Overview

Camera  
Sony XC-HR70

Running modes
- Freerunning [X]
- Restart/Reset [ ]
- Ext. Synchronized [X]
- Trigger Shutter [X]
- 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 [X] Frame Grabber [X] external [ ]
  - Frame Enable by camera [X] Frame Grabber [X] external [ ]
  - Trigger by external [ ] Frame Grabber [X]
  - Flash by camera [ ] Frame Grabber [ ] external [ ]

Software
- MVacquireControl [X]
- 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.
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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:

<table>
<thead>
<tr>
<th>SW 1</th>
<th>SW 1</th>
<th>SW 3</th>
<th>SW 4</th>
<th>SW 5</th>
<th>SW 6</th>
<th>SW 7</th>
<th>SW 8</th>
<th>SW 9</th>
<th>SW 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

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

Switch HD/VD:
Set to INT

Pin connection

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

/* -------------------------- Sony XC-HR70 ------------------------------------ */
DefCamType "XC-HR70" VM_VSCAN NONINTERLACED 60 23230 29650 PCLK_INTERN
DefCamAcquireSetup "XC-HR70" VS3AN 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.
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:

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<th>SW 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

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

Switch HD/VD:
Set to EXT

Pin connection

<table>
<thead>
<tr>
<th>XC-HR70 12 pin Hirose</th>
<th>Direction</th>
<th>mvTITAN-G1 HD26ST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 GND</td>
<td>➔</td>
<td>10 GND</td>
</tr>
<tr>
<td>2 +12 VDC</td>
<td>低压</td>
<td>1 +12 VDC</td>
</tr>
<tr>
<td>3 video out</td>
<td>➔</td>
<td>2 Video 1</td>
</tr>
<tr>
<td>6 HD out</td>
<td>低压</td>
<td>26, 7 HD out, HD in</td>
</tr>
<tr>
<td>7 VD out</td>
<td>低压</td>
<td>24, 6 VD out, VD in</td>
</tr>
</tbody>
</table>

Recommended cable for this mode from MATRIX VISION GmbH: not currently available
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 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 \textit{mvDefDisplayMode()}. Sample for calling in used INI file:

\begin{verbatim}
[TITAN]
InitBoard
DefDisplayMode 0 NULL 0 0 1273 786 0 0 200 100 0 0 0 23230
\end{verbatim}

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 \textit{mvDefDisplayMode()} in the mvTITAN-G1’s manual.

Remarks

none
**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 shutttetime of the camera.

### Signal map

![Signal map diagram](image)

### Camera settings set by hardware

![Camera settings diagram](image)

**Dip-Switch settings:**

<table>
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<th>SW 7</th>
<th>SW 8</th>
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<th>SW 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
</tbody>
</table>

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

**Switch HD/VD:**

Set to INT

### Pin connection

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<th>Direction</th>
<th>mvTITAN-G1 HD26ST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 GND</td>
<td>←→</td>
<td>10 GND</td>
</tr>
<tr>
<td>2 +12 VDC</td>
<td>←</td>
<td>1 +12 VDC</td>
</tr>
<tr>
<td>3 Video out</td>
<td>→</td>
<td>2 Video 1</td>
</tr>
<tr>
<td>6 HD out</td>
<td>→</td>
<td>7 HD in</td>
</tr>
<tr>
<td>7 VD out</td>
<td>→</td>
<td>6 VD in</td>
</tr>
<tr>
<td>11 Trigger In</td>
<td>←</td>
<td>19 GPout 0</td>
</tr>
</tbody>
</table>

Recommended cable for this mode from MATRIX VISION GmbH: KS41-0231 03.0
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" A C100 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 synchrononous
- 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
## Glossary

<table>
<thead>
<tr>
<th>Expression</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VD</td>
<td>Vertical drive, signal is sent to signalize next field (noninterlaced) or frame (interlaced). Also called Frame Enable, VSync or frame start signal.</td>
</tr>
<tr>
<td>HD</td>
<td>Horizontal drive, signal is sent to signalize next line. Also called Line Enable, HSync or line start signal.</td>
</tr>
</tbody>
</table>