

Matrox Meteor-II/Multi-Channel Camera Interface Application Note

TELI CS8531D

August 22, 2002

*Basics about the
camera*

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

*Basics about the
interface modes*

Camera Descriptions

- $640 \times 480 \times 8\text{-bit}$ @ up to 120 fps.
- Single or dual channel analog video output.
- Interlaced or progressive scan.
- Internal or external sync.
- Internal or external exposure control.
- 24.54 MHz pixel clock rate.

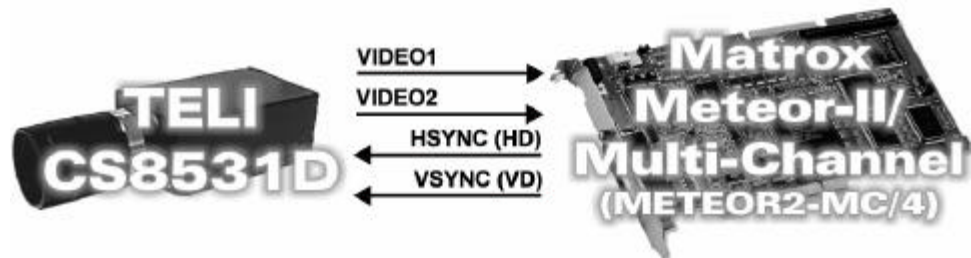
Interface Modes

- Continuous (Normal Electronic Shutter)
- Asynchronous reset (Random Trigger Shutter, Restart/Reset)

Camera Interface Briefs

Mode 1: Continuous (Normal Electronic Shutter)

- $640 \times 480 \times 8\text{-bit}$ @ 60/120 fps.
- Single channel progressive scan, dual channel interlaced scan.
- Matrox Meteor-II/Multi-Channel sending HSYNC (HD) and VSYNC (VD) signals to camera.
- Matrox Meteor-II/Multi-Channel receiving video signals from camera.
- DCF used: [8531DCI.DCF](#) (Interlaced scan @ 120 fps).
- DCF used: [8531DCN.DCF](#) (Progressive scan @ 60 fps).



Mode 2: Asynchronous Reset (Random Trigger Shutter)

- $640 \times 480 \times 8\text{-bit}$.
- Single channel progressive scan, dual channel interlaced scan.
- Matrox Meteor-II/Multi-Channel receiving external trigger signal.
- Matrox Meteor-II/Multi-Channel sending EXPOSURE1 (TRIGGER) signal to camera to initiate and control exposure time.
- Matrox Meteor-II/Multi-Channel sending HSYNC (HD), VSYNC (VD) to camera.
- Matrox Meteor-II/Multi-Channel receiving video signals from camera.
- DCF used: [8531DATI.DCF](#) (Interlaced scan).
- DCF used: [8531DATN.DCF](#) (Progressive scan).

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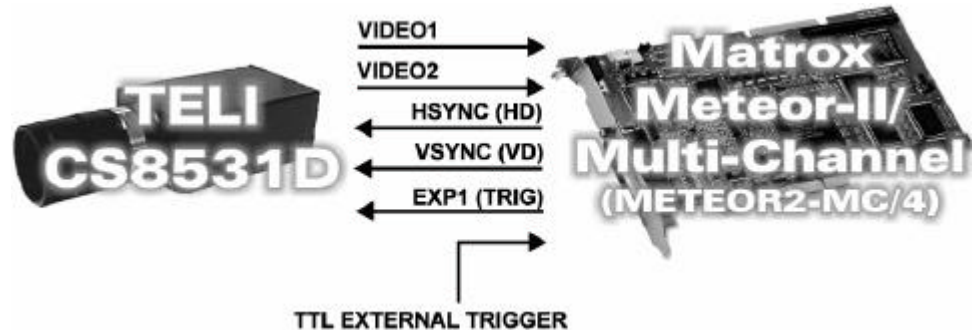
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Basics about the
interface modes

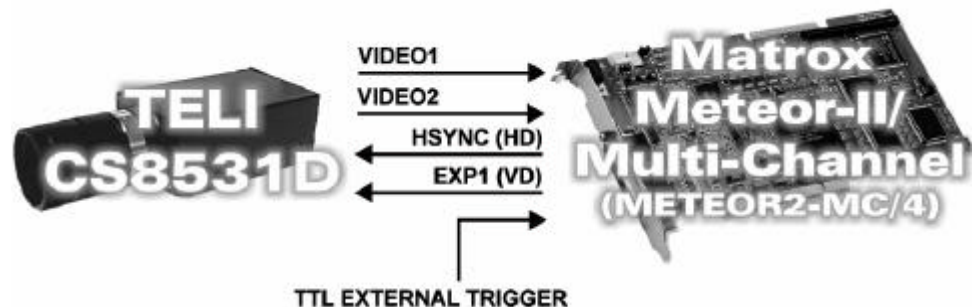
Camera Interface Briefs (continued)

Mode 2: Asynchronous Reset (Random Trigger Shutter)



Mode 3: Asynchronous Reset (Restart/Reset)

- 640 × 480 × 8-bit.
- Single channel progressive scan, dual channel interlaced scan.
- Matrox Meteor-II/Multi-Channel receiving external trigger signal.
- Matrox Meteor-II/Multi-Channel sending EXPOSURE1 (VD) signal to camera to initiate and control exposure time.
- Matrox Meteor-II/Multi-Channel sending HSYNC (HD) and VSYNC (VD) signals to camera.
- Matrox Meteor-II/Multi-Channel receiving video signals from camera.
- DCF used: [8531DARI.DCF](#) (Interlaced scan).
- DCF used: [8531DARN.DCF](#) (Progressive scan).



Specifics about the
interface modes

Camera Interface Details

Mode 1: Continuous (Normal Electronic Shutter)

- **Frame Rate:** Matrox Meteor-II/Multi-Channel receives the continuous video from the camera at 60 or 120 frames per second (Progressive or interlaced scan respectively).
- **Exposure time:** Exposure time is determined by the shutter setting using internal switches. Refer to the camera manual for more information.

Continued...

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Specifics about the
interface modes

Camera Interface Details (continued)

Mode 1: Continuous (Normal Electronic Shutter)

- **Camera switch settings:** Refer to the camera manual for additional information. Switches for this mode should be set as follows:

External Switch Settings	
Parameter	Settings
Mode	1/60*, 1/120**
Gain	A, F or M
* 1/60 for Progressive scan	
**1/120 for Interlaced scan	

Internal Switch Settings	
Parameter	Settings
SW-1-1	OFF
SW-1-2	OFF
SW-1-3	OFF
SW-1-4	As desired
SW-1-5	As desired
SW-1-6	As desired
HD/VD IN/OUT	IN
HD/VD Termination	75 Ω

Mode 2: Asynchronous Reset (Random Trigger Shutter)

- **Frame rate:** The frame rate is determined by the frequency of the TTL external trigger signal.
- **Exposure time:** The low level (pulse period) of the EXPOSURE1 (TRIGGER) signal is the exposure time. The default exposure time is equal to **0.16 ms**. The exposure time can be modified in the DCF using Matrox Intellicam or with the MIL MdigControl() function. Consult the respective manual for more information. The minimum EXPOSURE1 (TRIGGER) pulse width is equal to **0.16 ms**.
- **Camera switch settings:** Refer to the camera manual for additional information. Switches for this mode should be set as follows:

External Switch Settings	
Parameter	Settings
Mode	1/60*, 1/120**
Gain	A, F or M
* 1/60 for Progressive scan	
**1/120 for Interlaced scan	

Internal Switch Settings-	
Parameter	Settings
SW-1-1	OFF
SW-1-2	OFF
SW-1-3	ON
SW-1-4	OFF
SW-1-5	OFF
SW-1-6	OFF
HD/VD IN/OUT	IN
HD/VD Termination	75 Ω

Continued...

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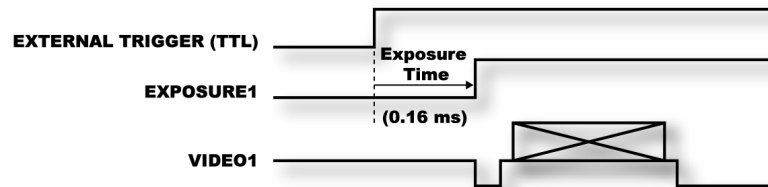
Specifics about the
interface modes

Camera Interface Details (continued)

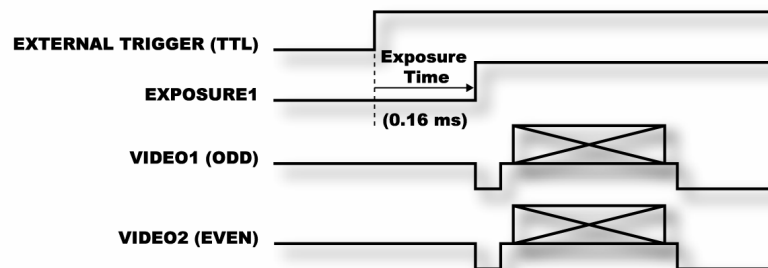
Mode 2: Asynchronous Reset (Random Trigger Shutter)

▪ Timing diagrams:

Progressive scan



Interlaced scan



Mode 3: Asynchronous Reset (Restart/Reset)

- **Frame rate/Exposure time:** The frame rate and exposure time are determined by the period of the EXPOSURE1 (VD) Input signal of the camera. The external trigger signal is received by the Matrox Meteor-II/Multi-Channel, whereby an EXPOSURE1 (VD) signal is initiated and sent to the VD Input of the camera. Frame rate and exposure time are therefore dependent on the external trigger input and inversely proportionate to the each other. The pulse width of the EXPOSURE 1 (VD) signal is fixed and equals **0.16 ms** (low level).
- **Camera switch settings:** Refer to the camera manual for additional information. Switches for this mode should be set as follows:

External Switch Settings	
Parameter	Settings
Mode	1/60*, 1/120**
Gain	A, F or M
* 1/60 for Progressive scan	
**1/120 for Interlaced scan	

Internal Switch Settings	
Parameter	Settings
SW-1-1	OFF
SW-1-2	ON
SW-1-3	OFF
SW-1-4	OFF
SW-1-5	OFF
SW-1-6	OFF
HD/VD IN/OUT	IN
HD/VD Termination	75 Ω

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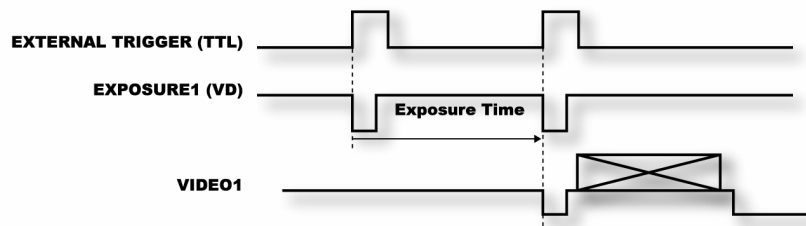
Specifics about the
interface modes

Camera Interface Details (continued)

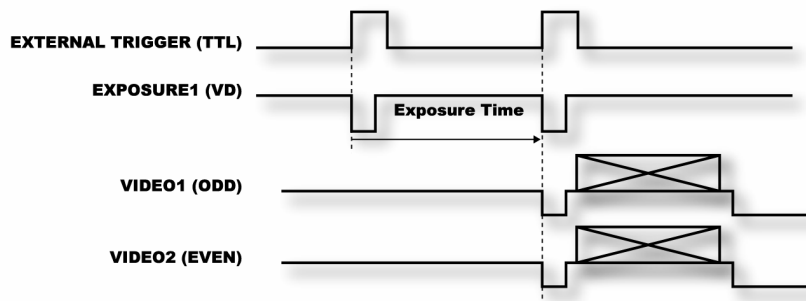
Mode 3: Asynchronous Reset (Restart/Reset)

Timing diagrams:

Progressive scan



Interlaced scan



Cabling details for the
interface modes

Cabling Requirements

Mode 1: Continuous

- **Cable:** DBHD44-TO-8BNC/O (open ended) cable required for video, synchronization and control signals. BNC-TO-12-pin junction box required for synchronization and exposure signals.
- **Connection:** Connections between the 12-pin connector of the camera (via the junction box) and the 44-pin connector of the Matrox Meteor-II/Multi-Channel are as follows:

METEOR2-MC/4
(44-pin connector)
Pin name

Pin no.

TELI CS8351D
(12-pin connector)
Pin name

Pin no.

Interlaced scan mode

VID_IN1 (RED BNC)	15	←	VIDEO OUTPUT 2	09
VID_IN2 (GREEN BNC)	44	←	VIDEO OUTPUT 1	04

Progressive scan mode

VID_IN1 (RED BNC)	15	←	VIDEO OUTPUT 1	04
HSYNC_TTL	02	→	HD INPUT	06

Continued...

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Camera Interface Application Note

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*Cabling details for the
interface modes*

Cabling Requirements (continued)

Mode 1: Continuous

- **Connection:** Connections between the 12-pin connector of the camera (via the junction box) and the 44-pin connector of the Matrox Meteor-II/Multi-Channel are as follows:

METEOR2-MC/4 (44-pin connector) <i>Pin name</i>	<i>Pin no.</i>		TELI CS8351D (12-pin connector) <i>Pin name</i>	<i>Pin no.</i>
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Interlaced and Progressive scan modes

HSYNC_TTL	02	→	HD INPUT	06
GROUND	03	--	HD INPUT (GROUND)	05
VSYNC_TTL	32	→	VD INPUT	07
GROUND	31	--	VD INPUT (GROUND)	08

Mode 2: Asynchronous Reset (Random Trigger Shutter)

- **Cable:** DBHD44-TO-8BNC/O (open ended) cable required for video, synchronization and control signals. BNC-TO-12-pin junction box required for synchronization and exposure signals.
- **External trigger:** TTL external trigger source should be connected to the TTL Trigger input (pin 20) of the DBHD44-TO-8BNC/O cable.
- **Connection:** Connections between the 12-pin connector of the camera (via the junction box) and the 44-pin connector of the Matrox Meteor-II/Multi-Channel are as follows:

METEOR2-MC/4 (44-pin connector) <i>Pin name</i>	<i>Pin no.</i>		TELI CS8351D (12-pin connector) <i>Pin name</i>	<i>Pin no.</i>
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Interlaced scan mode

VID_IN1 (RED BNC)	15	←	VIDEO OUTPUT 2	09
VID_IN2 (GREEN BNC)	44	←	VIDEO OUTPUT 1	04

Progressive scan mode

VID_IN1 (RED BNC)	15	←	VIDEO OUTPUT 1	04
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Interlaced and Progressive scan modes

HSYNC_TTL	02	→	HD INPUT	06
GROUND	03	--	HD INPUT (GROUND)	05
VSYNC_TTL	32	→	VD INPUT	07
GROUND	31	--	VD INPUT (GROUND)	08
EXP(1)	38	→	TRIGGER	11

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*Cabling details for the
interface modes*

Cabling Requirements (continued)

Mode 3: Asynchronous Reset (Restart/Reset)

- **Cable:** DBHD44-TO-8BNC/O (open ended) cable required for video, synchronization and control signals. BNC-TO-12-pin junction box required for synchronization and exposure signals.
- **External trigger:** TTL external trigger source should be connected to the TTL Trigger input (pin 20) of the DBHD44-TO-8BNC/O cable.
- **Connection:** Connections between the 12-pin connector of the camera (via the junction box) and the 44-pin connector of the Matrox Meteor-II/Multi-Channel are as follows:

METEOR2-MC/4 (44-pin connector) <i>Pin name</i>	<i>Pin no.</i>		TELI CS8531D (12-pin connector) <i>Pin name</i>	<i>Pin no.</i>
Interlaced scan mode				
VID_IN1 (RED BNC)	15	←	VIDEO OUTPUT 2	09
VID_IN2 (GREEN BNC)	44	←	VIDEO OUTPUT 1	04
Progressive scan mode				
VID_IN1 (RED BNC)	15	←	VIDEO OUTPUT 1	04
Interlaced and Progressive scan modes				
HSYNC_TTL	02	→	HD INPUT	06
GROUND	03	--	HD INPUT (GROUND)	05
VSYNC_TTL	32	→	VD INPUT	07
GROUND	31	--	VD INPUT (GROUND)	08
EXP(1)	38	→	VD INPUT	07

The DCF(s) mentioned in this application note can be found on the MIL CD or our FTP site ([ftp.matrox.com](ftp: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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