MATRIX VISION	Subject:	mvGAMMA-G connected to Jai A11	Created	Last change
			29.10.03	29.10.03
Application Note	Project:	Camera adaption	Version 1.0	

Overview

Camera   Jai A11

Running modes

Freerunning	[X]	
Edge Pre-select	[X]	By frame grabber and external
Pulse Width control	[X]	By frame grabber and external
Trigger Shutter	[ ]	[remarks]
Flash & Reset	[ ]	[remarks]

Resolution

Horizontal	648	pixel
Vertical	492	pixel
Binning	[ ]	
Partial Scan	[ ]	

Timings

Pixel clock	12.270	MHz
Horizontal	15.734	kHz
Vertical	29.96	fps

MATRIX VISION GmbH Frame Grabber

Typ	mvGAMMA-G					
Line Enable by	camera	[X]	Frame Grabber	[ ]	external	
Frame Enable by	camera	[X]	Frame Grabber	[ ]	external	
Trigger by	external	[X]	Frame Grabber	[X]		
Flash by	camera	[ ]	Frame Grabber	[ ]	external	

Software

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

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Freerunning Mode

Camera acquires the images with its own timing and sends the video signal including the signals for synchronizing (HD and VD) to the mvGAMMA-G.

Signal map
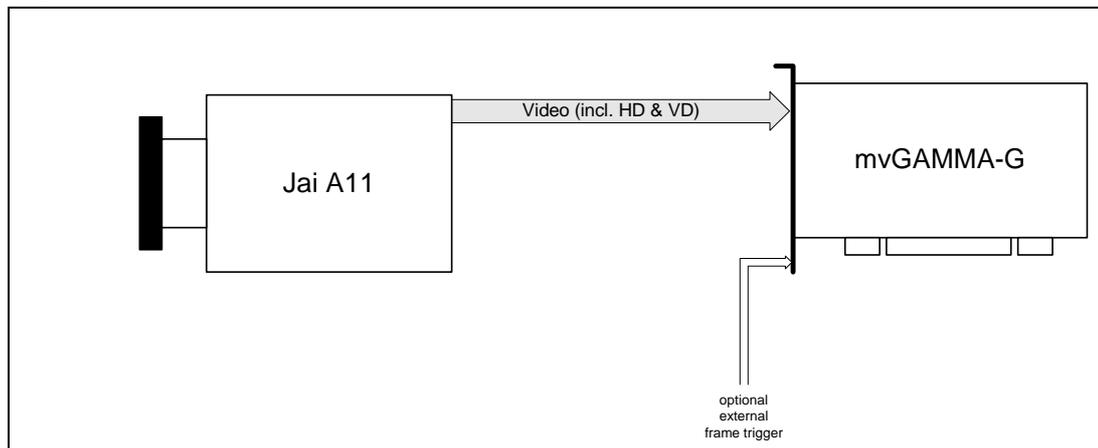
Camera settings set by software

For setting up the camera it is needed to connect the serial pins of the camera with a free COM port of the host PC. A suitable cable is available from Jai or from us.
To control the camera install the *CV-A11 Control Tool* supplied by Jai.
After starting you get the following windows:
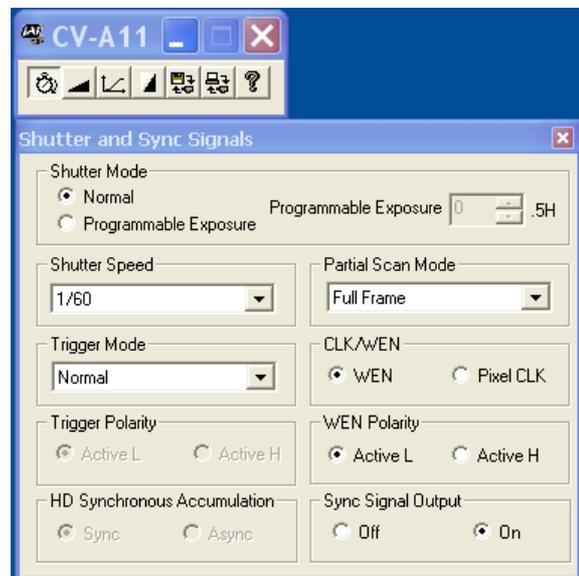
Be sure the *Trigger Mode* is set to *Normal*.
Partial scan mode should be set to *Full Frame* in case of using the camera definition you will find later.
Define the *Shutter Mode* and the *Shutter Speed* as your application needs.
The *Sync Signal Output* must be set to *On*. So the camera sends its VD and HD within the video signal.
The *CLK/WEN* settings are irrelevant.

Pin assignment

Jai CV-A11		Direction	mvGAMMA-G	
1	GND	→	16	GND
2	+12V DC	←	1	+12V DC
3	GND video	←	10	GND
4	Video out	→	2	Video 1 in
5	GND	←→	17	GND
6	HD out	→	7	HD in
7	NC			
8	GND	←→	18	GND
9	PCLK out	→	9	PCLK in
10	WEN out	→	6	VD in
11	Trigger Input	→	19	GPout 0

A recommended cable for the 26pin jack from MATRIX VISION GmbH is KS41-EIAJ 03.0 or KS41-EIAJ XT 03.0 (ext. Trigger of mvGAMMA-G on additional cable).
Alternatively an 1:1 connection between the 12p Hirose jacks of mvGAMMA-G and Jai CV-A11 can be used. Suitable cable from MATRIX VISION GmbH is KS-HRS12 03.0.

Cameradefinition

```
/*  ----------------------- Jai A11 ---------------------------------- */
DefCamType             "Jai-CV-A11" VM_RS170 NONINTERLACED 60 15734 12270 PCLK_INTERN
DefCamAcquireSetup     "Jai-CV-A11" STANDARD NOT_INV NEXT_FIELD
DefCamAnalogParam      "Jai-CV-A11" AC 1 0 0 1200
DefHorizontalUnit      "Jai-CV-A11" PIXEL
DefVerticalUnit        "Jai-CV-A11" LINES
DefCamHorizontalAcquire "Jai-CV-A11" 113L 648L 1
DefCamVerticalAcquire   "Jai-CV-A11" 22L 492L 1
DefCamClamp            "Jai-CV-A11" 74L 5L
DefCamZero             "Jai-CV-A11" 84L 5L
DefCamFieldGate        "Jai-CV-A11" 260L 330L
```

Setting up mvAcquireControl

This description requires a proper installation of the mvGAMMA-G and the mvAcquireControl. It is recommended to use the latest versions of the Win32 driver and the mvAcquireControl. You will find these installations on the latest mvIMPACT CD-ROM or as a download from our homepage.

Open the mvGAMMA-G in the mvAcquireControl and choose the camera definition *Jai-CV-A11*. It is recommended to activate the *Greyscale* mode in register *Acquire* and set it to *8bit*. So will get 8bpp images.

If an external frame trigger is wanted supply the mvGAMMA-G with this signal on the *Ext. Trigger in* pin. Switch to register *Trigger* and set *Enable trigger* and *ext. trigger*. Now the mvGAMMA-G will acquire only the images which are sent by the camera right after a ext. trigger pulse.

Remarks to mvSDK

Choose in your program the camera definition *Jai-CV-A11* by use of function *SelCamera* in the INI-File.
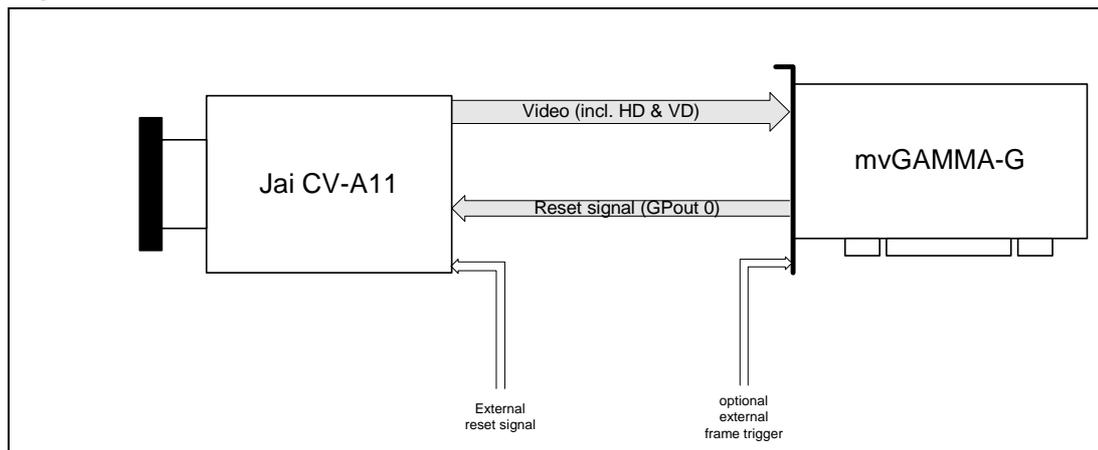It is recommended to use the colormode *COL_GREY* with this camera. You will get 8bpp images in the DMA buffer.

Edge Pre-select mode

Camera is reset by a trigger signal and integrates the images with a predefined integration time set in the camera. The video signal including the signals for synchronization (HD and VD) is sent to the mvGAMMA-G after the image was acquired.

The restart signal can be send from mvGAMMA-G or can be supplied directly from external to the camera.

Signal map

Camera settings set by software

For setting up the camera it is needed to connect the serial pins of the camera with a free COM port of the host PC. A suitable cable is available from Jai or from us.

To control the camera install the *CV-A11 Control Tool* supplied by Jai.

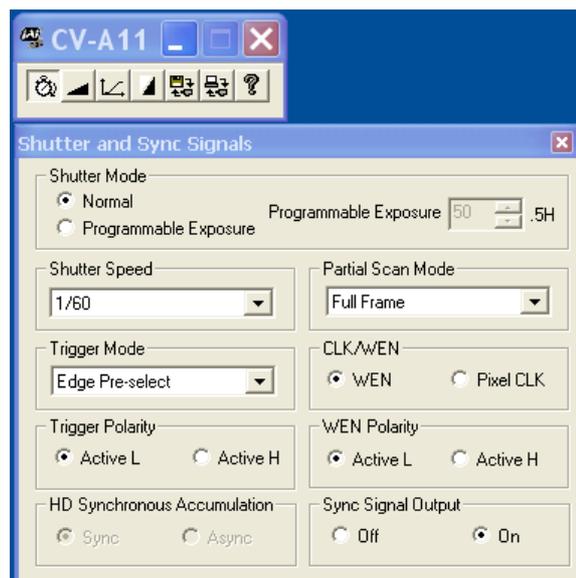After starting you get the following windows:

Be sure the *Trigger Mode* is set to *Edge Pre-select*.

Partial scan mode should be set to *Full Frame* in case of using the camera definition you will find later.

Define the *Shutter Mode* and the *Shutter Speed* as your application needs.

The *Sync Signal Output* must be set to *On*. So the camera sends its VD and HD within the video signal.

The *CLK/WEN* settings are irrelevant.

Pin connection

	Jai CV-A11	Direction		mvGAMMA-G
1	GND	→	16	GND
2	+12V DC	←	1	+12V DC
3	GND video	←	10	GND
4	Video out	→	2	Video 1 in
5	GND	←→	17	GND
6	HD out	→	7	HD in
7	NC			
8	GND	←→	18	GND
9	PCLK out	→	9	PCLK in
10	WEN out	→	6	VD in
11	Trigger Input	→	19	GPout 0

A recommended cable for the 26pin jack from MATRIX VISION GmbH is KS41-EIAJ 03.0 or KS41-EIAJ XT 03.0 (ext. Trigger of mvGAMMA-G on additional cable).
Alternatively an 1:1 connection between the 12p Hirose jacks of mvGAMMA-G and Jai CV-A11 can be used. Suitable cable from MATRIX VISION GmbH is KS-HRS12 03.0.

Cameradefinition

```
/* ------------------------ Jai A11 ---------------------------------- */
DefCamType               "Jai-CV-A11" VM_RS170 NONINTERLACED 60 15734 12270 PCLK_INTERN
DefCamAcquireSetup       "Jai-CV-A11" STANDARD NOT_INV NEXT_FIELD
DefCamAnalogParam        "Jai-CV-A11" AC 1 0 0 1200
DefHorizontalUnit        "Jai-CV-A11" PIXEL
DefVerticalUnit          "Jai-CV-A11" LINES
DefCamHorizontalAcquire  "Jai-CV-A11" 113L 648L 1
DefCamVerticalAcquire    "Jai-CV-A11" 22L 492L 1
DefCamClamp              "Jai-CV-A11" 74L 5L
DefCamZero               "Jai-CV-A11" 84L 5L
DefCamFieldGate          "Jai-CV-A11" 260L 330L
```

Remarks to mvAcquireControl

This description requires a proper installation of the mvGAMMA-G and the mvAcquireControl. It is recommended to use the latest versions of the Win32 driver and the mvAcquireControl. You will find these installations on the latest mvIMPACT CD-ROM or as a download from our homepage.
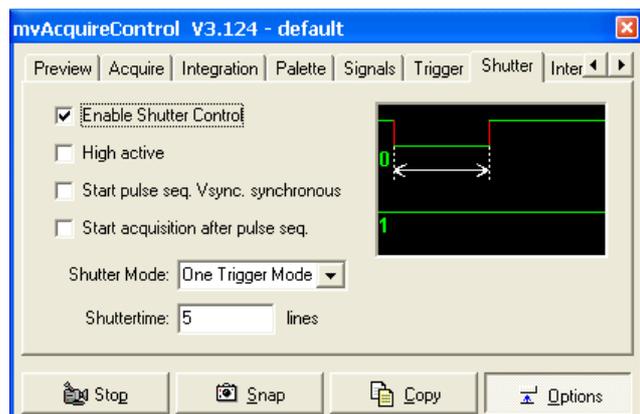
Open the mvGAMMA-G in the mvAcquireControl and choose the camera definition *Jai-CV-A11*. It is recommended to activate the *Greyscale* mode in register *Acquire* and set it to *8bit*. So will get 8bpp images.

Reset signal sent by mvGAMMA-G
For activating the output of the mvGAMMA-G to reset the camera switch to register *Shutter*:

Following settings must be done:
- Enable *Shutter Control*
- Disable *High active*
- Disable *Start pulse seq. Vsync synchronous*
- Disable *Start acquisition after pulse seq.*
- Choose mode *One Trigger Mode*
- Shuttertime must be set >1

Switch to register *Trigger*.

By default the mode *autotrigger* is automatically enabled. This means the mvGAMMA-G generates the trigger signal itself which is needed for output the shutter signals. The time between two trigger signals is set by *Autotrigger period*.

Instead of using the autotriggered mode you can supply the mvGAMMA-G with an external signal which triggers the output of the shutter signals. For that supply the mvGAMMA-G with such a signal on the *Trigger In* pin and switch from *autotrigger* to *ext. trigger*. Now the camera is reset every time a signal occurred on the *Trigger In* pin of the mvGAMMA-G.

Remarks to mvSDK

Choose in your program the camera definition *Jai-CV-A11* by use of function *SelCamera* in the INI-File.

It is recommended to use the colormode *COL_GREY* with this camera. You will get 8bpp images in the DMA buffer.

To activate the signal output for resetting the camera use the shuttercontrol method. Define a single signal output by *mvDefPulseSeq()*.

Example:
```
mvDefPulseSeq(dev, 0, 0, pPulse)
```
with pPulse array:

        Element 0: 2

        Element 1: -1

Decide if you want to use the autotrigger mode or an external signal for starting the output of the reset signal.

If using the autotriggered mode define the period time with *mvSetTriggerPeriod(dev, period_time)*.

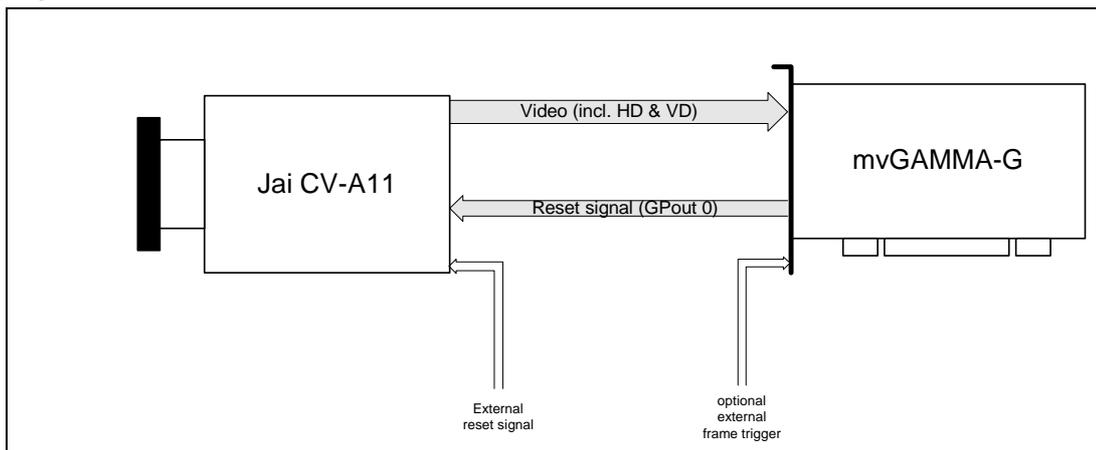To tell the mvGAMMA-G to use the *Trigger In* pin for starting use the function *mvSelExtTrig(dev,1)*.

You will find more about the programming of the shutter control in the mvGAMMA-G's manual.

Pulse Width Control Mode

Camera is reset by a trigger signal. The length of the pulse defines the integration time on the camera. The video signal including the signals for synchronization (HD and VD) is sent to the mvGAMMA-G after the image was acquired.

The restart signal can be send from mvGAMMA-G or can be supplied directly from external to the camera.

Signal map

Camera settings set by software

For setting up the camera it is needed to connect the serial pins of the camera with a free COM port of the host PC. A suitable cable is available from Jai or from us.

To control the camera install the *CV-A11 Control Tool* supplied by Jai.

After starting you get the following windows:

Be sure the *Trigger Mode* is set to *Pulse Width Control*.
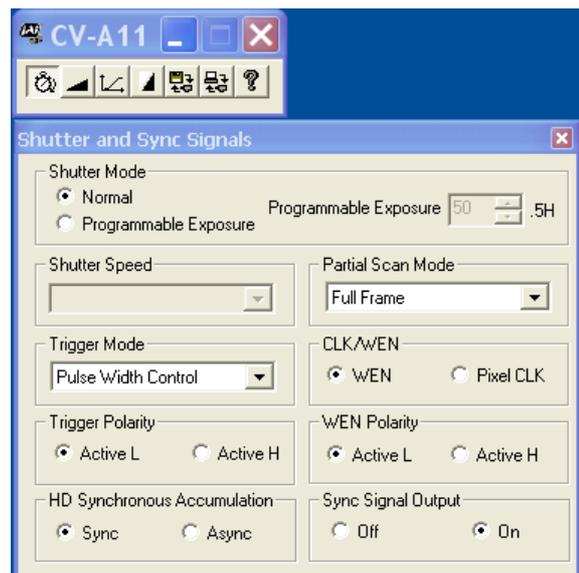
Partial scan mode should be set to *Full Frame* in case of using the camera definition you will find later.

Define the *Shutter Mode* and the *Shutter Speed* as your application needs.

The *Sync Signal Output* must be set to *On*. So the camera sends its VD and HD within the video signal.

Set the Trigger Polarity to *Active L* and the HD Synchronous Accumulation to *Sync*.

The *CLK/WEN* settings are irrelevant.

Pin connection

	Jai CV-A11	Direction		mvGAMMA-G
1	GND	→	16	GND
2	+12V DC	←	1	+12V DC
3	GND video	←	10	GND
4	Video out	→	2	Video 1 in
5	GND	←→	17	GND
6	HD out	→	7	HD in
7	NC			
8	GND	←→	18	GND
9	PCLK out	→	9	PCLK in
10	WEN out	→	6	VD in
11	Trigger Input	→	19	GPout 0

A recommended cable for the 26pin jack from MATRIX VISION GmbH is KS41-EIAJ 03.0 or KS41-EIAJ XT 03.0 (ext. Trigger of mvGAMMA-G on additional cable).
Alternatively an 1:1 connection between the 12p Hirose jacks of mvGAMMA-G and Jai CV-A11 can be used. Suitable cable from MATRIX VISION GmbH is KS-HRS12 03.0.

Cameradefinition

```
/* ------------------------- Jai A11 ----------------------------------- */
DefCamType              "Jai-CV-A11" VM_RS170 NONINTERLACED 60 15734 12270 PCLK_INTERN
DefCamAcquireSetup      "Jai-CV-A11" STANDARD NOT_INV NEXT_FIELD
DefCamAnalogParam       "Jai-CV-A11" AC 1 0 0 1200
DefHorizontalUnit       "Jai-CV-A11" PIXEL
DefVerticalUnit         "Jai-CV-A11" LINES
DefCamHorizontalAcquire "Jai-CV-A11" 113L 648L 1
DefCamVerticalAcquire   "Jai-CV-A11" 22L 492L 1
DefCamClamp             "Jai-CV-A11" 74L 5L
DefCamZero              "Jai-CV-A11" 84L 5L
DefCamFieldGate         "Jai-CV-A11" 260L 330L
```

Remarks to mvAcquireControl

This description requires a proper installation of the mvGAMMA-G and the mvAcquireControl. It is recommended to use the latest versions of the Win32 driver and the mvAcquireControl. You will find these installations on the latest mvIMPACT CD-ROM or as a download from our homepage.
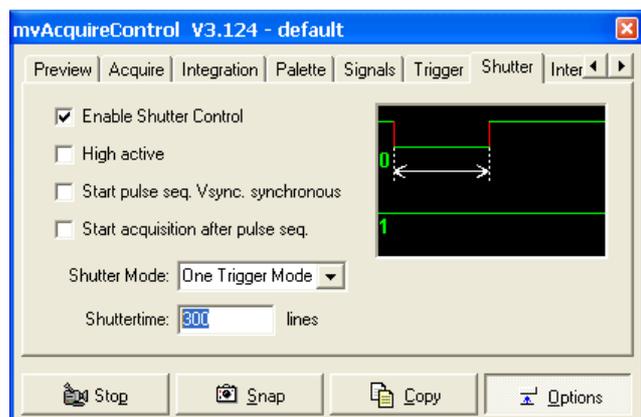
Open the mvGAMMA-G in the mvAcquireControl and choose the camera definition *Jai-CV-A11*. It is recommended to activate the *Greyscale* mode in register *Acquire* and set it to *8bit*. So will get 8bpp images.

Reset signal sent by mvGAMMA-G
For activating the output of the mvGAMMA-G to reset the camera switch to register *Shutter*:

Following settings must be done:
- Enable *Shutter Control*
- Disable *High active*
- Disable *Start pulse seq. Vsync synchronous*
- Disable *Start acquisition after pulse seq.*
- Choose mode *One Trigger Mode*
- *Shuttertime* defines pulse length and so the integration time. The time given in number of lines depends on your application.

Switch to register *Trigger*.

By default the mode *autotrigger* is automatically enabled. This means the mvGAMMA-G generates the trigger signal itself which is needed for output the shutter signals. The time between two trigger signals is set by *Autotrigger period*.

Instead of using the autotriggered mode you can supply the mvGAMMA-G with an external signal which triggers the output of the shutter signals. For that supply the mvGAMMA-G with such a signal on the *Trigger In* pin and switch from *autotrigger* to *ext. trigger*. Now the camera is reset every time a signal occurred on the *Trigger In* pin of the mvGAMMA-G. In this case the pulse length of the external signal doesn't define the integration time in the camera.

Remarks to mvSDK

Choose in your program the camera definition *Jai-CV-A11* by use of function *SelCamera* in the INI-File.

It is recommended to use the colormode *COL_GREY* with this camera. You will get 8bpp images in the DMA buffer.

To activate the signal output for resetting the camera use the shuttercontrol method. Define a single signal output by *mvDefPulseSeq()*.

Example:
```
mvDefPulseSeq(dev, 0, 0, pPulse)
```

with pPulse array:
> Element 0: number of lines, this time is equal to the integration time.
> Element 1: -1

Decide if you want to use the autotrigger mode or an external signal for starting the output of the reset signal.

If using the autotriggered mode define the period time with *mvSetTriggerPeriod(dev, period_time)*.

To tell the mvGAMMA-G to use the *Trigger In* pin for starting use the function *mvSelExtTrig(dev,1)*. In this case the pulse length of the external signal doesn't define the integration time in the camera.

You will find more about the programming of the shutter control in the mvGAMMA-G's manual.

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			29.10.03	29.10.03
Application Note	Project:	Camera adaption	Version 1.0	

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.
Bpp	Bits per pixel