	<b>Subject:</b>	<b>Sony XC-HR70 with mvTITAN-G1</b>	Created	Last change
			09.04.03	10.04.03
Application Note	Project:	Camera adaption	Version 1.0	

## Overview

Camera Sony XC-HR70

### Running modes

Freerunning   
 Restart/Reset   
 Ext. Synchronized   
 Trigger Shutter   
 Flash & Reset

### Resolution

Horizontal 1024 pixel  
 Vertical 768 pixel  
  
 Binning   
 Partial Scan

### Timings

Pixel clock 29.5 MHz  
 Horizontal 23.23 kHz  
 Vertical 29.5 fps

### MATRIX VISION GmbH Frame Grabber

Typ	mvTITAN-G1				
Line Enable by	camera	<input checked="" type="checkbox"/>	Frame Grabber	<input checked="" type="checkbox"/>	external <input type="checkbox"/>
Frame Enable by	camera	<input checked="" type="checkbox"/>	Frame Grabber	<input checked="" type="checkbox"/>	external <input type="checkbox"/>
Trigger by	external	<input type="checkbox"/>	Frame Grabber	<input checked="" type="checkbox"/>	
Flash by	camera	<input type="checkbox"/>	Frame Grabber	<input type="checkbox"/>	external <input type="checkbox"/>

### Software

MVacquireControl   
 mvIMPACT Go!   
 Other  [e.g. LabView™, Halcon, etc.]

### Imprint

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This document requires the general knowledge of the usage and the technical data of the used frame grabber, camera and application.

Information in this document is subject to change without notice and does not represent a commitment on the part of MATRIX VISION GmbH.

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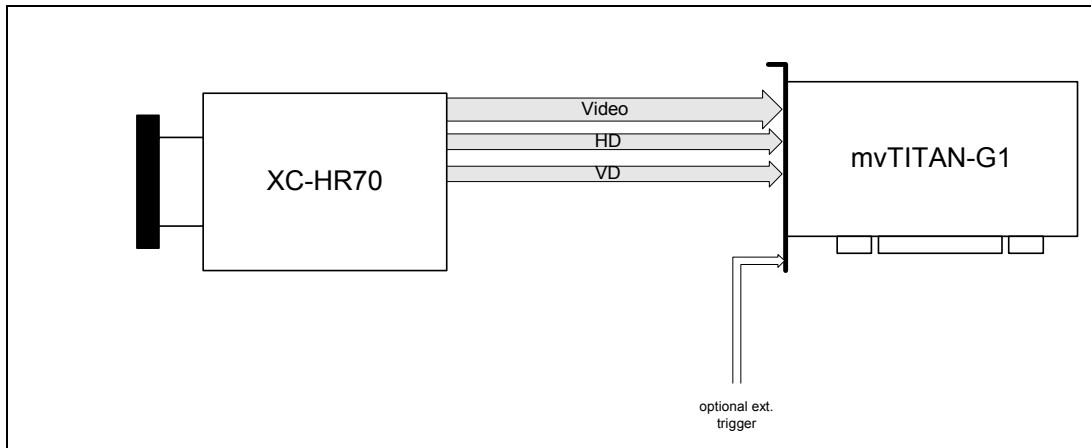
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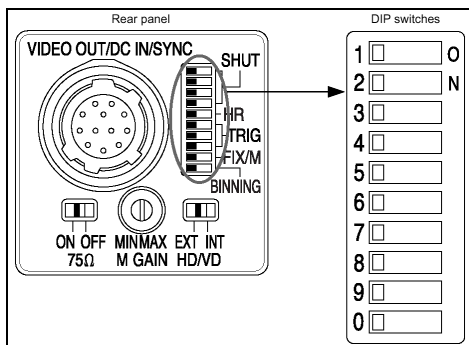
## Freerunning Mode

In freerunning mode the camera runs with its own timing and outputs the video signal, HD and VD on separate pins. There are no HD and VD within video signal.

### Signal map



### Camera settings set by hardware



#### Dip-Switch settings:

SW 1	SW 1	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8	SW 9	SW 0
X	X	X	X	X	OFF	OFF	OFF	OFF	OFF

'ON': switched on, 'OFF': switched off, 'X': switch setting not relevant


#### Switch HD/VD:

Set to INT

### Pin connection

XC-HR70 12 pin Hirose		Direction	mvTITAN-G1 HD26ST	
1	GND	→	10	GND
2	+12 VDC	←	1	+12 VDC
3	video out	→	2	Video 1
6	HD out	→	7	HD in
7	VD out	→	6	VD in

Recommended cable for this mode from MATRIX VISION GmbH: KS41-0083 03.0

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Application Note	Project:	Camera adaption	Version 1.0

### Camera definition


```

/* ----- Sony XC-HR70 ----- */
DefCamType           "XC-HR70" VM_VSCAN NONINTERLACED 60 23230 29650 PCLK_INTERN
DefCamAcquireSetup   "XC-HR70" VSCAN INV_SYNC NEXT_FIELD
DefCamAnalogParam    "XC-HR70" AC 1 0 0 1200
DefHorizontalUnit    "XC-HR70" PIXEL
DefVerticalUnit      "XC-HR70" LINES
DefCamHorizontalAcquire "XC-HR70" 247L 1024L 1
DefCamVerticalAcquire "XC-HR70" 18L 768L 1
DefCamClamp          "XC-HR70" 100L 5L
DefCamZero           "XC-HR70" 100L 5L
DefCamFieldGate      "XC-HR70" 300L 400L

```

### Remarks

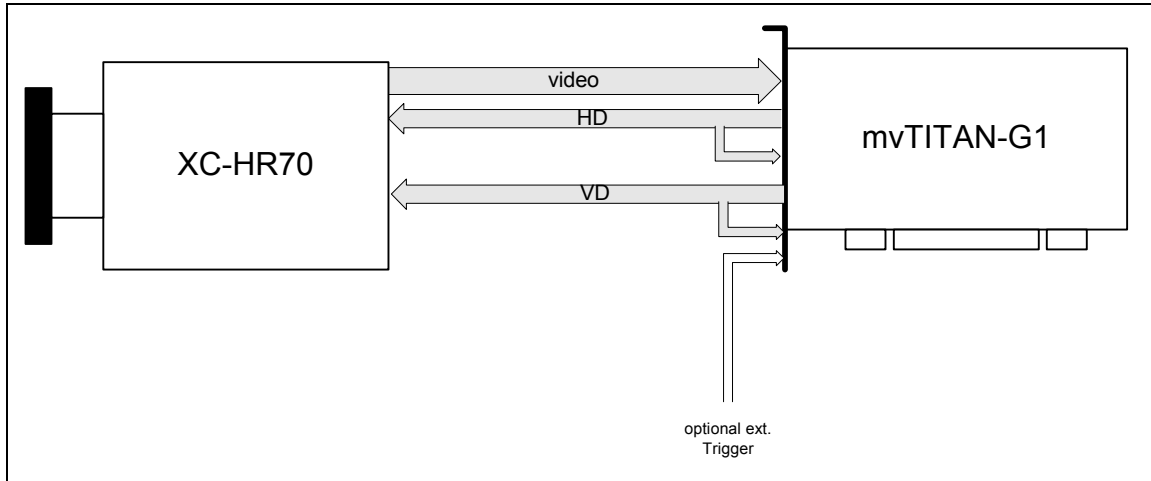
Basic settings in MVAcquireControl:  
Choose the camera definition "XC-HR70" in register *camera*.

	<b>Subject:</b> Sony XC-HR70 with mvTITAN-G1	Created	Last change
		09.04.03	10.04.03
Application Note	Project:	Camera adaption	Version 1.0

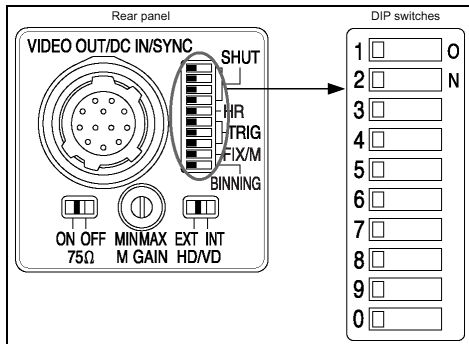
## Ext. Synchronized Mode

In this mode the camera uses the timings provided by the mvTITAN-G1. For that the HDout and VDout of the mvTITAN-G1 is connected to HDin and VDin of the camera.  
 Because the camera sends no HD and VD within the video signal the HDout and VDout of the mvTITAN-G1 must be connected also to HDin and VDin of mvTITAN-G1.

### Signal map



### Camera settings set by hardware



#### Dip-Switch settings:

SW 1	SW 1	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8	SW 9	SW 0
X	X	X	X	X	OFF	OFF	OFF	OFF	OFF

'ON': switched on, 'OFF': switched off, 'X': switch setting not relevant


#### Switch HD/VD:

Set to **EXT**

### Pin connection

XC-HR70 12 pin Hirose		Direction	mvTITAN-G1 HD26ST	
1	GND	→	10	GND
2	+12 VDC	←	1	+12 VDC
3	video out	→	2	Video 1
6	HD out	←	26, 7	HD out, HD in
7	VD out	←	24, 6	VD out, VD in

Recommended cable for this mode from MATRIX VISION GmbH: not currently available

	<b>Subject:</b> Sony XC-HR70 with mvTITAN-G1	Created	Last change
		09.04.03	10.04.03
Application Note	Project:	Camera adaption	Version 1.0

### Camera definition

```

/* ----- Sony XC-HR70 ----- */
DefCamType           "XC-HR70" VM_VSCAN NONINTERLACED 60 23230 29650 PCLK_INTERN
DefCamAcquireSetup   "XC-HR70" VSCAN INV_SYNC NEXT_FIELD
DefCamAnalogParam    "XC-HR70" AC 1 0 0 1200
DefHorizontalUnit    "XC-HR70" PIXEL
DefVerticalUnit       "XC-HR70" LINES
DefCamHorizontalAcquire "XC-HR70" 247L 1024L 1
DefCamVerticalAcquire "XC-HR70" 18L 768L 1
DefCamClamp          "XC-HR70" 100L 5L
DefCamZero           "XC-HR70" 100L 5L
DefCamFieldGate      "XC-HR70" 300L 400L

```

### Setting up the horizontal and vertical frequency

For setting up the horizontal and vertical frequency the mvTITAN-G1 sends to the camera on HDout and VDout you have to use the command *mvDefDisplayMode()*.

Sample for calling in used INI file:

```

...
[TITAN]
...
InitBoard
...
DefDisplayMode 0 NULL 0 0 0 1273 786 0 0 200 100 0 0 0 23230
...


```

With this calling a horizontal frequency of 23.23 kHz is sent on HDout. The resultant vertical frequency on VDout is about 60Hz.

Read more about *mvDefDisplayMode()* in the mvTITAN-G1's manual.

### Remarks

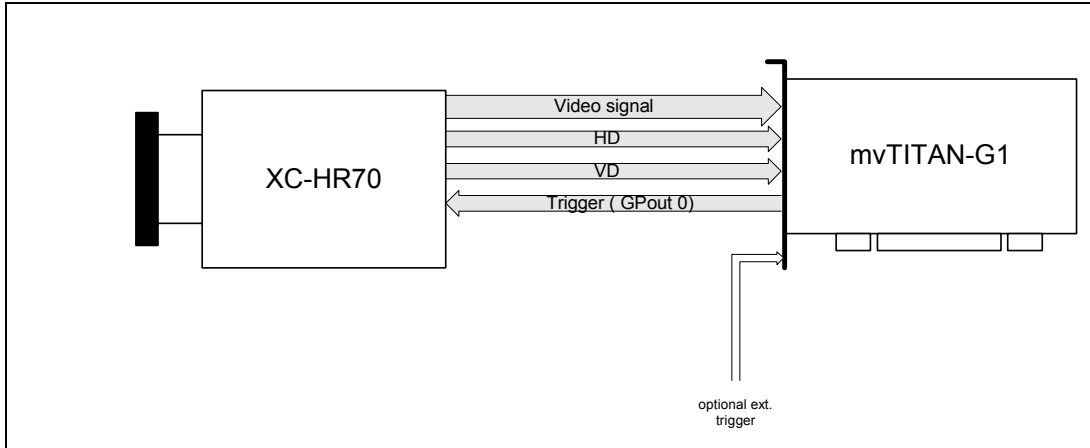
none

	<b>Subject:</b> Sony XC-HR70 with mvTITAN-G1	Created	Last change
		09.04.03	10.04.03
Application Note	Project:	Camera adaption	Version 1.0

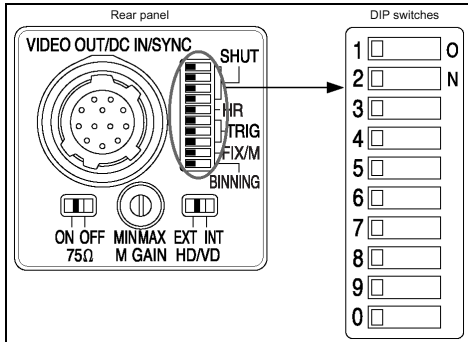
## Trigger Shutter Mode

The camera runs with its own timings and the mvTITAN-G1 resets the camera. The length of the trigger pulse defines the shuttertime of the camera.

### Signal map



### Camera settings set by hardware



#### Dip-Switch settings:

SW 1	SW 1	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8	SW 9	SW 0
X	X	X	X	X	OFF	ON	ON	OFF	OFF

'ON': switched on, 'OFF': switched off, 'X': switch setting not relevant


#### Switch HD/VD:

Set to INT

### Pin connection

XC-HR70 12 pin Hirose		Direction	mvTITAN-G1 HD26ST	
1	GND	↔	10	GND
2	+12 VDC	←	1	+12 VDC
3	Video out	→	2	Video 1
6	HD out	→	7	HD in
7	VD out	→	6	VD in
11	Trigger In	←	19	GPout 0

Recommended cable for this mode from MATRIX VISION GmbH: KS41-0231 03.0

	<b>Subject:</b> Sony XC-HR70 with mvTITAN-G1	Created	Last change
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Application Note	Project:	Camera adaption	Version 1.0

### Cameradefinition

```

/* ----- Sony XC-HR70 ----- */
DefCamType "XC-HR70" VM_VSCAN NONINTERLACED 60 23230 29650 PCLK_INTERN
DefCamAcquireSetup "XC-HR70" VSCAN_INV_SYNC NEXT_FIELD
DefCamAnalogParam "XC-HR70" AC 1 0 0 1200
DefHorizontalUnit "XC-HR70" PIXEL
DefVerticalUnit "XC-HR70" LINES
DefCamHorizontalAcquire "XC-HR70" 247L 1024L 1
DefCamVerticalAcquire "XC-HR70" 18L 768L 1
DefCamClamp "XC-HR70" 100L 5L
DefCamZero "XC-HR70" 100L 5L
DefCamFieldGate "XC-HR70" 300L 400L

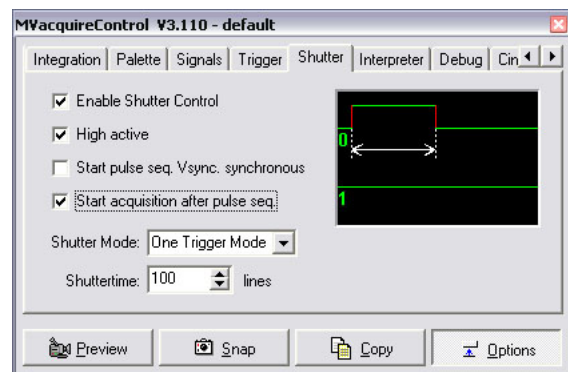
```

### Setting up camera trigger

For the camera reset GPout 0 of mvTITAN-G1 is used.  
The best way to setup GPout 0 as a trigger signal is to use the shutter control.

In MVacquireControl switch to register *Shutter* and do the following settings:

- Enable Shutter Control
  - Activate *High active*
  - Activate *Start acquisition after pulse seq.*
  - Disable *Start puls seq. Vsync synchronous*
  - Set Shutter mode to *One Trigger Mode*
- The setting in *Shuttertime* defines the length of the pulse and so the shuttertime of the camera.




Automatically the Autotrigger in register *Trigger* is activated. Define in *Autotrigger periode* the time between two images to acquire. Useful settings are between 100 ms and 1000 ms.

If you are using the optional external trigger signal connected to the *Trigger In* pin of the mvTITAN-G1 switch from *autotrigger* to *ext. trigger* and the camera reset signal will be output right after each external trigger pulse.

If using the shuttercontrol in software you have to use the functions *mvDefPulsSeq()* and *mvSetTriggerPeriod()* to define the shutter control method. You will find more about these functions in the mvTITAN-G1's manual.

### Remarks

none

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## Glossary

Expression	Explanation
VD	Vertical drive, signal is sent to signalize next field (noninterlaced) or frame (interlaced). Also called Frame Enable, VSync or frame start signal.
HD	Horizontal drive, signal is sent to signalize next line. Also called Line Enable, HSync or line start signal.