

MATROX GENESIS

CAMERA INTERFACE APPLICATION NOTE

DALSTAR 1M60

OCTOBER 19, 2001

Basics about the
camera

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

Basics about the
interface modes

Camera Descriptions

- 1024 × 1024 × 12-bit @ 60 fps.
- Four channel RS-422 digital video output.
- Progressive scan.
- Internal (separate) sync.
- Internal and external exposure control.
- 20 MHz pixel clock rate.

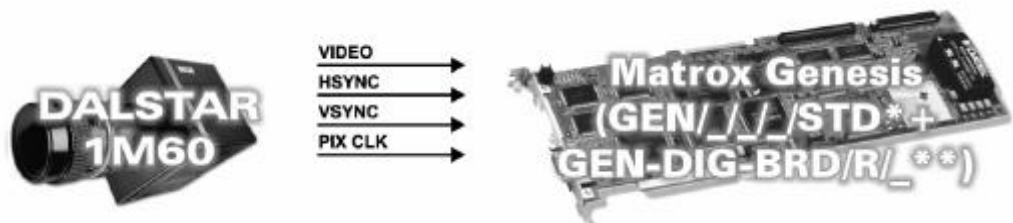
Interface Modes

- Continuous (no binning, binning)
- Asynchronous reset (no binning, binning)

Camera Interface Briefs

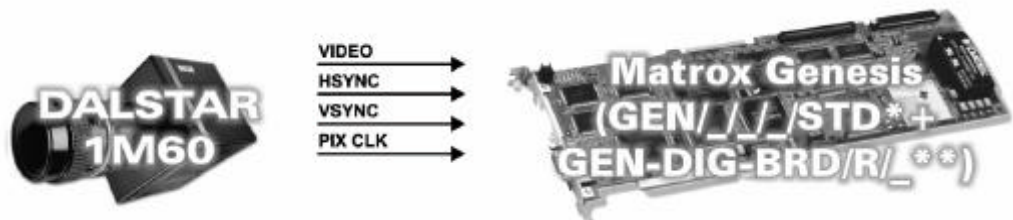
Mode 1: Continuous (no binning)

- 1024 × 1024 × 12-bit @ 60 fps.
- Four channel RS-422 digital video.
- Progressive scan.
- Matrox Genesis receiving HSYNC, VSYNC, PIXEL CLOCK (@ 20 MHz) and video signals from camera.
- DCF: [G1M60C1.DCF](#)



Mode 2: Continuous (Binning)

- Up to 512 × 512 × 12-bit @ 120 fps.
- Four channel RS-422 digital video.
- Progressive scan.
- Matrox Genesis receiving HSYNC, VSYNC, PIXEL CLOCK (@ 10 MHz) and video signals from camera.
- DCF used: [G1M60C2.DCF](#)



*Matrox Genesis main board with grab module

**Matrox RS-422 digital input board

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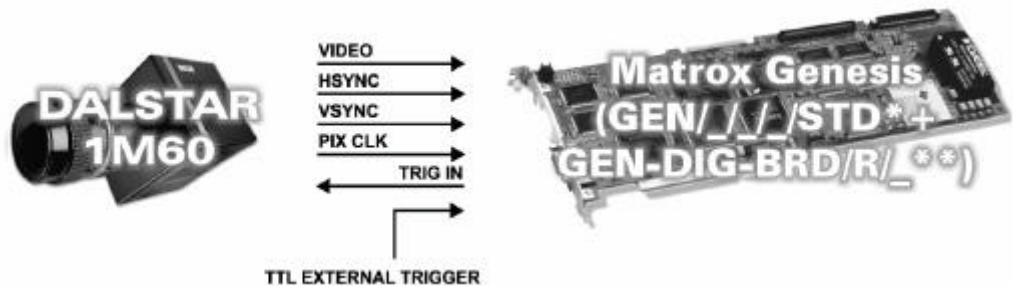
OCTOBER 19, 2001

Basics about the
interface modes

Camera Interface Briefs (continued)

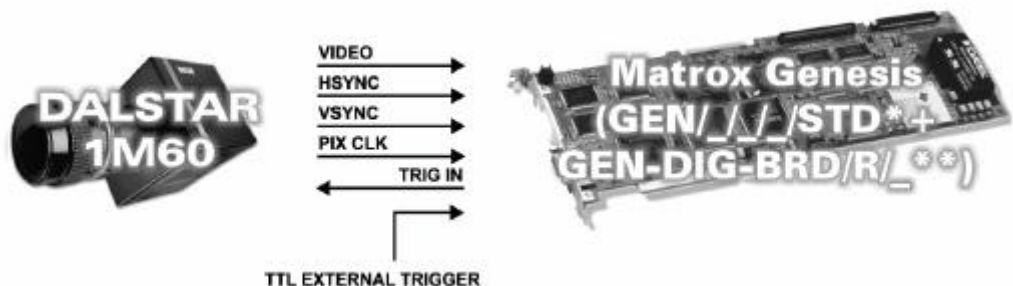
Mode 3: Asynchronous reset (no binning)

- $1024 \times 1024 \times 12$ -bit.
- Single channel RS-422 digital video.
- Progressive scan.
- Matrox Genesis receiving TTL external trigger signal.
- Matrox Genesis sending EXPOSURE2 (TRIGGER IN) signal to camera to initiate and control exposure time.
- Matrox Genesis receiving HSYNC, VSYNC, PIXEL CLOCK (@ 20 MHz) and video signals from camera.
- DCF used: [G1M60A1.DCF](#)



Mode 4: Asynchronous reset (binning)

- $512 \times 512 \times 12$ -bit.
- Single channel RS-422 digital video.
- Progressive scan.
- Matrox Genesis receiving TTL external trigger signal.
- Matrox Genesis sending EXPOSURE2 (TRIGGER IN) signal to camera to initiate and control exposure time.
- Matrox Genesis receiving HSYNC, VSYNC, PIXEL CLOCK (@ 10 MHz) and video signals from camera.
- DCF used: [G1M60A2.DCF](#)



*Matrox Genesis main board with grab module
Matrox RS-422 digital input board

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*Specifics about the
interface modes*

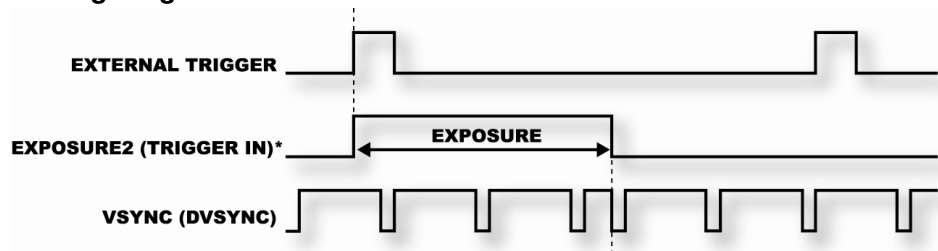
Camera Interface Details

Modes 1 and 2: Continuous

- **Frame Rate:** Matrox Genesis receives the continuous video from the camera at 60/120 frames per second (no binning/binning).
- **Exposure time:** Exposure time is inversely proportionate to the frame rate or determined by the shutter setting. Refer to the camera manual for more information.
- **Camera Control:** Camera control settings are made using DALSA's control software. Contact DALSA for more information.

Modes 3 and 4: Asynchronous Reset

- **Frame rate:** The frame rate is determined by the frequency of the external trigger signal.
- **Exposure time:** External trigger source activates EXPOSURE2 (TRIGGER IN)* signal. The width (rising edge to falling edge) of the EXPOSURE2 (TRIGGER IN)* signal is the exposure time. The default exposure time is equal to **30 ms** (no binning) or **11 ms** (binning). The exposure time can be modified in the DCF using Matrox Intellicam, Genesis Native Library (GNL) imCamControl() or with the MIL MdigControl() function. Refer to the respective manual for more information.
- **Camera Control:** External Trigger Mode/Integrate checkbox must be checked in DALSA's control software. Refer to the camera manual for more information.
- **Timing diagram:**



*SMA Connector

MATROX GENESIS

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*Cabling details for this
interface mode*

Cabling Requirements

Modes 1 and 2: Continuous

- **Cable:** DBHD100-TO-OPEN (open ended) cable required for video, synchronization and control signals.
- **Connection:** Connections between the 60-pin quad row connectors (**DATA1/DATA2**) of the camera and the 100-pin connector of the Matrox Genesis are as follows:

DALSA 1M60

(60-pin connector- DATA 1)

Pin name

Pin no.

Matrox Genesis

(100-pin connector)

Pin name

Pin no.

D1A4+	9	→	DATA, INPUT, 0+	1
D1A4-	10	→	DATA, INPUT, 0-	2
D1A5+	11	→	DATA, INPUT, 1+	3
D1A5-	12	→	DATA, INPUT, 1-	4
D1A6+	13	→	DATA, INPUT, 2+	5
D1A6-	14	→	DATA, INPUT, 2-	6
D1A7+	17	→	DATA, INPUT, 3+	7
D1A7-	18	→	DATA, INPUT, 3-	8
D1A8+	19	→	DATA, INPUT, 4+	9
D1A8-	20	→	DATA, INPUT, 4-	10
D1A9+	21	→	DATA, INPUT, 5+	11
D1A9-	22	→	DATA, INPUT, 5-	12
D1A10+	23	→	DATA, INPUT, 6+	13
D1A10-	24	→	DATA, INPUT, 6-	14
D1A11+	25	→	DATA, INPUT, 7+	15
D1A11-	26	→	DATA, INPUT, 7-	16
D1B4+	40	→	DATA, INPUT, 8+	17
D1B4-	39	→	DATA, INPUT, 8-	18
D1B5+	38	→	DATA, INPUT, 9+	19
D1B5-	37	→	DATA, INPUT, 9-	20
D1B6+	36	→	DATA, INPUT, 10+	21
D1B6-	35	→	DATA, INPUT, 10-	22
D1B7+	34	→	DATA, INPUT, 11+	23
D1B7-	33	→	DATA, INPUT, 11-	24
D1B8+	32	→	DATA, INPUT, 12+	25
D1B8-	31	→	DATA, INPUT, 12-	26
D1B9+	52	→	DATA, INPUT, 13+	27
D1B9-	51	→	DATA, INPUT, 13-	28
D1B10+	50	→	DATA, INPUT, 14+	29
D1B10-	49	→	DATA, INPUT, 14-	30
D1B11+	48	→	DATA, INPUT, 15+	31
D1B11-	47	→	DATA, INPUT, 15-	32

Continued...

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*Cabling details for this
interface mode*

Cabling Requirements (continued)

Modes 1 and 2: Continuous

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(60-pin connector- DATA 1)

Pin name Pin no.

D1HSYNC+	58	→
D1HSYNC -	57	→
D1VSYNC+	56	→
D1VSYNC -	55	→
GND	45	→
GND	46	→
D1PCLK+	60	→
D1PCLK -	59	→

Matrox Genesis

(100-pin connector)

Pin name Pin no.

HSYNC, INPUT, +	33
HSYNC, INPUT, -	34
VSYNC, INPUT, +	35
VSYNC, INPUT, -	36
GROUND	37
GROUND	38
CLOCK, INPUT, +	39
CLOCK, INPUT, -	40

DALSA 1M60

(60-pin connector- DATA 2)

Pin name Pin no.

D2A4+	9	→
D2A4-	10	→
D2A5+	11	→
D2A5-	12	→
D2A6+	13	→
D2A6-	14	→
D2A7+	17	→
D2A7-	18	→
D2A8+	19	→
D2A8-	20	→
D2A9+	21	→
D2A9-	22	→
D2A10+	23	→
D2A10-	24	→
D2A11+	25	→
D2A11-	26	→
D2B4+	40	→
D2B4-	39	→
D2B5+	38	→
D2B5-	37	→
D2B6+	36	→
D2B6-	35	→
D2B7+	34	→
D2B7-	33	→
D2B8+	32	→
D2B8-	31	→

Matrox Genesis

(100-pin connector)

Pin name Pin no.

DATA, INPUT, 16+	51
DATA, INPUT, 16-	52
DATA, INPUT, 17+	53
DATA, INPUT, 17-	54
DATA, INPUT, 18+	55
DATA, INPUT, 18-	56
DATA, INPUT, 19+	57
DATA, INPUT, 19-	58
DATA, INPUT, 20+	59
DATA, INPUT, 20-	60
DATA, INPUT, 21+	61
DATA, INPUT, 21-	62
DATA, INPUT, 22+	63
DATA, INPUT, 22-	64
DATA, INPUT, 23+	65
DATA, INPUT, 23-	66
DATA, INPUT, 24+	67
DATA, INPUT, 24-	68
DATA, INPUT, 25+	69
DATA, INPUT, 25-	70
DATA, INPUT, 26+	71
DATA, INPUT, 26-	72
DATA, INPUT, 27+	73
DATA, INPUT, 27-	74
DATA, INPUT, 28+	75
DATA, INPUT, 29-	76

Continued...

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*Cabling details for this
interface mode*

Cabling Requirements (continued)

Modes 1 and 2: Continuous

DALSA 1M60

(60-pin connector- DATA 2)

Pin name Pin no.

D2B9+	52	→
D2B9-	51	→
D2B10+	50	→
D2B10-	49	→
D2B11+	48	→
D2B11-	47	→

Matrox Genesis

(100-pin connector)

Pin name Pin no.

DATA, INPUT, 29+	77
DATA, INPUT, 30-	78
DATA, INPUT, 31+	79
DATA, INPUT, 31-	80
DATA, INPUT, 32+	81
DATA, INPUT, 32-	82

- **Connection:** Connections between the SMA/BNC connector of the camera and the 100-pin connector of the Matrox Genesis are as follows:

DALSA 1M60

(SMA/BNC connector)

Pin name Pin no.

SMA or BNC*	--	←
GND*	--	--

Matrox Genesis

(100-pin connector)

Pin name Pin no.

EXPOSURE2, OUTPUT, TTL	88*
GROUND	38*

* This connection is not necessary for this mode, however allows the cable to be used for all modes.

Modes 3 and 4: Asynchronous Reset

- **Cable:** DBHD100-TO-OPEN (open ended) and IMG-7W2-TO-5BNC cables required for video, synchronization and control signals.
- **External Trigger:** TTL external trigger source should be connected to the TTL trigger input (Gray BNC) of the IMG-7W2-TO-5BNC cable.
- **Connection:** Connections between the two 60-pin quad row connectors (**DATA1**) of the camera and the 100-pin connector of the Matrox Genesis are as in Mode 1: *Continuous* along with the following:

DALSA 1M60

(SMA/BNC connector)

Pin name Pin no.

SMA or BNC	--	←
GND	--	--

Matrox Genesis

(100-pin connector)

Pin name Pin no.

EXPOSURE2, OUTPUT, TTL	88
GROUND	38

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>). The information furnished by Matrox Electronic Systems, 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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