# Intruduction of Multimedia function for DOP-112MX / DOP-115MX

Detail description for new functions for DOP-112MX and DOP-115MX.

DOP-100 series provide 12 inch and 15 inch, incould DOP-112MX, DOP-112WX, DOP-115MX and DOP-115WX mode type. M means have Multimedia function, W means Narrow border standard model, X means XGA TFT resolution.

Multimedia function provide Analog Camera, IP Camera, VGA in, Video play and event trigger.

In this manual have introduce Multimedia function, if choose DOP-112MX and DOP-115MX model that could refer to this document. Otherwise, it will not have Multimedia function to use.

Internal Memory increase to 200000 from $0 ~ $199999. This function support all model.

# 1. Analog Camera display

What is Analog Camera? For HMI, Analog camera only supports CVBS signals in PAL or NTSC format. Its connector is BNC Connector. This CVBS signal is different from AHD, TVI and CVI signal input formats.

PAL (Phase Alternation Line) is an alternating phase scan. Generally, the 8 MHz bandwidth is used, and the color signal transmission can accept a large phase offset error.

The NTSC (National Television System Committee) is the earliest developed television system. It generally uses a 6MHz bandwidth and can express the widest range of colors.

What is the CVBS signal? CVBS (Composite video baseband signal) is a composite video broadcast signal, which is commonly known as the Video terminal of the AV terminal. CVBS is the most original Video signal format. This signal line contains brightness (Y), color (C), horizontal sync signal (H.Sync) and vertical sync signal (V.Sync).

After the initial introduction to the concept of Analog Camera, please refer to the following table for the Analog camera example.

Table1.1 Analog Camera display example

| Analog Camera | |
|---|---|
| Camera display element | Create Camera display element and set as below parameter.<br><br>| Camera display element | |<br>|---|---|<br>| Camera Type | Analog Camera |<br>| Camera Name | CH1 |<br>| Show size | 640x360 |<br><br>Analog Camera Display |
| Result | ■ After create all element, please execute compile and then download program to HMI.<br>■ It will show the video screen at camera display element after download.<br><br> |

Double-click the Camera Display element Properties screen as shown below.



Figure 1.1 Camera Display Element Properties

Table 1.2 Camera Display Element Function Page

| Camera Dsplay Element | |
|---|---|
| **Function Page** | **Content Description** |
| Preview | Cannot view Multilanguage data and multistate data. |
| Main | Sets Invisible address, CH1/CH2 toggle bits.<br>Sets Camera type, Camera Name, and Show size. |
| Coordinates | Sets the X-Y coordinate, width, and height of elements. |

■ Main



Figure1.2 Camera display element Main Properties Page

| No. | Property | Function |
|---|---|---|
| (1) | Invisible address | ■ When the Invisible Item is "On", camera display elements are hidden, and the corresponding button functions are disabled.<br><br>Camera display element<br><br><br>**Invisible address OFF** <br><br>**Invisible address ON**  |
| (2) | CH1/CH2 Toggle bits | ■ Trigger on CH1 or CH2 toggle bit, channels will be switch. |
| (3) | Cemera type | ■ Select Camera type for Analog Camera or IP Camera.<br> |
| (4) | Camera Name | ■ Will display corresponding camera name after select camera type.<br>■ If select Analog Camera, camera name will be CH1 or CH2. Please use BNC connector to connect CH1 or CH2 port of back cover.<br><br>■ If select IP Camera, camera name will be show up by Camera device setting (example is CAMERA1 or CAMERA2). Please set IP address of IP camera at the same domain with HMI. |

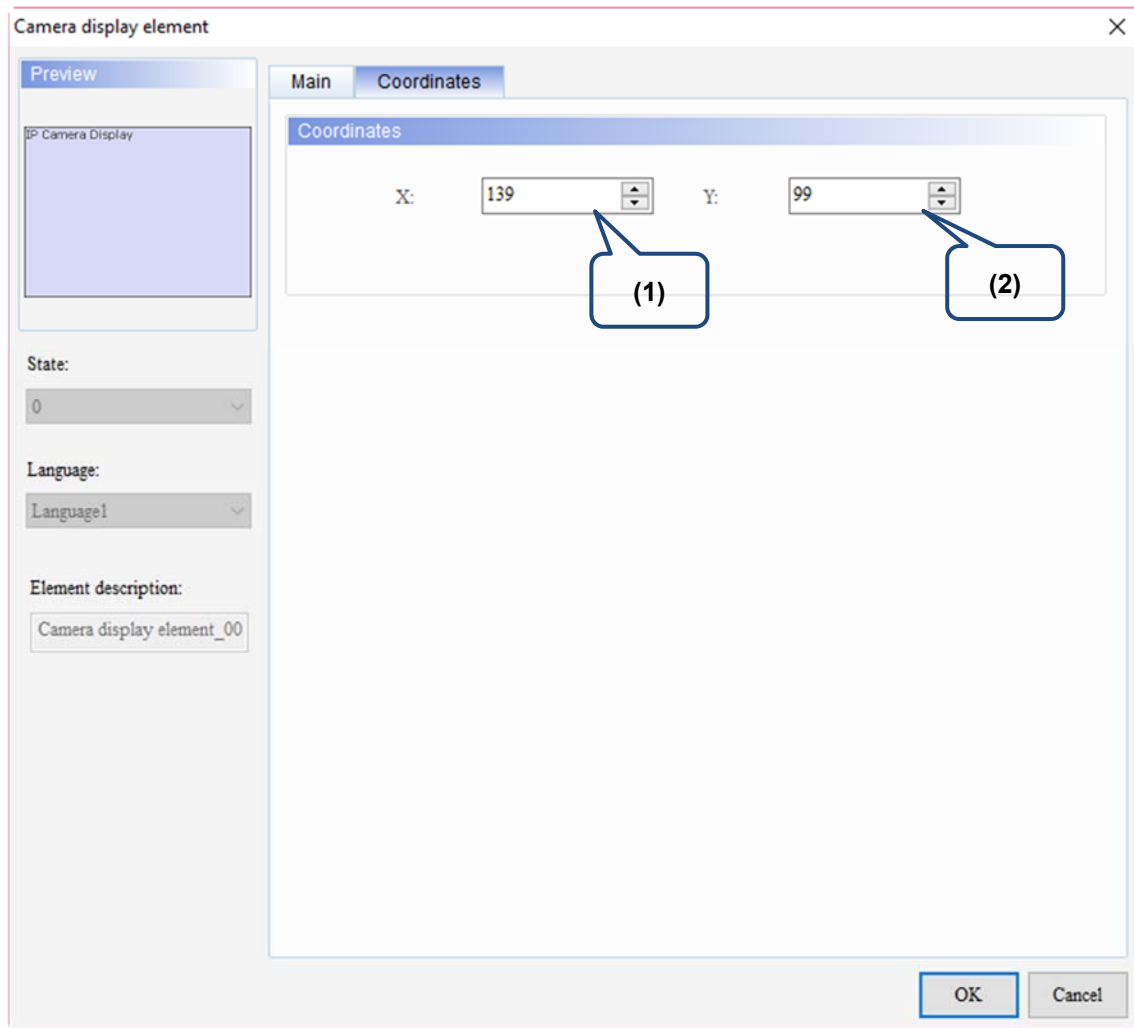| No. | Property | Function |
|-----|----------|----------|
| | | Camera type:<br><br>IP CAMERA ⌄<br><br>Camera Name:<br><br>CAMERA1 ⌄<br>CAMERA1<br>CAMERA2 |
| (5) | Show size | ■ Show size diplay resolution of element.<br><br>Show size: 320x240 ⌄<br>800x600<br>640x480<br>320x240<br>160x120<br>64x48<br>1024x600<br>640x360<br>512x300<br>256x150<br>128x75 |

■ Coordinates



Figure 1.3 Camera display element Coordinates Properties Page

| No. | Property | Function |
|---|---|---|
| **(1)** | X-value and Y-value | Sets the upper left X-coordinate and Y-coordinate of elements. |

# 2. IP Camera display

IP Camera is a network camera, a new generation of cameras that combines traditional camera and network technologies. It is a digital transmission device based on network transmission. It has a network output interface and can be used for remote network connection through Ethernet. The IP Camera supported by the HMI only provides the RTSP (Real Time Streaming Protocol) protocol, which is called real-time streaming. It is an application layer protocol in the TCP/IP protocol system. It is designed for use in entertainment and communication systems to control Streaming server.

Please refer to the following table for the IP camera example.

Table 2.1 IP Camera example

| IP Camera |
|---|

| | |
|---|---|
| Camera Device | Before use IP camera, it must be set camera device. Please go to [Options] → [Camera device]. After into this setting page, it will display as below.  Please click  to add camera. Default IP display as below 【rtsp://192.168.0.1:554/entry_name】。  Above has IP example, this example is for HIKVISION used with Account, password, IP address, port and entry name. |

rtsp://admin:hk888888@192.168.123.177:554/Streaming/Channels/101/

| Account | admin |
|---|---|
| Password | hk888888 |
| IP address | 192.168.123.177 |
| Port | 554 |
| Entry name | Streaming/Channels/101/ Streaming/Channels/102/ |

Please refer to IP example to modify as below.



After set up IP, please select source format. Example here is H.264 for channel 101.

| Camera display element | Create Camera display element and set parameter. |
|---|---|

Create Camera display element and set parameter.

| Camera display element | |
|---|---|
| Camera Type | IP Camera |
| Camera Name | CAMERA1 |
| Show size | 640x360 |

IP Camera Display

| Result | ■ After create all element, please execute compile and then download program to HMI.<br>■ It will show the video screen at camera display element after download. |
|---|---|

01-08-1970 Thu 03:03:27

Camera 01

The content configurations of Camera Device will be described below.
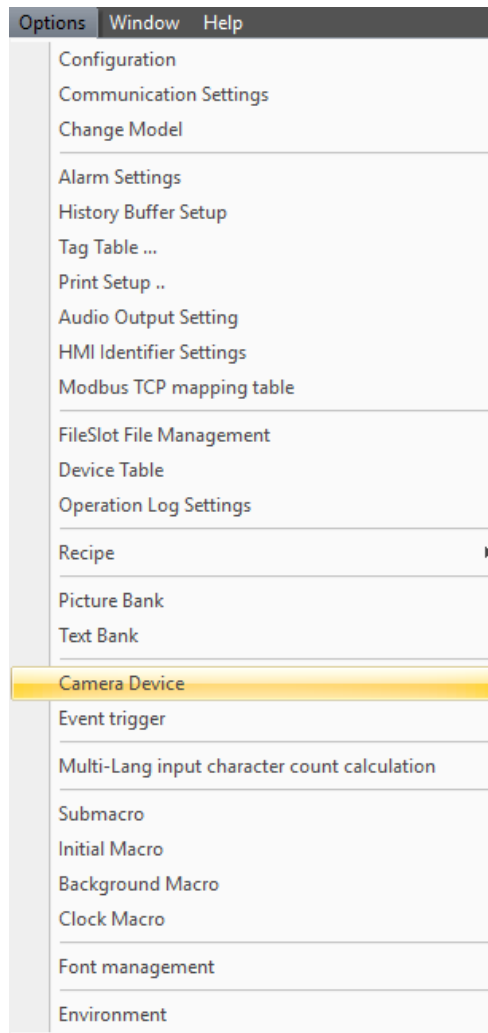
Please select【Options】→【Camera Device】.





Figure 2.1 Camera device

| Add Camera | | ■ Click add camera icon. |
|---|---|---|
| | |  |
| | Name | Users could customize camera name. |
| | IP | IP format is fixed. Please refer to your IP camera setting to modify. According to the format, it can be divided into the following parts to illustrate. |

| | | |
|---|---|---|
| | Account | Please refer to your brand of IP camera to input account. |
| | Password | Please refer to your brand of IP camera to input password. |
| | IP address | Please refer to your brand of IP camera to input IP address. |
| | Port | Default port is 554. |
| | Entry name | Each brand have different entry name, please search by following format [brand name rtsp address] at google, for example [HIKVISION rtsp address].  After search will get following result.  101 means main stream of HIKVISION, 102 means sub stream of HIKVISION. Please input correct entry name as below.  |

| | | |
|---|---|---|
| Source format | Please follow IP camera setting to select source format.<br>For example we use IP camera of HIKVISION, it could log in with as below IP address.<br>http://192.168.123.199/doc/page/login.asp?_1534130000127】<br>Enter account and password will log in to HIKVISION. | |

| Account | admin |
|---|---|
| Password | hk888888 |



Enter【Configuration】→【Video/Audio】to check video encoding. In the case of HIKVISION, video encoding of main stream support H.264 and H.265, video encoding of sub stream support H.264, H.265 and Motion JPEG. Due to HMI only support Motion JPEG and H.264, if select main stream (channel 101), please select H.264 of source format, otherwise if select sub stream (channel 102), please select Motrion JPEG of source format.
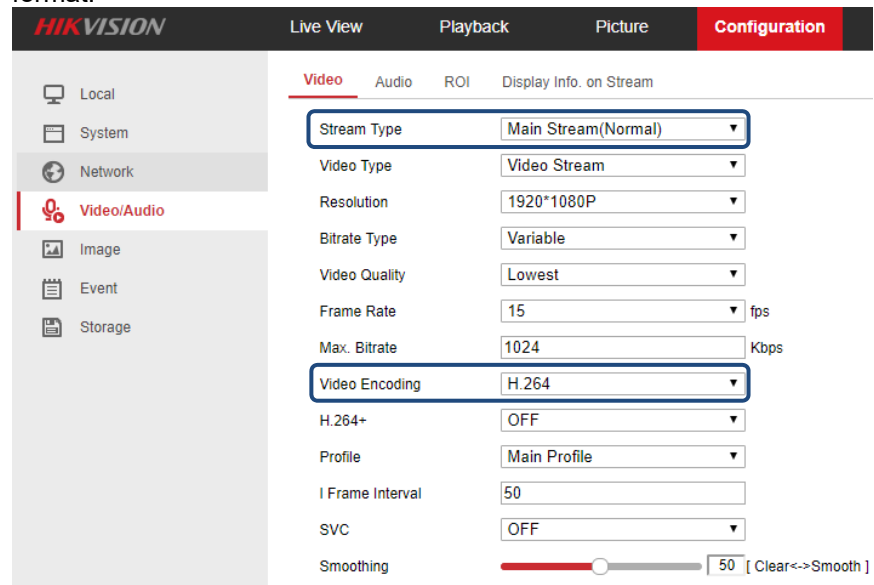


HMI setting as below.



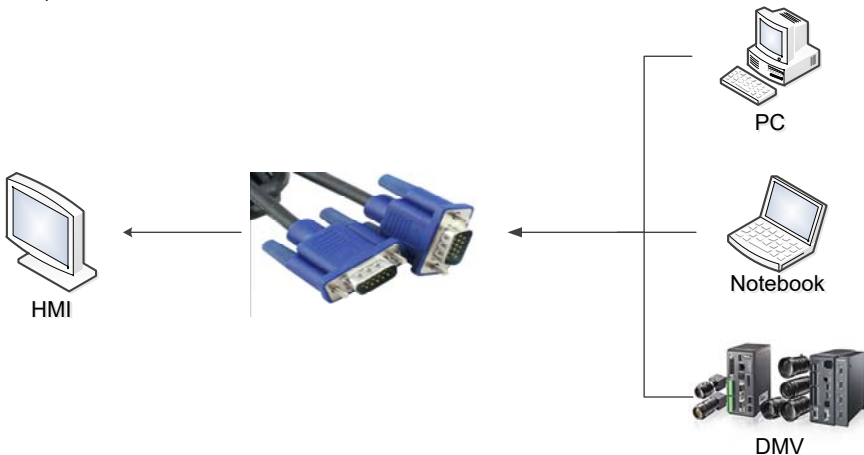| | | |
|---|---|---|
| Remove Camera | Click remove camera icon will delete camera setting. | |

Scence camera display element is share with Analog Camera and IP Camera, please refer to element property description for P.5 ~ P.9.

# 3. VGA Display

HMI provide VGA port to display image from external device like DMV, PC or notebook. Please refer to the following table for the VGA display example.

Table 3.1 VGA display example

| VGA display | |
|---|---|
| VGA display element | Create VGA display element and set parameter. <br><br> **VGA display** <br><br> | Source Resolution | 1024 x 768 60Hz | <br> | Show Size | 640x360 | <br><br> VGA IN Display |
| Connection | Please use VGA cable to connect between HMI and device like PC, Notebook or DMV. <br><br> HMI ← ← PC <br> Notebook <br> DMV |
| Result | ■ After create all element, please execute compile and then download program to HMI. <br> ■ It will show the image from PC at VGA display element after download. |

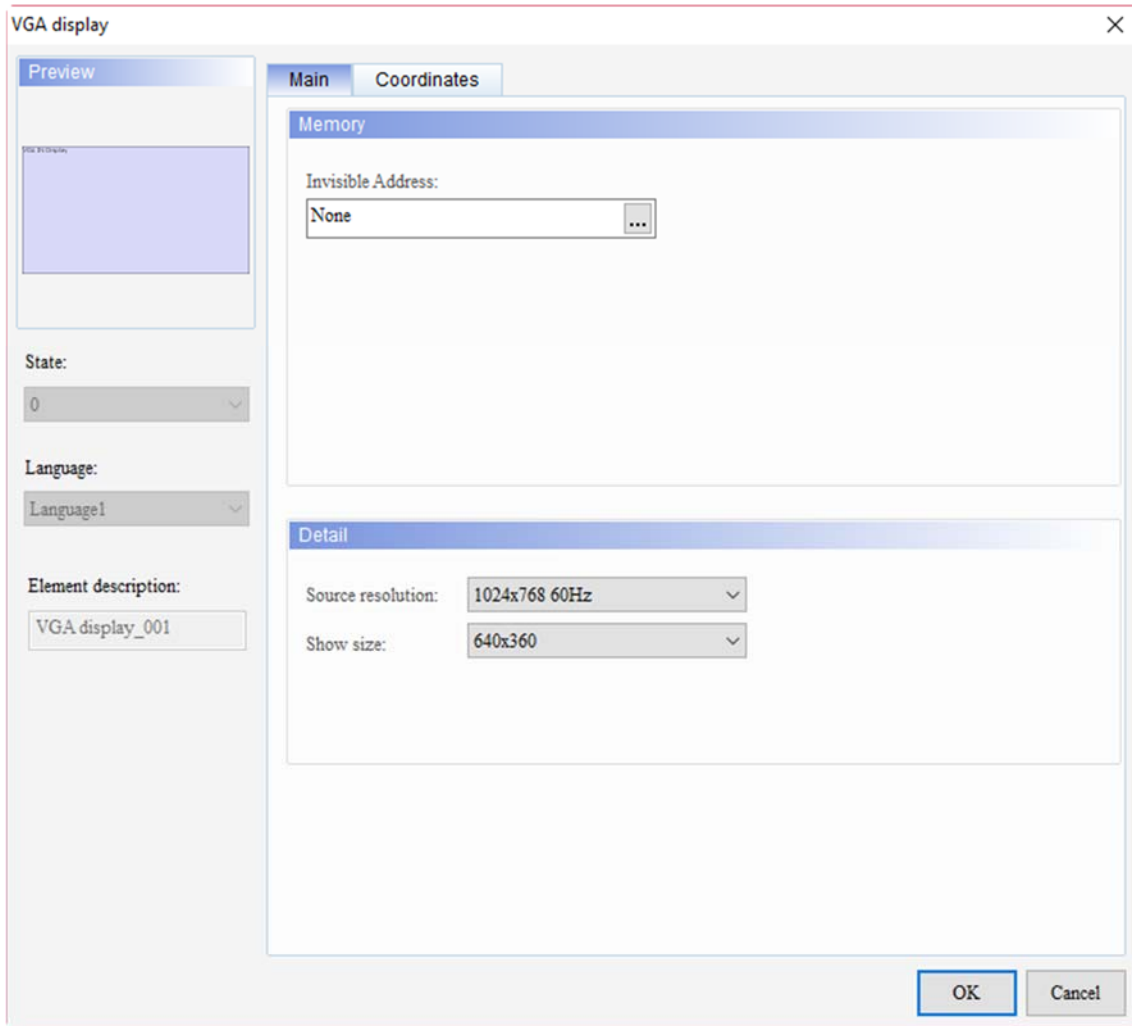Double-click the VGA display element Properties screen as shown below.



Figure 3.1 VGA Display Element Properties

Table 3.2 VGA Display Element Function Page

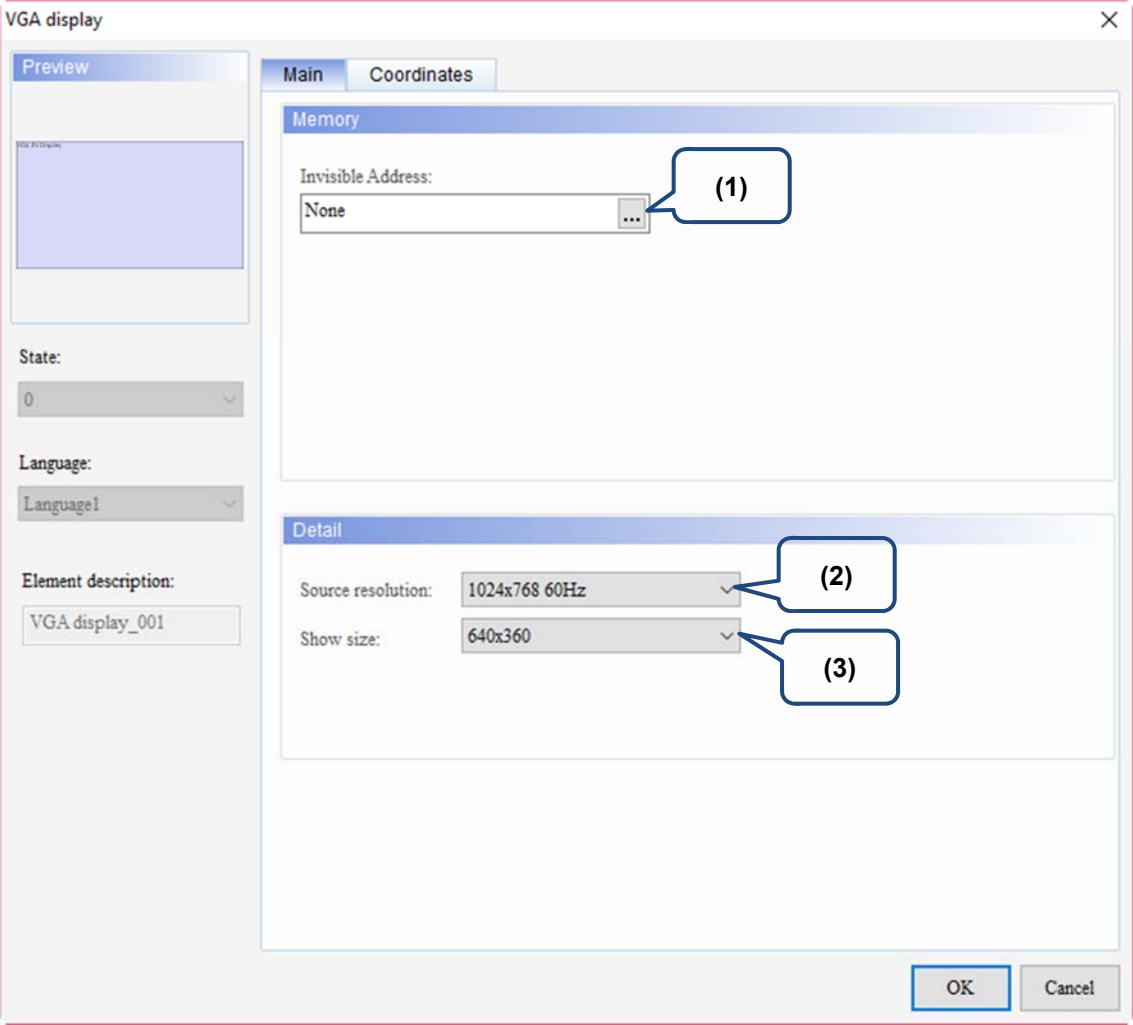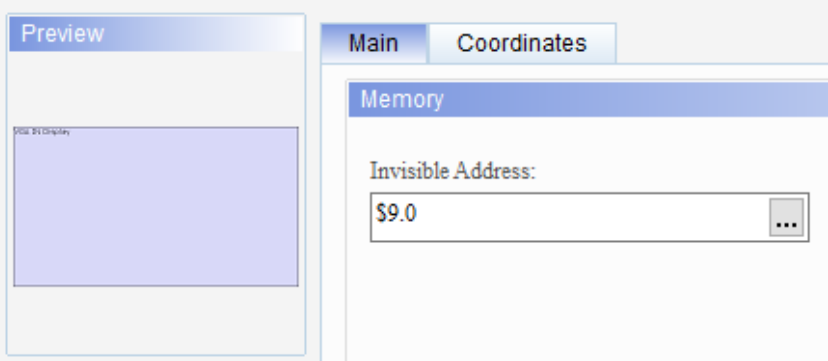| VGA display | |
|---|---|
| **Function page** | **Content Description** |
| Preview | Cannot view Multilanguage data and multistate data. |
| Main | Sets Invisible address. Sets Source resolution and Show size. |
| Coordinates | Sets the X-Y coordinate, width, and height of elements. |
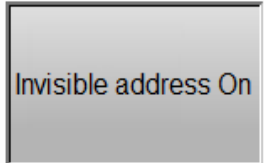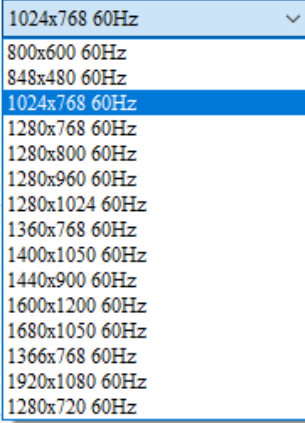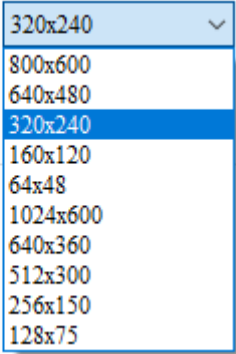
■    Main



Figure 3.2 VGA display element Main Properties Page

| No. | Property | Function |
|---|---|---|
| (1) | Invisible address | ■ When the Invisible Item is "On", camera display elements are hidden, and the corresponding button functions are disabled.<br><br>VGA display<br><br><br><br>**Invisible address OFF**<br><br><br>**Invisible address ON**<br> |
| (2) | Source resolution | ■ Please follow ouput device resolution to choose source resolution.<br> |
| (3) | Show size | ■ Show size diplay resolution of element.<br> |

■ Coordinate



Figure 3.3 VGA display element Coordinates Properties Page

| No. | Property | Function |
|-----|----------|----------|
| (1) | X-value and Y-value | Sets the upper left X-coordinate and Y-coordinate of elements. |

# 4. Video Play

Video play element provide users could view mpeg4 file regardless via Analog camera and IP camera saved to HMI or located at USB disk and SD card.

The file format located at USB disk and SD card must be mpeg4 with H.264 video encoding if it does not save via Analog camera and IP camera.

Please refer to the following table for via Analog camera and IP camera saved to HMI or located at USB disk and SD card example.

Table 4.1 Video play example (Via Analog camera and IP camera saved to HMI)

| Video play | | |
|---|---|---|
| | Create video play element and set up parameter. | |
| | **Video play** | |
| Video play element | File list of left side | Please choose【Play】,【Pause】,【Stop】, 【Delete】,【Export to USB】,【Export to SD】and click Set as default description button.  |
| | File display of right side | Please set Loop as Yes.  |
| | | After finish will list as below.  |

| | |
|---|---|
| Camera display element | Create Camera display element and set up parameter.<br><br>Camera display element<br><br>Preview<br>Analog Camera Display<br><br>State:<br>0<br><br>Language:<br>Language1<br><br>Element description:<br>Camera display element_00<br><br>Main | Coordinates<br><br>Address<br><br>Invisible Address:<br>None · · ·<br><br>CH1 / CH2 Toggle bits:<br>None · · ·<br><br>Setting<br><br>Camera type:<br>ANALOG CAMERA<br><br>Camera Name:<br>CH1<br><br>Show size: 320x240<br><br>Analog Camera Display |

| | |
|---|---|
| Camera display element | Create Camera display element and set up parameter.<br>Camera display element<br><br>IP Camera Display |
| Camera device | Enter Options → Camera device to set name, IP and source format.<br><br>IP Camera<br><br>| Name | IP | Source format |<br>|---|---|---|<br>| CAMERA1 | rtsp://admin:hk888888@192.168.123.199:554/Streaming/Channels/101/ | H.264 | |

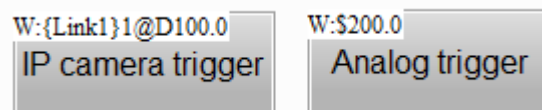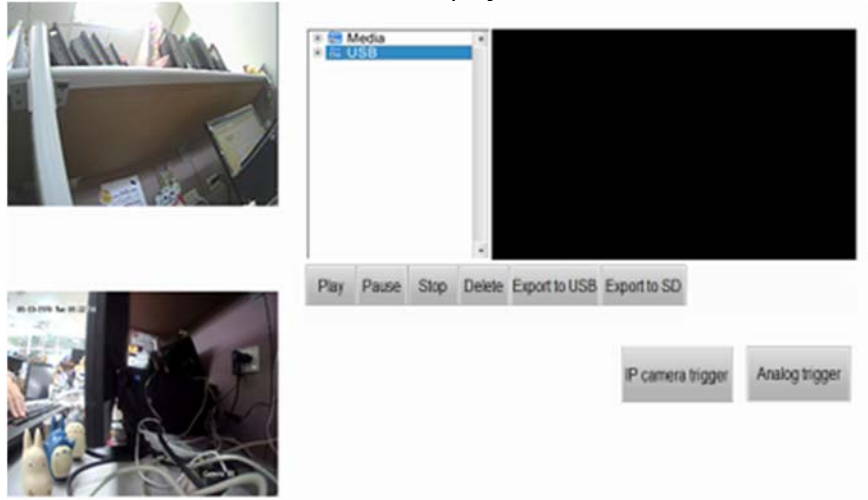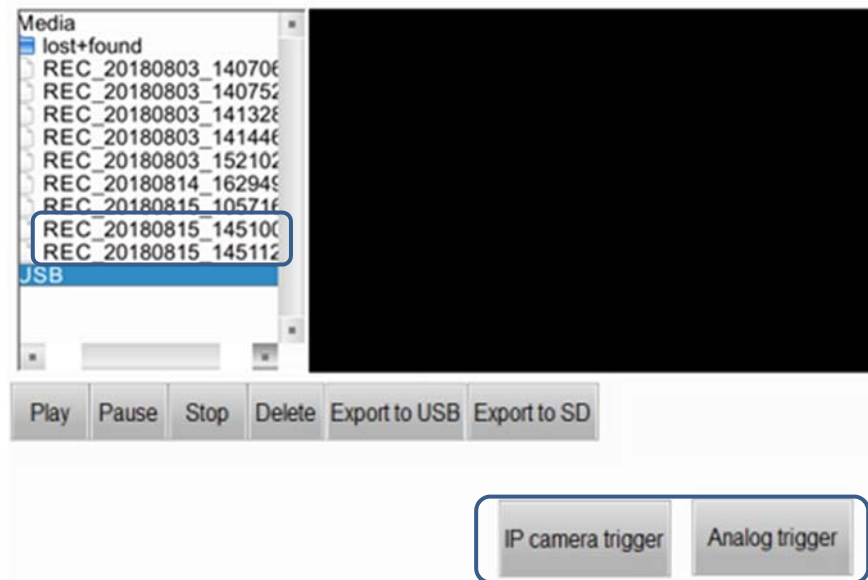| | |
|---|---|
| Event trigger | Enter Options → Event trigger to set condition and action to save video file. Details description please refer item 5 Event trigger function.<br>Add two trigger evnet, set parameter as below.<br><br><br><br><br><br>After finish setting, list as below table.<br><br> |
| Momentary button | Create two momentary button and set write address as D100.0 and $200.0.<br><br> |

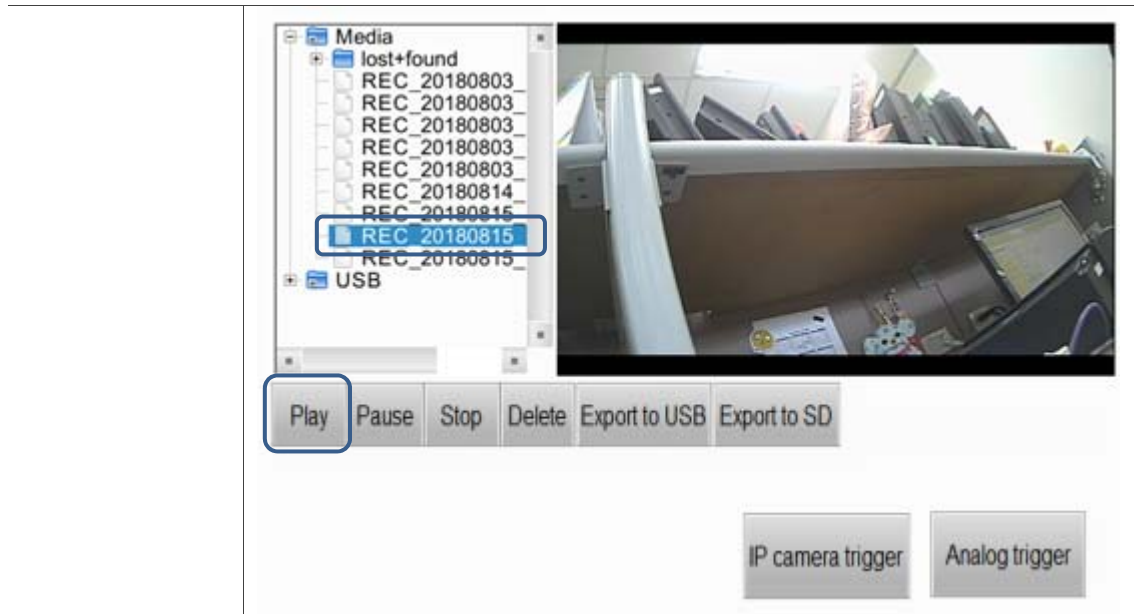| | |
|---|---|
| Result | After create all element, please execute compile and then download program to HMI.<br>It will show the video from camera display element after download.<br><br><br><br>After trigger D100.0 and $200.0, it will append two video file under Media path.<br><br><br><br>Select video file and click play button, file display of right side will show the video. |

Please refer to the following table for located at USB disk and SD card example.

Table 4.2 Video play example (located at USB disk and SD card)

| Video play | | |
|---|---|---|
| Create video play element and set up parameter. | | |
| | **Video play** | |
| Video play element | File list of left side | Please choose【Play】,【Pause】,【Stop】,【Delete】,【Export to USB】,【Export to SD】and click Set as default description button.  |
| | File display of right side | Please set Loop as Yes.  |
| | | After finish will list as below.  |

| Result | After create all element, please execute compile and then download program to HMI.<br>Please put mpeg4 with H.264 video encoding file to USB disk or SD card at PC side.<br>Insert USB disk or SD card to HMI, select video file and then click play button.<br> |
|--------|----------------------------------------------------------------------------------------|
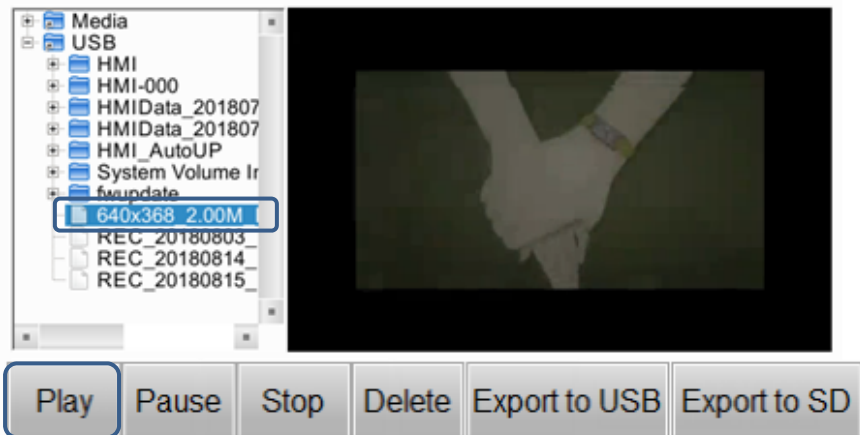
Video play element divided two part, one is file list of left side, and another is file display of right side.
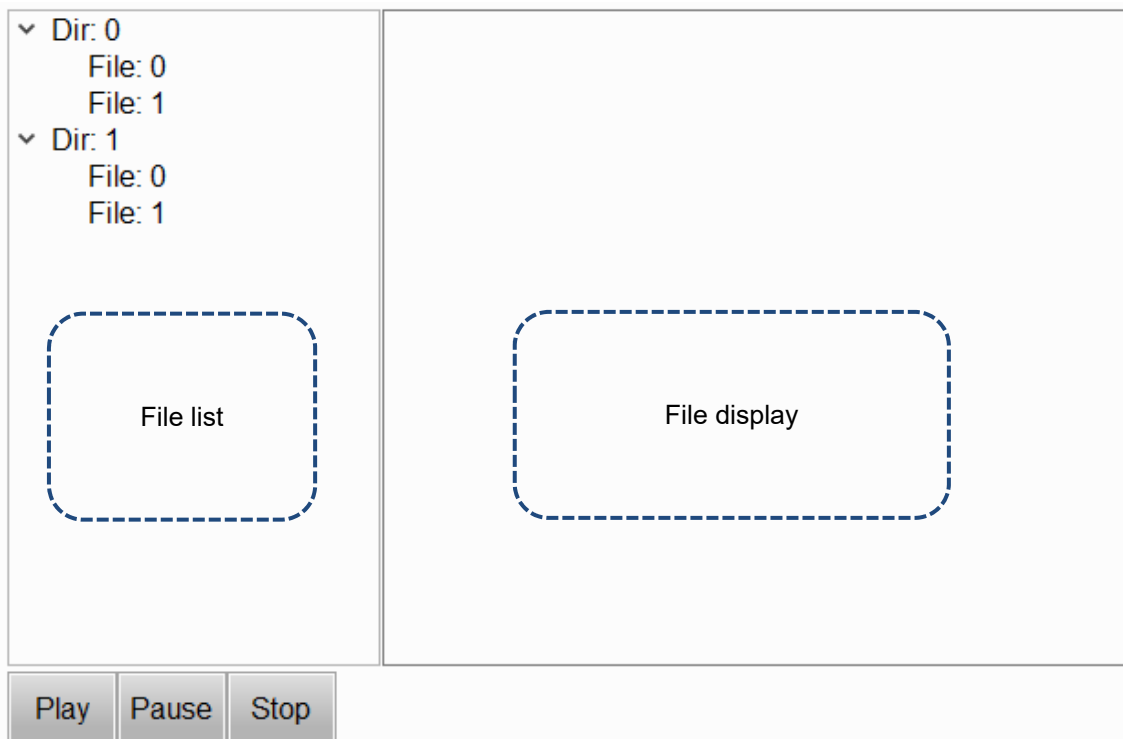
Double-click the left side of video play element Properties screen as shown below.



Figure 4.1 Left side of Video Play Element Properties

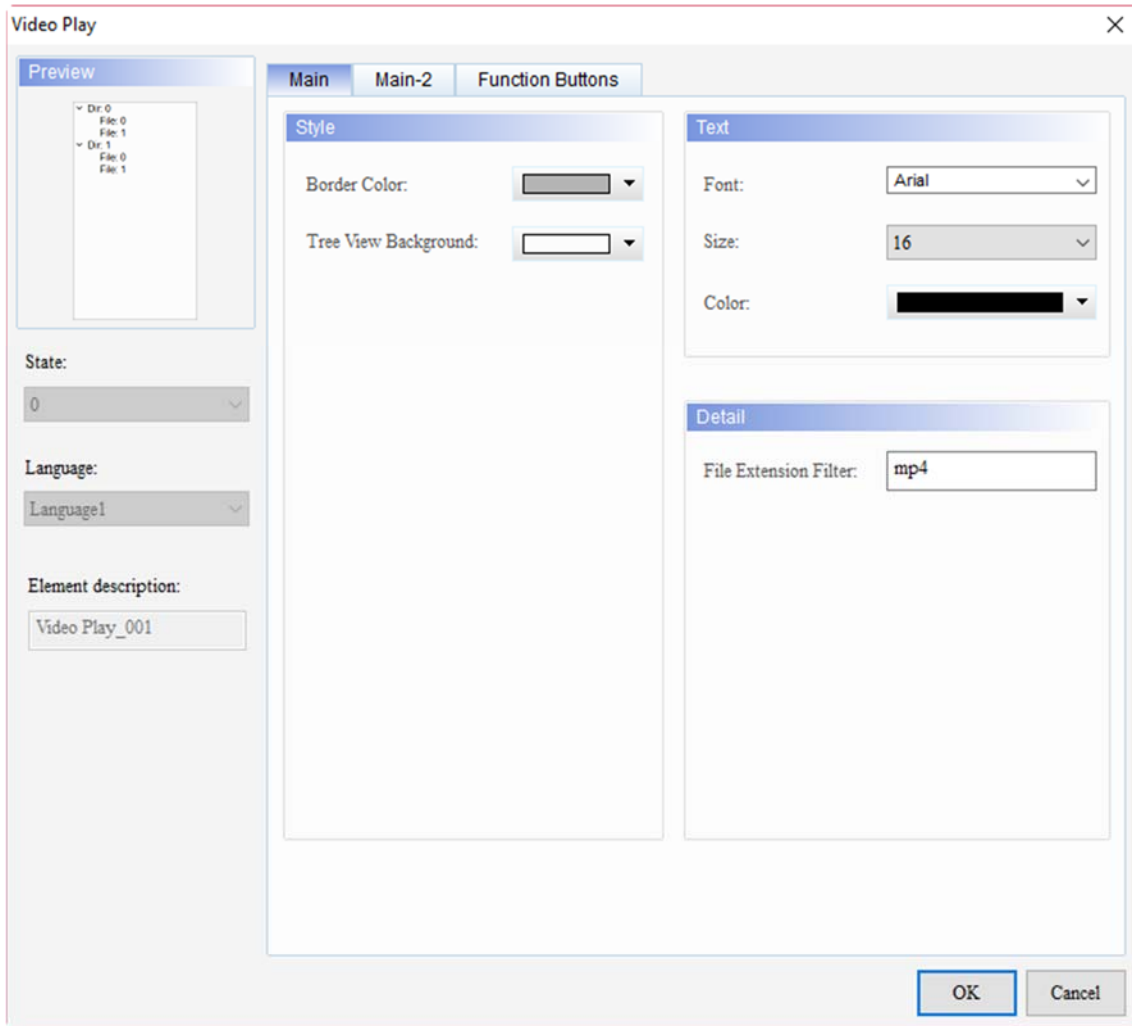Talbe 4.3 Left side of Video Play Element Function Page

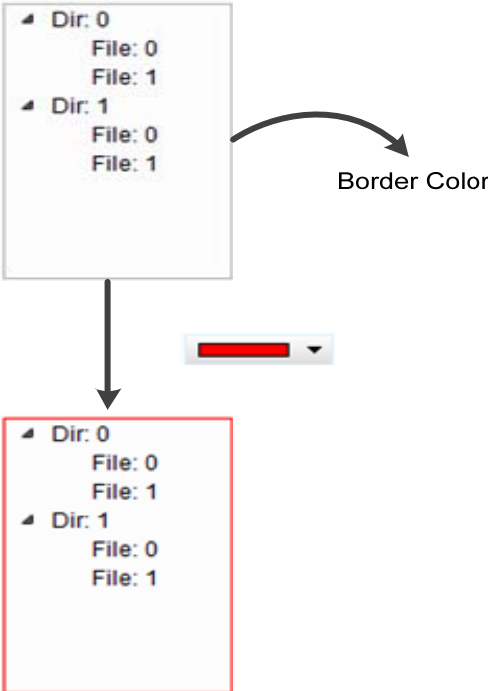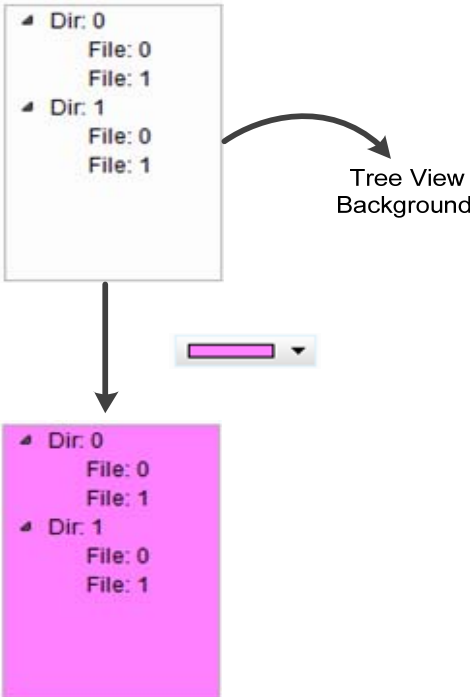| Video Play (File list of left side) | |
|---|---|
| **Function page** | **Content Description** |
| Preview | Cannot view Multilanguage data and multistate data. |
| Main | Set Border Color, Tree View Background Color.<br>Set Font of text, Size of text, Color ot text.<br>Set File Extension Filter. |
| Main-2 | Set Transparent, Smooth animation, Anti-aliasing. |
| Function Buttons | Set Scroll up a interval, Scroll down a interval, Scroll up one page, Scroll down one page, Play, Pause, Stop, Delete, Export to USB, Export to SD.<br>Set Default Button width and height. |

■  Main
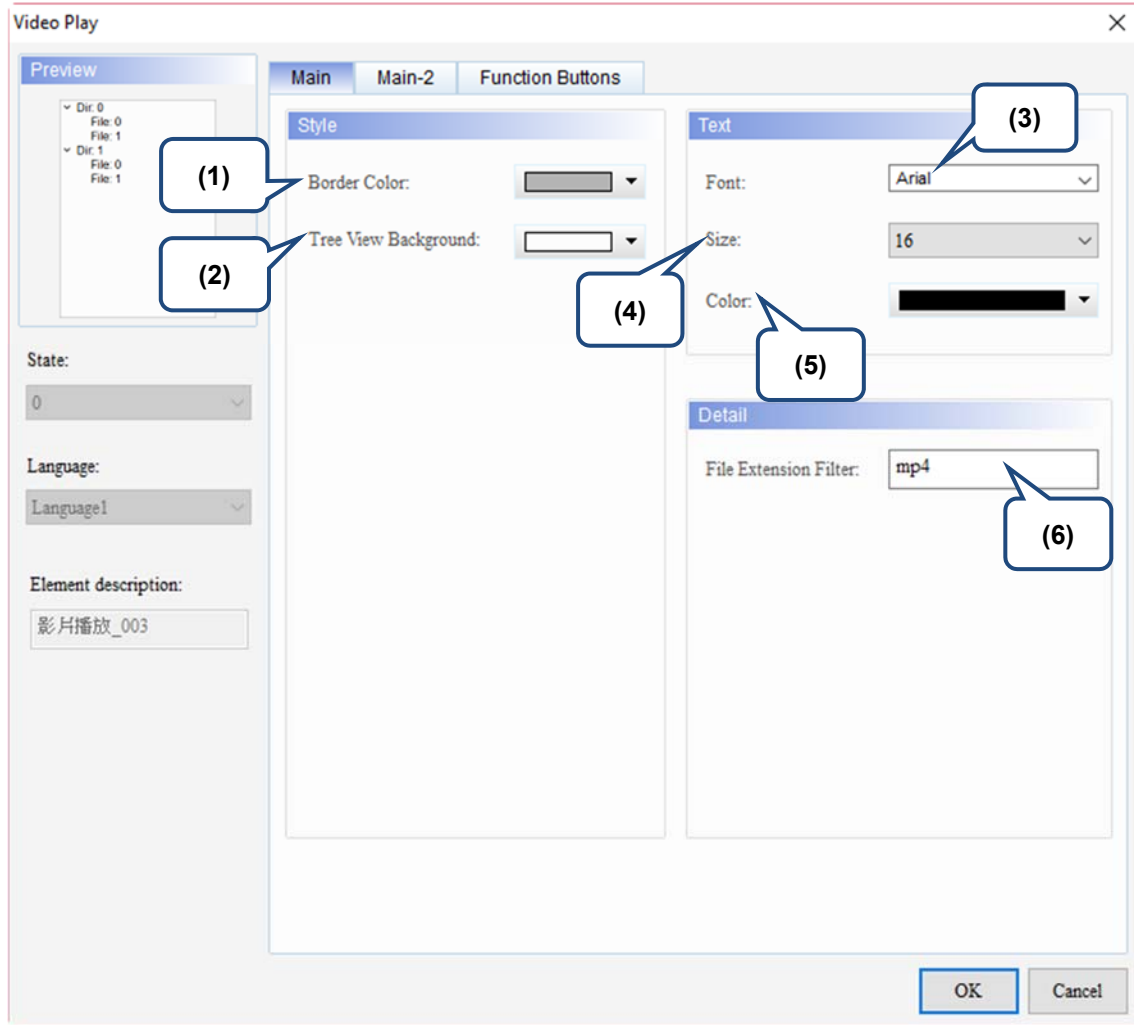


Figure 4.2 Left side of Video Play Element Main Properties Page

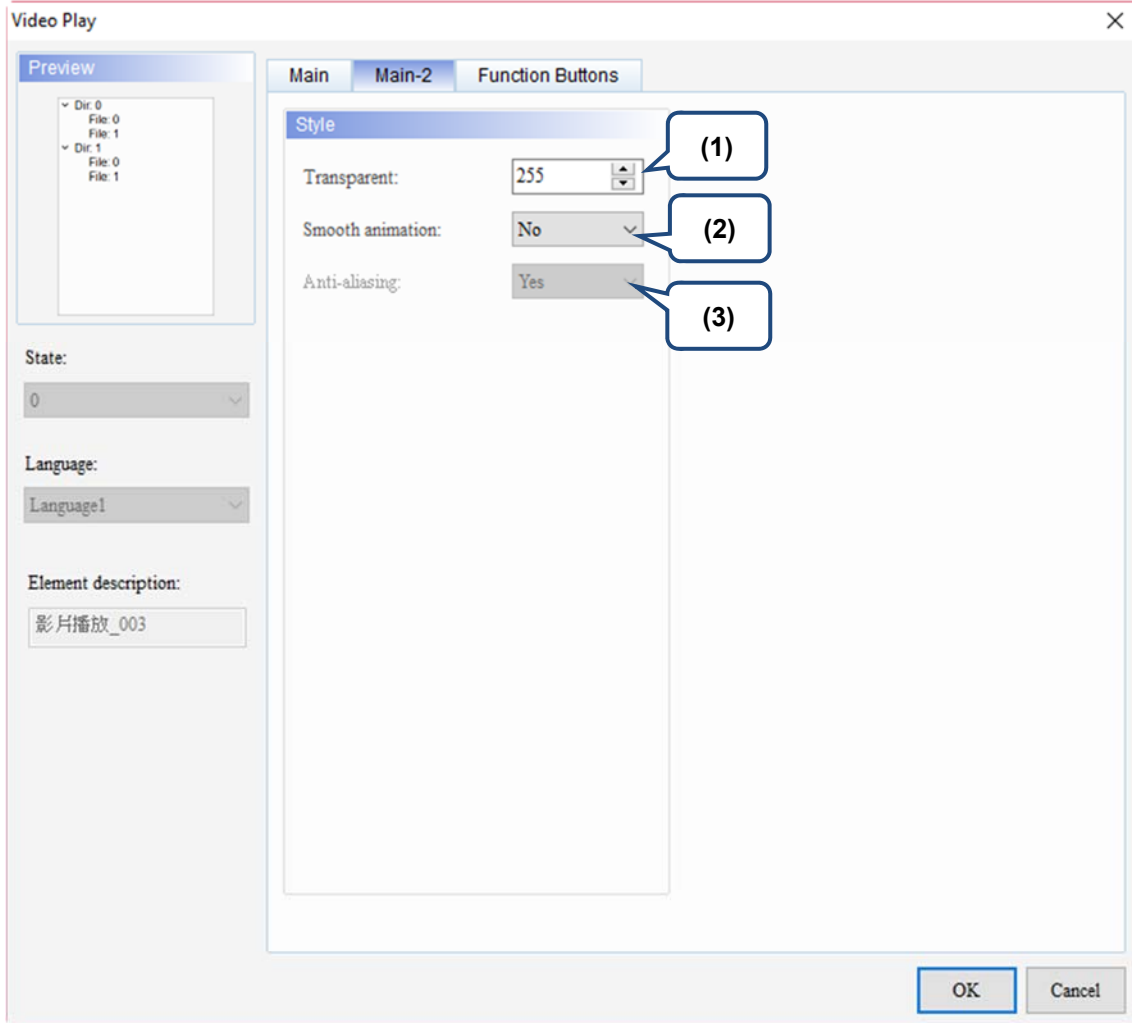| No. | Property | Function |
|-----|----------|----------|
| (1) | Border Color | Set border color.<br><br>Border Color |
| (2) | Tree View Background | Set Tree view background color.<br><br>Tree View Background |
| (3) | Font | Set font of text. |
| (4) | Size | Set size of text. |
| (5) | Color | Set color of text. |
| (6) | File Extension Filter | Set the name of the extension to be displayed on the left file list. The default is mp4. Only the file with the mp4 file name will be displayed in the root directory of the external disk.<br>If changed to *, the files in all root directories are displayed. |

■  Main-2



Figure 4.3 Left side of Video Play Element Main-2 Properties Page

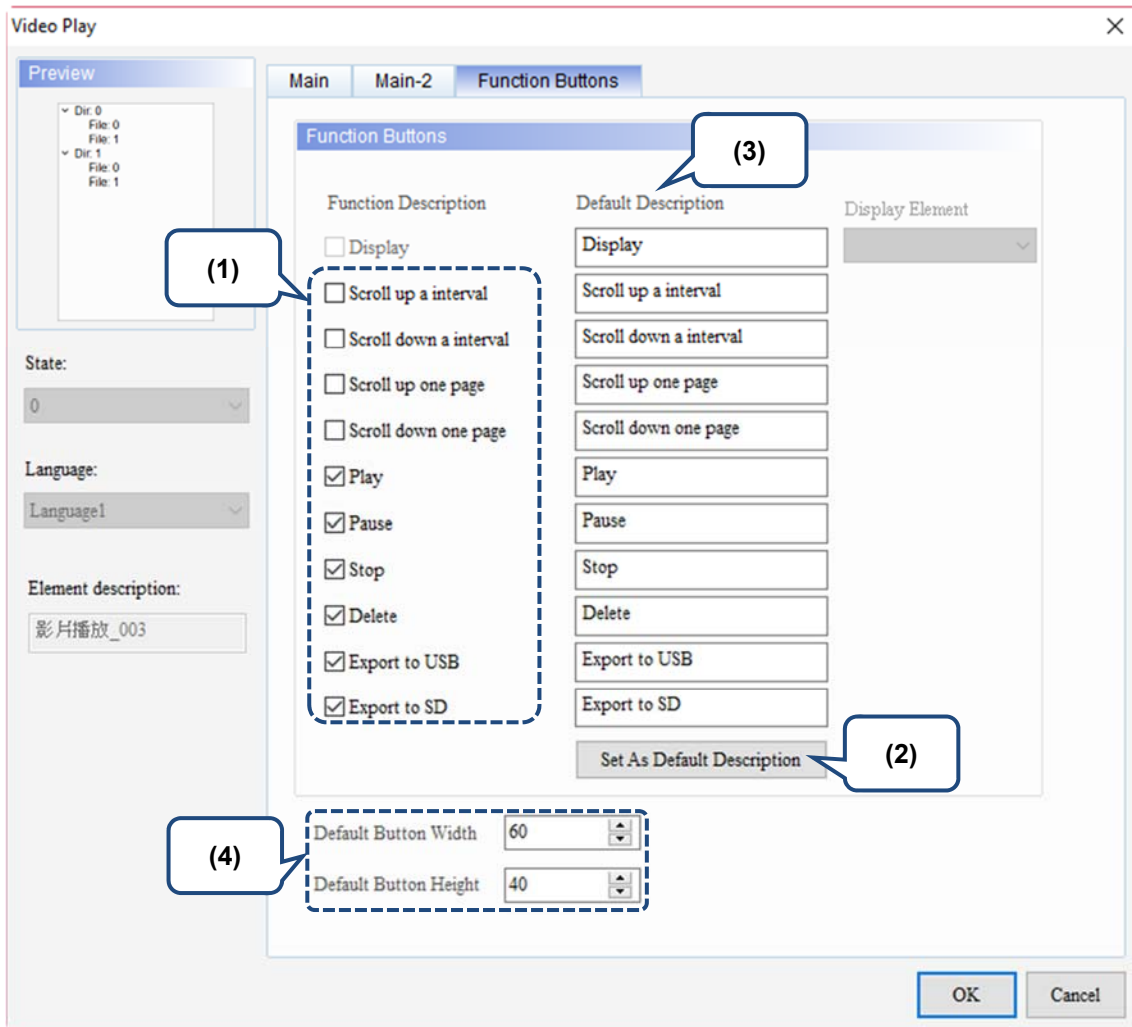| No. | Property | Function |
|---|---|---|
| (1) | Transparent | Transparent default value is 255, minimum value is 50, maximum value is 255, user could customize this value. The smaller the value, the higher the transparency of the component. |
| (2) | Smooth animation | The left file list after opening the animation will have a sliding effect when it is expanded or retracted. |
| (3) | Anti-aliasing | This element cannot turn on anti-aliasing. |

■　　Function Buttons



Figure 4.4 Left side of Video Play Element Function Buttons Properties Page

| No. | Property | Function |
|---|---|---|
| (1) | Function buttons | ■ Provide Scroll up a interval, Scroll down a interval, Scroll up one page, Scroll down one page to scroll through the list of files and determine the extent of scrolling.<br>■ Play, Pause, Stop, Delete to control video file.<br>■ Export to USB and Export to SD to export the video file originally stored in the HMI to USB or SD. |
| (2) | Set As Default Description | Click this button will fill default description. |
| (3) | Default Description | Click Set as default button will fill default string to default description.<br>User could customize string. |
| (4) | Default Button Width and Height | User could customize button of width and height. |

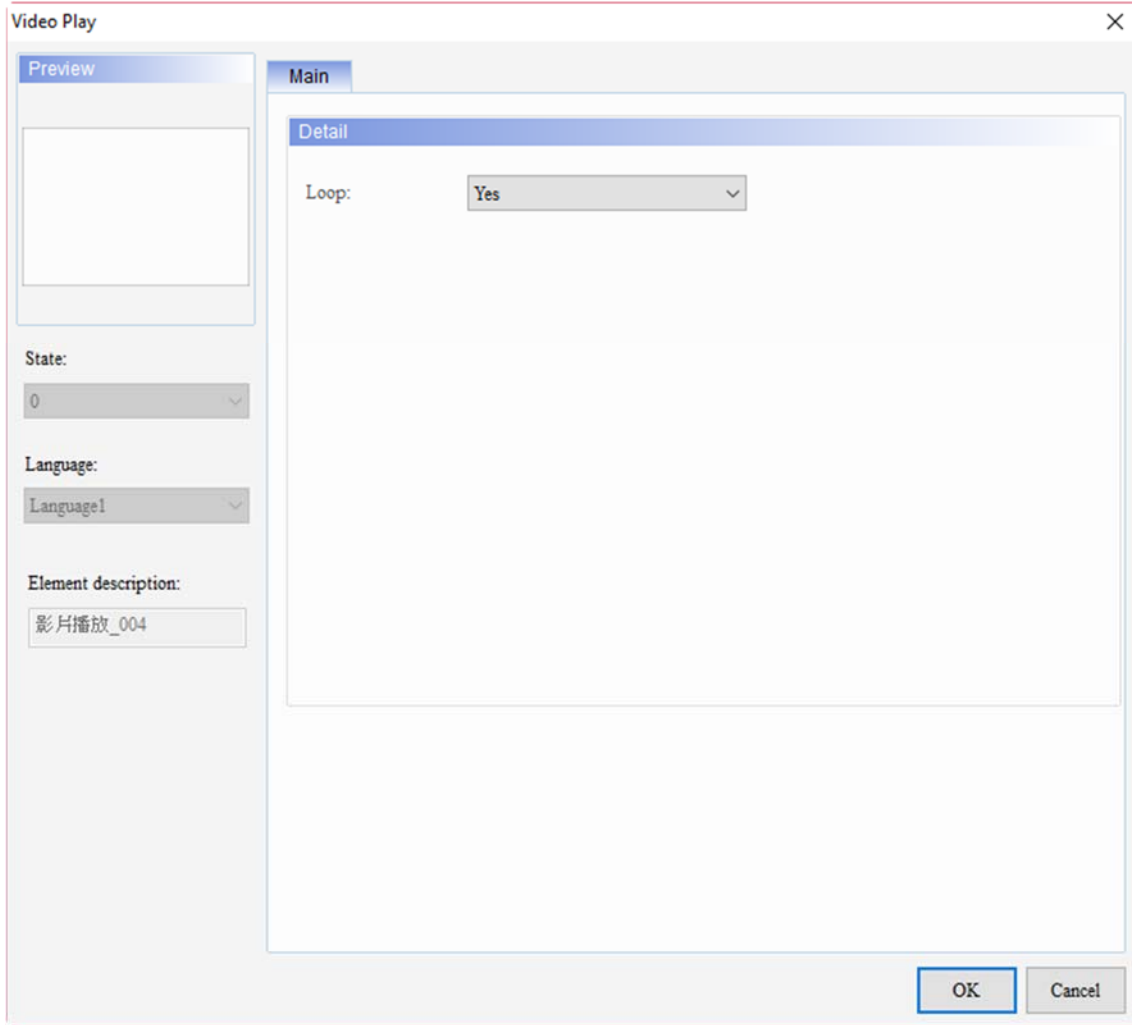Double-click the right side of video play element Properties screen as shown below.



Figure 4.5 Right side of Video Play Element Properties

Table 4.4 Right side of Video Play Element Function Page

| Video Play (File display of left side) | |
|---|---|
| **Function Page** | **Content Description** |
| Main | Set Loop. |

■ Main
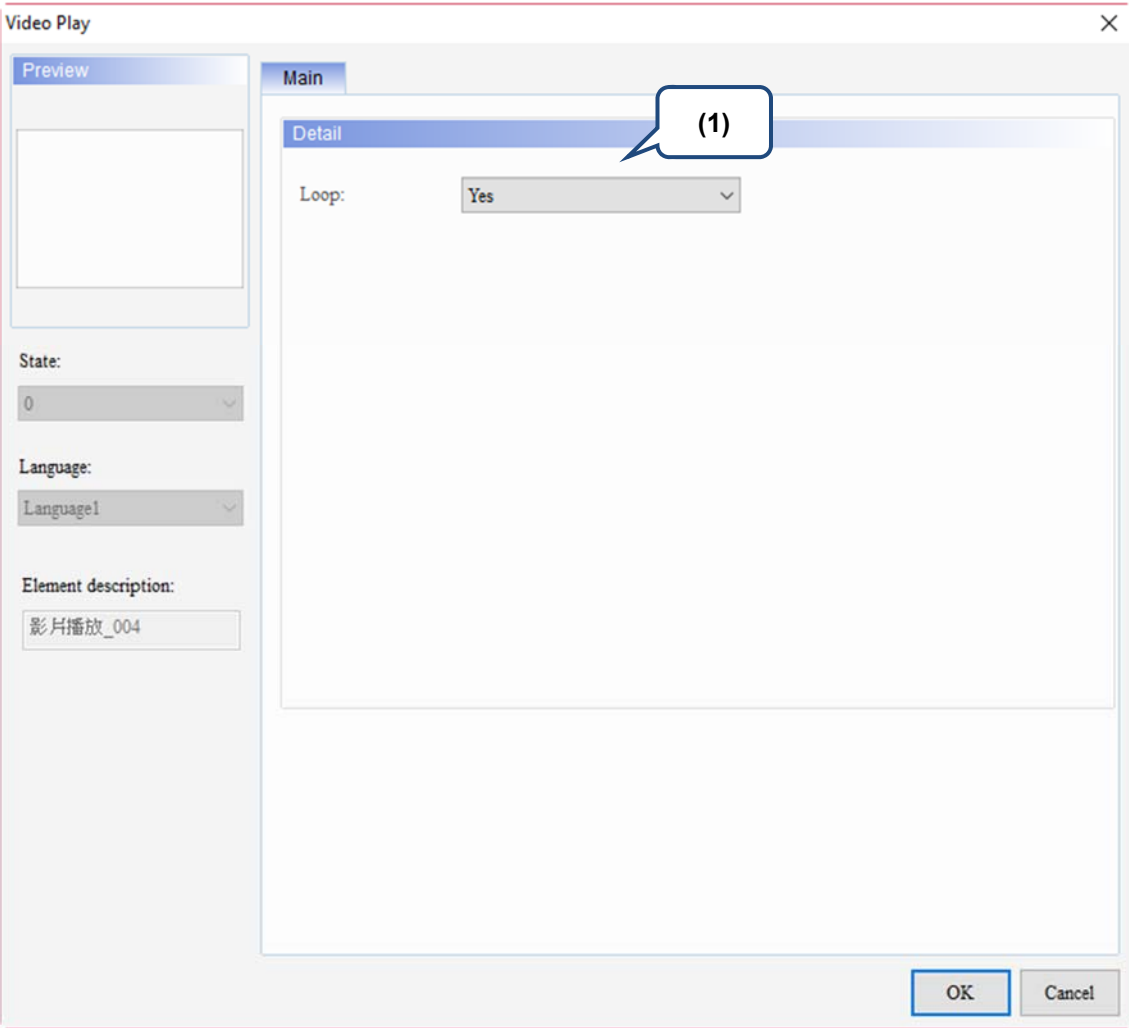


Figure 4.6 Right side of Video Play Element Main Properties Page

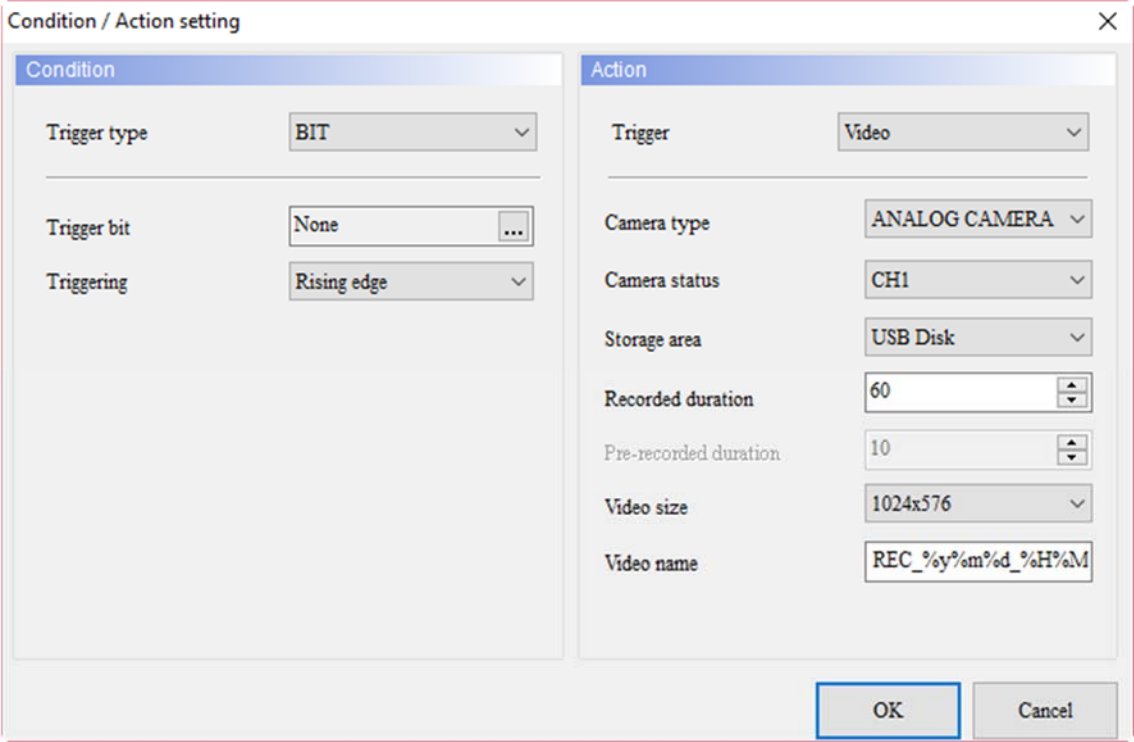| No. | Property | Function |
|-----|----------|----------|
| (1) | Loop | The default is Yes, and the video file will continue to replay after it has finished playing. |

# 5. Event trigger

The event trigger is mainly used to match the Camera display element. After the conditions set by the event trigger are met, the content captured by the camera at that time can be archived into an mpeg4 video file.

Enter【Options】 → 【Event trigger】 to add event.

| Options | Window | Help |
| --- | --- | --- |
| Configuration | | |
| Communication Settings | | |
| Change Model | | |
| Alarm Settings | | |
| History Buffer Setup | | |
| Tag Table ... | | |
| Print Setup .. | | |
| Audio Output Setting | | |
| HMI Identifier Settings | | |
| Modbus TCP mapping table | | |
| FileSlot File Management | | |
| Device Table | | |
| Operation Log Settings | | |
| Recipe | | ▶ |
| Picture Bank | | |
| Text Bank | | |
| Camera Device | | |
| Event trigger | | |
| Multi-Lang input character count calculation | | |
| Submacro | | |
| Initial Macro | | |
| Background Macro | | |
| Clock Macro | | |
| Font management | | |
| Environment | | |

Click  to add trigger event.



Figre 5.1 Event trigger

| Condition | |
|---|---|
| Trigger type | Only have bit type. |
| Trigger bit | Set bit address, could be PLC address or internal memory address. |
| Triggering | Trigger have Rising edge, Falling edge and Rising or falling.<br><br><br><br>Rising means bit status from On to Off.<br><br>Falling means bit status from Off to On. |
| Action | |
| Trigger | Trigger have Video and Goto screen.<br><br><br><br><br><br>If select Video, interface as below. |

| | |
|---|---|
| Camera type | Camera type have Analog Camera and IP Camera.<br> |
| Camera status | The camera status will depend on the camera type.<br>Select Analog Camera, status only list for CH1 and CH2.<br><br>Select IP camera, status will depend on Name of Camera device setting. Enter【Options】→【Camera device】to create IP Camera name for Camera 1 and Camera 2.<br> |
| Storage area | Storage area have Media, USB DISK and SD.<br><br>Media is located at HMI, if select this area, only provide 2G capacity to save video file.<br>USB or SD stores the movie according to the selected capacity. The supported format is FAT32. |
| Recorded duration | The number of seconds to start recording after the trigger bit condition is met. |
| Video size | Video size only support 1024x576 and 640x480. |

| | | |
|---|---|---|
| | | Video size     1024x576 ⌄<br>                1024x576<br>Video name    640x480<br>If choose video size of 640x480 and recorded duration of 120 seconds, a file will occupy 30MB. 。# |
| | Video name | Video name default is REC_%y%m%d_%H%M%S.<br>%y is year, %m is month, %d is date, %H is hour, %M is minute, %S is second.<br>User could customize video name. |

Select action to Goto screen, interface as below.

Change the          Screen_1        ...

If choose goto screen, after the trigger bit on, will be changed to the specified screen number.

# 6. Internal Memory increase to 200000 from $0 ~ $199999

The internal register is the memory in the human-machine available for free reading and supporting different configurations, such as the element communication address. As the internal register does not support the non-volatile function, when the human-machine is disconnected from the power supply, data in the register cannot be maintained. The human-machine increase internal register to 200000, each 16-bit.

| Access Type | Element Type | Access Range |
| --- | --- | --- |
| Word | $n | $0 ~ $199999 |
| Bit | $n.b | $0.0 ~ $199999.15 |

Note: n is Word (0-199999); and b is Bit (0-15)

Internal memory increase to 200000 from $0 to $199999 only apply on elements. Macro command still can use 65536 from $0 ~ $65535.