

SC5C0 Extra Software Programming Guide

Custom Property

- 1. **KSPROPERTY_CUSTOM_GET_DEVICE_SERIAL_NUMBER_INFO** (0) (READ ONLY)
- 1. **KSPROPERTY_CUSTOM_GET_DEVICE_BUS_NUMBER_INFO** (2) (READ ONLY)
- 1. **KSPROPERTY_CUSTOM_GET_DEVICE_FPGA_VERSION_INFO** (6) (READ ONLY)

The property **KSPROPERTY_CUSTOM_GET_DEVICE_SERIAL_NUMBER_INFO** allows you to get Vendor ID (VID) and Product ID (PID) for the capture card. Vendor ID and product ID are 16-bit numbers used to identify PCI devices to a computer. The VID and PID are embedded in the capture card and communicated to the computer.

EXAMPLE#01: TO GET THE VENDER ID AND PRODUCT ID FROM THE CAPTURE CARD.

```
ULONG dwSerialNumber = 0x00000000;  
AMESDK_GET_CUSTOM_PROPERTY( hDevice, 0, &dwSerialNumber);
```

The property **KSPROPERTY_CUSTOM_GET_DEVICE_BUS_NUMBER_INFO** allows you to get current PCI bus number on the capture card. For example, the capture card on the first PCI slot, on the second PCI slot, or on the third PCI slot, etc.

EXAMPLE#02: TO GET THE BUS NUMBER ON THE CAPTURE CARD.

```
ULONG dwBusNumber = 0x00000000;  
AMESDK_GET_CUSTOM_PROPERTY( hDevice, 2, &dwBusNumber);
```

The property **KSPROPERTY_CUSTOM_GET_DEVICE_FPGA_VERSION_INFO** allows you to get current FPGA build version on the capture card.

EXAMPLE#03: TO GET THE FPGA BUILD VERSION ON THE CAPTURE CARD.

```
ULONG dwFpgaVersion = 0x00000000;  
AMESDK_GET_CUSTOM_PROPERTY( hDevice, 6, &dwFpgaVersion);
```

- 2. KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_SIGNAL_LOCK_STATUS (230) (READ ONLY)
- 2. KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_RESOLUTION (210) (READ ONLY)
- 2. KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_INTERLEAVED (223) (READ ONLY)
- 2. KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_FRAME_RATE (208) (READ ONLY)
- 2. KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_FRACTION_1000_1001 (241) (READ ONLY)
- 2. KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_SIGNAL_COLORIMETRY (370) (READ ONLY)
- 2. KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_SIGNAL_COLORRANGE (371) (READ ONLY)
- 2. KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_MACROVISION (202) (READ ONLY)
- 2. KSPROPERTY_CUSTOM_GET_ANALOG_AUDIO_SAMPLE_FREQUENCY (253) (READ ONLY)

The property **KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_SIGNAL_LOCK_STATUS** is used to determine whether the signal is locked.

SUPPORT VALUE: 0 ~ 1 - UNLOCK ~ LOCK

EXAMPLE#01: TO GET THE CURRENT SIGNAL STATUS.

```
LONG nLock = 0x00;
AMESDK_GET_CUSTOM_PROPERTY( hDev, 230, &nLock );
```

These properties (210/223/208/241) can auto detect video format and can report the current input format to your software. The both properties can help to obtain current video format's resolution and frame rate. Some supported formats are described in the table. The format table keeps on increasing into the new driver. Please check our sales to obtain the latest one.

FORMAT	RESOLUTION	FRAME RATE
1920×1080p@60fps	0x07800438	60 / 59.94
1920×1080p@50fps	0x07800438	50 / 49.95
1920×1080p@30fps	0x07800438	30 / 29.97
1920×1080p@25fps	0x07800438	25 / 24.97
1920×1080p@24fps	0x07800438	24 / 23.97
1920×1080i@60fps	0x0780021C	60 / 59.94
1920×1080i@50fps	0x0780021C	50 / 49.95
1280×720P@60fps	0x050002D0	60 / 59.94
1280×720P@50fps	0x050002D0	50 / 49.95
1280×720P@30fps	0x050002D0	30 / 29.97
1280×720P@25fps	0x050002D0	25 / 24.97
1280×720P@24fps	0x050002D0	24 / 23.97
720×480P@60fps	0x02D001E0	60 / 59.94
720×576P@50fps	0x02D00240	50 / 49.95
720×480i@60fps	0x02D000F0	60 / 59.94
720×576i@50fps	0x02D00120	50 / 49.95

720×240P@60fps	0x05A001E0	60 / 59.94	* ₁
720×288P@50fps	0x05A00240	50 / 49.95	* ₁
1440×900p@60fps	0x05A00384	60 / 59.94	
1280×1024p@60fps	0x05000400	60 / 59.94	
1280×960p@60fps	0x050003C0	60 / 59.94	
1280×800p@60fps	0x05000320	60 / 59.94	
1280×768p@60fps	0x05000300	60 / 59.94	
1024×768p@60fps	0x04000300	60 / 59.94	
800×600p@60fps	0x03200258	60 / 59.94	
640×480p@60fps	0x028001E0	60 / 59.94	* ₂
640×400p@60fps	0x02800190	60 / 59.94	* ₃
640×384p@60fps	0x02800180	60 / 59.94	* ₃

*₁ THE FORMAT IS USED BY SONY PS1/PS2 GAME MACHINE.

*₂ THE FORMAT IS USED BY MICROSOFT XBOX360 GAME MACHINE (640×480p@60fps).

*₃ THE FORMAT IS USED BY NEC IPC MACHINE (640×400p@56.4fps).

Note!! Developer should design one polling operation in one background thread to obtain/update current input format.

The resolution property **KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_RESOLUTION:**

SUPPORT VALUE: RESOLUTION = (WIDTH << 16) | (HEIGHT << 0)

The interleaved property **KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_INTERLEAVED:**

SUPPORT VALUE: 0: PROGRESSIVE

1: INTERLACED

The frame rate property **KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_FRAME_RATE:**

SUPPORT VALUE: 24 / 25 / 30 / 50 / 60 FPS

EXAMPLE#02: GET CURRENT VIDEO FORMAT.

```
AMESDK_GET_CUSTOM_PROPERTY( hDev, 210, &RESOLUTION );
```

```
AMESDK_GET_CUSTOM_PROPERTY( hDev, 223, &INTERLACED );
```

```
AMESDK_GET_CUSTOM_PROPERTY( hDev, 208, &FRAMERATE );
```

To obtain a more precise frame rate, combined with fraction property.

The **KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_FRACTION_1000_1001:**

SUPPORT VALUE: 23.97 / 24.97 / 29.97 / 49.95 / 59.94 FPS

$$\begin{aligned}
 23.97 &= 24 * (1000/1001) \\
 24.97 &= 25 * (1000/1001) \\
 29.97 &= 30 * (1000/1001) \\
 49.95 &= 50 * (1000/1001) \\
 59.94 &= 60 * (1000/1001)
 \end{aligned}$$

EXAMPLE#03: TO GET MORE ACCURATE VIDEO FRAME RATE.

```

DWORD dw_framerate_fraction_property = 0;
double d_video_framerate_property = 0.0;

AMESDK_GET_CUSTOM_PROPERTY( hDev, 208, &FRAMERATE );
AMESDK_GET_CUSTOM_PROPERTY( hDev, 241, &dw_framerate_fraction_property );

d_video_framerate_property = FRAMERATE;

if ( dw_framerate_fraction_property == 1 )
{
    d_video_framerate_property *= 1000;
    d_video_framerate_property /= 1001;
}

```

The two properties **KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_SIGNAL_COLORIMETRY** / **KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_SIGNAL_COLORRANGE** allows you to get the YCbCr transfer matrix and RGB color range for incoming signal. For example, suppose the device converts from RGB to YCbCr. If it gets the YCbCr matrix is 2 and the RGB color range is 1, the device converts full range RGB to ITU-R BT.709 YCbCr.

SUPPORT VALUE: 0: UNKNOWN
 1: BT601
 2: BT709

EXAMPLE#04: GET CURRENT COLORIMETRY.

```

ULONG nColorIMETRY = 0;
AMESDK_GET_CUSTOM_PROPERTY( hDev, 370, &nYCbCrMatrix );

```

SUPPORT VALUE: 0: UNKNOWN
 1: FULL RANGE (0 ~ 255)
 2: LIMITED RANGE (16 ~ 235)

EXAMPLE#05: GET CURRENT RGB COLOR RANGE.

```
ULONG nColorRange = 0;
AMESDK_GET_CUSTOM_PROPERTY( hDev, 371, &nColorRange );
```

The property **KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_MACROVISION** allows you to detect if the input's media content owns HDCP or MarcoVision protection.

Note!! To protect the content license, all behaviors in software porting should be complied with HDCP rules. Detect in any registered content of HDCP or MarcoVision, please disable the recording function in software.

SUPPORT VALUE: 0, 1 - NO ~ YES

EXAMPLE#06: GET HDCP PROTECT.

```
AMESDK_GET_CUSTOM_PROPERTY( hDev, 202, &HDCP );
if( HDCP == 1 ) { RECORD_FUNCTION = DISABLE; }
if( HDCP == 0 ) { RECORD_FUNCTION = ENABLE; }
```

The property **KSPROPERTY_CUSTOM_GET_ANALOG_AUDIO_SAMPLE_FREQUENCY** can auto detect current audio format and can report it to upper software. Currently, all audio formats are stereo and 16bits quality. The only difference is their sample frequency, so you can use the property to obtain the input's sample frequency.

SUPPORT VALUE: 48000 - STEREO / 16BITS / 48000HZ
44100 - STEREO / 16BITS / 44100HZ
32000 - STEREO / 16BITS / 32000HZ

EXAMPLE#07: GET CURRENT AUDIO SAMPLE FREQUENCY.

```
AMESDK_GET_CUSTOM_PROPERTY( hDev, 253, &FREQUENCY );
```

- 3. **KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_SINGAL_DEBUG_INFO** (271) (READ ONLY)
- 3. **KSPROPERTY_CUSTOM_GET_PREVIEW_VIDEO_STARAM_FRAME_NUMBER_INFO** (351) (READ ONLY)
- 3. **KSPROPERTY_CUSTOM_GET_PREVIEW_AUDIO_STARAM_FRAME_NUMBER_INFO** (361) (READ ONLY)
- 3. **KSPROPERTY_CUSTOM_GET_ENCODER_VIDEO_DEFAULT_FRAME_NUMBER_INFO** (430) (READ ONLY)

The property **KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_SINGAL_DEBUG_INFO** is used to get the debug information in capture card running state. The output information is 32-bit error numbers. If the number is 0, the device is working properly. You can call it in timer function to get current signal status regularly.

SUPPORT VALUE: 0: GOOD

OTHERS: ERROR BITS

EXAMPLE#01: TO GET CURRENT SINGAL DEBUG STATUS.

```
ULONG dwSingalDebugInfo = 0x00000000;  
AMESDK_GET_CUSTOM_PROPERTY( hDevice, 271, &dwSingalDebugInfo);
```

The property **KSPROPERTY_CUSTOM_GET_PREVIEW_VIDEO_STARAM_FRAME_NUMBER_INFO** allows you to get the total number of frames in preview video. The property reads frame number information from video stream. You can call it in timer function to get current frame number regularly.

SUPPORT VALUE: FRAME NUMBER

EXAMPLE#02: TO GET VIDEO PREVIEW STREAM'S FRAME NUMBER.

```
ULONG dwPreviewVideoFrameNumber = 0;  
AMESDK_GET_CUSTOM_PROPERTY( hDev, 351, &dwPreviewVideoFrameNumber );
```

The property **KSPROPERTY_CUSTOM_GET_PREVIEW_AUDIO_STARAM_FRAME_NUMBER_INFO** allows you to get the total number of frames in preview audio. The property reads frame number information from audio stream. You can call it in timer function to get current frame number regularly.

SUPPORT VALUE: FRAME NUMBER

EXAMPLE#03: TO GET AUDIO PREVIEW STREAM'S FRAME NUMBER.

```
ULONG dwPreviewAudioFrameNumber = 0;  
AMESDK_GET_CUSTOM_PROPERTY( hDev, 361, &dwPreviewAudioFrameNumber);
```

The property **KSPROPERTY_CUSTOM_GET_ENCODER_VIDEO_DEFAULT_FRAME_NUMBER_INFO** allows you to get the total number of frames in video encoder. The property reads frame number information from compressed video stream. You can call it

in timer function to get current frame number regularly.

SUPPORT VALUE: FRAME NUMBER

EXAMPLE#04: TO GET VIDEO ENCODER STREAM STREAM'S FRAME NUMBER.

```
ULONG dwEncoderVideoFrameNumber = 0;
```

```
AMESDK_GET_CUSTOM_PROPERTY( hDev, 430, &dwEncoderVideoFrameNumber);
```

- 4. **KSPROPERTY_CUSTOM_GET_DEVICE_VIDEO_INPUT_CONFIG_INFO** (8) (READ ONLY)
- 4. **KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_INPUT** (201)
- 4. **KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_INPUT_AUTO_SCAN_ENABLED** (232)
- 4. **KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_DVI_YCBCR** (235)
- 4. **KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_SOG** (234)

The property **KSPROPERTY_CUSTOM_GET_DEVICE_VIDEO_CONFIG** allows you to get an OR combination of flag bits. This value shows what types of video sources you can set are supplied on one capture card.

EXAMPLE#01: TO GET THE SUPPORT INPUTS OF THE VIDEO SOURCE ON ONE CAPTURE CARD.

```
ULONG nInput = 0xFFFFFFFF;
AMESDK_GET_CUSTOM_PROPERTY( hDevice, 8, &nInput);
```

SUPPORT VALUE: 0: COMPOSITE
 1: SVIDEO
 2: HDMI
 3: DVI-D
 4: COMPONENTS (YCBCR)
 5: DVI-A (RGB) (VGA)
 6: SDI

The property **KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_INPUT** allows you to get/change current video input source. We can support total 7 kinds of video input sources, HDMI, DVI-D, Components, DVI-A, SDI, COMPOSITE and SVIDEO.

SUPPORT VALUE: 0: HDMI
 1: DVI-Digital
 2: Components (YCbCr)
 3: DVI-Analog (RGB) (VGA)
 4: SDI
 5: COMPOSITE
 6: SVIDEO

EXAMPLE#02: SET INPUT TO HDMI.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 201, 0 );
```

EXAMPLE#03: CHANGE TO SDI INPUT.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 201, 4 );
```

EXAMPLE#04: GET CURRENT INPUT SOURCE.

```
AMESDK_GET_CUSTOM_PROPERTY( hDev, 201, &INPUT );
```


The property **KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_INPUT_AUTO_SCAN** allows you to enable or disable the automatic scan video input signal source. If this function detects the actual video input source and format on capture card, it will automatically set the correct video input source and format.

SUPPORT VALUE: 0 ~ 1 - DISABLE ~ ENABLE

EXAMPLE#05 ENABLE THE AUTO INPUT SCAN FUNCTION

```
LONG enable = 0x01;  
AMESDK_SET_CUSTOM_PROPERTY( hDev, 232, enable );
```

The property **KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_DVI_YCBCR** allows you to use the DVI-I connector for component incoming signals.

SUPPORT VALUE: 0 ~ 1 - DISABLE ~ ENABLE

EXAMPLE#06: TO ENABLE THE FUNCTION

```
LONG input = 0x01;  
AMESDK_SET_CUSTOM_PROPERTY( hDev, 235, input );
```

If your input supports SOG (Sync on Green), you can use the property **KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_SOG** to enable or disable it.

SUPPORT VALUE: 0 ~ 1 - DISABLE ~ ENABLE

EXAMPLE#07: TO ENABLE SYNC ON GREEN

```
LONG input = 0x01;  
AMESDK_SET_CUSTOM_PROPERTY( hDev, 234, input );
```

5. KSPROPERTY_CUSTOM_GET_DEVICE_AUDIO_CONFIG (9)
5. KSPROPERTY_CUSTOM_XET_ANALOG_AUDIO_INPUT (255)

The property **KSPROPERTY_CUSTOM_GET_DEVICE_AUDIO_CONFIG** allows you to get an OR combination of flag bits. This value shows what types of audio sources you can set are supplied on one capture card.

EXAMPLE#01: TO GET THE SUPPORT INPUTS OF THE AUDIO SOURCE ON ONE CAPTURE CARD.
`ULONG nInput = 0xFFFFFFFF;`
`AMESDK_GET_CUSTOM_PROPERTY(hDevice, 9, &nInput);`

The property **KSPROPERTY_CUSTOM_XET_ANALOG_AUDIO_INPUT** allows you to get/change current audio input source. You can select audio from embedded audio data or from extra line-in cable.

SUPPORT VALUE: 0: Embedded Audio
 1: Line In

Note!! The property is enabled only by HDMI, DVI-D, and SDI input mode.

EXAMPLE#02: CHANGE TO EMBEDDED AUDIO INPUT.
`AMESDK_SET_CUSTOM_PROPERTY(hDev, 255, 0);`

EXAMPLE#03: CHANGE TO LINE-IN INPUT.
`AMESDK_SET_CUSTOM_PROPERTY(hDev, 255, 1);`

EXAMPLE#04: GET CURRENT AUDIO INPUT SOURCE.
`AMESDK_GET_CUSTOM_PROPERTY(hDev, 255, &INPUT);`

- 6. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_DEINTERLACE_TYPE (200)
- 6. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_VERTICAL_MIRROR (244)
- 6. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_HORIZONTAL_MIRROR (245)

MZ0380 offers one hardware-based deinterlacer on chip. The property (200) will allow you to access it. You can call the function, AMESDK_SET_CUSTOM_PROPERTY, to enable/disable this function.

SUPPORT VALUE: 0 ~ 1 - DISABLE ~ ENABLE

EXAMPLE#01: TO TURN OFF HARDWARE DEINTERLACE FUNCTION.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 200, 0 );
```

EXAMPLE#02: TO TURN ON HARDWARE DEINTERLACE FUNCTION.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 200, 1 );
```

Note!! The function, AMESDK_SET_DEINTERLACE, is used for software-based deinterlacer only. If you enable the hardware-based deinterlace function, you don't need call AMESDK_SET_DEINTERLACE again.

The two properties (244/245) are used to set mirror function. When mirror function is enabled, the vertical or horizontal video frame is inverted on display window. Same as deinterlacing, the property is used for display engine only.

SUPPORT VALUE: 0 ~ 1 - DISABLE ~ ENABLE

EXAMPLE#03: ENABLE THE VERTICAL MIRROR FUNCTION ON DISPLAY WINDOW

```
LONG enable = 0x01;
```

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 244, enable);
```

EXAMPLE#04: ENABLE THE HORIZONTAL MIRROR FUNCTION ON DISPLAY WINDOW

```
LONG enable = 0x01;
```

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 245, enable);
```

7. KSPROPERTY_CUSTOM_XET_ANALOG_AUDIO_VOLUME (251)

The property is used to control the current audio ADC's volume on the capture card.

SUPPORT VALUE: 0 (Mute): ~ 255 (Full)

Note!! The property is enabled only by HDMI, DVI-D, and SDI input mode.

EXAMPLE#01: TO SET THE AUDIO VOLUME AMPLITUDE.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 251, 128 );
```

EXAMPLE#02: TO GET THE AUDIO VOLUME AMPLITUDE.

```
AMESDK_GET_CUSTOM_PROPERTY( hDev, 251, &VOLUME );
```

8. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_RX_VGA_PHASE (219)

If input is in VGA or YCbCr, the property allows you to adjust the hardware receiver's property. If your monitor is on a VGA or YCbCr cable, you need to set the phase right. The property has values from 0 to 63. You can increase or decrease the value until the display clears up, no more fuzziness or shakiness.

The auto phase property can be set as below:

SUPPORT VALUE: 0 ~ 63 - MANUAL PHASE DEGREE

SUPPORT VALUE: 0x80000000 - AUTO PHASE

EXAMPLE#01: TO SET VGA PHASE AUTOMATICALLY.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 219, 0x80000000 );
```

9. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_IS_720H_PIXELS_OUTPUT (214)

The property allows you to check whether the output video height is 720 pixels. If the value is 0, the output video height is 960 pixels. If the value is 1, the output video height is 720 pixels.

SUPPORT VALUE: 0: 960 PIXELS
 1: 720 PIXELS

EXAMPLE#01: TO GET HEIGHT OUTPUT.

```
AMESDK_GET_CUSTOM_PROPERTY( hDev, 214, &HEIGHT_PIXELS );
```

- 10. `KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_RX_VGA_OFFSET_X` (221)
- 10. `KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_RX_VGA_OFFSET_Y` (222)
- 10. `KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_RX_VGA_ASPECT_RATIO` (224)
- 10. `KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_RX_VGA_HACTIVE_PIXELS` (225)

If input is in VGA or YCbCr, these properties (221/222/224/225) allow you to adjust the hardware receiver's property.

The offset property (221/222) allows you to adjust the horizontal and vertical offset for signal. Moreover, our driver will do auto memorize for setting value in next detection.

SUPPORT VALUE: -127 ~ +128

EXAMPLE#01: TO SET HORIZONTAL OFFSET FOR VGA.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 221, -8 );
```

EXAMPLE#02: TO SET VERTICAL OFFSET FOR VGA.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 222, -8 );
```

The aspect ratio property (224) allows you to adjust signal's aspect ratio during displaying. The boundary will be filled by black image.

SUPPORT VALUE: 0 (4 : 3) , 1 (5 : 4) , 3 (16 : 9) ,
4 (16 : 10) , 5 (3 : 2) , 6 (1 : 1) ,
7 (HACTIVE PIXELS)

EXAMPLE#3: TO SET 16:9 ASPECT RATIO FOR VGA.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 224, 3 );
```

The horizontal active pixel property (225) allows you to set the total number of active pixels on a horizontal line. The horizontal component of timing consists of the horizontal active and horizontal blanking periods.

SUPPORT VALUE: PIXELS

EXAMPLE#4: TO SET HORIZONTAL ACTIVE PIXELS FOR VGA.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 225, 1920 );
```

11. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_INPUT_EQ (240)

11. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_INPUT_BANDWIDTH (248)

The property (240) allows you to set a suitable distance in meter when using the DVI and HDMI signal. Basically, the quality of signal can vary widely based on the cable's materials, but here can adjust the settings through the property.

SUPPORT VALUE: 0 ~ 2 - **2m, 10m, 10~15m (METER)**

EXAMPLE#01: TO SET THE CABLE LENGTH IN 2 METER

```
LONG input = 0x00;
```

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 240, input );
```

EXAMPLE#02: TO SET THE CABLE LENGTH IN 10 METER

```
LONG input = 0x01;
```

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 240, input );
```

EXAMPLE#03: TO SET THE CABLE LENGTH IN 10~15 METER

```
LONG input = 0x02;
```

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 240, input );
```

The property (248) allows you to get/set current video input bandwidth for the HDMI or DVI input. We can support total 6 kinds of video input bandwidth, 50%, 75%, 100%, 125%, 150%, and 200%. By default, the bandwidth is 75%.

SUPPORT HDMI/DVI BANDWIDTH: 0: 50%

1: 75%

2: 100%

3: 125%

4: 150%

5: 200%

EXAMPLE#04: SET THE INPUT BANDWIDTH PERCENTAGE TO 50 PERCENT.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 248, 0 );
```

EXAMPLE#05: SET THE INPUT BANDWIDTH PERCENTAGE TO 100 PERCENT.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 248, 2 );
```

EXAMPLE#06: SET THE INPUT BANDWIDTH PERCENTAGE TO 200 PERCENT.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 248, 5 );
```


12. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_COLOR_RANGE (231)

The property allows you to control each input (HDMI, COMPONENT, VGA) to different scale range. You should choose proper mode because it makes you achieve the most accurate color.

We can use a 32-bit number (4 byte) as input value:

A 2-bit **operation code** can be set as below to specify the conversion operation:

- 0: Keep the color range unchanged. (Default)
- 1: Shrink the input from full range to limited range. (16-235 level)
- 2: Expand the input from limited range to full range. (0-255 level)

Other bit fields are used to represent as below:

- [1:0] Operation code for HDMI input when register reveals 0 "Default (depend on video format)"
- [5:4] Operation code for HDMI input when register reveals 1 "Limited range"
- [9:8] Operation code for HDMI input when register reveals 2 "Full range"
- [13:12] Operation code for Component input
- [17:16] Operation code for VGA input

NOTE: Normally it is recommended to set operation code to default. If the displayed black or white color in the video input is not enough true. You can use the mode adjustment to change the color quality for video input.

EXAMPLE#01: TO CHANGE HDMI INPUT LIMITED RANGE TO FULL RANGE

```
LONG input = 0x00020;  
AMESDK_SET_CUSTOM_PROPERTY( hDev, 231, input );
```

EXAMPLE#02: TO CHANGE HDMI INPUT FULL RANGE TO LIMITED RANGE

```
LONG input = 0x00100;  
AMESDK_SET_CUSTOM_PROPERTY( hDev, 231, input );
```

EXAMPLE#03: TO CHANGE ALL INPUT TO LIMITED RANGE

```
LONG input = 0x11100;  
AMESDK_SET_CUSTOM_PROPERTY( hDev, 231, input );
```

EXAMPLE#04: TO EXPAND ALL INPUT COOR RANGE NO MATTER WHAT

```
LONG input = 0x22222;  
AMESDK_SET_CUSTOM_PROPERTY( hDev, 231, input );
```

13. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_FLEXIBLE_FPS_PATCH (218)

The property allows you to control the output format from one video capture filter. It allows you to adjust the video's frame rate from driver side. If it is disabled, the output frame rate is equal to input signal's frame rate.

SUPPORT VALUE: 0 ~ 1 - DISABLE ~ ENABLE

EXAMPLE#01: TO ENABLE FRAMERATE SCALER.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 218, 1 );
```

14. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_FLEXIBLE_RESOLUTION_PATCH (220)

The property allows you to adjust the video's resolution from hardware board. If it is disabled, the output resolution is equal to input signal's resolution. If it is enabled, we will enable one auto scalar to output customized format. For example, input resolution is 1920x1080 and capture output pin's resolution is 720x480.

SUPPORT VALUE: 0 ~ 1 - DISABLE ~ ENABLE

EXAMPLE#01: TO ENABLE RESOLUTION SCALER.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 220, 1 );
```

15. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_IS_SINGLE_FOMART_OUTPUT (215)

To configure a capture filter's output format, the property can expose all range of output formats or expose only single format. If it is disabled, the capture filter expose all output formats. If it is enabled, we can only expose one format on the video capture filter output.

SUPPORT VALUE: 0: EXPOSE ALL FORMATS
1: SINGLE FORMAT

We can combine these three properties (215/218/220) to remove image scale function.

EXAMPLE#01: TO REMOVE IMAGE SCALER.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 215, 0 );  
AMESDK_SET_CUSTOM_PROPERTY( hDev, 218, 0 );  
AMESDK_SET_CUSTOM_PROPERTY( hDev, 220, 0 );
```

Note, to enable them (218, 220, 215), you need reboot the system.

16. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_CUSTOMIZED_OUTPUT_RESOLUTION (233)

The property allows user to set customized output resolution on the capture card. The driver will perform a check to ensure the resolution you have added is safe. If it is not, the return value of the property will be FALSE.

SUPPORT VALUE: RESOLUTION = (WIDTH << 16) | (HEIGHT << 0)

EXAMPLE#01: TO SETUP ONE CUSTOMIZED OUTPUT RESOLUTION.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 233, &RESOLUTION );
```

17. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_MAXIMAL_OUTPUT_RESOLUTION (242)

The property allows user to set maximal output resolution on the capture card. The driver will perform a check to ensure the resolution you have set is safe. If it is not, the return value of the property will be FALSE.

SUPPORT VALUE: RESOLUTION = (WIDTH << 16) | (HEIGHT << 0)

EXAMPLE#01: TO SET MAXIMAL OUTPUT RESOLUTION.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 242, &RESOLUTION );
```

18. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_QUEUE_BUFFER_SIZE (216)

The property allows you to specify the number of the rendered video frame in the queue buffer for a preview or hardware-encoded stream. By the default, the queue size of the corresponding a preview and hardware-encoded stream is set 10 and 16. Here we recommended use the size by default because this is implicated in many resource issues. For example, the unexpected signal error may occur if the total buffer sizes you want to set exceed the system capabilities.

Note: Setting queue buffer size will involve in dynamically allocated memory.

EXAMPLE#01: TO SET THE PREVIEW QUEUE SIZE TO 10 FRAMES

```
LONG nBfferSize = 10;  
AMESDK_SET_CUSTOM_PROPERTY( hPreviewDevice, 216, nBfferSize );
```

EXAMPLE#02: TO SET THE HARDWARE-ENCODED QUEUE SIZE TO 16 FRAMES

```
LONG nBfferSize = 16;  
AMESDK_SET_CUSTOM_PROPERTY( hMainDevice, 216, nBfferSize );
```

19. KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_IS_ENABLED_SUB_ENCODER (273)

The property allows you to enable H.264 sub hardware encoder. This is only for the capture card that has Dual Stream (Main Stream and Sub Stream) on it. By the default, the H.264 sub hardware encoder is disabled.

SUPPORT VALUE: 0: DISABLE
 1: ENABLE

EXAMPLE#01: TO ENABLE H.264 SUB HARDWARE ENCODER.

```
LONG enable = 1;
```

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 273, &enable);
```


20. KSPROPERTY_CUSTOM_XET_PREVIEW_VIDEO_STERAM_POST_RESOLUTION (350)

The property allows you to adjust current video resolution dynamically. The driver will re-allocate memory during changing video format on capture card running state.

SUPPORT VALUE: RESOLUTION = (WIDTH << 16) | (HEIGHT << 0)

EXAMPLE#01: TO SET PREVIEW VIDEO RESOLUTION DYNAMICALLY.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 350, &RESOLUTION );
```

21. KSPROPERTY_CUSTOM_XET_PREVIEW_VIDEO_STREAM_POST_SKIP_FRAMERATE (246)

21. KSPROPERTY_CUSTOM_XET_PREVIEW_VIDEO_STARAM_POST_AVG_FRAMERATE (247)

The property (246) allows you to adjust current video skip frame rate dynamically. The range of the property is from 1 to 255. It is identical to the skip number of frame. For example, the value 1 will generate the preview frame rate, 15.000fps.

SUPPORT VALUE: 0: DISABLE
 1, 2, 3, 4, ... SKIP

EXAMPLE#01: TO SET PREVIEW VIDEO SKIP FRAMERATE DYNAMICALLY.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 246, &FRAMERATE );
```

The property (247) allows you to adjust current video average frame rate dynamically. The range of the property is from 1 to 85. To enable it, our driver will follow the setting value to output one average fps. For example, 9 mean 9.00fps.

SUPPORT VALUE: 0: DISABLE
 1 ~ 85 FPS

EXAMPLE#02: TO SET PREVIEW VIDEO AVERAGE FRAMERATE DYNAMICALLY.

```
AMESDK_SET_CUSTOM_PROPERTY( hDev, 247, &FRAMERATE );
```

22. KSPROPERTY_CUSTOM_XET_GPIO_DIRECTION (940)
22. KSPROPERTY_CUSTOM_XET_GPIO_DATA (941)
22. KSPROPERTY_CUSTOM_GET_GPIO_SUPPORT (942) (READ ONLY)

The property allows you to access MZ0380's GPIO interface. The property KSPROPERTY_CUSTOM_XET_GPIO_DIRECTION allows you to control its direction. Here, writing 1 to bit enables this pin as output pin. Usually, the GPIO is controlled by the first chipset in one board.

SUPPORT VALUE: 0 ~ 1 - INPUT ~ OUTPUT

The property KSPROPERTY_CUSTOM_XET_GPIO_DATA allows you to access GPIO's data.

SUPPORT VALUE: 0 ~ 1 - LOW ~ HIGH

The property KSPROPERTY_CUSTOM_XET_GPIO_SUPPORT allows you to obtain GPIO's information (pin size) on hardware board. Developer can use it to check if the device can support GPIO access.

SUPPORT VALUE: 0 IS NON-SUPPORT

EXAMPLE#01: TO DEFINE GPIO AS 8 OUTPUT PINS [0:7] AND 8 INPUT PINS [8:15].
`AMESDK_SET_CUSTOM_PROPERTY(hDev, 940, 0x00FF);`

EXAMPLE#02: TO DEFINE GPIO AS 16 OUTPUT PINS [0:15] THEN PULL HIGH FOR ALL.
`AMESDK_SET_CUSTOM_PROPERTY(hDev, 940, 0xFFFF);`
`AMESDK_SET_CUSTOM_PROPERTY(hDev, 941, 0xFFFF);`

EXAMPLE#03: TO DEFINE GPIO AS 16 INPUT PINS [0:15] THEN READ DATA FROM IT.
`AMESDK_SET_CUSTOM_PROPERTY(hDev, 940, 0x0000);`
`AMESDK_GET_CUSTOM_PROPERTY(hDev, 941, &GPIO);`

- 23. **KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_RECORD_MODE** (407)
- 23. **KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_RECORD_QUALITY** (404)
- 23. **KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_RECORD_BITRATE** (403)
- 23. **KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_RECORD_MAX_BITRATE** (409)
- 23. **KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_RECORD_MIN_BITRATE** (410)

The property **KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_RECORD_MODE** allows you to get/set record mode on hardware-compressed capture device. There are 3 kinds of encoder mode: variable bitrate (VBR), constant bitrate (CBR) and average bitrate (ABR).

SUPPORT VALUE: 0: VBR (FQP)
1: CBR
2: ABR

In the VBR mode, you choose the desired quality going from 0 (lowest quality) to 1000 (highest quality). The encoder tries to maintain the given quality for your video file. The main advantage is that you are able to specify the quality level that you want to reach, but the disadvantage is that the video size is unpredictable.

The property **KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_RECORD_QUALITY** allows you to set a suitable quality in VBR mode.

SUPPORT VALUE: 0 ~ 10000

EXAMPLE#01: TO SET VIDEO ENCODER QUALITY.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 407, 0 );  
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 404, 8000 );
```

In the CBR mode, the bitrate will be the same for the whole video file. The quality of your video is variable. The main advantage is that final video size can be accurately predicted, but the disadvantage is that the complex video parts will be a lower quality.

The property **KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_RECORD_BITRATE** allows you to set a suitable bitrate in CBR mode.

SUPPORT VALUE: 0 ~ 60000000 BPS

EXAMPLE#02: TO SET VIDEO ENCODER BITRATE.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 407, 1 );
```

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 403, 12 * 1024 * 1024 );
```

In the ABR mode, you choose a target bitrate and the encoder will try to constantly maintain an average bitrate while using higher bitrate for the parts of your video that need more bits. The result will be of higher quality than CBR encoding while the average file size will remain predictable.

SUPPORT VALUE: 0 ~ 600000000 BPS

EXAMPLE#03: TO SET VIDEO ENCODER BITRATE.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 407, 2 );
```

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 403, 12 * 1024 * 1024 );
```

The two properties **KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_RECORD_MAX_BITRATE** / **KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_RECORD_MIN_BITRATE** allow you to set a suitable through/peak bitrate in ABR mode.

SUPPORT VALUE: 0 ~ 600000000 BPS

EXAMPLE#04: TO SET VIDEO ENCODER PEAK BITRATE.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 407, 2 );
```

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 409, 12 * 1024 * 1024 );
```

EXAMPLE#05: TO SET VIDEO ENCODER THROUGH BITRATE.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 407, 2 );
```

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 410, 1 * 1024 * 1024 );
```

24. KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STREAM_POST_SKIP_FRAMERATE (402)

24. KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STARAM_POST_AVG_FRAMERATE (422)

The property (402) allows you to adjust encoding skip frame rate dynamically. The range of the property is from 1 to 255. It is identical to the skip number of frame. For example, the value 1 will generate the encoding frame rate, 15.000fps.

SUPPORT VALUE: 0: DISABLE
 1, 2, 3, 4, ... SKIP

EXAMPLE#01: TO SET VIDEO ENCODER SKIP FRAMERATE DYNAMICALLY.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 402, 1 );
```

The property (422) allows you to adjust encoding average frame rate dynamically. The range of the property is from 1 to 85. To enable it, our driver will follow the setting value to output one average fps. For example, 9 mean 9.00fps.

SUPPORT VALUE: 0: DISABLE
 1 ~ 85 FPS

EXAMPLE#02: TO SET VIDEO ENCODER AVERAGE FRAMERATE DYNAMICALLY.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 422, 9 );
```

25. KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_POST_RESOLUTION (401)

The property allows you to adjust video encoding resolution dynamically. The driver will re-allocate memory during changing video format on capture card running state.

SUPPORT VALUE: RESOLUTION = (WIDTH << 16) | (HEIGHT << 0)

EXAMPLE#01: TO SET VIDEO ENCODER RESOLUTION DYNAMICALLY.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 401, &RESOLUTION );
```

26. KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_PROFILE (412)

The property allows you to adjust video encoder profile on hardware-compressed capture device. There are 3 kinds of profile value.

SUPPORT VALUE: 0: DEFAULT (HIGH)
 1: BASELINE
 2: MAIN
 3: HIGH

EXAMPLE#01: TO SET VIDEO ENCODER PROFILE.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 412, 3 );
```


27. KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_LEVEL (414)

The property allows you to adjust video encoder level on hardware-compressed capture device. The value of the property is auto.

SUPPORT VALUE: AUTO

EXAMPLE#01: TO GET VIDEO ENCODER LEVEL.

```
AMESDK_GET_CUSTOM_PROPERTY( hEncoderDev, 414, &LEVEL );
```

28. KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_ENTROPY (415)

The property allows you to adjust video encoder entropy on hardware-compressed capture device. There are 2 kinds of entropy value.

SUPPORT VALUE: 0: DEFAULT (CABAC)
 1: CAVLC
 2: CABAC

EXAMPLE#01: TO SET VIDEO ENCODER ENTROPY.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 412, 2 );
```

29. KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_GOP (405)

The property allows you to set the maximum number of frames between each key frame on hardware-compressed capture device. For example, a value of 100 will create a key frame every 100 frames. A smaller GOP value will increase the size of your video file, but it will allow more precise playback in most players. The GOP set to higher value can increase the compression ratio, but that would not be free to jump to any time point in playback.

SUPPORT VALUE: 0 ~ 255

EXAMPLE#01: TO SET VIDEO ENCODER GOP.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 405, 30 );
```

30. KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_ASPECT_RATIO (413)

The property allows you to set video encoder aspect ratio on hardware-compressed capture device. The property can maintain aspect ratio when resizing your video. Aspect ratio is expresses as the relation of the width and height.

SUPPORT VALUE: ASPECT_RATIO = (WIDTH << 16) | (HEIGHT << 0)

EXAMPLE#01: TO SET VIDEO ENCODER ASPECT RATIO.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 413, &ASPECT_RATIO );
```

31. KSPROPERTY_CUSTOM_SET_ENCODER_VIDEO_STERAM_FORCE_KEY_FRAME (406)

The property allows you to set video encoder force key frame on hardware-compressed capture device. The property puts key frame on the next frame or forcing a key frame at specified timestamp.

SUPPORT VALUE: 1: FROCE KEYFRAME

EXAMPLE#01: TO SET VIDEO ENCODER FORCE KEYFRAME.

```
AMESDK_SET_CUSTOM_PROPERTY( hEncoderDev, 406, 1 );
```

32. KSPROPERTY_CUSTOM_XET_ENCODER_VIDEO_STERAM_FRAME_QUEUE_LENGTH (424)

The property allows you to specify the number of the rendered video frame in the queue buffer for video encoded stream. By the default, the queue size of the corresponding video encoded stream is set 16. Here we recommended use the size by default because this is implicated in many resource issues. For example, the unexpected signal error may occur if the total buffer sizes you want to set exceed the system capabilities.

Note: Setting queue buffer size will involve in dynamically allocated memory.

EXAMPLE#01: TO SET THE VIDEO ENCODER QUEUE SIZE TO 16 FRAMES

```
LONG nBfferSize = 16;
```

```
AMESDK_SET_CUSTOM_PROPERTY(hEncoderDev, 424, nBfferSize );
```

33. Access Encoder Property

Developer can use the AMESDK_G/SET_VIDEOCOMPRESSION_PROPERTY function to access all MZ0380's video encoder properties. These properties as describe as the table below:

PROPERTY	RANGE
VideoCompression_PostResolution	(cx << 12) + (cy << 0)
VideoCompression_PostSkipFrameRate	0 ~ 255
VideoCompression_PostAvgFrameRate	0 ~ 85
VideoCompression_Profile	0 (HIGH DEFAULT), 1 (BASELINE), 2 (MAIN), 3 (HIGH)
VideoCompression_Level	AUTO
VideoCompression_Entropy	0 (CABAC DEFAULT), 1 (CAVLC), 2 (CABAC)
VideoCompression_RecordMode	0 (VBR), 1 (CBR), 2 (ABR)
VideoCompression_RecordQuality	0 ~ 10000
VideoCompression_BitRate	0 ~ 60000000 BPS
VideoCompression_MaxBitRate	0 ~ 60000000 BPS
VideoCompression_MinBitRate	0 ~ 60000000 BPS
VideoCompression_KeyFrameRate	0 ~ 255
VideoCompression_AspectRatio	(cx << 12) + (cy << 0)
VideoCompression_OverrideKeyFrame	1 (WRITE ONLY)

33. Access Custom Property for DirectShow Developer

Customer uses DirectShow to develop software can bypass our SDK to access MZ0380 directly. The interface can be queried from our capture source filter.

You can use IKsPropertySet to access all.

33.1 Device Serial Number Property:

```
#define KSPROPERTY_CUSTOM_GET_DEVICE_SERIAL_NUMBER 0 (READ ONLY) (ULONG)
```

33.2 Device Bus Number Property:

```
#define KSPROPERTY_CUSTOM_GET_DEVICE_BUS_NUMBER_INFO 2 (READ ONLY) (ULONG)
```

33.3 Device Firmware Version Property:

```
#define KSPROPERTY_CUSTOM_GET_FPGA_VERSION_INFO 6 (READ ONLY) (ULONG)
```

33.4 GPIO Property:

```
#define KSPROPERTY_CUSTOM_XET_GPIO_DIRECTION 940 (ULONG)
```

```
#define KSPROPERTY_CUSTOM_XET_GPIO_DATA 941 (ULONG)
```

```
#define KSPROPERTY_CUSTOM_GET_GPIO_SUPPORT 942 (READ ONLY) (ULONG)
```

33.5 Video & Audio Property:

```
#define KSPROPERTY_CUSTOM_GET_DEVICE_VIDEO_CONFIG 8 (READ ONLY) (ULONG)
```

```
#define KSPROPERTY_CUSTOM_GET_DEVICE_AUDIO_CONFIG 9 (READ ONLY) (ULONG)
```

```
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_DEINTERLACE_TYPE 200 (ULONG)
```

```
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_INPUT 201 (ULONG)
```

```
#define KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_MACROVISION 202 (READ ONLY) (ULONG)
```

```
#define KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_FRAME_RATE 208 (READ ONLY) (ULONG)
```

```
#define KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_RESOLUTION 210 (READ ONLY) (ULONG)
```

```
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_IS_720H_PIXELS_OUTPUT 214 (ULONG)
```

```
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_IS_SINGLE_FOMART_OUTPUT 215 (ULONG)
```

```
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_QUEUE_BUFFER_SIZE 216 (ULONG)
```

```
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_FLEXIBLE_FPS_PATCH 218 (ULONG)
```

```
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_RX_VGA_PHASE 219 (ULONG)
```

```
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_FLEXIBLE_RESOLUTION_PATCH 220 (ULONG)
```

```
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_RX_VGA_OFFSET_X 221 (ULONG)
```

```
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_RX_VGA_OFFSET_Y 222 (ULONG)
```

```
#define KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_INTERLEAVED 223 (READ ONLY) (ULONG)
```



```
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_RX_VGA_ASPECT_RATIO 224 (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_RX_VGA_HACTIVE_PIXELS 225 (ULONG)
#define KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_SIGNAL_LOCK_STATUS 230 (READ ONLY) (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_COLOR_RANGE 231 (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_INPUT_AUTO_SCAN 232 (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_CUSTOMIZED_OUTPUT_RESOLUTION 233 (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_SOG 234 (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_DVI_YCBCR 235 (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_INPUT_EQ 240 (ULONG)
#define KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_FRACTION_1000_1001 241 (READ ONLY) (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_MAXIMAL_OUTPUT_RESOLUTION 242 (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_VERTICAL_MIRROR 244 (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_HORIZONTAL_MIRROR 245 (ULONG)
#define KSPROPERTY_CUSTOM_XET_PREVIEW_VIDEO_STREAM_POST_SKIP_FRAMERATE 246 (ULONG)
#define KSPROPERTY_CUSTOM_XET_PREVIEW_VIDEO_STREAM_POST_AVG_FRAMERATE 247 (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_INPUT_BANDWIDTH 248 (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_AUDIO_VOLUME 251 (ULONG)
#define KSPROPERTY_CUSTOM_GET_ANALOG_AUDIO_SAMPLE_FREQUENCY 253 (READ ONLY) (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_AUDIO_INPUT 255 (ULONG)
#define KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_SINGAL_DEBUG_INFO 271 (READ ONLY) (ULONG)
#define KSPROPERTY_CUSTOM_XET_ANALOG_VIDEO_IS_ENABLED_SUB_ENCODER 273 (ULONG)
#define KSPROPERTY_CUSTOM_XET_PREVIEW_VIDEO_STERAM_POST_RESOLUTION 350 (ULONG)
#define KSPROPERTY_CUSTOM_GET_PREVIEW_VIDEO_STARAM_FRAME_NUMBER_INFO 351 (READ ONLY)
#define KSPROPERTY_CUSTOM_XET_PREVIEW_AUDIO_SAMPLE_POST_FREQUENCY 360 (ULONG)
#define KSPROPERTY_CUSTOM_GET_PREVIEW_AUDIO_STARAM_FRAME_NUMBER_INFO 361 (READ ONLY)
#define KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_SIGNAL_COLORIMETRY 370 (READ ONLY) (ULONG)
#define KSPROPERTY_CUSTOM_GET_ANALOG_VIDEO_SIGNAL_COLORRANGE 371 (READ ONLY) (ULONG)
#define KSPROPERTY_CUSTOM_GET_ENCODER_VIDEO_DEFAULT_FRAME_NUMBER_INFO 430 (READ ONLY)
```

33.6 Video Encoder Property:

Please reference the two functions to get/set all video encoder's parameters.

```
static const GUID GUID_KPS_MZ0380 = { 0xD1E5209F, 0x68FD, 0x4529, 0xBE, 0xE0, 0x5E, 0x7A, 0x1F, 0x47, 0x92, 0x22 };
```

```
BOOL OnGetVideoCompressionProperty( ULONG nProperty, ULONG * pValue )
{
    if( NULL == m_pAMVideoCompression ) { FALSE; }

    if( NULL == m_pKsPropertySet ) { FALSE; }

    if( nProperty == 0x00000000 ) { // KEY.FRAME.RATE (GOP)

        if( S_OK != m_pAMVideoCompression->get_KeyFrameRate( (LONG *) (pValue) ) ) { return FALSE; }
    }
    if( nProperty == 0x00000001 ) { // QUALITY

        double fQuality = 0.0f;

        if( S_OK != m_pAMVideoCompression->get_Quality( &fQuality ) ) { return FALSE; }

        *pValue = (ULONG) (fQuality * 10000.0f);
    }
    if( nProperty == 0x00000003 ) { // BIT.RATE.MODE

        if( S_OK != m_pKsPropertySet->Get( GUID_KPS_MZ0380, 407, NULL, 0, pValue, sizeof(ULONG), &cbBytes ) ) {

            return FALSE;

        }
    }
    if( nProperty == 0x00000004 ) { // BIT.RATE

        if( S_OK != m_pKsPropertySet->Get( GUID_KPS_MZ0380, 403, NULL, 0, pValue, sizeof(ULONG), &cbBytes ) ) {

            return FALSE;

        }
    }
    if( nProperty == 0x00000008 ) { // POST.RESOLUTION

        if( S_OK != m_pKsPropertySet->Get( GUID_KPS_MZ0380, 401, NULL, 0, pValue, sizeof(ULONG), &cbBytes ) ) {

            return FALSE;

        }
    }
    if( nProperty == 0x00000009 ) { // POST.SKIP.FRAME.RATE

        if( S_OK != m_pKsPropertySet->Get( GUID_KPS_MZ0380, 402, NULL, 0, pValue, sizeof(ULONG), &cbBytes ) ) {

            return FALSE;

        }
    }
    if( nProperty == 0x0000000D ) { // POST.AVG.FRAME.RATE

        if( S_OK != m_pKsPropertySet->Get( GUID_KPS_MZ0380, 422, NULL, 0, pValue, sizeof(ULONG), &cbBytes ) ) {

            return FALSE;

        }
    }
    if( nProperty == 0x0000000A ) { // B.FRAME

        if( S_OK != m_pKsPropertySet->Get( GUID_KPS_MZ0380, 411, NULL, 0, pValue, sizeof(ULONG), &cbBytes ) ) {

            return FALSE;

        }
    }
    if( nProperty == 0x0000000B ) { // PROFILE

        if( S_OK != m_pKsPropertySet->Get( GUID_KPS_MZ0380, 412, NULL, 0, pValue, sizeof(ULONG), &cbBytes ) ) {

            return FALSE;

        }
    }
    if( nProperty == 0x0000000C ) { // ASPECT.RATIO

        if( S_OK != m_pKsPropertySet->Get( GUID_KPS_MZ0380, 413, NULL, 0, pValue, sizeof(ULONG), &cbBytes ) ) {

            return FALSE;

        }
    }
    if( nProperty == 0x0000000E ) { // LEVEL

        if( S_OK != m_pKsPropertySet->Get( GUID_KPS_MZ0380, 414, NULL, 0, pValue, sizeof(ULONG), &cbBytes ) ) {

            return FALSE;

        }
    }
}
```

```
if( nProperty == 0x0000000F ) { // ENTROPY
    if( S_OK != m_pKsPropertySet->Get( GUID_KPS_MZ0380, 415, NULL, 0, pValue, sizeof(ULONG), &cbBytes ) ) {
        return FALSE;
    }
}
return TRUE;
}
```

```

BOOL OnSetVideoCompressionProperty( ULONG nProperty, ULONG nValue )
{
    if( NULL == m_pAMVideoCompression ) { return FALSE; }

    if( NULL == m_pKsPropertySet ) { return FALSE; }

    if( nProperty == 0x00000000 ) { // KEY.FRAME.RATE (GOP)
        if( S_OK != m_pAMVideoCompression->put_KeyFrameRate( nValue ) ) { return FALSE; }
    }
    if( nProperty == 0x00000001 ) { // QUALITY
        double fQuality = nValue;

        fQuality /= 10000.0f;

        if( S_OK != m_pAMVideoCompression->put_Quality( fQuality ) ) { return FALSE; }
    }
    if( nProperty == 0x00000002 ) { // OVERRIDE.KEY.FRAME
        if( S_OK != m_pAMVideoCompression->OverrideKeyFrame( nValue ) ) { return FALSE; }
    }
    if( nProperty == 0x00000003 ) { // BIT.RATE.MODE
        if( S_OK != m_pKsPropertySet->Set( GUID_KPS_MZ0380, 407, NULL, 0, &nValue, sizeof(ULONG) ) ) {
            return FALSE;
        }
    }
    if( nProperty == 0x00000004 ) { // BIT.RATE
        if( S_OK != m_pKsPropertySet->Set( GUID_KPS_MZ0380, 403, NULL, 0, &nValue, sizeof(ULONG) ) ) {
            return FALSE;
        }
    }
    if( nProperty == 0x00000008 ) { // POST.RESOLUTION
        if( S_OK != m_pKsPropertySet->Set( GUID_KPS_MZ0380, 401, NULL, 0, &nValue, sizeof(ULONG) ) ) {
            return FALSE;
        }
    }
    if( nProperty == 0x00000009 ) { // POST.SKIP.FRAME.RATE
        if( S_OK != m_pKsPropertySet->Set( GUID_KPS_MZ0380, 402, NULL, 0, &nValue, sizeof(ULONG) ) ) {
            return FALSE;
        }
    }
    if( nProperty == 0x0000000D ) { // POST.AVG.FRAME.RATE
        if( S_OK != m_pKsPropertySet->Set( GUID_KPS_MZ0380, 422, NULL, 0, &nValue, sizeof(ULONG) ) ) {
            return FALSE;
        }
    }
    if( nProperty == 0x0000000A ) { // B.FRAME
        if( S_OK != m_pKsPropertySet->Set( GUID_KPS_MZ0380, 411, NULL, 0, &nValue, sizeof(ULONG) ) ) {
            return FALSE;
        }
    }
    if( nProperty == 0x0000000B ) { // PROFILE
        if( S_OK != m_pKsPropertySet->Set( GUID_KPS_MZ0380, 412, NULL, 0, &nValue, sizeof(ULONG) ) ) {
            return FALSE;
        }
    }
    if( nProperty == 0x0000000C ) { // ASPECT.RATIO
        if( S_OK != m_pKsPropertySet->Set( GUID_KPS_MZ0380, 413, NULL, 0, &nValue, sizeof(ULONG) ) ) {
            return FALSE;
        }
    }
    if( nProperty == 0x0000000E ) { // LEVEL
        if( S_OK != m_pKsPropertySet->Set( GUID_KPS_MZ0380, 414, NULL, 0, &nValue, sizeof(ULONG) ) ) {
            return FALSE;
        }
    }
    if( nProperty == 0x0000000F ) { // ENTROPY
        if( S_OK != m_pKsPropertySet->Set( GUID_KPS_MZ0380, 415, NULL, 0, &nValue, sizeof(ULONG) ) ) {
            return FALSE;
        }
    }
    return TRUE;
}

```

34. Application Note for DirectShow Developer

The developer who uses DirectShow to access our capture source filter need check the frame size in the callback function of your SampleGrabber class. If the frame size is 0 bytes, it means the frame is one bad frame. You should drop it. More detail, please check with our engineer team directly.