should be checked at initialization. Some cameras support the DCAM_IDPROP_SENSORTEMPERATURE property that reports the current temperature of the image sensor. This property is read-only. Some cameras support the DCAM_IDPROP_SENSORTEMPERATURETARGET property that controls the target temperature of cooling. These properties are supported by many HAMAMATSU cameras however if a digital camera supports one of these temperature properties, that does not guarantee the camera will support any of the other temperature properties.

Mechanical shutter properties

Some full frame transfer CCD cameras have an attached mechanical shutter. The DCAM_IDPROP_MECHANICALSHUTTER property can be used to control this shutter. By default, this property has the value of DCAMPROP_MECHANICALSHUTTER_AUTO which makes the mechanical shutter synchronized to the start of exposure and the start of the readout.

This property can be set to DCAMPROP_MECHANICALSHUTTER_AUTOMODE_OPEN_WHEN_EXPOSURE for normal use or to DCAMPROP_MECHANICALSHUTTER_AUTOMODE_CLOSE_WHEN_READOUT for flash lamp lighting. If necessary, the shutter can also be set to DCAMPROP_MECHANICALSHUTTER_OPEN or DCAMPROP_MECHANICALSHUTTER_CLOSE.

Back Focus Pos properties

ORCA-D2 has dual sensors in a head and a slave side sensor has a capability to control back focus by internal stage. The application can move this stage with DCAM_IDPROP_BACKFOCUSPOS_TARGET. When the target position is far from current one, the moving takes a while. The application can check the current stage position by DCAM_IDPROP_BACKFOCUSPOS_CURRENT.

ORCA-D2 remembers the stage positions in memory banks. You can recall it by setting a memory bank index into DCAM_IDPROP_BACKFOCUSPOS_LOADFROMMEMORY. These positions are stored by ORCA-D2 back focus calibration software. You can run it from DCAM Configurator. And this property has VALUETEXT. These values are set in same back focus calibration software, so we recommend you show these VALUETEXT instead of value itself.

If your application wants to update the value inside of memory banks, you can use DCAM_IDPROP_BACKFOCUSPOS_STORETOMEMORY. But ORCA-D2 has a limitation the memory bank should be same as DCAM_IDPROP_BACKFOCUSPOS_LOADFROMMEMORY. These two properties should not be initialized at beginning so they have DCAMPROP_ATTR2_INITIALIZEIMPROPER.

Contrast enhancement properties

There are two major properties for contrast enhancement. One is DCAM_IDPROP_CONTRASTGAIN and the other is DCAM_IDPROP_CONTRASTOFFSET. Some devices may have the VOLATILE attribute associated with these properties. Color cameras also support the DCAM_IDPROP_CONTRASTGAIN_RATIO property.

White balance properties

There are three white balance properties available for color cameras. The DCAM_IDPROP_WHITEBALANCEMODE property can be used to choose the mode of the white balance function. If this property value is set to OFF, the acquired data will be raw. If the property value is set to TEMPERATURE, the white balance will be controlled by DCAM_IDPROP_WHITEBALANCETEMPERATURE property. If the property value is set to USER PRESET, the white balance will be controlled by DCAM_IDPROP_WHITEBALANCEUSERPRESET property.

ALU properties

Some cameras support ALU functionality. The “Recursive” function, sometimes called “averaging”, is controlled by the DCAM_IDPROP_RECURSIVEFILTER property. When this property is OFF, the output data will be raw. When this property is ON, the output data will be averaged in the number of frames which is specified by DCAM_IDPROP_RECURSIVEFILTERFRAMES property.

The “Spot Noise Reducer” function is controlled by DCAM_IDPROP_SPOTNOISEREDUCER property. When this property is ON, the “Spot noise” which is produced on the sensor will be reduced but intensity is also darker than normal output.

The “Subtract” function is controlled by the DCAM_IDPROP_SUBTRACT property. When this property is OFF, the output data will be raw. When this property is ON, the output data is subtracted. The subtractive image is captured by setting the DCAM_IDPROP_STORESUBTRACTIMAGETOMEMORY property. This property is write-only.

Readout properties

Dual scan CCD cameras have two readout modes. One of these modes is faster which allows for a faster frame rate while the other mode is slower but allows for higher precision. The DCAM_IDPROP_READOUTSPEED property can control the readout speed. If the application sets the readout with DCAMPROP_READOUTSPEED__SLOWEST, the readout speed will be set to the slowest readout mode. If the application sets the readout with DCAMPROP_READOUTSPEED__FASTEST, the readout speed will be set to the fastest readout mode. The readout value after setting DCAMPROP_READOUTSPEED__FASTEST will be different. This value will be the actual value for the digital camera.

Binning and sub-array properties

The DCAM_IDPROP_BINNING property is used to control the binning of the camera. This MODE value determines the horizontal and vertical binning sizes that are set. Some devices also support independent binning modes. The DCAM_IDPROP_BINNING_HORZ property controls the horizontal binning while the DCAM_IDPROP_BINNING_VERT property controls the vertical binning. The DCAM_IDPROP_BINNING_INDEPENDENT property must be set ON in order for independent binning values to be used.

Four properties are used to control subarray.
The DCAM_IDPROP_SUBARRAYHPOS property controls the horizontal offset.
The DCAM_IDPROP_SUBARRAYHSIZE property controls the horizontal size.
The DCAM_IDPROP_SUBARRAYVPOS property controls the vertical offset.
The DCAM_IDPROP_SUBARRAYVSIZE property controls the vertical size.

The DCAM_IDPROP_SUBARRAYHPOS and DCAM_IDPROP_SUBARRAYVPOS properties can be changed during any state including BUSY state as they do not affect the data stream. The DCAM_IDPROP_SUBARRAYHSIZE and DCAM_IDPROP_SUBARRAYVSIZE properties can only be changed during UNSTABLE or STABLE state. These values are specified by sensor pixel unit therefore properties such as binning will not affect this value.

When setting subarray, there are two rules. The DCAM_IDPROP_SUBARRAYHPOS value plus the DCAM_IDPROP_SUBARRAYHSIZE value must be equal or smaller than the horizontal sensor size. And the DCAM_IDPROP_SUBARRAYVPOS value plus the DCAM_IDPROP_SUBARRAYVSIZE value must be equal or smaller than the vertical sensor size.

If the DCAM_IDPROP_SUBARRAYMODE property is OFF, these rules are not checked when changing each value. However, these rules are checked when the DCAM_IDPROP_SUBARRAYMODE is set to ON. If these properties break these rules, **dcam_setproperty(**DCAM_IDPROP_SUBARRAYMODE**)** fails.

Timing information properties

The DCAM_IDPROP_TIMING_READOUTTIME property gives the duration time of the frame readout. DCAM_IDPROP_INTERNAL_FRAMEINTERVAL property gives the duration time between two frame starts.

The DCAM_IDPROP_TIMING_CYCLICTRIGGERPERIOD property gives the time after end of readout that the camera works cyclic trigger in external or software trigger mode. If the next trigger is later than this cyclic trigger period, the trigger works immediately. But if the next trigger is during this period, the trigger will have jitter and can overlap exposure to readout.

The DCAM_IDPROP_TIMING_MINTRIGGERBLANKING property gives the minimum period between frame readout end and next valid trigger.

Tc is DCAM_IDPROP_TIMING_CYCLICTRIGGERPERIOD.
MinTB is DCAM_IDPROP_TIMING_MINTRIGGERBLANKING.
Tx is next exposure time.
Ti is trigger interval
Tb is trigger blanking period. It is from end of previous exposure to next trigger.

Following condition has to be approved.

```
// Ti = Tx + Tb      // this is a definition
if( Tx < Tc )
{
        ( Tb > Tc - Tx ) AND ( Tb >= MinTB )
}
else
{
        Tb >= MinTB
}
```

Output data type properties

The application can choose output data format with the DCAM_IDPROP_COLORTYPE property. DCAMPROP_COLORTYPE__BW is used to set monochrome output and DCAMPROP_COLORTYPE__RGB is used to set color output.

Depending on the digital camera, the application can get bits per channel information and set a new value. The values are predefined from DCAMPROP_BITSPERCHANNEL__8 to DCAMPROP_BITSPERCHANNEL__16.

Frame bundle properties

"Frame bundle" is a way to pack the output image data from the camera to reduce the number of VVALID_BEGIN, FRAME_START and FRAME_END events during capture. This is useful when events are occurring faster than the computer can process and the application cannot lose any frames.

The DCAM_IDPROP_FRAMEBUNDLE_MODE property enables or disables frame bundle mode. The DCAM_IDPROP_FRAMEBUNDLE_NUMBER property specifies how many frames are bundled.

Frame bundle mode makes 2D image data to 1D image data with horizontal dummy.

For example, if the camera outputs following image in non Frame bundle mode,

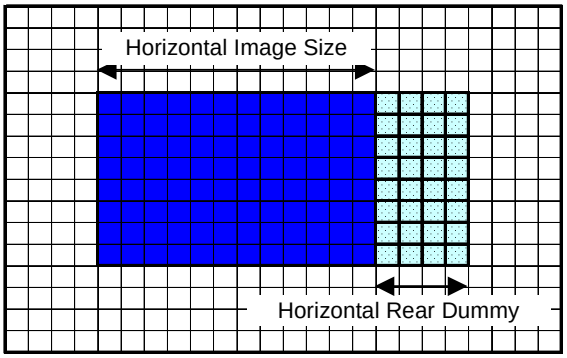
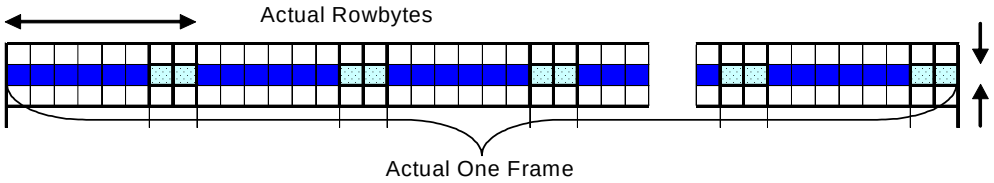


Image Output from The Camera with Dummy

In frame bundle mode, the image format is as following.



The application can get the actual row bytes by DCAM_IDPROP_FRAMEBUNDLE_ROWBYTES property

BUS speed property

Depending on the bus, the device can control the output data speed, e.g. IEEE 1394. DCAM_IDPROP_BUS_SPEED property can control the bus speed by relative number. This property is fixed by the device so there is no relationship between two or more devices.

System properties

Some cameras have different limitations of exposure time between internal and software/external trigger mode. If the application wants to use same limitations and does not care about the slower frame rate, the application can set the DCAM_IDPROP_SYSTEM_INTERNALEMULATION property to ON. When this property is enabled, DCAM-API automatically fires triggers to the camera so that the exposure time limitation looks the same as one in software/external trigger mode.

The DCAM_IDPROP_SYSTEM_OPTIONALRGBFILTER property can be used to choose the optical filter mode manually. This value is usually set by the DCAM configurator and stored in the registry when running the application under Microsoft Windows. However, if application wants to control this value, this property can be used to choose the color data mode. The value ON means an optional RGB filer is attached.

TECHNOLOGY

SENSOR MODE TDI

When using TDI mode, the application needs to set several properties. The most common mode is when the TDI is synchronized to the trigger pulse. For this mode, DCAM_IDPROP_SENSORMODE should be DCAMPROP_SENSORMODE__TDI. If the TDI can control the exposure time from trigger timing, the ID should be DCAMPROP_TRIGGERACTIVE__EDGE. Both modes should set DCAMPROP_TRIGGER_MODE__TDI to DCAM_IDPROP_TRIGGER_MODE.

In TDI mode, the camera outputs the image the same way as line sensor camera but the line rate is usually too high to capture each line into PC. So the application must set the number of bundle lines by DCAM_IDPROP_SENSORMODE_LINEBUNDLEHEIGHT and access to line bundled image.

FUNCTION REFERENCE

```
/* get the attribute of the property */
BOOL    dcam_getpropertyattr        ( HDCAM h, DCAM_PROPERTYATTR* param );

/* get current value of the property */
BOOL    dcam_getpropertyvalue       ( HDCAM h, int32 iProp, double* pValue );

/* set a value to the property */
BOOL    dcam_setpropertyvalue       ( HDCAM h, int32 iProp, double fValue );


/* set a value to the property then get actual set value */
BOOL    dcam_setgetpropertyvalue ( HDCAM h, int32 iProp, double* pValue, int32 option );

/* query the value when setting a value. */
BOOL    dcam_querypropertyvalue  ( HDCAM h, int32 iProp, double* pValue, int32 option );


/* get next id of the property  */
BOOL    dcam_getnextpropertyid      ( HDCAM h, int32* pProp, int32 option OPTION );

/* get name of the property  */
BOOL    dcam_getpropertyname        ( HDCAM h, int32 iProp, char* text, int32 textbytes );

/* get value text of the property  */
BOOL    dcam_getpropertyvaluetext( HDCAM h, DCAM_PROPERTYVALUETEXT* param );
```

dcam_getnextpropertyid()

Usage

Get next property ID with option.

Declaration

BOOL dcam_getnextpropertyid(HDCAM h, int32* iProp, int32 option OPTION);

Input arguments

HDCAM h;	handle to the camera
int32* iProp;	pointer to an int32 that receives next property id while the content of the pointer is the beginning of the id
int32 option;	specifies the type of id. This parameter can be one or more of the following values

DCAMPROP_OPTION_SUPPORT	content of *iProp* will be the ID of property that the device supports.
DCAMPROP_OPTION_UPDATED	content of *iProp* will be the ID of property which the value or mode has been changed. If the application gets the ID once, internal flag will be reset and the application cannot get this ID with this flag anymore until the property will be changed again.
DCAMPROP_OPTION_VOLATILE	content of *iProp* will be the ID of property which the value or mode has been changed unexpectedly by user manually or by device automatically. All of these properties have VOLATILE attribute and every time the application get same property list from the device.
DCAMPROP_OPTION_INFLUENCE	content of *iProp* will be the ID of property which the value or mode that may changed when the property stated by iProp has changed.
DCAMPROP_OPTION_ARRAYELEMENT	content of *iProp* will be the ID of next array element property. If the input iProp is not inside of array, this function returns DCAMERR_NOPROPERTY.

Result

Return value	determines if this function has succeeded or failed. If the return value is 0, the function has failed and the application can get the errorcode by calling dcam_getlasterror().
(int32)iProp;	is filled with the next ID which specified by *option* parameter if succeeded. The value NULL means end of id list.

Error value

DCAMERR_INVALIDHANDLE	The camera handle is invalid.
DCAMERR_INVALIDPARAM	The *iProp* argument is NULL.
DCAMERR_NOPROPERTY	Next property does not exist.

Explanation

This function provides a way to query all supported property IDs by a device. If the application calls this function with the *iProp* value set to 0, the function will return the next property ID in the iProp value. If you call this function in a loop where you set *iProp* with the value of the previous property ID, you will be able to retrieve all the property IDs that the device supports. The end of the list is determined when *iProp* returns 0. If the camera does not support the input property ID, the property ID will be the next value which it supports. Please see Sample - Enumerate supported properties.

If the application sets the *option* DCAMPROP_OPTION_UPDATED, this function enumerates only the properties that the value have changed. If the application sets the *option* DCAMPROP_OPTION_VOLATILE, this function enumerates all VOLATILE properties.

Reference

dcam_getpropertyattr()

Usage

Get the attributes of a property

Declaration

BOOL dcam_getpropertyattr(HDCAM h, DCAM_PROPERTYATTR* param);

Input Argument(s)

HDCAM h;	handle to the camera
DCAM_PROPERTYATTR* param;	pointer to the **DCAM_PROPERTYATTR** structure that is to receive the information

Error value

DCAMERR_INVALIDHANDLE	The camera handle is invalid
DCAMERR_INVALIDPARAM	The *param* argument is NULL or *cbSize* member is smaller than 64
DCAMERR_NOTSUPPORT	The camera does not support the property that *iProp* member specifies.

Explanation

This function fills the **DCAM_PROPERTYATTR** structure with the attribute of the property that is specified by *iProp* member. Before using this structure, the application should fill with 0 then set the *iProp* member.

If the *option* member has DCAMPROP_OPTION_UPDATED flag, this function assumes the specified id is the next updated one. If the camera does not support the input *iProp* property id, the property id will be the next value which it supports.

If the *option* member does not have DCAMPROP_OPTION_UPDATED flag and the camera does not support the *iProp* property id, this function failures and error code is DCAMERR_NOTSUPPORT.

Reference

DCAM_PROPERTYATTR

dcam_getpropertyname()

Usage

Get name of the property.

Declaration

```
BOOL    dcam_getpropertyname( HDCAM h, int32 iProp, char* text, int32 textbytes );
```

Argument(s)

HDCAM h;	specifies the camera
int32 iProp;	specifies the id of property which application wants to get the name
char* text;	pointer to the char buffer that is to receive the name of the property
int32 textbytes;	is the byte size of the buffer specified by *text* argument

Error value

DCAMERR_INVALIDHANDLE	The camera handle is invalid.
DCAMERR_INVALIDPARAM	The *text* argument is NULL or *textbytes* argument is not greater than 0.
DCAMERR_NOTSUPPORT	The camera does not support the property that *iProp* argument specifies.

Explanation

This function returns the character string as name of the property specified by the *iProp* argument. If the camera specified by *h* argument does not support the *iProp* property ID, this function will fail with error code DCAMERR_NOTSUPPORT.

Reference

dcam_getpropertyvalue()

Usage

Get current value of the property

Declaration

BOOL dcam_getpropertyvalue(HDCAM h, int32 iProp, double* pValue);

Argument(s)

HDCAM h;	specifies the camera.
int32 iProp;	specifies the id of property which application wants to get the value.
double* pValue;	pointer to the double variable that is to receive the value of the property:

Error value

DCAMERR_INVALIDHANDLE	The camera handle is invalid.
DCAMERR_INVALIDPARAM	The *pValue* argument is NULL.
DCAMERR_NOTSUPPORT	The camera does not support the property that *iProp* argument specifies.
DCAMERR_NOTREADABLE	The property does not support getting that *iProp* argument specifies.
DCAMERR_ACCESSDENY	The property does not allow to access during current DCAM status that *iProp* argument specifies.

Explanation

This function fills a double floating value into *pValue* argument with the property value specified by *iProp* argument.

Reference

dcam_querypropertyvalue(), **dcam_setpropertyvalue()**

dcam_getpropertyvaluetext()

Usage

Get value text of the property.

Declaration

BOOL dcam_getpropertyvaluetext(HDCAM h, DCAM_PROPERTYVALUETEXT* param);

Argument(s)

HDCAM h;	specifies the camera.
DCAM_PROPERTYVALUETEXT* param;	pointer to the DCAM_PROPERTYVALUETEXT structure that is to receive the information

Error value

DCAMERR_INVALIDHANDLE	The camera handle is invalid.
DCAMERR_INVALIDPARAM	The *param* argument is NULL or *cbSize* member is smaller than 20 or *text* member is NULL or *textbytes* member is not greater than 0.
DCAMERR_NOTSUPPORT	The camera does not support the property that *iProp* member specifies or the value that value member specifies.
DCAMERR_INVALIDVALUE	The camera does not support the value.

Explanation

This function returns the character string as a property value. The application has to set property ID as *iProp* and the value as a value member. If the camera does not support the property, this function fails and generates the error code DCAMERR_NOTSUPPORT. If the camera supports the property but the value is not available, the function fails and generates the error code DCAMERR_INVALIDVALUE.

Reference

dcam_querypropertyvalue()

Usage

Query the value without setting a value.

Declaration

```
BOOL    dcam_querypropertyvalue( HDCAM h, int32 iProp, double* pValue, int32 option );
```

Argument(s)

HDCAM h;	specifies the camera
int32 iProp;	specifies the id of property which application wants to query the value
double* pValue;	pointer to the double variable that is to receive the value of the property
int32 option;	specifies to request what kind of id. This parameter can be one of following values
DCAMPROP_OPTION_NONE	return value is the actual set value for the device when application calls **dcam_setpropertyvalue()**
DCAMPROP_OPTION_PRIOR	return value is the prior value
DCAMPROP_OPTION_NEXT	return value is the next value

Error value

DCAMERR_INVALIDHANDLE	The camera handle is invalid
DCAMERR_INVALIDPARAM	The *pValue* argument is NULL
DCAMERR_NOTSUPPORT	The camera does not support the property that *iProp* argument specifies
DCAMERR_INVALIDVALUE	The camera supports the property it does not have AUTOROUNDING attribute and the value is not accurate without DCAMPROP_OPTION_PRIOR or DCAMPROP_OPTION_NEXT flag in *option*
DCAMERR_OUTOFRANGE	The value or prior value or next value is out of range

Explanation

This function returns the current property value without setting a new value. If the *option* argument has DCAMPROP_OPTION_PRIOR or DCAMPROP_OPTION_NEXT, this function returns prior or next value. If the camera does not support the property, this function fails with the error code DCAMERR_NOTSUPPORT. If the camera supports the property but the prior or next values are out of range, this function fails and generates the error code DCAMERR_OUTOFVALUE

Value condition	Property attribute	PRIOR	No flag	NEXT
< minimum	No attr.	Out of range	Invalid	MIN
	AUTOROUNDING	Out of range	MIN	MIN
Minimum	No attr.	Out of range	MIN	MIN
	AUTOROUNDING	Out of range	MIN	MIN
Valid value	No attr.	Prior	Same	Next
	AUTOROUNDING	Prior	Same	Next
Invalid value	No attr.	Prior	Invalid	Next
	AUTOROUNDING	Prior	Actual	Next
Maximum	No attr.	Prior	Same	Out of range
	AUTOROUNDING	Prior	Same	Out of range
> Maximum	No attr.	MAX	Invalid	Out of range
	AUTOROUNDING	MAX	MAX	Out of range

* Invalid failure with DCAMERR_INVALIDVALUE
* Out of range failure with DCAMERR_OUTOFRANGE

Reference

dcam_getpropertyvalue(), **dcam_setpropertyvalue()**

dcam_setgetpropertyvalue()

Usage

Set a value to a property then get actual set value

Declaration

```
BOOL    dcam_setgetpropertyvalue( HDCAM h, int32 iProp, double* pValue, int32 option );
```

Argument(s)

HDCAM h;	specifies the camera
int32 iProp;	specifies the id of property which application wants to set
double* pValue;	pointer to the double variable that is to set and receive the value of the property
int32 option;	is reserved

Error value

DCAMERR_INVALIDHANDLE	The camera handle is invalid
DCAMERR_INVALIDPARAM	The *pValue* argument is NULL
DCAMERR_NOTSUPPORT	The camera does not support the property that *iProp* argument specifies
DCAMERR_INVALIDVALUE	The camera supports the property but the property does not have AUTOROUNDING attribute and specified value is not accurate
DCAMERR_OUTOFRANGE	The value is out of range
DCAMERR_NOTWRITABLE	The property does not support setting that *iProp* argument specifies
DCAMERR_ACCESSDENY	The property does not allow to access during current DCAM status that *iProp* argument specifies

Explanation

This function sets a double floating value specified by the *pValue* argument to the property specified by *iProp* then gets the accurate value if successful. If the camera does not support the *iProp* property id, this function will fail with the error code DCAMERR_NOTSUPPORT. If *pValue* argument is invalid, this function fails and generates the error code DCAMERR_INVALIDPARAM. If *iProp* property does not have AUTOROUNDING and the value specified by *pValue* is not a valid value, the function fails and generates the error code DCAMERR_INVALIDPARAM.

Reference

dcam_getpropertyvalue(), **dcam_setpropertyvalue()**

dcam_setpropertyvalue()

Usage

Set a value to a property

Declaration

BOOL dcam_setpropertyvalue(HDCAM h, int32 iProp, double fValue);

Argument(s)

HDCAM h;	specifies the camera
int32 iProp;	specifies the id of the property which the application wants to set
double fValue;	double variable that is to set the value of the property

Error value

DCAMERR_INVALIDHANDLE	The camera handle is invalid
DCAMERR_NOTSUPPORT	The camera does not support the property that *iProp* argument specifies
DCAMERR_INVALIDVALUE	The camera supports the property but the property does not have AUTOROUNDING attribute and specified value is not accurate
DCAMERR_OUTOFRANGE	The value is out of range
DCAMERR_NOTWRITABLE	The property does not support setting that *iProp* argument specifies
DCAMERR_ACCESSDENY	The property does not allow to access during current DCAM status that *iProp* argument specifies

Explanation

This function sets a double floating value specified by *fValue* into the property specified by *iProp*. If the camera specified by *h* argument does not support the *iProp* property id, this function will fail with the error code DCAMERR_NOTSUPPORT. If *iProp* property does not have AUTOROUNDING and the value specified by *fValue* is not valid value, the function fails and generates the error code DCAMERR_INVALIDPARAM.

Reference

dcam_getpropertyvalue(), dcam_querypropertyvalue()

DCAM_PROPERTYATTR

Usage

Get the attribute information of the property.

Declaration

```
typedef struct DCAM_PARAM_PROPERTYATTR
{
    /* input parameters */
    int32       cbSize;             // size of this structure
    int32       iProp;              // DCAMIDPROPERTY
    int32       option;             // DCAMPROPOPTION
    int32       iReserved1;         // reserved

    /* output parameters */
    int32       attribute;          // DCAMPROPATTRIBUTE
    int32       iGroup;             // reserved
    int32       iUnit;              // DCAMPROPUNIT
    int32       attribute2;         // DCAMPROPATTRIBUTE2

    double      valuemin;           // minimum value
    double      valuemax;           // maximum value
    double      valuestep;          // minimum stepping between a value and the
next
    double      valuedefault;       // default value

    int32       nMaxChannel;        // max channel
    int32       iReserved3;         // reserved
    int32       nMaxView;           // max view

    int32       iProp_NumberOfElement;  // number of elements for array
    int32       iProp_ArrayBase;        // base id of array if element
    int32       iPropStep_Element;      // step for iProp to next element
} DCAM_PROPERTYATTR;
```

Input Parameter

The caller application has to set these following members.

int32 cbSize;	byte size of this structure
int32 iProp;	property index specified which application wants to know
int32 option;	usually this should be DCAMPROP_OPTION_NONE. In this case, *iProp* means the property ID what the application wants to get this information. This member can be one of following values:
DCAMPROP_OPTION_UPDATED	content of *iProp* will be the next property ID which the attribute has been changed. If the application gets the ID once, internal flag will be reset and the application cannot get this ID with this flag anymore until the property will be changed again.
int32 iReserved1;	reserved

Output Parameter

The DCAM fills following members.

int32 attribute; the capability of the property .

type

DCAMPROP_TYPE_NONE	The value type is not defined. E.g. DCAM_IDPROP_STORESUBTRACTIMAGETOMEMORY
DCAMPROP_TYPE_MODE	The property has several levels, e.g. ON and OFF
DCAMPROP_TYPE_LONG	The property is a 32bit integer value
DCAMPROP_TYPE_REAL	The property is a 64bit double floating point value

capability

DCAMPROP_ATTR_READABLE	This property can be read
DCAMPROP_ATTR_WRITABLE	This property can be written
DCAMPROP_ATTR_STEPPING_INCONSISTENT	The step of property is not consistent
DCAMPROP_ATTR_VOLATILE	The value may be changed by other way. E.g. sensor temperature
DCAMPROP_ATTR_AUTOROUNDING	The value has automatic rounding capability
DCAMPROP_ATTR_ACCESSREADY	This property can be access during READY state
DCAMPROP_ATTR_ACCESSBUSY	This property can be access during BUSY state

information

DCAMPROP_ATTR_HASRANGE	*valuemin* and *valuemax* members are used
DCAMPROP_ATTR_HASSTEP	*valuestep* is used
DCAMPROP_ATTR_HASDEFAULT	*valuedefault* is used
DCAMPROP_ATTR_HASVALUETEXT	This property has the *text* for the values
DCAMPROP_ATTR_HASCHANNEL	This property can set the value for each channel
DCAMPROP_ATTR_INFLUENTIAL	This property is influential to other properties
DCAMPROP_ATTR_DATASTREAM	This property will affect data size, format or layout
DCAMPROP_ATTR_HASRATIO	This property can be controlled by ratio.
DCAMPROP_ATTR_HASVIEW	This property has view control

int32 iGroup; reserved.

int32 iUnit; the Unit ID of property.

DCAMPROP_UNIT_NONE	This property has no unit
DCAMPROP_UNIT_SECOND	The unit of this property is seconds
DCAMPROP_UNIT_CELSIUS	The unit of this property is Celsius degree
DCAMPROP_UNIT_KELVIN	The unit of this property is Kelvin degree
DCAMPROP_UNIT_METERPERSECOND	The unit of this property is meter per second
DCAMPROP_UNIT_PERSECOND	The unit of this property is hertz

int32 attribute2;	the extended capability of the property .
information	
DCAMPROP_ATTR2_ARRAYBASE	This property is the top of ARRAY property.
DCAMPROP_ATTR2_ARRAYELEMENT	iProp_NumberOfElement, iProp_ArrayBase and iPropStep_Element are valid.

double valuemin;	the minimum value of the property.
double valuemax;	the maximum value of the property.
double valuemstep;	the minimum step value of the property.
double valuedefault;	the default value of the property.
int32 nMaxChannel;	the maximum number of channel. If this value is 0, the camera has only 1 channel for this property. This value is guaranteed when *iProp* is GENERAL id.
int32 iReserved3;	reserved
int32 nMaxView	the number of view if this property support multiple view.
int32 iProp_NumberOfElement;	this value indicates the property id which can control how many elements are enable in this ARRAY property.
int32 iProp_ArrayBase;	this value indicates the property id which is the top of this ARRAY property.
int32 iProp_NumberOfElement;	this value is the step value for property id to access next element in this ARRAY property.

Explanation

Each property has its own attributes. The application can get these attributes by calling **dcam_getpropertyattr()** with this structure.

When using this structure, the application must fill required fields. The member *cbSize* is the byte size of this structure and *iProp* is the property ID to specify which property the application wants to get.

The application will get the members *attribute* and *iUnit*. Each bit of the *attribute* member is defined. Please look “Output Parameter” section.

Notes

The application should clear all fields to zero before using this structure.

Reference

dcam_getpropertyattr(),**dcam_getpropertyvaluetext()**

DCAM_PROPERTYVALUETEXT

Usage

Inquire feature value range and capability.

Syntax

```
#include "dcamprop.h"

typedef struct DCAM_PARAM_PROPERTYVALUETEXT
{
        int32       cbSize;         // size of this structure
        int32       iProp;          // DCAMIDPROP
        double      value;          // [in]
        char*       text;
        int32       textbytes;
} DCAM_PROPERTYVALUETEXT;
```

Input Parameter

int32 cbSize;	byte size of this structure
int32 iProp;	property index specified which application wants to know
double value;	The value which application wants to get the string
char* text;	The receive text buffer for the string
int32 textbytes;	The size of parameter *text*

Explanation

This structure returns the text value of the parameter *value* for the property specified by *iProp*.

Reference

dcam_getpropertyvaluetext()

PROPERTY REFERENCE

Sensor mode			
DCAM_IDPROP_SENSORMODE	R/W	MODE	107
DCAM_IDPROP_SENSORMODE_LINEBUNDLEHEIGHT	R/W	LONG	108
DCAM_IDPROP_CCDMODE	R/W	MODE	60
DCAM_IDPROP_EMCCD_CALIBRATIONMODE	R/W	MODE	70

Readout Speed			
DCAM_IDPROP_READOUTSPEED	R/W	LONG	

Trigger			
DCAM_IDPROP_TRIGGER_FIRSTEXPOSURE	R/W	MODE	146
DCAM_IDPROP_TRIGGERSOURCE	R/W	MODE	150
DCAM_IDPROP_TRIGGER_MODE	R/W	MODE	148
DCAM_IDPROP_TRIGGERACTIVE	R/W	MODE	143
DCAM_IDPROP_TRIGGER_GLOBALEXPOSURE	R/W	MODE	147
DCAM_IDPROP_FIRSTTRIGGER_BEHAVIOR	R/W	MODE	82
DCAM_IDPROP_TRIGGERPOLARITY	R/W	MODE	149
DCAM_IDPROP_TRIGGERTIMES	R/W	LONG	151
DCAM_IDPROP_INTERNALTRIGGER_HANDLING	R/W	MODE	89

Sensor cooler			
DCAM_IDPROP_SENSORCOOLER	R/W	MODE	105
DCAM_IDPROP_SENSORTEMPERATURE	R/O	REAL, Celsius	109
DCAM_IDPROP_SENSORTEMPERATURETARGET	R/W	REAL, Celsius	110
DCAM_IDPROP_SENSORCOOLERFAN	R/W	MODE	106

Back focus position			
DCAM_IDPROP_BACKFOCUSPOS_TARGET	R/W	REAL, Micrometer	47
DCAM_IDPROP_BACKFOCUSPOS_CURRENT	R/O	REAL, Micrometer	44
DCAM_IDPROP_BACKFOCUSPOS_STORETOMEMORY	R/W	LONG	46
DCAM_IDPROP_BACKFOCUSPOS_LOADFROMMEMORY	R/W	LONG	45

Sensitivity			
DCAM_IDPROP_DIRECTEMGAIN_MODE	R/W	MODE	69
DCAM_IDPROP_EMGAINPROTECT_MODE	R/W	MODE	72
DCAM_IDPROP_EMGAINPROTECT_AFTERFRAMES	R/W	LONG	71
DCAM_IDPROP_EMGAINWARNING_ALARM	R/W	MODE	73
DCAM_IDPROP_EMGAINWARNING_LEVEL	R/W	LONG	74
DCAM_IDPROP_EMGAINWARNING_STATUS	R/O	MODE	75
DCAM_IDPROP_PHOTONIMAGINGMODE	R/W	MODE	102

Feature			
DCAM_IDPROP_LIGHTMODE	R/W	MODE	
DCAM_IDPROP_EXPOSURETIME	R/W	REAL, Second	76
DCAM_IDPROP_CONTRASTGAIN	R/W	LONG	
DCAM_IDPROP_CONTRASTOFFSET	R/W	LONG	

Contrast enhance			
DCAM_IDPROP_HIGHDYNAMICRANGE_MODE	R/W	MODE	81

Binning and ROI			
DCAM_IDPROP_BINNING	R/W	MODE	46
DCAM_IDPROP_BINNING_HORZ	R/W	LONG	49
DCAM_IDPROP_BINNING_INDEPENDENT	R/W	MODE	50
DCAM_IDPROP_BINNING_VERT	R/W	LONG	51
DCAM_IDPROP_SUBARRAYHPOS	R/W	LONG	123
DCAM_IDPROP_SUBARRAYHSIZE	R/W	LONG	124
DCAM_IDPROP_SUBARRAYVPOS	R/W	LONG	126
DCAM_IDPROP_SUBARRAYVSIZE	R/W	LONG	127
DCAM_IDPROP_SUBARRAYMODE	R/W	MODE	125
DCAM_IDPROP_DIGITALBINNING_METHOD	R/W	MODE	68
DCAM_IDPROP_DIGITALBINNING_HORZ	R/W	LONG	65

ALU			
DCAM_IDPROP_CAPTUREMODE	R/W	MODE	46
DCAM_IDPROP_SUBTRACT	R/W	MODE	128
DCAM_IDPROP_SUBTRACTOFFSET	R/W	LONG	130
DCAM_IDPROP_SUBTRACTIMAGEMEMORY	R/W	MODE	129
DCAM_IDPROP_STORESUBTRACTIMAGETOMEMORY	W/O	MODE	121
DCAM_IDPROP_SHADINGCORRECTION	R/W	MODE	118
DCAM_IDPROP_SHADINGCALIBDATAMEMORY	R/W	MODE	111
DCAM_IDPROP_STORESHADINGCALIBDATATOMEMORY	W/O	MODE	120
DCAM_IDPROP_INTERFRAMEALU_ENABLE	R/W	MODE	84
DCAM_IDPROP_SPOTNOISEREDUCER	R/W	MODE	119
DCAM_IDPROP_RECURSIVEFILTER	R/W	MODE	103
DCAM_IDPROP_RECURSIVEFILTERFRAMES	R/W	LONG	104
DCAM_IDPROP_FRAMEAVERAGINGMODE	R/W	MODE	78
DCAM_IDPROP_FRAMEAVERAGINGFRAMES	R/W	LONG	77

Calibration and correction			
DCAM_IDPROP_DARKCALIB_STABLEMAXINTENSITY	R/W	LONG	62
DCAM_IDPROP_DARKCALIB_STABLESAMPLES	R/W	LONG	63
DCAM_IDPROP_DARKCALIB_SAMPLES	R/W	LONG	61
DCAM_IDPROP_SHADINGCALIB_STABLEMININTENSITY	R/W	LONG	115
DCAM_IDPROP_SHADINGCALIB_STABLEMAXERRORPERCENT	R/W	LONG	114
DCAM_IDPROP_SHADINGCALIB_STABLESAMPLES	R/W	LONG	116
DCAM_IDPROP_SHADINGCALIB_SAMPLES	R/W	LONG	113
DCAM_IDPROP_SHADINGCALIB_METHOD	R/W	MODE	112
DCAM_IDPROP_SHADINGCALIB_TARGET	R/W	LOGN	117
DCAM_IDPROP_TAPCALIB_GAIN	R/W	MODE [ARRAY]	134
DCAM_IDPROP_TAPGAINCALIB_METHOD	R/W	MODE	135
DCAM_IDPROP_TAPCALIB_BASEDATAMEMORY	R/W	MODE	132
DCAM_IDPROP_TAPCALIBDATAMEMORY	W/O	MODE	133
DCAM_IDPROP_STORETAPCALIBDATATOMEMORY	R/W	MODE	122
DCAM_IDPROP_NUMBEROF_TAPCALIB	R/W	LONG	96
DCAM_IDPROP_CALIBREGION_MODE	R/W	MODE [ARRAY]	55
DCAM_IDPROP_CALIBREGION_HPOS	R/W	LONG [ARRAY]	46
DCAM_IDPROP_CALIBREGION_HSIZE	R/W	LONG [ARRAY]	54
DCAM_IDPROP_NUMBEROF_CALIBREGION	R/W	LONG	93
DCAM_IDPROP_MASKREGION_MODE	R/W	MODE [ARRAY]	92
DCAM_IDPROP_MASKREGION_HPOS	R/W	LONG [ARRAY]	87
DCAM_IDPROP_MASKREGION_HSIZE	R/W	LONG [ARRAY]	91
DCAM_IDPROP_NUMBEROF_MASKREGION	R/W	LONG	95
DCAM_IDPROP_DEFECTCORRECT_HPOS	R/W	LONG [ARRAY]	64
DCAM_IDPROP_DEFECTCORRECT_METHOD	R/W	MODE [ARRAY]	65
DCAM_IDPROP_DEFECTCORRECT_MODE	R/W	MODE	66
DCAM_IDPROP_NUMBEROF_DEFECTCORRECT	R/W	LONG	94

Output intensity			
DCAM_IDPROP_OUTPUT_INTENSITY	R/W	MODE	97
DCAM_IDPROP_TESTPATTERN_KIND	R/W	MODE	136
DCAM_IDPROP_TESTPATTERN_OPTION	R/W	MODE	137

Output Trigger			
DCAM_IDPROP_OUTPUTTRIGGER_POLARITY	R/W	MODE	101
DCAM_IDPROP_OUTPUTTRIGGER_ACTIVE	R/W	MODE	98
DCAM_IDPROP_OUTPUTTRIGGER_DELAY	R/W	REAL, Second	99
DCAM_IDPROP_OUTPUTTRIGGER_PERIOD	R/W	REAL, Second	100

Synchronous timing			
DCAM_IDPROP_TIMING_READOUTTIME	R/O	REAL, Second	142
DCAM_IDPROP_TIMING_CYCLICTRIGGERPERIOD	R/O	REAL, Second	137
DCAM_IDPROP_TIMING_MINTRIGGERBLANKING	R/O	REAL, Second	141
DCAM_IDPROP_TIMING_MINTRIGGERINTERVAL	R/O	REAL, Second	
DCAM_IDPROP_TIMING_GLOBALEXPOSUREDELAY	R/O	REAL, Second	**Error! Bookmark not defined.**
DCAM_IDPROP_INTERNALFRAMERATE	R/W	REAL, 1/Second	86
DCAM_IDPROP_INTERNAL_FRAMEINTERVAL	R/W	REAL, Second	76
DCAM_IDPROP_INTERNALLINERATE	R/W	REAL, 1/Second	87
DCAM_IDPROP_INTERNALLINESPEED	R/W	REAL, Meter / Second	88

Frame bundle			
DCAM_IDPROP_FRAMEBUNDLE_MODE	R/W	MODE	79
DCAM_IDPROP_FRAMEBUNDLE_NUMBER	R/W	LONG	80
DCAM_IDPROP_FRAMEBUNDLE_ROWBYTES	R/O	LONG	81

Camera status			
DCAM_IDPROP_CAMERASTATUS_INPUTTRIGGER	R/O	MODE	57
DCAM_IDPROP_CAMERASTATUS_INTENSITY	R/O	MODE	58
DCAM_IDPROP_CAMERASTATUS_CALIBRATION	R/O	MODE	56

System information			
DCAM_IDPROP_COLORTYPE	R/W	MODE	
DCAM_IDPROP_BITSPERCHANNEL	R/W	LONG	52
DCAM_IDPROP_IMAGE_WIDTH	R/O	LONG	
DCAM_IDPROP_IMAGE_HEIGHT	R/O	LONG	
DCAM_IDPROP_IMAGE_ROWBYTES	R/O	LONG	
DCAM_IDPROP_IMAGE_FRAMEBYTES	R/O	LONG	
DCAM_IDPROP_NUMBEROF_CHANNEL	R/O	LONG	
DCAM_IDPROP_NUMBEROF_VIEW	R/O	LONG	
DCAM_IDPROP_SYSTEM_ALIVE	R/O	MODE	131
DCAM_IDPROP_TIMING_EXPOSURE	R/O	MODE	139

DCAM_IDPROP_BACKFOCUSPOS_CURRENT

Genre

Back Focus Position

Read write mode

R/O

Type of value

REAL, Micrometer

Explanation

This property allows you to read the current position of the back focus stage.

Reference

DCAM_IDPROP_BACKFOCUSPOS_LOADFROMMEMORY,
DCAM_IDPROP_BACKFOCUSPOS_STOREMEMORY,
DCAM_IDPROP_BACKFOCUSPOS_TARGET

DCAM_IDPROP_BACKFOCUSPOS_LOADFROMMEMORY

Genre

Back Focus Position

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to load a back focus position from the camera memory.

Reference

DCAM_IDPROP_BACKFOCUSPOS_CURRENT,
DCAM_IDPROP_BACKFOCUSPOS_STOREMEMORY,
DCAM_IDPROP_BACKFOCUSPOS_TARGET

DCAM_IDPROP_BACKFOCUSPOS_STORETOMEMORY

Genre

Back Focus Position

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to store the back focus stage position into camera memory.

Reference

DCAM_IDPROP_BACKFOCUSPOS_CURRENT,
DCAM_IDPROP_BACKFOCUSPOS_LOADFROMMEMORY,
DCAM_IDPROP_BACKFOCUSPOS_TARGET

DCAM_IDPROP_BACKFOCUSPOS_TARGET

Genre

Back Focus Position

Read write mode

R/W

Type of value

REAL, Micrometer

Explanation

This property allows you to set the target position of the back focus stage.

Reference

DCAM_IDPROP_BACKFOCUSPOS_CURRENT,
DCAM_IDPROP_BACKFOCUSPOS_LOADFROMMEMORY,
DCAM_IDPROP_BACKFOCUSPOS_STOREMEMORY

DCAM_IDPROP_BINNING

Genre

Binning and subarray

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the camera's binning mode. The camera may support one or more of the following values:

DCAMPROP_BINNING__1	
"1X1"	The binning is 1x1.
DCAMPROP_BINNING__2	
"2X2"	The binning is 2x2.
DCAMPROP_BINNING__4	
"4X4"	The binning is 4x4.
DCAMPROP_BINNING__8	
"8X8"	The binning is 8x8.
DCAMPROP_BINNING__16	
"16X16"	The binning is 16x16

If the DCAM_IDPROP_BINNING_INDEPENDENT property is set to "ON", this value is ignored and the DCAM_IDPROP_BINNING_HORZ and DCAM_IDPROP_BINNING_VERT properties are used for the binning settings.

Reference

DCAM_IDPROP_BINNING_INDEPENDENT

DCAM_IDPROP_BINNING_HORZ

Genre

Binning and subarray

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the horizontal binning. This property is only effective if DCAM_IDPROP_BINNING_INDEPENDENT is available and set to “ON”.

Reference

DCAM_IDPROP_BINNING_INDEPENDENT, DCAM_IDPROP_BINNING_VERT

DCAM_IDPROP_BINNING_INDEPENDENT

Genre

Binning and subarray

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to select binning mode to common or independent.

DCAMPROP_MODE__OFF	
"OFF"	The independent binning mode is off. Both values of horizontal and vertical binning are the same and they are specified by DCAM_IDPROP_BINNING.
DCAMPROP_MODE__ON	
"ON"	The independent binning mode is on. The values of horizontal and vertical binning are independent and they are specified by DCAM_IDPROP_BINNING_HORZ and DCAM_IDPROP_BINNING_VERT.

Reference

DCAM_IDPROP_BINNING_HORZ, DCAM_IDPROP_BINNING_VERT

DCAM_IDPROP_BINNING_VERT

Genre

Binning and subarray

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the vertical binning. This property is only effective if DCAM_IDPROP_BINNING_INDEPENDENT is available and set to “ON”.

Reference

DCAM_IDPROP_BINNING_HORZ, DCAM_IDPROP_BINNING_INDEPENDENT

DCAM_IDPROP_BITSPERCHANNEL

Genre

Readout

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to specify the channel bit depth. The device may support one or more the following.

DCAMPROP_BITSPERCHANNEL__8	
"8BIT"	The channel data depth is 8bits.
DCAMPROP_BITSPERCHANNEL__10	
"10BIT"	The channel data depth is 10bits.
DCAMPROP_BITSPERCHANNEL__12	
"12BIT"	The channel data depth is 12bits.
DCAMPROP_BITSPERCHANNEL__14	
" 14BIT"	The channel data depth is 14bits.
DCAMPROP_BITSPERCHANNEL__16	
"16BIT"	The channel data depth is 16bits.

This value determines the number of bits per channel, not per pixel. The DCAM_IDPROP_COLORTYPE property can be used to get the bits per pixel.

Reference

DCAM_IDPROP_COLORTYPE

DCAM_IDPROP_CALIBREGION_HPOS

Genre

Binning and ROI

Read write mode

R/W

Type of value

LONG [ARRAY]

Explanation

This property allows you to set a horizontal start address for the regions that will be calibrated

This is an ARRAY.

Reference

DCAM_IDPROP_CALIBREGION_HSIZE
DCAM_IDPROP_CALIBREGION_MODE
DCAM_IDPROP_NUMBEROF_CALIBREGION

DCAM_IDPROP_CALIBREGION_HSIZE

Genre

Binning and ROI

Read write mode

R/W

Type of value

LONG [ARRAY]

Explanation

This property allows you to set a horizontal size for the regions that will be calibrated.
This is an ARRAY.

Reference

DCAM_IDPROP_CALIBREGION_HPOS
DCAM_IDPROP_CALIBREGION_MODE
DCAM_IDPROP_NUMBEROF_CALIBREGION

DCAM_IDPROP_CALIBREGION_MODE

Genre

Binning and ROI

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to determine which regions you want to calibrate. This property can have one of following values:

DCAMPROP_MODE__OFF	
“OFF”	The region is not used for calibration
DCAMPROP_MODE__ON	
“ON”	The region is used for calibration

This is an ARRAY.

Reference

DCAM_IDPROP_CALIBREGION_HPOS
DCAM_IDPROP_CALIBREGION_HSIZE
DCAM_IDPROP_NUMBEROF_CALIBREGION

DCAM_IDPROP_CAMERASTATUS_CALIBRATION

Genre

Camera Status

Read write mode

R/O

Type of value

MODE

Explanation

This property shows you current camera status about calibration. This property is only effective during calibration.

DCAMPROP_CAMERASTATUS_CALIBRATION__DONE	
"DONE"	Calibration is done.
DCAMPROP_CAMERASTATUS_CALIBRATION__NOTYET	
"NOT YET"	Calibration is not completed yet.
DCAMPROP_CAMERASTATUS_CALIBRATION__NOTRIGGER	
"NO TRIGGER"	No trigger comes. Please check trigger source and cable connection.
DCAMPROP_CAMERASTATUS_CALIBRATION__TOOFREQUENTTRIGGER	
"TOO FREQUENT TRIGGER"	Trigger comes too much. Camera cannot run with current frequent trigger.
DCAMPROP_CAMERASTATUS_CALIBRATION__OUTOFADJUSTABLERANGE	
"OUT OF ADJUSTABLE RANGE"	The intensity is output of range for adjustment. Please control light source or speed.
DCAMPROP_CAMERASTATUS_CALIBRATION__UNSUITABLETABLE	
"UNSUITABLE TABLE"	Calibration table is unstable.

Reference

DCAM_IDPROP_CAPTUREMODE

DCAM_IDPROP_CAMERASTATUS_INPUTTRIGGER

Genre

Camera Status

Read write mode

R/O

Type of value

MODE

Explanation

This property shows you current camera status about input trigger.

DCAMPROP_CAMERASTATUS_INPUTTRIGGER__GOOD	
"GOOD"	Input trigger is good.
DCAMPROP_CAMERASTATUS_INPUTTRIGGER__NONE	
"NONE"	No triggers come.
DCAMPROP_CAMERASTATUS_INPUTTRIGGER__TOOFREQUENT	
"TOO FREQUENT"	Too many triggers come in

Reference

DCAM_IDPROP_CAMERASTATUS_INTENSITY

DCAM_IDPROP_CAMERASTATUS_INTENSITY

Genre

Camera Status

Read write mode

R/O

Type of value

MODE

Explanation

This property shows you current camera status about intensity during calibration.

DCAMPROP_CAMERASTATUS_INTENSITY__GOOD	
"GOOD"	Intensity is good.
DCAMPROP_CAMERASTATUS_INTENSITY__TOODARK	
"TOO DARK"	Intensity is too dark.
DCAMPROP_CAMERASTATUS_INTENSITY__TOOBRIGHT	
"TOO BRIGHT"	Intensity is too bright.
DCAMPROP_CAMERASTATUS_INTENSITY__UNCARE	
"UNCARE"	Calibration is not done.

Reference

DCAM_IDPROP_CAMERASTATUS_INPUTTRIGGER

DCAM_IDPROP_CAPTUREMODE

Genre

ALU

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the capture mode of the camera. The following values are predefined:

DCAMPROP_CAPTUREMODE__NORMAL	
“NORMAL”	The camera will output normal image data.
DCAMPROP_CAPTUREMODE__DARKCALIB	
“DARK CALIBRATION”	The camera will output data for dark calibration.
DCAMPROP_CAPTUREMODE__SHADINGCALIB	
“SHADING CALIBRATION”	The camera will output data for shading calibration.
DCAMPROP_CAPTUREMODE__TAPGAINCALIB	
“TAP GAIN CALIBRATION”	The camera will calibrate gain parameter of each tap.
DCAMPROP_CAPTUREMODE__BACKFOCUSCALIB	
“BACK FOCUS CALIBRATION”	The camera will calibrate back focus position.

Changing this value is necessary when using background subtraction, shading correction, tap gain calibration or back focus calibration. It is important to capture in the proper capture mode prior to using certain correction methods. You can wait DCAM_EVENT_CAPTUREEND to detect calibration is finished.

If the camera supports tap gain calibration, it is best to use this first. X-Rray line and TDI cameras support this.

If the camera supports back focus calibration, it is best to use this first. ORCA-D2 supports this.

Use dark calibration before storing a new background image. Use shading calibration before storing a new shading image.

Reference

DCAM_IDPROP_DARKCALIB_STABLEMAXINTENSITY
DCAM_IDPROP_NUMBEROF_TAPCALIB
DCAM_IDPROP_SHADINGCALIB_SAMPLES
DCAM_IDPROP_SHADINGCALIB_STABLEMAXERRORPERCENT
DCAM_IDPROP_SHADINGCALIB_METHOD
DCAM_IDPROP_SHADINGCALIB_STABLEMININTENSITY
DCAM_IDPROP_SHADINGCALIB_STABLESAMPLES
DCAM_IDPROP_SHADINGCALIB_TARGET
DCAM_IDPROP_SHADINGCALIBDATAMEMORY
DCAM_IDPROP_SHADINGCORRECTION
DCAM_IDPROP_STORESHADINGCALIBDATATOMEMORY
DCAM_IDPROP_STORESUBTRACTIMAGETOMEMORY
DCAM_IDPROP_STORETAPCALIBDATATOMEMORY
DCAM_IDPROP_SUBTRACT
DCAM_IDPROP_SUBTRACTIMAGEMEMORY
DCAM_IDPROP_SUBTRACTOFFSET
DCAM_IDPROP_TAPCALIB_BASEDATAMEMORY
DCAM_IDPROP_TAPCALIB_GAIN
DCAM_IDPROP_TAPCALIBDATAMEMORY
DCAM_IDPROP_TAPGAINCALIB_METHOD

DCAM_IDPROP_CCDMODE

Genre

Readout

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the output port of the sensor. This value can be one of the following values:

DCAMPROP_CCDMODE__NORMALCCD	
" NORMAL CCD"	Output the image data through the normal readout port
DCAMPROP_CCDMODE__EMCCD	
"EM CCD"	Output the image data through the EM readout port

If this property is absent, the device only has one readout port. If this property has been set to EM CCD, the value of DCAM_IDPROP_SENSITIVITY will affect the output image.

Reference

DCAM_IDPROP_EMCCD_CALIBRATIONMODE
DCAM_IDPROP_SENSITIVITY

DCAM_IDPROP_DARKCALIB_SAMPLES

Genre

Calibration and correction

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the total number of samples for averaging during dark calibration.

If the SENSOR type is AREA, sample unit is one frame, if the SENSOR type is LINE/TDI, sample unit is one line.

Reference

DCAM_IDPROP_DARKCALIB_STABLEMAXINTENSITY
DCAM_IDPROP_DARKCALIB_STABLESAMPLES

DCAM_IDPROP_DARKCALIB_STABLEMAXINTENSITY

Genre

Calibration and correction

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the maximum acceptable intensity value for dark calibration. If there is a value that exceeds this set value, the dark calibration process will discard the data.

Reference

DCAM_IDPROP_CAPTUREMODE

DCAM_IDPROP_DARKCALIB_STABLESAMPLES

Genre

Calibration and correction

Read write mode

R/W

Type of value

LONG

Explanation

No. of times data is confirmed

This property allows you to set the minimum number of stable samples. Stable samples are data that pass all of conditions which are set by other properties, such as the following:

DCAM_IDPROP_DARKCALIB_STABLEMAXINTENSITY

If this value is maximum, camera will calibrate with any incoming data.

Reference

DCAM_IDPROP_DARKCALIB_SAMPLES
DCAM_IDPROP_DARKCALIB_STABLEMAXINTENSITY

DCAM_IDPROP_DEFECTCORRECT_HPOS

Genre

Calibration and correction

Read write mode

R/W

Type of value

LONG [ARRAY]

Explanation

This property allows you to set the horizontal pixel position which you want to correct the data forcefully. The correct method is specified by DCAM_IDPROP_DEFECTCORRECT_METHOD.

This property is an ARRAY. You can make some number of these properties enable by DCAM_IDPROP_NUMBEROF_DEFECTCORRECT.

Reference

DCAM_IDPROP_DEFECTCORRECT_METHOD
DCAM_IDPROP_DEFECTCORRECT_MODE
DCAM_IDPROP_NUMBEROF_DEFECTCORRECT

DCAM_IDPROP_DEFECTCORRECT_METHOD

Genre

Calibration and correction

Read write mode

R/W

Type of value

MODE [ARRAY]

Explanation

This property allows you to set the method how to correct the data which is specified by DCAM_IDPROP_DEFECTCORRECT_HPOS. You can choose following methods.

DEFECTCORRECT_METHOD__CEILING	
" CEILING"	Output data becomes brightest value.
DEFECTCORRECT_METHOD__PREVIOUS	
" PREVIOUS "	Output data is same as previous pixel.

This property is an ARRAY. You can enable some of these properties with DCAM_IDPROP_NUMBEROF_DEFECTCORRECT.

Reference

DCAM_IDPROP_DEFECTCORRECT_HPOS
DCAM_IDPROP_DEFECTCORRECT_MODE
DCAM_IDPROP_NUMBEROF_DEFECTCORRECT

DCAM_IDPROP_DEFECTCORRECT_MODE

Genre

Calibration and correction

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to enable defect correction. You can choose following values.

DCAMPROP_MODE__OFF	
" OFF"	DEFECTCORRECT is disabled.
DCAMPROP_MODE__ON	
"ON "	DEFECTCORRECT is enabled.

This property is an ARRAY. You can enable several of these properties with DCAM_IDPROP_NUMBEROF_DEFECTCORRECT.

Reference

DCAM_IDPROP_DEFECTCORRECT_HPOS
DCAM_IDPROP_DEFECTCORRECT_METHOD
DCAM_IDPROP_NUMBEROF_DEFECTCORRECT

DCAM_IDPROP_DIGITALBINNING_HORZ

Genre

Binning and ROI

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to specify the digital binning mode of the camera. The following values are predefined:

1	Output data is not compressed.
2	Output data is compressed from 2 horizontal pixels to 1.

The compression method is selected by DCAM_IDPROP_DIGITALBINNING_METHOD.

Reference

DCAM_IDPROP_DIGITALBINNING_METHOD

DCAM_IDPROP_DIGITALBINNING_METHOD

Genre

Sensitivity

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to choose the method of digital binning. Following values are predefined:

DCAMPROP_DIGITALBINNING_METHOD__MINIMUM	
“MINIMUM”	The output data is lower one.
DCAMPROP_DIGITALBINNING_METHOD__MAXIMUM	
“MAXIMUM”	The output data is higher one.
DCAMPROP_DIGITALBINNING_METHOD__ODD	
“ODD”	The output data is the data of pixel at odd horizontal address.
DCAMPROP_DIGITALBINNING_METHOD__EVEN	
“EVEN”	The output data is the data of pixel at even horizontal address.
DCAMPROP_DIGITALBINNING_METHOD__SUM	
“SUM”	The output data is sum of two data.
DCAMPROP_DIGITALBINNING_METHOD__AVERAGE	
“AVERAGE”	The output data is average of two data.

This property will be effective if the value of DCAM_IDPROP_DIGITALBINNING_HPOS is larger than 1.

Reference

DCAM_IDPROP_DIGITALBINNING_HPOS

DCAM_IDPROP_DIRECTEMGAIN_MODE

Genre

Sensitivity

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to set the values of DCAM_IDPROP_SENSITIVITY as absolute values instead of relative values. This property can have one of following values:

DCAMPROP_MODE__OFF	
“OFF”	DCAM_IDPROP_SENSITIVITY is relative value.
DCAMPROP_MODE__ON	
“ON”	DCAM_IDPROP_SENSITIVITY is absolute value.

If this property is set to “ON”, the values provided by DCAM_IDPROP_SENSITIVITY will represent the actual EM gain magnification.

For example, if the current EM gain magnification is 4x and user wants to 10 times that value, then user can set DCAM_IDPROP_SENSITIVITY to 40 to achieve 40x gain

The minimum and maximum limits of DCAM_IDPROP_SENSITIVITY will also change to the absolute values.

Reference

DCAM_IDPROP_SENSITIVITY

DCAM_IDPROP_EMCCD_CALIBRATIONMODE

Genre

Readout

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the special readout mode for EM-CCD sensor. This property can have one of following values:

DCAMPROP_MODE__OFF	
“OFF”	The EM Calibration mode is OFF.
DCAMPROP_MODE__ON	
“ON”	The EM Calibration mode is ON.

If this property is set to “ON”, the EM output is not amplified. This is prepared for calibration of EM gain. This means DCAM_IDPROP_SENSITIVITY is not effective.

This property is only effective when DCAM_IDPROP_CCDMODE is set to DCAMPROP_EMREADOUTMODE__EMREADOUT if exists.

Reference

DCAM_IDPROP_CCDMODE

DCAM_IDPROP_EMGAINPROTECT_AFTERFRAMES

Genre

Sensitivity

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to specify the number of frames which EM Gain protection will continue to work after EM warning status becomes WARNING.

This property is only effective when DCAM_IDPROP_EMGAINPROTECT_MODE is set to ON and DCAM_IDPROP_CCDMODE is DCAMPROP_CCDMODE__EMCCD.

Reference

DCAM_IDPROP_EMGAINWARNING_ALARM
DCAM_IDPROP_EMGAINWARNING_LEVEL
DCAM_IDPROP_EMGAINWARNING_STATUS
DCAM_IDPROP_EMGAINPROTECT_MODE

DCAM_IDPROP_EMGAINPROTECT_MODE

Genre

Sensitivity

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to turn EM Gain protection on and/or off. This property can have one of following values:

DCAMPROP_MODE__OFF	
“OFF”	The EM Gain protection is disabled.
DCAMPROP_MODE__ON	
“ON”	The EM Gain protection is enabled.

If this property is set to “ON”, the intensity of output will be 0 when EM Gain protection is working. To recover from this, you have to stop capturing by dcam_idle().

Reference

DCAM_IDPROP_EMGAINWARNING_ALARM
DCAM_IDPROP_EMGAINWARNING_LEVEL
DCAM_IDPROP_EMGAINWARNING_STATUS
DCAM_IDPROP_EMGAINPROTECT_AFTERFRAMES

DCAM_IDPROP_EMGAINWARNING_ALARM

Genre

Sensitivity

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the special readout mode for EM-CCD sensor. This property can have one of following values:

DCAMPROP_MODE__OFF	
“OFF”	The EM Calibration mode is OFF.
DCAMPROP_MODE__ON	
“ON”	The EM Calibration mode is ON.

If this property is set to “ON”, the EM output is not amplified. This is prepared for calibration of EM gain. This means DCAM_IDPROP_SENSITIVITY is not effective.

This property is only effective when DCAM_IDPROP_CCDMODE is set to DCAMPROP_EMREADOUTMODE__EMREADOUT if exists.

Reference

DCAM_IDPROP_EMGAINWARNING_LEVEL
DCAM_IDPROP_EMGAINWARNING_STATUS
DCAM_IDPROP_EMGAINPROTECT_MODE
DCAM_IDPROP_EMGAINPROTECT_AFTERFRAMES

DCAM_IDPROP_EMGAINWARNING_LEVEL

Genre

Sensitivity

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to specify the level of EM Gain Warning for EM-CCD sensor. If this property is big, less input set to “ON”, the EM output is not amplified. This is prepared for calibration of EM gain. This means DCAM_IDPROP_SENSITIVITY is not effective.

This property is only effective when DCAM_IDPROP_CCDMODE is set to DCAMPROP_EMREADOUTMODE__EMREADOUT if exists.

Reference

DCAM_IDPROP_EMGAINWARNING_ALARM
DCAM_IDPROP_EMGAINWARNING_STATUS
DCAM_IDPROP_EMGAINPROTECT_MODE
DCAM_IDPROP_EMGAINPROTECT_AFTERFRAMES

DCAM_IDPROP_EMGAINWARNING_STATUS

Genre

Sensitivity

Read write mode

R/O

Type of value

MODE

Explanation

This property allows you to specify the special readout mode for EM-CCD sensor. This property can have one of following values:

DCAMPROP_EMGAINWARNING_STATUS__NORMAL	
“OFF”	The EM Calibration mode is OFF.
DCAMPROP_MODE__ON	
“ON”	The EM Calibration mode is ON.

If this property is set to “ON”, the EM output is not amplified. This is prepared for calibration of EM gain. This means DCAM_IDPROP_SENSITIVITY is not effective.

This property is only effective when DCAM_IDPROP_CCDMODE is set to DCAMPROP_EMREADOUTMODE__EMREADOUT if exists.

Reference

DCAM_IDPROP_EMGAINWARNING_ALARM
DCAM_IDPROP_EMGAINWARNING_LEVEL
DCAM_IDPROP_EMGAINPROTECT_MODE
DCAM_IDPROP_EMGAINPROTECT_AFTERFRAMES

DCAM_IDPROP_EXPOSURETIME

Genre

Features

Read write mode

R/W

Type of value

REAL, Second

Explanation

The property allows you to specify the exposure time in seconds.

This value may have various steps depending on the camera. For example, C9100 EM-CCD camera has 10µs step through the whole range. C7190-2x/4x/5x EB-CCD camera has fixed step 30ms. C4742-95 ORCA has two steps. One is about 100 µs step below 110ms and the other is 110ms above 110ms.

The application can use **dcam_querypropertyvalue()** with DCAM_OPTION_NEXT to get accurate value.

Some RGB cameras support this property with channel.

Reference

DCAM_IDPROP_FRAMEAVERAGINGFRAMES

Genre

ALU

Read write mode

R/W

Type of value

LONG

Explanation

This property is used to set the number of frames to use for the frame averaging function. This property is only effective when DCAM_IDPROP_FRAMEAVERAGINGMODE is set to DCAMPROP_MODE__ON.

Reference

DCAM_IDPROP_FRAMEAVERAGINGMODE

DCAM_IDPROP_FRAMEAVERAGINGMODE

Genre

ALU

Read write mode

R/W

Type of value

MODE

Explanation

This property is used to enable frame averaging mode.

DCAMPROP_MODE__OFF	
"OFF"	The FRAME AVERAGING is turned off.
DCAMPROP_MODE__ON	
"ON"	The FRAME AVERAGING is turned on.

The number of frame is set by This property turns FRAME AVERAGING on and off.

Reference

DCAM_IDPROP_FRAMEAVERAGINGFRAMES

DCAM_IDPROP_FRAMEBUNDLE_MODE

Genre

Frame bundle

Read write mode

R/W

Type of value

MODE

Explanation

This property is used to enable frame bundle mode.

DCAMPROP_MODE__OFF	
"OFF"	The frames are not bundled.
DCAMPROP_MODE__ON	
"ON"	The frames are bundled.

Reference

DCAM_IDPROP_FRAMEBUNDLE_NUMBER
DCAM_IDPROP_FRAMEBUNDLE_ROWBYTES

DCAM_IDPROP_FRAMEBUNDLE_NUMBER

Genre

Frame bundle

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to specify how many frames to bundled.

Reference

DCAM_IDPROP_FRAMEBUNDLE_MODE
DCAM_IDPROP_FRAMEBUNDLE_ROWBYTES

DCAM_IDPROP_FRAMEBUNDLE_ROWBYTES

Genre

Frame bundle

Read write mode

R/O

Type of value

LONG

Explanation

This property returns the rowbytes in a frame.

Reference

DCAM_IDPROP_FRAMEBUNDLE_MODE

DCAM_IDPROP_FIRSTTRIGGER_BEHAVIOR

Genre

Trigger

Read write mode

R/W

Type of value

MODE

Explanation

This property is used to get or set behavior of first coming trigger after dcam_capture().

DCAMPROP_FIRSTTRIGGER_BEHAVIOR__STARTEXPOSURE	
"START EXPOSURE"	Camera starts exposure by first trigger. The first image is exposed after the first trigger.
DCAMPROP_FIRSTTRIGGER_BEHAVIOR__STARTREADOUT	
"START READOUT"	Camera reads out an image by first trigger. The first image includes expose between dcam_capture() and the first trigger.

If camera supports this property, it becomes EFFECTIVE in START or SYNCREAOUT trigger. In other trigger mode, this is not EFFECTIVE.

Reference

DCAM_IDPROP_HIGHDYNAMICRANGE_MODE

Genre

Contrast enhance

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to enable or disable high dynamic range mode. When enabled, DCAM_IDPROP_CONTRASTGAIN setting will be ignored.

DCAMPROP_MODE__OFF	
“OFF”	The high dynamic range mode is OFF.
DCAMPROP_MODE__ON	
“ON”	The high dynamic range mode is ON.

Reference

DCAM_IDPROP_CONTRASTGAIN

DCAM_IDPROP_INTERFRAMEALU_ENABLE

Genre

ALU

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to enable or disable inter frame ALU function. This property can have one of following values:

DCAMPROP_INTERFRAMEALU_ENABLE__OFF	
“OFF”	The inter frame ALU is disable in any trigger source.
DCAMPROP_INTERFRAMEALU_ENABLE__TRIGGERSOURCE_ALL	
“TRIGGER SOURCE ALL”	The inter frame ALU is enable in any trigger source.
DCAMPROP_INTERFRAMEALU_ENABLE__TRIGGERSOURCE_INTERNAL	
“TRIGGER SOURCE INTERNAL ONLY”	The inter frame ALU is enable in only trigger source internal.

Reference

DCAM_IDPROP_TRIGGERSOURCE

DCAM_IDPROP_INTERNAL_FRAMEINTERVAL

Genre

Synchronous timing

Read write mode

R/W

Type of value

REAL, SECOND

Explanation

This property returns the period between the start of two frames. Some devices can set this property.

Reference

DCAM_IDPROP_INTERNALFRAMERATE

Genre

Synchronous timing

Read write mode

R/W

Type of value

REAL, 1 / SECOND

Explanation

This property returns the number of frames per second that the camera outputs. Some devices can set this property.

Reference

DCAM_IDPROP_INTERNAL_FRAMEINTERVAL

DCAM_IDPROP_INTERNALLINERATE

Genre

Synchronous timing

Read write mode

R/W

Type of value

REAL, 1 / SECOND

Explanation

This property returns the number of lines per second that are shifted on the sensor. Some devices can set this property.

Reference

DCAM_IDPROP_INTERNAL_FRAMEINTERVAL

DCAM_IDPROP_INTERNALLINESPEED

Genre

Synchronous timing

Read write mode

R/W

Type of value

REAL, METER / SECOND

Explanation

This property returns the speed of the vertical shifting on the sensor. Some devices can set this property.

Reference

DCAM_IDPROP_INTERNALTRIGGER_HANDLING

Genre

trigger

Read write mode

R/W

Type of value

MODE

Explanation

This property returns the speed of the vertical shifting on the sensor. Some devices can set this property.

This property allows you to choose behavior of TRIGGER SOURCE INTERNAL mode. This property can have one of following values:

DCAMPROP_INTERNALTRIGGER_HANDLING__SHORTEREXPOSURETIME	
“SHORTER EXPOSURE TIME”	Exposure time is shorter than frame readout time but frame rate is slower.
DCAMPROP_INTERNALTRIGGER_HANDLING__FASTERFRAMERATE	
“FASTER FRAME RATE”	Frame rate is faster than above mode but exposure time must be equal or longer than frame readout time.

or

DCAMPROP_INTERNALTRIGGER_HANDLING__ABANDONWRONGFRAME	
“ABANDON WRONG FRAME”	If data coming from camera is corrupted, DCAM abandons the frame.
DCAMPROP_INTERNALTRIGGER_HANDLING__BURSTMODE	
“BURST MODE”	DCAM just transfer the data coming from camera.

Reference

DCAM_IDPROP_MASKREGION_HPOS

Genre

Binning and ROI

Read write mode

R/W

Type of value

LONG [ARRAY]

Explanation

This property allows you to set a horizontal start address of a mask region.
This is an ARRAY.

Reference

DCAM_IDPROP_MASKREGION_HSIZE
DCAM_IDPROP_MASKREGION_MODE
DCAM_IDPROP_NUMBEROF_MASKREGION

DCAM_IDPROP_MASKREGION_HSIZE

Genre

Binning and ROI

Read write mode

R/W

Type of value

LONG [ARRAY]

Explanation

This property allows you to set a horizontal size of a mask region.
This is an ARRAY.

Reference

DCAM_IDPROP_MASKREGION_HPOS
DCAM_IDPROP_MASKREGION_MODE
DCAM_IDPROP_NUMBEROF_MASKREGION

DCAM_IDPROP_MASKREGION_MODE

Genre

Binning and ROI

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to use the mask region. This property can have one of following values:

DCAMPROP_MODE__OFF	
“OFF”	The region is not used for calibration
DCAMPROP_MODE__ON	
“ON”	The region is used for calibration

This is ARRAY.

Reference

DCAM_IDPROP_MASKREGION_HPOS
DCAM_IDPROP_MASKREGION_HSIZE
DCAM_IDPROP_NUMBEROF_MASKREGION

DCAM_IDPROP_NUMBEROF_CALIBREGION

Genre

Calibration and correction

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the region to judge the brightness when brightness correction data is acquired.

The judgment range can be specified in up to four separate sections. Data is transmitted in the following order: first the command name, then the quantity, then the first pixel value on the front side, then the first pixel value on the back side, then the next pixel on the front side, then the next pixel value on the back side. When data is transmitted, the pixels should be specified in order beginning with the smallest, and there should be no duplication of pixels.

The default value is one for the measurement range, so that the entire element field is targeted.

The maximum value on the back side differs depending on the model, so this should be determined based on the data for the X-ray line sensor camera being used.

Reference

DCAM_IDPROP_CALIBREGION_HPOS
DCAM_IDPROP_CALIBREGION_HSIZE
DCAM_IDPROP_CALIBREGION_MODE

DCAM_IDPROP_NUMBEROF_DEFECTCORRECT

Genre

Calibration and correction

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the number how many you correct the data which is on a specified position.

When this value is 0, no data is corrected.

Reference

DCAM_IDPROP_DEFECTCORRECT_METHOD
DCAM_IDPROP_DEFECTCORRECT_HPOS

DCAM_IDPROP_NUMBEROF_MASKREGION

Genre

Calibration and correction

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the number how many you select region for filling data 0 instead of intensity.

The default value is 0, so that the entire element field will be output.

Reference

DCAM_IDPROP_MASKREGION_HPOS
DCAM_IDPROP_MASKREGION_HSIZE
DCAM_IDPROP_MASKREGION_MODE

DCAM_IDPROP_NUMBEROF_TAPCALIB

Genre

Calibration and correction

Read write mode

R/O

Type of value

LONG

Explanation

This property allows you to set the A/D gain table. You can set the A/D table for each tap individually, or for all elements. To set the table for all elements, specify an element count. To set the table for an individual element, specify an element number. When setting a gain table, calibration is required.

Reference

DCAM_IDPROP_TAPCALIB_GAIN
DCAM_IDPROP_TAPGAINCALIB_METHOD
DCAM_IDPROP_TAPCALIB_BASEDATAMEMORY
DCAM_IDPROP_TAPCALIBDATAMEMORY
DCAM_IDPROP_STORETAPCALIBDATATOMEMORY

DCAM_IDPROP_OUTPUT_INTENSITY

Genre

Output intensity

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the output intensity of the camera. The following values are predefined:

DCAMPROP_OUTPUT_INTENSITY__NORMAL	
“NORMAL”	The camera will output normal intensity data.
DCAMPROP_OUTPUT_INTENSITY__TESTPATTERN	
“TEST PATTERN”	The camera will output test pattern data.

Reference

DCAM_IDPROP_TESTPATTERN_KIND
DCAM_IDPROP_TESTPATTERN_OPTION

DCAM_IDPROP_OUTPUTTRIGGER_ACTIVE

Genre

Trigger

Read write mode

R/W

Type of value

MODE

Explanation

Some devices support output trigger. This property allows you to select the output trigger from one of following values:

DCAMPROP_OUTPUTTRIGGER_ACTIVE__EDGE	
“EDGE”	The trigger shape is edge. The trigger starts from the binning of specified period and the output trigger period is specified by DCAM_IDPROP_OUTPUTTRIGGER_PERIOD
DCAMPROP_OUTPUTTRIGGER_ACTIVE__LEVEL	
“LEVEL”	The trigger shape is level. The period is same as specified period.

Reference

DCAM_IDPROP_OUTPUTTRIGGER_DELAY

Genre

Trigger

Read write mode

R/W

Type of value

REAL, Second

Explanation

Some devices support output trigger. This property allows you to specify the delay of output trigger if DCAM_IDPROP_OUTPUTTRIGGER_ACTIVE is set to “EDGE”

Reference

DCAM_IDPROP_OUTPUTTRIGGER_ACTIVE

DCAM_IDPROP_OUTPUTTRIGGER_PERIOD

Genre

Trigger

Read write mode

R/W

Type of value

REAL, Second

Explanation

Some devices support output trigger. This property allows you to specify the output trigger period if DCAM_IDPROP_OUTPUTTRIGGER_ACTIVE is set to “EDGE”

Reference

DCAM_IDPROP_OUTPUTTRIGGER_ACTIVE

DCAM_IDPROP_OUTPUTTRIGGER_POLARITY

Genre

Trigger

Read write mode

R/W

Type of value

MODE

Explanation

Some devices support output trigger. This property allows you to select the output trigger property from one of following values:

DCAMPROP_OUTPUTTRIGGER_POLARITY__NEGATIVE	
“NEGATIVE”	The trigger polarity is negative. The output trigger is low active.
DCAMPROP_OUTPUTTRIGGER_POLARITY__POSITIVE	
“POSITIVE”	The trigger polarity is positive. The output trigger is high active.

Reference

DCAM_IDPROP_PHOTONIMAGINGMODE

Genre

Sensitivity

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the value of the photon imaging mode which is useful in a low light image field. This property is independent from DCAM_IDPROP_SENSITIVITYMODE. This property can have one of the following values:

DCAMPROP_PHOTONIMAGINGMODE__0	
“0”	Photon imaging mode is disabled.
DCAMPROP_PHOTONIMAGINGMODE__1	
“1”	Photon imaging mode is enabled to mode 1.
DCAMPROP_PHOTONIMAGINGMODE__2	
“2”	Photon imaging mode is enabled to mode 2.
DCAMPROP_PHOTONIMAGINGMODE__3	
“3”	Photon imaging mode is enabled to mode 3.

Reference

DCAM_IDPROP_RECURSIVEFILTER

Genre

ALU

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the recursive filter mode. This property can have one of following values:

DCAMPROP_MODE__OFF	
“OFF”	The recursive filter function is turned off.
DCAMPROP_MODE__ON	
“ON”	The recursive filter function is turned on.

Reference

DCAM_IDPROP_RECURSIVEFILTERFRAMES

DCAM_IDPROP_RECURSIVEFILTERFRAMES

Genre

ALU

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to specify the number of recursive frames. This is effective when the property DCAM_IDPROP_RECURSIVEFILTER is set to “ON”.

DCAMPROP_RECURSIVEFILTERFRAMES__2	
"2 FRAMES"	The recursive filter will use 2 frames
DCAMPROP_RECURSIVEFILTERFRAMES__4	
"4 FRAMES"	The recursive filter will use 4 frames
DCAMPROP_RECURSIVEFILTERFRAMES__8	
"8 FRAMES"	The recursive filter will use 8 frames
DCAMPROP_RECURSIVEFILTERFRAMES__16	
"16 FRAMES"	The recursive filter will use 16 frames

Reference

DCAM_IDPROP_RECURSIVEFILTER

DCAM_IDPROP_SENSORCOOLER

Genre

Sensor cooler

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the sensor-cooling mode. This property can have one of following values:

DCAMPROP_SENSORCOOLER__OFF	
"OFF"	The sensor cooling is turned off.
DCAMPROP_SENSORCOOLER__ON	
"ON"	The sensor is cooled up to the cooling temperature target.
DCAMPROP_SENSORCOOLER__MAX	
"MAX"	The sensor is as cooled as possible.

Reference

DCAM_IDPROP_SENSORTEMPERATURE,
DCAM_IDPROP_SENSORTEMPERATURETARGET

DCAM_IDPROP_SENSORCOOLERFAN

Genre

Sensor cooler

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to turn the sensor-cooler fan on or off. This property can have one of following values:

DCAMPROP_MODE_ON	
"ON"	Fan is turning.
DCAMPROP_MODE_OFF	
"OFF"	Fan is stopped.

Reference

DCAM_IDPROP_SENSORMODE

Genre

Readout

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the sensor mode of the camera. The following values are predefined:

DCAMPROP_SENSORMODE__AREA	
“AREA”	The camera will output area image.
DCAMPROP_SENSORMODE__LINE	
“LINE”	The camera will output line image merged by DCAM_IDPROP_SENSORMODE_LINEBUNDLEHEIGHT.
DCAMPROP_SENSORMODE__TDI	
“TDI”	The camera will output line image with TDI technology merged by DCAM_IDPROP_SENSORMODE_LINEBUNDLEHEIGHT.

In “AREA” sensor mode, the camera sets its sensor to AREA mode so the output data will be an area image.

In “LINE” sensor mode, the camera sets it sensor to LINE mode even if it is an AREA sensor. The output data will be an area image which is merged by the number specified by DCAM_IDPROP_SENSORMODE_LINEBUNDLEHEIGHT.

In “TDI” sensor mode, the camera exposes and reads out with TDI technology and the output data will be an area image which is merged by the number specified by DCAM_IDPROP_SENSORMODE_LINEBUNDLEHEIGHT.

Reference

DCAM_IDPROP_MULTILINE_VPOS
DCAM_IDPROP_MULTILINE_VSIZE
DCAM_IDPROP_SENSORMODE_LINEBUNDLEHEIGHT

DCAM_IDPROP_SENSORMODE_LINEBUNDLEHEIGHT

Genre

Readout

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the number of lines to bundle when SENSORMODE is LINE or TDI. This number is used to merge the line type output image to be used as frame.

Reference

DCAM_IDPROP_SENSORMODE

DCAM_IDPROP_SENSORTEMPERATURE

Genre

Sensor cooler

Read write mode

R/O

Type of value

REAL Celsius

Explanation

This property reports the temperature of the image sensor in Celsius.

Reference

DCAM_IDPROP_SENSORCOOLER
DCAM_IDPROP_SENSORTEMPERATURETARGET

DCAM_IDPROP_SENSORTEMPERATURETARGET

Genre

Sensor cooler

Read write mode

R/W

Type of value

REAL Celsius

Explanation

This property allows you to specify the target temperature of the image sensor in Celsius.

Reference

DCAM_IDPROP_SENSORCOOLER
DCAM_IDPROP_SENSORTEMPERATURE

DCAM_IDPROP_SHADINGCALIBDATAMEMORY

Genre

ALU

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the image page to use for shading correction. When the application sets the number into this property, the camera will use the specified image for shading correction. If DCAM_IDPROP_SHADINGCORRECTION is “ON”, this value is effective.

Reference

DCAM_IDPROP_SHADINGCORRECTION
DCAM_IDPROP_STORESHADINGCALIBDATATOMEMORY

DCAM_IDPROP_SHADINGCALIB_METHOD

Genre

Calibration and correction

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to choose the method of shading calibration. The following values are predefined:

DCAMPROP_SHADINGCALIB_METHOD__AVERAGE	
“AVERAGE”	The target value of data correction is the average of all pixel data.
DCAMPROP_SHADINGCALIB_METHOD__MAXIMUM	
“MAXIMUM”	The target value of data correction is the maximum number in all pixel data.
DCAMPROP_SHADINGCALIB_METHOD__USETARGET	
“USE TARGET”	The target value of data correction is set by DCAM_IDPROP_SHADINGCALIB_TARGET.

Reference

DCAM_IDPROP_SHADINGCALIB_SAMPLES
DCAM_IDPROP_SHADINGCALIB_STABLEMAXERRORPERCENT
DCAM_IDPROP_SHADINGCALIB_STABLEMININTENSITY
DCAM_IDPROP_SHADINGCALIB_STABLESAMPLES
DCAM_IDPROP_SHADINGCALIB_TARGET

DCAM_IDPROP_SHADINGCALIB_SAMPLES

Genre

Calibration and correction

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the total number of sampels for averaging during shading calibration.

If the SENSOR type is AREA, sample unit is one frame, if the SENSOR type is LINE/TDI, sample unit is one line.

Reference

DCAM_IDPROP_SHADINGCALIB_STABLEMAXERRORPERCENT
DCAM_IDPROP_SHADINGCALIB_METHOD
DCAM_IDPROP_SHADINGCALIB_STABLEMININTENSITY
DCAM_IDPROP_SHADINGCALIB_STABLESAMPLES
DCAM_IDPROP_SHADINGCALIB_TARGET

DCAM_IDPROP_SHADINGCALIB_STABLEMAXERRORPERCENT

Genre

Calibration and correction

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the percentage of disparity of the data during sensitivity calibration. The average brightness value is taken as the reference value, and when the disparity of the brightness data that has been specified for the brightness data confirmation range command drops below this set value, sensitivity correction data is acquired. This set value has the same value on both the positive and negative sides. If the set value is 0, only the disparity % is confirmed.

Reference

DCAM_IDPROP_SHADINGCALIB_SAMPLES
DCAM_IDPROP_SHADINGCALIB_METHOD
DCAM_IDPROP_SHADINGCALIB_STABLEMININTENSITY
DCAM_IDPROP_SHADINGCALIB_STABLESAMPLES
DCAM_IDPROP_SHADINGCALIB_TARGET

DCAM_IDPROP_SHADINGCALIB_STABLEMININTENSITY

Genre

Calibration and correction

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the minimum brightness judgment value for taking when correction data bright conditions. If any pixel data is lower than this value, camera does not use the all data for calibration. If such condition happens, calibration will not finish.

Reference

DCAM_IDPROP_SHADINGCALIB_SAMPLES
DCAM_IDPROP_SHADINGCALIB_STABLEMAXERRORPERCENT
DCAM_IDPROP_SHADINGCALIB_METHOD
DCAM_IDPROP_SHADINGCALIB_STABLESAMPLES
DCAM_IDPROP_SHADINGCALIB_TARGET

DCAM_IDPROP_SHADINGCALIB_STABLESAMPLES

Genre

Calibration and correction

Read write mode

R/W

Type of value

LONG

Explanation

No. of times data is confirmed

This property allows you to set the minimum number of stable frames. Stable frames are frames that pass all of conditions which are set by other properties, such as the following:

DCAM_IDPROP_SHADINGCALIB_STABLEMININTENSITY
DCAM_IDPROP_SHADINGCALIB_STABLEMAXERRORPERCENT

If this value is 0, camera will calibrate with any incoming data.

Reference

DCAM_IDPROP_SHADINGCALIB_SAMPLES
DCAM_IDPROP_SHADINGCALIB_STABLEMAXERRORPERCENT
DCAM_IDPROP_SHADINGCALIB_METHOD
DCAM_IDPROP_SHADINGCALIB_STABLEMININTENSITY
DCAM_IDPROP_SHADINGCALIB_TARGET

DCAM_IDPROP_SHADINGCALIB_TARGET

Genre

Calibration and correction

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the target value for calibration

Reference

DCAM_IDPROP_SHADINGCALIB_SAMPLES
DCAM_IDPROP_SHADINGCALIB_STABLEMAXERRORPERCENT
DCAM_IDPROP_SHADINGCALIB_METHOD
DCAM_IDPROP_SHADINGCALIB_STABLEMININTENSITY
DCAM_IDPROP_SHADINGCALIB_STABLESAMPLES

DCAM_IDPROP_SHADINGCORRECTION

Genre

ALU

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to enable the shading correction function. This property can have one of following values:

DCAMPROP_MODE__OFF	
"OFF"	The shading correction function is turned off.
DCAMPROP_MODE__ON	
"ON"	The shading correction function is available with another image which is specified by DCAM_IDPROP_SHADINGCALIBDATAMEMORY.

Reference

DCAM_IDPROP_SHADINGCALIBDATAMEMORY
DCAM_IDPROP_STORESHADINGCALIBDATATOMEMORY

DCAM_IDPROP_SPOTNOISEREDUCER

Genre

ALU

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to enable the spot noise reduce function. This property can have one of following values:

DCAMPROP_MODE__OFF	
“OFF”	The spot noise reduce is turned off.
DCAMPROP_MODE__ON	
“ON”	The spot noise reduce is turned on.

Reference

DCAM_IDPROP_STORESHADINGCALIBDATATOMEMORY

Genre

ALU

Read write mode

W/O

Type of value

MODE

Explanation

This property is used to set the shading calibration image. When the application sets the number into this property, the camera will capture the shading calibration image to specify the page by the number. This property can be set in any state.

Reference

DCAM_IDPROP_SHADINGCORRECTION
DCAM_IDPROP_SHADINGCALIBDATAMEMORY

DCAM_IDPROP_STORESUBTRACTIMAGETOMEMORY

Genre

ALU

Read write mode

W/O

Type of value

MODE

Explanation

This property is used to set the subtract image. When the application sets the number into this property, the camera will capture the subtract image to specified the page by the number. This property can be set in any state.

Reference

DCAM_IDPROP_SUBTRACT
DCAM_IDPROP_SUBTRACTIMAGEMEMORY

DCAM_IDPROP_STORETAPCALIBDATATOMEMORY

Genre

Calibration and correction

Read write mode

W/O

Type of value

MODE

Explanation

This property allows you to store the calibration data into memory. This property can be set in any state.

Reference

DCAM_IDPROP_SUBTRACT
DCAM_IDPROP_SUBTRACTIMAGEMEMORY

DCAM_IDPROP_SUBARRAYHPOS

Genre

Binning and Subarray

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to specify the left position of capturing area. This property is effective if DCAM_IDPROP_SUBARRAYMODE is set to DCAMPROP_MODE__ON.

Reference

DCAM_IDPROP_SUBARRAYMODE
DCAM_IDPROP_SUBARRAYHSIZE
DCAM_IDPROP_SUBARRAYVPOS
DCAM_IDPROP_SUBARRAYVSIZE

DCAM_IDPROP_SUBARRAYHSIZE

Genre

Binning and Subarray

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to specify the horizontal width of capturing area. This property is effective if DCAM_IDPROP_SUBARRAYMODE is set to DCAMPROP_MODE__ON.

Reference

DCAM_IDPROP_SUBARRAYMODE
DCAM_IDPROP_SUBARRAYHPOS
DCAM_IDPROP_SUBARRAYVPOS
DCAM_IDPROP_SUBARRAYVSIZE

DCAM_IDPROP_SUBARRAYMODE

Genre

Binning and Subarray

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to enable the SUBARRAY settings. Enabling this property will make all of the SUBARRAY properties effective.

Reference

DCAM_IDPROP_SUBARRAYHPOS
DCAM_IDPROP_SUBARRAYHSIZE
DCAM_IDPROP_SUBARRAYVPOS
DCAM_IDPROP_SUBARRAYVSIZE

DCAM_IDPROP_SUBARRAYVPOS

Genre

Binning and Subarray

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to specify the top position of capturing area. This property is effective if DCAM_IDPROP_SUBARRAYMODE is set to DCAMPROP_MODE__ON.

Reference

DCAM_IDPROP_SUBARRAYMODE
DCAM_IDPROP_SUBARRAYHPOS
DCAM_IDPROP_SUBARRAYHSIZE
DCAM_IDPROP_SUBARRAYVSIZE

DCAM_IDPROP_SUBARRAYVSIZE

Genre

Binning and Subarray

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to specify the vertical width of capturing area. This property is effective if DCAM_IDPROP_SUBARRAYMODE is set to DCAMPROP_MODE__ON.

Reference

DCAM_IDPROP_SUBARRAYMODE
DCAM_IDPROP_SUBARRAYHPOS
DCAM_IDPROP_SUBARRAYHSIZE
DCAM_IDPROP_SUBARRAYVPOS

DCAM_IDPROP_SUBTRACT

Genre

ALU

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the background subtraction mode. This property can have one of following values:

DCAMPROP_MODE__OFF	
"OFF"	The background subtraction function is turned off.
DCAMPROP_MODE__ON	
"ON"	The background subtraction function is available with another image which is specified by DCAM_IDPROP_SUBTRACTIMAGEMEMORY.

Reference

DCAM_IDPROP_SUBTRACTIMAGEMEMORY
DCAM_IDPROP_STORESUBTRACTIMAGETOMEMORY

DCAM_IDPROP_SUBTRACTIMAGEMEMORY

Genre

ALU

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to specify the image page to subtract. When the application sets a number into this property, the camera will use the subtract image to specified the page by the number. The application can set this property during any state. This value is used if DCAM_IDPROP_SUBTRACT is set to “ON”.

Reference

DCAM_IDPROP_SUBTRACT
DCAM_IDPROP_STORESUBTRACTIMAGETOMEMORY

DCAM_IDPROP_SUBTRACTOFFSET

Genre

ALU

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to specify the offset value of background subtraction. This value is used if DCAM_IDPROP_SUBTRACT is “OFFSET” or “IMAGE”.

Reference

DCAM_IDPROP_SUBTRACT

DCAM_IDPROP_SYSTEM_ALIVE

Genre

System information

Read write mode

R/O

Type of value

MODE

Explanation

This property returns the online status of the device. This property can have one of following values:

DCAMPROP_SYSTEM_ALIVE__OFFLINE	
"OFFLINE"	The system is off line.
DCAMPROP_SYSTEM_ALIVE__ONLINE	
" ONLINE"	The system is online.

Reference

DCAM_IDPROP_TAPCALIB_BASEDATAMEMORY

Genre

Calibration and correction

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to set the base data for calibration. This value from specified index memory is used for first value of calibration.

Reference

DCAM_IDPROP_NUMBEROF_TAPCALIB
DCAM_IDPROP_TAPCALIB_GAIN
DCAM_IDPROP_TAPCALIBDATAMEMORY
DCAM_IDPROP_TAPGAINCALIB_METHOD

DCAM_IDPROP_TAPCALIBDATAMEMORY

Genre

Calibration and correction

Read write mode

W/O

Type of value

MODE

Explanation

This property allows you to set the number of tab calibration data memory. When you set this value, camera load from the data from specified memory.

Reference

DCAM_IDPROP_NUMBEROF_TAPCALIB
DCAM_IDPROP_TAPCALIB_BASEDATAMEMORY
DCAM_IDPROP_TAPCALIB_GAIN
DCAM_IDPROP_TAPGAINCALIB_METHOD

DCAM_IDPROP_TAPCALIB_GAIN

Genre

Calibration and correction

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to set the number of gain table.
This property is an ARRAY.

Reference

DCAM_IDPROP_NUMBEROF_TAPCALIB
DCAM_IDPROP_TAPCALIB_BASEDATAMEMORY
DCAM_IDPROP_TAPCALIBDATAMEMORY
DCAM_IDPROP_TAPGAINCALIB_METHOD

DCAM_IDPROP_TAPGAINCALIB_METHOD

Genre

Calibration and correction

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to choose the method of tap gain calibration. This property can have one of following values:

DCAMPROP_TAPGAINCALIB_METHOD__AVE	
"AVERAGE"	Use average
DCAMPROP_TAPGAINCALIB_METHOD__MAX	
"MAXIMUM"	Use maximum
DCAMPROP_TAPGAINCALIB_METHOD__MIN	
" MINIMUM"	Use minimum

Reference

DCAM_IDPROP_NUMBEROF_TAPCALIB
DCAM_IDPROP_TAPCALIB_BASEDATAMEMORY
DCAM_IDPROP_TAPCALIB_GAIN
DCAM_IDPROP_TAPCALIBDATAMEMORY

DCAM_IDPROP_TESTPATTERN_KIND

Genre

Calibration and correction

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to choose test pattern. This property is effective if DCAM_IDPROP_OUTPUT_INTENSITY is DCAMPROP_OUTPUT_INTENSITY__TESTPATTERN. This property can have one of following values:

DCAMPROP_TESTPATTERN_KIND__HORZGRADATION	
"HORZ GRADATION"	The camera will output horizontal gradation data.
DCAMPROP_TESTPATTERN_KIND__IHORZGRADATION	
"INVERT HORZ GRADATION"	The camera will output horizontal inverted gradation data.
DCAMPROP_TESTPATTERN_KIND__VERTGRADATION	
" VERT GRADATION"	The camera will output vertical gradation data.
DCAMPROP_TESTPATTERN_KIND__IVERTGRADATION	
" INVERT VERT GRADATION"	The camera will output vertical inverted gradation data.
DCAMPROP_TESTPATTERN_KIND__LINE	
"LINE"	The camera will output line pattern data.
DCAMPROP_TESTPATTERN_KIND__FLAT	
" FLAT"	The camera will output constant brightness pattern data.
DCAMPROP_TESTPATTERN_KIND__DIAGONAL	
" DIAGONAL"	The camera will output diagonal line pattern data.

Reference

DCAM_IDPROP_OUTPUT_INTENSITY
DCAM_IDPROP_TESTPATTERN_OPTION

DCAM_IDPROP_TESTPATTERN_OPTION

Genre

Calibration and correction

Read write mode

W/O

Type of value

MODE

Explanation

This property allows you to set the option parameter for TESTPATTERN.

Reference

DCAM_IDPROP_TESTPATTERN_KIND

DCAM_IDPROP_TIMING_CYCLICTRIGGERPERIOD

Genre

Synchronous timing

Read write mode

R/O

Type of value

SECOND

Explanation

This property returns the cycle trigger period. If value is positive, the next trigger is cyclic trigger fired from end of exposure to next this period. If this value is 0, the camera does not support cyclic trigger.

Reference

DCAM_IDPROP_TIMING_READOUTTIME
DCAM_IDPROP_TIMING_MINTRIGGERBLANKING

DCAM_IDPROP_TIMING_EXPOSURE

Genre

Synchronous timing

Read write mode

R/O

Type of value

MODE

Explanation

This property returns the online status of the device. This property can have one of following values:

DCAMPROP_TIMING_EXPOSURE__AFTERREADOUT	
"AFTER READOUT"	The exposure starts after reading previous the frame completely.
DCAMPROP_TIMING_EXPOSURE__OVERLAPREADOUT	
" OVERLAP READOUT"	The exposure starts during reading the previous frame.
DCAMPROP_TIMING_EXPOSURE__ROLLING	
" ROLLING"	The exposure starts at each pixel after reading it at the previous frame.

Reference

DCAM_IDPROP_TIMING_CYCLICTRIGGERPERIOD

DCAM_IDPROP_TIMING_GLOBALEXPOSUREDELAY

Genre

Synchronous timing

Read write mode

R/O

Type of value

SECOND

Explanation

If the sensor does not have GLOBAL SHUTTER capability, GLOBAL EXPOSURE timing, which means all pixels on the sensor is exposed, is.delayed. This property returns how long GLOBAL EXPOSURE is delayed from beginning of EXPOSURE sensor itself.

This is useful with light source control system, e.g. strobe.

This property is EFFECTIVE when DCAM_IDPROP_TRIGGER_GLOBALEXPOSURE is DCAMPROP_TRIGGER_GLOBALEXPOSURE__DELAYED.

Reference

DCAM_IDPROP_TRIGGER_GLOBALEXPOSURE

DCAM_IDPROP_TIMING_MINTRIGGERBLANKING

Genre

Synchronous timing

Read write mode

R/O

Type of value

SECOND

Explanation

This property returns the period from the end of exposure.

Reference

DCAM_IDPROP_TIMING_READOUTTIME

Genre

Synchronous timing

Read write mode

R/O

Type of value

SECOND

Explanation

This property returns frame read out time in seconds.

Reference

DCAM_IDPROP_TRIGGERACTIVE

Genre

Trigger

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to choose how trigger effects. The following values are predefined:

DCAMPROP_TRIGGERACTIVE__EDGE	
“EDGE”	Exposure starts at raising or falling edge.
DCAMPROP_TRIGGERACTIVE__LEVEL	
“LEVEL”	Exposure during trigger is high or low.
DCAMPROP_TRIGGERACTIVE__SYNCREADOUT	
“SYNCREADOUT”	Exposure between two pulses.

Reference

DCAM_IDPROP_TRIGGER_MODE
DCAM_IDPROP_TRIGGERPOLARITY
DCAM_IDPROP_TRIGGERSOURCE
DCAM_IDPROP_TRIGGERTIMES

DCAM_IDPROP_TRIGGERENABLE_ACTIVE

Genre

Trigger

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to choose how trigger enable effects. You can input trigger enable signal to the camera if the camera supports this property. Trigger enable signal can make trigger enable as following.

DCAMPROP_TRIGGERENABLE_ACTIVE__ALWAYS	
“ALWAYS”	Trigger is always enabled independently from Trigger enable signal.
DCAMPROP_TRIGGERENABLE_ACTIVE__LEVEL	
“LEVEL”	Trigger is enabled during trigger enable is high or low.
DCAMPROP_TRIGGERENABLE_ACTIVE__START	
“START”	Trigger becomes enable after falling or rising edge of trigger enable.

Reference

DCAM_IDPROP_TRIGGERENABLE_POLARITY

DCAM_IDPROP_TRIGGERENABLE_POLARITY

Genre

Trigger

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to choose trigger enable polarity. The following values are predefined:

DCAMPROP_TRIGGERENABLE_POLARITY__NEGATIVE	
“NEGATIVE”	Falling edge or LOW level.
DCAMPROP_TRIGGERENABLE_POLARITY__POSITIVE	
“POSITIVE”	Rising edge or HIGH level.

Reference

DCAM_IDPROP_TRIGGERENABLE_ACTIVE

DCAM_IDPROP_TRIGGER_FIRSTEXPOSURE

Genre

Trigger

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to determine whether exposure of the DCAM captured data will be done before the trigger or after the trigger. This property can have one of following values:

DCAMPROP_TRIGGER_FIRSTEXPOSURE__NEW	
"NEW"	The captured data starts exposure after the trigger.
DCAMPROP_TRIGGER_FIRSTEXPOSURE__CURRENT	
"CURRENT"	The captured data starts exposure before the trigger.

Reference

DCAM_IDPROP_TRIGGER_GLOBALEXPOSURE

Genre

Trigger

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to choose GLOBAL EXPOSURE option in some trigger modes.
The following values are predefined:

DCAMPROP_TRIGGER_GLOBALEXPOSURE__NONE	
“NONE”	The sensor has no capability for global exposure.
DCAMPROP_TRIGGER_GLOBALEXPOSURE__ALWAYS	
“ALWAYS”	The sensor always exposes globally.
DCAMPROP_TRIGGER_GLOBALEXPOSURE__DELAYED	
“DELAYED”	Global exposure is delayed from beginning of sensor exposure,
DCAMPROP_TRIGGER_GLOBALEXPOSURE__EMULATE	
“EMULATE”	Global exposure is emulated,

Reference

DCAM_IDPROP_TIMING_GLOBALEXPOSUREDELAY
DCAM_IDPROP_TRIGGERACTIVE
DCAM_IDPROP_TRIGGER_MODE
DCAM_IDPROP_TRIGGERSOURCE

DCAM_IDPROP_TRIGGER_MODE

Genre

Trigger

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to choose which trigger mode to use. The following values are predefined:

DCAMPROP_TRIGGER_MODE__NORMAL	
“NORMAL”	Standard trigger mode. DCAM_IDPROP_TRIGGERACTIVE is effective.
DCAMPROP_TRIGGER_MODE__PIV	
“PIV”	Trigger makes PIV action. The first frame exposure is selected by DCAM_IDPROP_TRIGGERACTIVE.
DCAMPROP_TRIGGER_MODE__START	
“START”	Trigger starts internal trigger mode.

Reference

DCAM_IDPROP_TRIGGERACTIVE
DCAM_IDPROP_TRIGGERPOLARITY
DCAM_IDPROP_TRIGGERSOURCE
DCAM_IDPROP_TRIGGERTIMES

DCAM_IDPROP_TRIGGERPOLARITY

Genre

Trigger

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to choose trigger polarity. The following values are predefined:

DCAMPROP_TRIGGERPOLARITY__NEGATIVE	
“NEGATIVE”	Falling edge or LOW level.
DCAMPROP_TRIGGERPOLARITY__POSITIVE	
“POSITIVE”	Rising edge or HIGH level.

Reference

DCAM_IDPROP_TRIGGERACTIVE
DCAM_IDPROP_TRIGGER_MODE
DCAM_IDPROP_TRIGGERSOURCE
DCAM_IDPROP_TRIGGERTIMES

DCAM_IDPROP_TRIGGERSOURCE

Genre

Trigger

Read write mode

R/W

Type of value

MODE

Explanation

This property allows you to choose which trigger source you use. The following values are predefined:

DCAMPROP_TRIGGERSOURCE__INTERNAL	
“INTERNAL”	Camera uses its own timing.
DCAMPROP_TRIGGERSOURCE__EXTERNAL	
“EXTERNAL”	Camera works with trigger comes from input trigger pin.
DCAMPROP_TRIGGERSOURCE__SOFTWARE	
“SOFTWARE”	Camera works with trigger fired by software.

Reference

DCAM_IDPROP_TRIGGERACTIVE
DCAM_IDPROP_TRIGGER_MODE
DCAM_IDPROP_TRIGGERPOLARITY
DCAM_IDPROP_TRIGGERTIMES

DCAM_IDPROP_TRIGGERTIMES

Genre

Trigger

Read write mode

R/W

Type of value

LONG

Explanation

This property allows you to set the number of trigger times. When in synchronous readout trigger mode. The camera will readout the current exposure and begin a new exposure once the number of triggers specified by this property has been received.

Reference

DCAM_IDPROP_TRIGGERACTIVE
DCAM_IDPROP_TRIGGER_MODE
DCAM_IDPROP_TRIGGERPOLARITY
DCAM_IDPROP_TRIGGERSOURCE

PROGRAMMING

Enumerate supported properties
Show attribute of a property
Enumerate Value Text
Enumerate value of VOLATILE properties
Enumerate value of INFLUENTIAL properties
Enumerate value of UPDATED properties

Enumerate supported properties

```
void enumerate_supported_properties (
        HDCAM hdcam   /* DCAM handle   */
) {
        int32     iProp;    /* property ID       */

        iProp = 0;
        if( dcam_getnextpropertyid( hdcam, &iProp, DCAMPROP_OPTION_SUPPORT ) )
        {
                do {
                        /* The iProp value is a property ID that the device supports */

                        /* Getting property attribute. */
                        DCAM_PROPERTYATTR attr;
                        char      name[ 64 ];

                        memset( &attr, 0, sizeof( attr ) );
                        attr.iProp = iProp;
                        dcam_getpropertyattr( hdcam, &attr );

                        /* Getting property name. */
                        dcam_getpropertyname( hdcam, iProp, name, sizeof( name ) );

                        printf( "%s property is supported/\n", name );

                } while( dcam_getnextpropertyid( hdcam, &iProp,
DCAMPROP_OPTION_SUPPORT )
                        && iProp != 0 );
        }
}
```

Show attribute of a property

```
void show_property_type (
        HDCAM hdcam,   /* DCAM handle   */
        int32      iProp     /* property ID       */
) {
        DCAM_PROPERTYATTR attr;
        char       name[ 64 ];
        int32      type;

/* Getting property name. */
        dcam_getpropertyname( hdcam, iProp, name, sizeof( name ) );

/* Getting property attribute. */
        memset( &attr, 0, sizeof( attr ) );
        attr.iProp = iProp;
        dcam_getpropertyattr( hdcam, &attr );

        type = ( attr.attribute & DCAMPROP_TYPE_MASK );
        switch( type )
        {
        case DCAMPROP_TYPE_MODE:
                printf( "%s is MODE type.\n", name );
                break;
        case DCAMPROP_TYPE_LONG:
                printf( "%s is LONG type.\n", name );
                break;
        case DCAMPROP_TYPE_REAL:
                printf( "%s is REAL type.\n", name );
                break;
        default:
                printf( "%s is unknown type(0x%02X).\n", name, type );
                break;
        }
}
```

Enumerate Value Text

```
BOOL enumerate_valuetext(
        HDCAM hdcam,  /* DCAM handle   */
        int32     iProp     /* property ID       */
) {
        DCAM_PROPERTYATTR attr;
        char      text[ 64 ];
        double    v;

        /* Getting property attribute. */
        memset( &attr, 0, sizeof( attr ) );
        attr.iProp = iProp;

        if( ! dcam_getpropertyattr( hdcam, &attr ) )
        {
                /* The property ID may not be supported. */
                return FALSE;
        }

        /* Checking the property has value text or not. */
        if( ! (attr.attribute & DCAMPROP_ATTR_HASVALUETEXT) )
        {
                /* This property does not have value text. */
                return FALSE;
        }

        dcam_getpropertyname( hdcam, iProp, text, sizeof( text ) );

        printf( "%s property has following values.\n", text );

        /* Getting value text. */
        for( v = attr.valuemin; v <= attr.valuemax;)
        {
                DCAM_PROPERTYVALUETEXT    valuetext;
                memset( &attr, 0, sizeof( attr ) );
                attr.iProp = iProp;
                attr.value = v;
                attr.text = text;
                attr.textbytes = sizeof( text );

                if(dcam_getpropertyvaluetext( hdcam, &valuetext ) )
                {
                        /* The property has the value text of the value. */
                        printf( "%g : %s\n", v, text );
                }

                if(       !       dcam_querypropertyvalue(       hdcam,       iProp,       &v,
DCAMPROP_OPTION_NEXT ))
                {
                        /* no more value. */
                        break;
                }
        }

        return TRUE;
}
```

Enumerate value of VOLATILE properties

```
void get_volatile_properties(
        HDCAM hdcam   /* DCAM handle   */
) {
        int32     iProp;    /* property ID       */
        double    value;

        iProp = 0;
        if( dcam_getnextpropertyid( hdcam, &iProp, DCAMPROP_OPTION_VOLATILE ) )
        {
                do {
                        /* The iProp value is a VOLATILE property ID */

                        /* Getting property value. */
                        dcam_getpropertyvalue ( hdcam, iProp, &value );

                }       while(          dcam_getnextpropertyid(         hdcam,          &iProp,
DCAMPROP_OPTION_VOLATILE)
                        && iProp != 0 );
        }
}
```

Enumerate values of INFLUENTIAL properties

```
void get_influent_properties(
        HDCAM hdcam,   /* DCAM handle   */
        int32     iSrcProp /* influential property ID     */
) {
        int       i;
        double    value;
        int32     iDstProp;           /* effected property ID       */

        for( i= 1; ; i++ ))
        {
                int32                 option;
                option = DCAMPROP_OPTION_INFLUENCE;
                option |= ( DCAMPROP_OPTION_NEXT * i );

                iDstProp = iSrcProp;
                if( ! dcam_getnextpropertyid( hdcam, &iDstProp, option ) )
                {
                        /* No more effected property ID */
                        break;
                }

                /* The iDstProp value is one of effected property IDs */
        }
}
```

Enumerate values of UPDATED properties

```
void get_updated_properties(
        HDCAM hdcam   /* DCAM handle   */
) {
        int32     iProp;    /* property ID       */
        double    value;

        iProp = 0;
        if( dcam_getnextpropertyid( hdcam, &iProp, DCAMPROP_OPTION_UPDATED ) )
        {
                do {
                        /* The iProp value is an UPDATED property ID */

                        /* Getting property value. */
                        dcam_getpropertyvalue ( hdcam, iProp, &value );

                } while( dcam_getnextpropertyid( hdcam, &iProp,
DCAMPROP_OPTION_UPDATED )
                        && iProp != 0 );
        }
}
```

HAMAMATSU

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