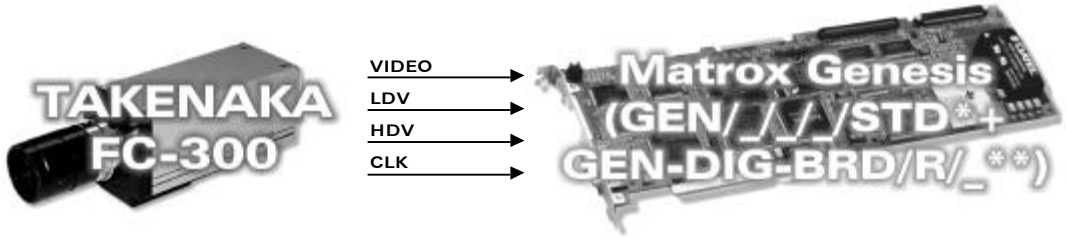
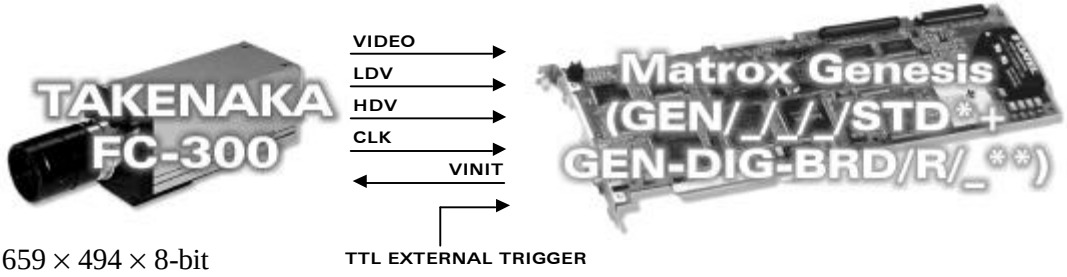
Application Note:
Interfacing non-standard cameras to Matrox Genesis

MATROX GENESIS

TAKENAKA FC-300

March 28, 2000

Camera Descriptions	• 659 × 494 × 8-bit @ 30 fps • Single tap analog or RS-422 digital video output. • Progressive scan • External sync. • Internal or external exposure control. • Pixel clock: 12.27 MHz
Interface modes	• Continuous, asynchronous reset
Camera Interface Briefs	**Mode 1: Continuous**  ***Matrox Genesis main board with grab module** ****Matrox RS-422 digital data input board** • 659 × 494 × 8-bit @ 30 fps • Single tap RS-422 digital video output. • Progressive scan • Continuous video. • Matrox Genesis receiving HSYNC (LDV), VSYNC (FDV), PIXEL CLOCK (CLK @ 12.27 MHz) and video signal from camera. • DCF used: GFC300C.DCF **Mode 2: Asynchronous reset**  ***Matrox Genesis main board with grab module** ****Matrox RS-422 digital data input board** • 659 × 494 × 8-bit • Single tap RS-422 digital video output. • Progressive scan • Matrox Genesis receiving TTL external trigger. • Matrox Genesis sending EXPOSURE1 (VINIT) signal to camera; the EXPOSURE1 (VINIT) signal initiate exposure. • Matrox Genesis receiving HSYNC (LDV), VSYNC (FDV), PIXEL CLOCK (CLK @ 12.27 MHz) and video signal from camera. • DCF used: GFC300A.DCF

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Camera Interface Details

Mode 1: Continuous

- **Frame rate**: Matrox Genesis receives the continuous video from the camera at 30 frames per second.
- **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:** External switch settings are as follows:

Switch	Setting
Shutter	0
Mode	5
Up/Down	UP

Mode 2: Asynchronous Reset

- Once it has received the external trigger signal, Matrox Genesis sends the EXPOSURE1 (VINIT) signal to the camera to initiate and control the exposure period.
- **Frame rate**: The frame rate is determined by the frequency of the external trigger signal.
- **Exposure time**: Exposure time is dependent on the shutter switch setting as well as the width of the EXPOSURE1 (VINIT) signal (active and inactive periods). The default exposure time for this DCF is equal to **200 ms**. In order to change the width and deployment time of EXPOSURE1 (VINIT) use the Exposure Settings menu tab in Matrox Intellicam. Consult the Matrox Intellicam User Guide for more information.
- **Camera switch settings:** External switch settings are as follows:

Switch	Setting
Shutter	0
Mode	5
Up/Down	DOWN

Cabling Requirements

Mode 1: Continuous

- DBHD100-TO-OPEN cable and GEN/DIG/BRD/R/_ board required for digital data, synchronization and control signals.
- Connections between the 36-pin connector (**D-SUB**) of the camera and the 100-pin connector of the Matrox Genesis are as follows:

TAKENAKA FC-300 (36-pin connector)			**GEN-DIG-BRD/R/_ (100-pin connector)**	
Pin name	***Pin no.***		***Pin name***	***Pin no.***
DO 0+	15	→	DATA, INPUT, 0+	01
DO 0-	16	→	DATA, INPUT, 0-	02
DO 1+	17	→	DATA, INPUT, 1+	03
DO 1-	18	→	DATA, INPUT, 1-	04
DO 2+	19	→	DATA, INPUT, 2+	05
DO 2-	20	→	DATA, INPUT, 2-	06
DO 3+	21	→	DATA, INPUT, 3+	07
DO 3-	22	→	DATA, INPUT, 3-	08

continued

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Cabling Requirements

TAKENAKA FC-300 (36-pin connector)			GEN-DIG-BRD/R/_ (100-pin connector)	
Pin name	***Pin no.***		***Pin name***	***Pin no.***
DO 4+	23	→	DATA, INPUT, 4+	09
DO 4-	24	→	DATA, INPUT, 4-	10
DO 5+	25	→	DATA, INPUT, 5+	11
DO 5-	26	→	DATA, INPUT, 5-	12
DO 6+	27	→	DATA, INPUT, 6+	13
DO 6-	28	→	DATA, INPUT, 6-	14
DO 7+	29	→	DATA, INPUT, 7+	15
DO 7-	30	→	DATA, INPUT, 7-	16
DO 8+	31	→	DATA, INPUT, 8+	17
DO 8-	32	→	DATA, INPUT, 8-	18
DO 9+	33	→	DATA, INPUT, 9+	19
DO 9-	34	→	DATA, INPUT, 9-	20
LDV+	03	→	HSYNC, INPUT, +	33
LDV-	04	→	HSYNC, INPUT, -	34
FDV+	05	→	VSYNC, INPUT, +	35
FDV-	06	→	VSYNC, INPUT, -	36
CLK+	01	→	CLOCK, INPUT, +	39
CLK-	02	→	CLOCK, INPUT, -	40
VINIT	14	←	EXPOSURE1, OUTPUT, TTL	87*

* This connection not required for this mode, however allows this cable to be used with all modes.

Mode 2: Asynchronous Reset

- DBHD100-TO-OPEN cable and GEN/DIG/BRD/R/_ board required for digital data, synchronization and control signals.
- All connections between the 36-pin connector (**D-SUB**) of the camera and the 100-pin connector of the Matrox Genesis are as in *Mode 1: Continuous*

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