

Writing Applications with xiAPI

Default parameters

After camera is opened by xiOpenDevice the default camera parameters are set by API. The default parameters might be different in different API versions. In order to ensure that your application will have camera in expected state with any API version - please set all parameters expected by your application to required value.

Temperature

XI_PRM_IS_COOLED or "iscooled"

Description: Returns 1 for cameras that support cooling.

Type: Integer.

Default value: XI_OFF

Usage:

```
int value = 0;  
xiGetParamInt(handle, XI_PRM_IS_COOLED, &value);
```

XI_PRM_COOLING or "cooling"

Description: [Set camera cooling control. Replaced by XI_PRM_TEMP_CONTROL_MODE](#)

Type: Enumerator.

Default value: XI_TEMP_CTRL_MODE_OFF

Usage:

```
xiSetParamInt(handle, XI_PRM_TEMP_SELECTOR, XI_TEMP_SENSOR_BOARD);  
xiSetParamFloat(handle, XI_PRM_TARGET_TEMP, 18.5);  
xiSetParamInt(handle, XI_PRM_COOLING, XI_TEMP_CTRL_MODE_AUTO);
```

Value	Description
XI_TEMP_CTRL_MODE_OFF	Controlling of elements (TEC/Peltier, Fans) is turned off
XI_TEMP_CTRL_MODE_AUTO	Controlling of elements is performed automatically by API or camera in order to reach parameter TARGET_TEMP.
XI_TEMP_CTRL_MODE_MANUAL	Controlling of elements is done manually by application.

XI_PRM_TARGET_TEMP or "target_temp"

Description: Set target temperature for automatic temperature control.

Type: Float.

Default value: 0.0

Typical range: [0.0, 200.0]

Usage:

```
xiSetParamFloat(handle, XI_PRM_TARGET_TEMP, 18.5);  
xiGetParamFloat(handle, XI_PRM_TARGET_TEMP, &target_temp);
```

XI_PRM_TEMP_SELECTOR or "temp_selector"

Description: Temperature sensor selector.

Type: Enumerator.

Default value: XI_TEMP_SENSOR_BOARD

Usage:

```
float temperature = 0.0;
```

```
xiSetParamInt(handle, XI_PRM_TEMP_SELECTOR, XI_TEMP_IMAGE_SENSOR_DIE_RAW);
```

```
xiGetParamFloat(handle, XI_PRM_TEMP, &temperature);
```

Value	Description
XI_TEMP_IMAGE_SENSOR_DIE_RAW	Image sensor die (non-calibrated)
XI_TEMP_IMAGE_SENSOR_DIE	Image sensor die (calibrated)
XI_TEMP_SENSOR_BOARD	Image sensor PCB
XI_TEMP_INTERFACE_BOARD	Data interface PCB
XI_TEMP_FRONT_HOUSING	Front part of camera housing
XI_TEMP_REAR_HOUSING	Rear part of camera housing
XI_TEMP_TEC1_COLD	TEC1 cold side temperature
XI_TEMP_TEC1_HOT	TEC1 hot side temperature
XI_TEMP_VCSEL_BOARD_A	VCSEL board temperature

XI_PRM_TEMP or "temp"

Description: Selected thermometer reading in degree Celsius. Thermometer can be selected by

[XI_PRM_TEMP_SELECTOR](#).

Type: Float.

Default value: 0.0

Is invalidated by: [XI_PRM_TEMP_SELECTOR](#)

Usage:

```
float value = 0.0;
```

```
xiGetParamFloat(handle, XI_PRM_TEMP, &value);
```

XI_PRM_TEMP_CONTROL_MODE or "device_temperature_ctrl_mode"

Description: Sets temperature control mode.

Note: On some camera models, when some component (e.g. housing) reaches critical temperature, the mode is changed to XI_TEMP_CTRL_MODE_OFF automatically by camera and this mode remains off. It can be re-enabled by setting mode to XI_TEMP_CTRL_MODE_AUTO. By getting XI_PRM_TEMP_CONTROL_MODE, application can get the information, about current state.

Type: Enumerator.

Default value: XI_TEMP_CTRL_MODE_OFF

Usage:

```
xiSetParamFloat(handle, XI_PRM_TARGET_TEMP, 18.5);
```

```
xiSetParamInt(handle, XI_PRM_TEMP_CONTROL_MODE, XI_TEMP_CTRL_MODE_AUTO);
```

```
// check the current mode periodically
xiGetParamInt(handle, XI_PRM_TEMP_CONTROL_MODE, &control_mode);
if (XI_TEMP_CTRL_MODE_AUTO == control_mode)
    printf("Temperature is controlled automatically.");
```

Value	Description
XI_TEMP_CTRL_MODE_OFF	Controlling of elements (TEC/Peltier, Fans) is turned off
XI_TEMP_CTRL_MODE_AUTO	Controlling of elements is performed automatically by API or camera in order to reach parameter TARGET_TEMP.
XI_TEMP_CTRL_MODE_MANUAL	Controlling of elements is done manually by application.

XI_PRM_CHIP_TEMP or "chip_temp"

Description: Temperature reading of thermometer chip. Sensor is located on the PCB close to imaging sensor. Units: degrees of Celsius.

Type: Float.

Default value: 0.0

Usage:

```
float value = 0.0;
xiGetParamFloat(handle, XI_PRM_CHIP_TEMP, &value);
```

XI_PRM_HOUS_TEMP or "hous_temp"

Description: Camera housing temperature.

Type: Float.

Default value: 0.0

Usage:

```
float value = 0.0;
xiGetParamFloat(handle, XI_PRM_HOUS_TEMP, &value);
```

XI_PRM_HOUS_BACK_SIDE_TEMP or "hous_back_side_temp"

Description: Camera housing back side temperature.

Type: Float.

Default value: 0.0

Usage:

```
float value = 0.0;
xiGetParamFloat(handle, XI_PRM_HOUS_BACK_SIDE_TEMP, &value);
```

XI_PRM_SENSOR_BOARD_TEMP or "sensor_board_temp"

Description: Camera sensor board temperature.

Type: Float.

Default value: 0.0

Usage:

float value = 0.0;

xiGetParamFloat(handle, XI_PRM_SENSOR_BOARD_TEMP, &value);

XI_PRM_TEMP_ELEMENT_SEL or "device_temperature_element_sel"

Description: Temperature element selector (TEC, Fan)

Type: Enumerator.

Default value: XI_TEMP_ELEM_TEC1

Usage:

See [XI_PRM_TEMP_ELEMENT_VALUE](#)

Value	Description
XI_TEMP_ELEM_TEC1	TEC1 = TEC/Peltier that is closest to the image sensor
XI_TEMP_ELEM_TEC2	TEC2 = TEC/Peltier location depends on camera model
XI_TEMP_ELEM_FAN1	Temperature element fan current or rotation (FAN1 = Fan)
XI_TEMP_ELEM_FAN1_THRS_TEMP	Temperature element fan start rotation threshold temperature

XI_PRM_TEMP_ELEMENT_VALUE or "device_temperature_element_val"

Description: Temperature element value in percents of full control range.

Type: Float.

Default value: 0.0

Typical range: [0.0, 100.0]

Is invalidated by: [XI_PRM_TEMP_ELEMENT_SEL](#)

Usage:

xiSetParamInt(handle, XI_PRM_COOLING, XI_TEMP_CTRL_MODE_MANUAL);

xiSetParamInt(handle, XI_PRM_TEMP_ELEMENT_SEL, XI_TEMP_ELEM_TEC1);

xiSetParamFloat(handle, XI_PRM_TEMP_ELEMENT_VALUE, 50.1);

Color Correction

Note: Works only for color cameras.

XI_PRM_CMS or "cms"

Description: Enable or disable color management.

Note: This feature is in Beta stage.

Type: Enumerator.

Default value: XI_CMS_DIS

Usage:

```
int cms = 0;
xiGetParamInt(handle, XI_PRM_CMS, &cms);
xiSetParamInt(handle, XI_PRM_CMS, XI_CMS_DIS);
```

Value	Description
XI_CMS_DIS	disables color management
XI_CMS_EN	enables color management (high CPU usage)
XI_CMS_EN_FAST	enables fast color management (high RAM usage)

XI_PRM_CMS_INTENT or "cms_intent"

Description: Defines rendering intents. See more at our support page [CMS INTENT](#).

Note1: This feature is in Beta stage.

Type: Enumerator.

Default value: XI_CMS_INTENT_PERCEPTUAL

Usage:

```
int cms_intent = 0;
xiGetParamInt(handle, XI_PRM_CMS_INTENT, &cms_intent);
xiSetParamInt(handle, XI_PRM_CMS_INTENT, XI_CMS_INTENT_PERCEPTUAL);
```

Value	Description
XI_CMS_INTENT_PERCEPTUAL	CMS intent perceptual
XI_CMS_INTENT_RELATIVE_COLORIMETRIC	CMS intent relative colorimetry
XI_CMS_INTENT_SATURATION	CMS intent saturation
XI_CMS_INTENT_ABSOLUTE_COLORIMETRIC	CMS intent absolute colorimetry

XI_PRM_APPLY_CMS or "apply_cms"

Description: If set to XI_ON applies CMS profile to xiGetImage.

Type: Integer.

Default value: XI_OFF

Usage:

```
int value = 0;
xiGetParamInt(handle, XI_PRM_APPLY_CMS, &value);
xiSetParamInt(handle, XI_PRM_APPLY_CMS, XI_ON);
```

XI_PRM_INPUT_CMS_PROFILE or "input_cms_profile"

Description: Filename of the input cms profile (e.g. input.icc)

Type: String.

Default value: (default device profile)

Usage:

```
xiSetParamString(handle, XI_PRM_INPUT_CMS_PROFILE, "C:\\ICC\\custom_in.icc", (DWORD)
strlen("C:\\ICC\\custom_in.icc"));
```

XI_PRM_OUTPUT_CMS_PROFILE or "output_cms_profile"

Description: Filename of the output cms profile (e.g. output.icc)

Type: String.

Default value: (sRGB profile)

Usage:

```
xiSetParamString(handle, XI_PRM_INPUT_CMS_PROFILE, "C:\\ICC\\custom_out.icc", (DWORD)  
strlen("C:\\ICC\\custom_out.icc"));
```

XI_PRM_IMAGE_IS_COLOR or "iscolor"

Description: Returns 1 for color cameras.

Type: Integer.

Default value: XI_OFF

Usage:

```
xiGetParamInt(handle, XI_PRM_IMAGE_IS_COLOR, &iscolor);
```

XI_PRM_COLOR_FILTER_ARRAY or "cfa"

Description: Returns color filter array type of RAW data.

Type: Enumerator.

Default value: XI_CFA_NONE

Usage:

```
int cfa = 0;
```

```
xiGetParamInt(handle, XI_PRM_COLOR_FILTER_ARRAY, &cfa(sizeof(value)));
```

Value	Description
XI_CFA_NONE	Result pixels have no filters applied in this format
XI_CFA_BAYER_RGGB	Regular RGGB
XI_CFA_CMYG	AK Sony sens
XI_CFA_RGR	2R+G readout
XI_CFA_BAYER_BGGR	BGGR readout
XI_CFA_BAYER_GRBG	GRBG readout
XI_CFA_BAYER_GBRG	GBRG readout
XI_CFA_POLAR_A_BAYER_BGGR	BGGR polarized 4x4 macropixel
XI_CFA_POLAR_A	Polarized 2x2 macropixel
XI_CFA_TOF_ANB	ToF A and B
XI_CFA_TOF_AMB	ToF A minus B
XI_CFA_TOF_APB	ToF A plus B
XI_CFA_TOF_A	ToF A only
XI_CFA_TOF_B	ToF B only

XI_PRM_GAMMAY or "gammaY"

Description: Luminosity gamma.

Lowering the value increases correction.

Type: Float.

Default value: 0.47

Typical range: [0.3, 1.0]

Usage:

float value = 0.0;

xiGetParamFloat(handle, XI_PRM_GAMMAY, &value);

xiSetParamFloat(handle, XI_PRM_GAMMAY, value);

XI_PRM_GAMMAC or "gammaC"

Description: Chromaticity gamma.

Type: Float.

Default value: 0.8

Typical range: [0.0, 1.0]

Usage:

float value = 0.0;

xiGetParamFloat(handle, XI_PRM_GAMMAC, &value);

xiSetParamFloat(handle, XI_PRM_GAMMAC, value);

XI_PRM_SHARPNESS or "sharpness"

Description: Sharpness Strength. Increasing the value results in sharper image.

Note: Works also for XI_MONO* formats, but only for color cameras.

Type: Float.

Default value: 0.0

Typical range: [-4.0, 4.0]

Usage:

float value = 0.0;

xiGetParamFloat(handle, XI_PRM_SHARPNESS, &value);

xiSetParamFloat(handle, XI_PRM_SHARPNESS, value);

XI_PRM_CC_MATRIX_00 or "ccMTX00"

Description: Color Correction Matrix element [0][0].

Correction Matrix elements:

coefficients:				default values:				
M_00	M_01	M_02	M_03	=	1.0	0.0	0.0	0.0
M_10	M_11	M_12	M_13	=	0.0	1.0	0.0	0.0
M_20	M_21	M_22	M_23	=	0.0	0.0	1.0	0.0
M_30	M_31	M_32	M_33	=	0.0	0.0	1.0	0.0

Type: Float.

Default value: 1.0

Typical range: [-8.0, 8.0]

Usage:

```
float value = 0.0;  
xiGetParamFloat(handle, XI_PRM_CC_MATRIX_00, &value);  
xiSetParamFloat(handle, XI_PRM_CC_MATRIX_00, value);
```

XI_PRM_DEFAULT_CC_MATRIX or "defccMTX"

Description: Set default Color Correction Matrix

Type: Integer.

Default value: 0

Usage:

```
int value = 0;  
xiSetParamInt(handle, XI_PRM_DEFAULT_CC_MATRIX, value);
```

XI_PRM_CC_MATRIX_NORM or "ccMTXnorm"

Description: Activates normalization of color correction matrix.

Type: Integer.

Default value: 0 for disabled normalization.

Usage:

```
xiSetParamInt(handle, XI_PRM_CC_MATRIX_NORM, XI_ON); //enable color correction matrix normalization
```