

MATROX GENESIS

CAMERA INTERFACE APPLICATION NOTE

SONY XC-HR300

OCTOBER 18, 2001

Basics about the
camera

Camera Descriptions

- 767×575 @ up to 100 fps.
- Single or dual channel analog video output.
- Interlaced or progressive scan.
- Internal (composite) or external sync.
- Internal or external exposure control.
- 29.50 MHz pixel clock rate.

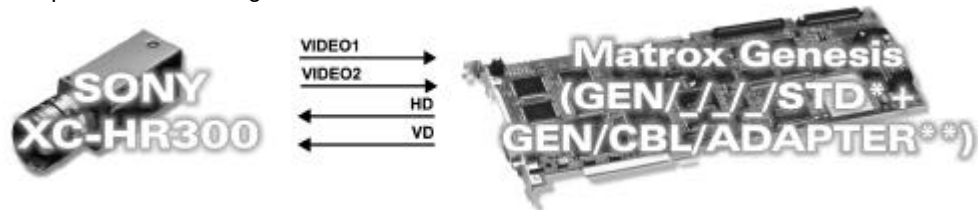
Interface Modes

- Continuous (Normal mode)
- Asynchronous reset (Reset mode)

Camera Interface Briefs

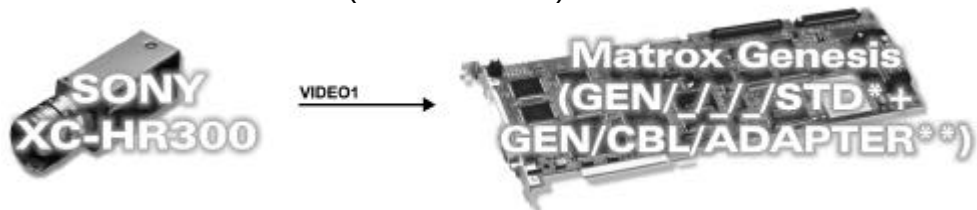
Mode 1: Continuous – master/dual-channel

- $763 \times 574 \times 8$ -bit @ 100 fps.
 - Dual channel analog video.
 - Interlaced scan.
 - Matrox Genesis sending HSYNC (HD) and VSYNC (VD) signals to camera.
 - Matrox Genesis receiving video signals from camera.
 - DCF used: [G300CM.DCF](#)*
- *Requires MIL 6.1 or higher



Mode 2: Continuous – slave/single channel

- $763 \times 575 \times 8$ -bit @ 50 fps (progressive scan).
- $763 \times 575 \times 8$ -bit @ 50 fps (interlaced scan).
- Single channel analog video.
- Progressive / interlaced scan.
- Matrox Genesis receiving video signals from camera.
- DCF used: [G300NC.DCF](#) (progressive scan)
- DCF used: [G300C1.DCF](#) (interlaced scan)



*Matrox Genesis main board with grab module
**Matrox digital cable adapter board

Mode of operations as
per Matrox Imaging (in
parentheses as per
camera manufacturer)

Basics about the
interface modes

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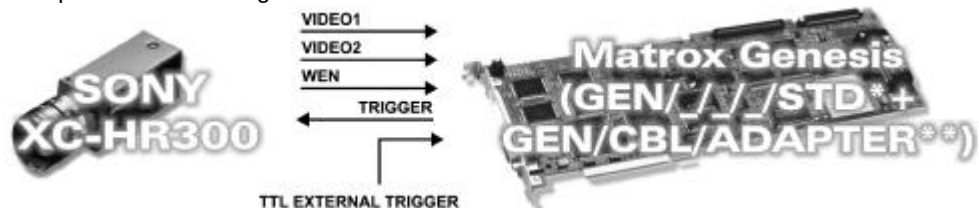
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Basics about the
interface modes

Camera Interface Briefs (Continued)

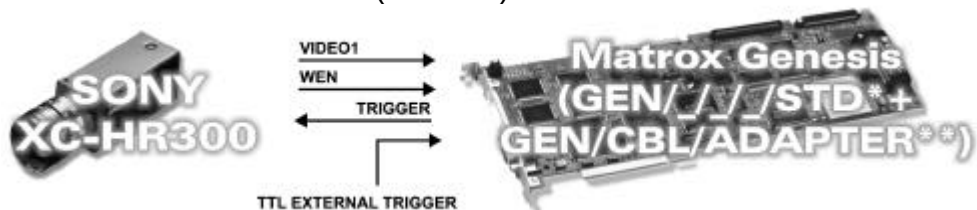
Mode 3: Asynchronous Reset - Dual channel

- 763 × up to 574 × 8-bit.
 - Dual channel analog video.
 - Interlaced Scan.
 - Matrox Genesis receiving external trigger signal.
 - Matrox Genesis sending EXPOSURE2 (TRIGGER) signal to camera to initiate and control exposure time.
 - Matrox Genesis receiving VSYNC (WEN PULSE) and video signals from camera.
 - DCF used: [GR3NBAE1.DCF](#)* (763 × 574)
 - DCF used: [GR3NBAE2.DCF](#)* (763 × 222)
 - DCF used: [GR3NBAE3.DCF](#)* (763 × 102)
 - DCF used: [GR3NBAE4.DCF](#)* (763 × 42)
- * Required MIL 6.1 or higher.



Mode 4: Asynchronous Reset - Single Channel

- 766 × up to 580 × 8-bit
- Single channel analog video.
- Progressive Scan.
- Matrox Genesis receiving external trigger signal.
- Matrox Genesis sending EXPOSURE2 (TRIGGER) signal to camera to initiate and control exposure time.
- Matrox Genesis receiving VSYNC (WEN PULSE) and video signals from camera.
- DCF used: [GR3NAE1.DCF](#) (763 × 580)
- DCF used: [GR3NAE2.DCF](#) (763 × 242)
- DCF used: [GR3NAE3.DCF](#) (763 × 118)
- DCF used: [GR3NAE4.DCF](#) (763 × 55)



*Matrox Genesis main board with grab module

**Matrox digital cable adapter board

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Specifics about the
interface modes

Camera Interface Details

Modes 1 and 2: Continuous

- **Frame Rate:** Matrox Genesis receives the continuous video from the camera at 100 frames per second (dual channel) or 50 frames per second (single channel).
- **Exposure time:** Exposure time is inversely proportionate to the frame rate (no shutter) or determined by the shutter setting. Refer to the camera manual for more information.
- **Camera switch settings:** Refer to the camera manual for additional information. Switches for this mode should be set as follows:

Switch	M300CM.DCF	HR300NC.DCF	M300C1.DCF
Signal	2I	1N	2I
Mode	N	N	N
Gain	F or M	F or M	F or M
Sync	EXT	INT	INT
Shutter Speed	As desired	As desired	As desired

Modes 3 and 4: Asynchronous Reset

- **Frame rate:** The frame rate is determined by the frequency of the external trigger signal. The maximum possible frame rate is dependent on the exposure time as well as the frame readout period.
- **Exposure time:** The width (rising edge to falling edge) of the EXPOSURE2 (TRIGGER) signal is the exposure time. The default exposure time is equal to **1.6 ms**. The exposure time can be modified in the DCF using Matrox Intellicam, Genesis Native Library (GNL) imCamControl() or with the MIL MdigControl() function. Consult the respective manual for more information.
- **Minimum exposure width:** minimum EXPOSURE2 (TRIGGER) pulse width is equal to **2 ms**.
- **Camera switch settings:** Refer to the camera manual for additional information. Switches for this mode should be set as follows:

Switch	HR3NBAEx.DCF	HR3NAEx.DCF
Signal	2I	1N
Mode	M2	M2
Gain	F or M	F or M
Sync	INT	INT
Shutter Speed	ALL OFF	ALL OFF

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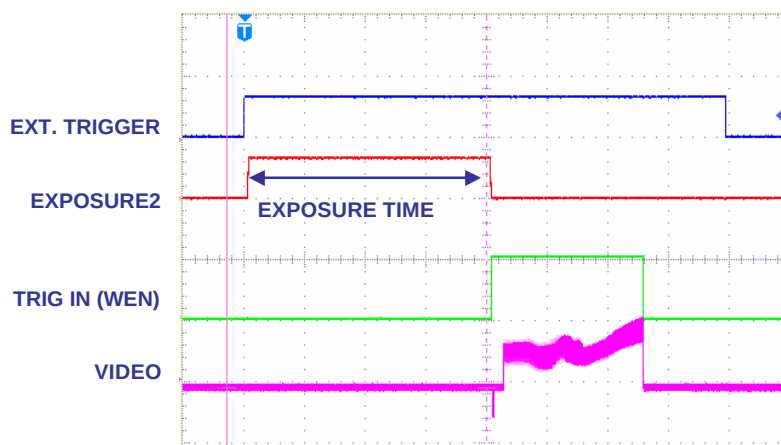
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Specifics about the
interface modes

Camera Interface Details (continued)

- Timing Diagram for Modes 3 and 4 Asynchronous Reset:



Cabling details for this
interface mode

Cabling Requirements

Mode 1: Continuous – master/dual-channel

- Cable: IMG-7W2-TO-5BNC and DBHD68-TO-OPEN (open ended) cables required for video, synchronization and control signals.
- BNC-TO-6/12-pin junction box (e.g. JU-F1) required for synchronization and exposure signals.
- Connection: Connections between the 12-pin connector (via BNC-TO-6/12-pin junction box) of the camera and the 7-pin/68-pin connectors of the Matrox Genesis are as follows:

Matrox Genesis (BNC connector)			SONY XC-HR300 (12-pin connector)	
Pin name	Pin no.		Pin name	Pin no.
RED BNC	--	←	VIDEO 2 OUTPUT	09
RED BNC (GND)	--	←	VID 2 (GROUND)	08
GREEN BNC	--	←	VIDEO 1 OUTPUT	04
GREEN BNC (GND)	--	←	VID 1 (GROUND)	03
Cable Adapter Board (68-pin connector)			SONY XC-HR300 (12-pin connector)	
Pin name	Pin no.		Pin name	Pin no.
HSYNC_TTL	62	→	HD IN	06
GROUND	60	--	HD IN (GROUND)	05
VSYNC_TTL	26	→	VD IN	07
GROUND	25	--	VD IN (GROUND)	12

- Power:** Connections between the power supply and the 12-pin connector of the camera are as follows:

Power Supply			SONY XC-HR300 (12-pin connector)	
Name			Name	Pin no.
+ 12V DC	--	--	+12 V DC	02
GROUND	--	--	GROUND	01

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Cabling details for this interface mode

Cabling Requirements (Continued)

Mode 2: Continuous – slave/single channel

- **Cable:** IMG-7W2-TO-5BNC cable required for video, synchronization and control signals.
- BNC-TO-6/12-pin junction box (e.g. JU-F1) required for synchronization and exposure signals.
- **Connection:** Connection between the 12-pin connector (via BNC-TO-6/12-pin junction box) of the camera and the 7-pin connector of the Matrox Genesis is as follows:

Matrox Genesis (BNC connector)			SONY XC-HR300 (12-pin connector)	
Pin name	Pin no.		Pin name	Pin no.
RED BNC	--	←	VIDEO 1 OUTPUT	04
RED BNC (GND)	--	←	VID 1 (GROUND)	03

- **Power:** Connections between the power supply and the 12-pin connector of the camera are as in *Mode 1: Continuous - Master, Dual Channel*.

Mode 3: Asynchronous Reset - Dual channel

- **Cable:** IMG-7W2-TO-5BNC and DBHD68-TO-OPEN (open ended) cables required for video, synchronization and control signals.
- BNC-TO-6/12-pin junction box (e.g. JU-F1) required for synchronization and exposure signals.
- **Connection:** Connections between the 12-pin connector (via BNC-TO-6/12-pin junction box) of the camera and the 7-pin/68-pin connectors of the Matrox Genesis are as follows:

Matrox Genesis (BNC connector)			SONY XC-HR300 (12-pin connector)	
Pin name	Pin no.		Pin name	Pin no.
RED BNC	--	←	VIDEO 2 OUTPUT	09
RED BNC (GND)	--	←	VID 2 (GROUND)	08
GREEN BNC	--	←	VIDEO 1 OUTPUT	04
GREEN BNC (GND)	--	←	VID 1 (GROUND)	03

Cable Adapter Board (68-pin connector)			SONY XC-HR300 (12-pin connector)	
Pin name	Pin no.		Pin name	Pin no.
TRIGGER, INPUT, TTL	67	←	WEN OUTPUT	10
GROUND	68	--	GROUND	12
EXPOSURE2, OUTPUT, TTL	58	→	TRIG IN	11
GROUND	25	--	GROUND	12

Matrox Genesis (BNC connector)			TTL External Trigger Source	
Pin name	Pin no.			
GRAY BNC	--	←	SIGNAL	

- **Power:** Connections between the power supply and the 12-pin connector of the camera are as in *Mode 1: Continuous - Master, Dual Channel*.

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Cabling details for the
interface modes

Cabling Requirements (Continued)

Mode 4: Asynchronous Reset - Single channel

- **Cable:** IMG-7W2-TO-5BNC and DBHD68-TO-OPEN (open ended) cables required for video, synchronization and control signals.
- BNC-TO-6/12-pin junction box (e.g. JU-F1) required for synchronization and exposure signals.
- **Connection:** Connections between the 12-pin connector (via BNC-TO-6/12-pin junction box) of the camera and the 7-pin/68-pin connectors of the Matrox Genesis are as follows:

Matrox Genesis (BNC connector)			SONY XC-HR300 (12-pin connector)	
Pin name	Pin no.		Pin name	Pin no.
RED BNC	--	←	VIDEO 1 OUTPUT	04
RED BNC (GND)	--	←	VID 1 (GROUND)	03
Cable Adapter Board (68-pin connector)			SONY XC-HR300 (12-pin connector)	
Pin name	Pin no.		Pin name	Pin no.
TRIGGER, INPUT, TTL	67	←	WEN OUTPUT	10
GROUND	68	--	GROUND	12
EXPOSURE2, OUTPUT, TTL	58	→	TRIG IN	11
GROUND	25	--	GROUND	12
Matrox Genesis (BNC connector)			TTL External Trigger Source	
Pin name	Pin no.			
GRAY BNC	--	←	SIGNAL	

- **Power:** Connections between the power supply and the 12-pin connector of the camera are as in *Mode 1: Continuous - Master, Dual Channel*.

The DCF(s) mentioned in this application note can be found on the MIL and Native Library CD, or our FTP site ([ftp.matrox.com](ftp:matrox.com)). The information furnished by Matrox Electronics System, Ltd. is believed to be accurate and reliable. Please verify on our FTP site ([ftp.matrox.com](ftp:matrox.com)). The information furnished by Matrox Electronics System, Ltd. is believed to be accurate and reliable. Please verify all interface connections with camera documentation or manual. Contact your local sales representative or Matrox Sales office or Matrox Imaging Applications at 514-822-6061 for assistance.

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