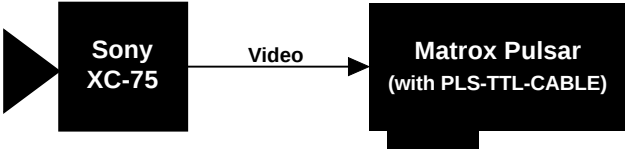
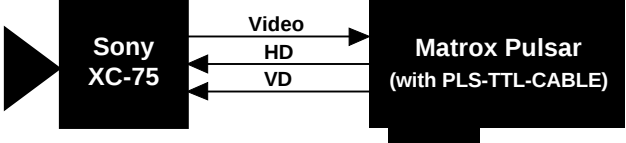
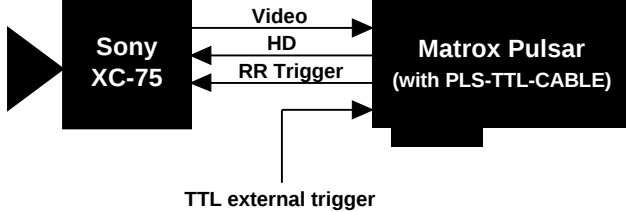


Application Note:

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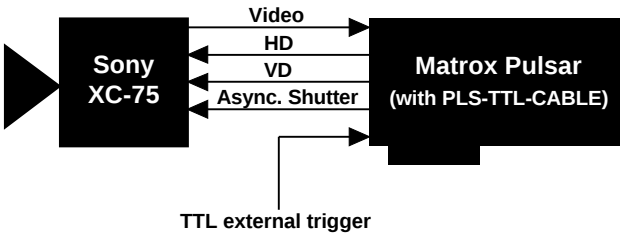
Camera Interface Overview	• 640 x 484 x 8-bit @ 60fps (max) • Analog video output • Interlaced or non-interlaced • Internal or external sync • Internal or external exposure control • 4 modes: continuous mode (internal sync), continuous mode (external sync), restart reset mode, asynchronous shutter mode (S-Donpisha mode)
Camera Interface Details	1. Continuous mode (internal sync) • 640 x 484 x 8-bit @ 30fps • Analog (composite) video output • Interlaced • Continuous video • DCF used: XC75.DCF  2. Continuous mode (external sync) • 640 x 484 x 8-bit @ 30fps • Analog video output • Interlaced • Continuous video • Matrox Pulsar sending TTL hsync (HD) and vsync (VD) signals to camera • DCF used: XC75M.DCF  3. Restart reset mode • 640 x 484 x 8-bit @ 15fps (max) • Analog video output • Interlaced • Matrox Pulsar receiving TTL external trigger • Matrox Pulsar sending TTL hsync (HD) and vsync (RR trigger) signals to camera • DCF used: XC75AM.DCF 

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Camera Interface Details	4. Asynchronous shutter mode (S-Donpisha mode)  • 640 x 240 x 8-bit @ 60fps (max) • Analog video output • Non-interlaced • External exposure control with exposure times ranging from 42.2μs to 13ms in increments of 63.5μs • Matrox Pulsar receiving TTL external trigger • Matrox Pulsar sending TTL hsync (HD), vsync (VD) and asynchronous shutter trigger signals to camera • DCF used: XC75DP1.DCF																																													
Cabling Requirements	1. Continuous mode (internal sync) • IMG-7W2-TO-1BNC (or 5BNC) required for video signal • Video input BNC of IMG-7W2-TO-1BNC cable should be connected to VIDEO OUT BNC connector of camera 2. Continuous mode (external sync) • IMG-7W2-TO-1BNC (or 5BNC) required for video signal; PLS-TTL-CABLE required for digital syncs • Video input BNC of IMG-7W2-TO-1BNC cable should be connected to VIDEO OUT BNC connector of camera • The connections between the DB-37 connector of the PLS-TTL-CABLE and the 12-pin connector of the camera are as follows: <table><tr><th colspan="2">PLS-TTL-CABLE (DB-37 connector)</th><th></th><th colspan="2">Sony XC-75 (12-pin connector)</th></tr><tr><th>Pin name</th><th>Pin no.</th><th></th><th>Pin name</th><th>Pin no.</th></tr><tr><td>GROUND</td><td>6 & 7</td><td></td><td>VD INPUT (GND)</td><td>12</td></tr><tr><td>GROUND</td><td>6 & 7</td><td></td><td>HD INPUT (GND)</td><td>5</td></tr><tr><td>GROUND</td><td>6 & 7</td><td></td><td>VIDEO OUT (GND)</td><td>3</td></tr><tr><td>GROUND</td><td>6 & 7</td><td></td><td>GND</td><td>1</td></tr><tr><td>GROUND</td><td>6 & 7</td><td></td><td>GND</td><td>10</td></tr><tr><td>TTL_VSYNC</td><td>11</td><td>→</td><td>VD INPUT</td><td>7</td></tr><tr><td>TTL_HSYNC</td><td>26</td><td>→</td><td>HD INPUT</td><td>6</td></tr></table>	PLS-TTL-CABLE (DB-37 connector)			Sony XC-75 (12-pin connector)		Pin name	Pin no.		Pin name	Pin no.	GROUND	6 & 7		VD INPUT (GND)	12	GROUND	6 & 7		HD INPUT (GND)	5	GROUND	6 & 7		VIDEO OUT (GND)	3	GROUND	6 & 7		GND	1	GROUND	6 & 7		GND	10	TTL_VSYNC	11	→	VD INPUT	7	TTL_HSYNC	26	→	HD INPUT	6
PLS-TTL-CABLE (DB-37 connector)			Sony XC-75 (12-pin connector)																																											
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Cabling Requirements Continued	3. Restart reset mode • IMG-7W2-TO-5BNC required for video signal and TTL external trigger signal; PLS-TTL-CABLE required for digital syncs • Video input BNC of IMG-7W2-TO-5BNC cable should be connected to VIDEO OUT BNC connector of camera • The connections between the DB-37 connector of the PLS-TTL-CABLE and the12-pin connector of the camera are as in continuous mode (external sync) • TTL external trigger source should be connected to the TTL Trigger Input of the IMG-7W2-TO-5BNC cable 4. Asynchronous shutter mode (S-Donpisha mode) • IMG-7W2-TO-5BNC cable required for video signal and TTL external trigger signal; PLS-TTL-CABLE required for digital syncs • Video input BNC of IMG-7W2-TO-5BNC cable should be connected to VIDEO OUT BNC connector of camera • The connections between the DB-37 connector of the PLS-TTL-CABLE and the12-pin connector of the camera are as in continuous mode (external sync) • The connections between the DB-37 connector of the PLS-TTL-CABLE and the 6-pin lens connector of the camera are as follows: PLS-TTL-CABLE (DB-37 connector) Pin namePin no. GROUND7 TTL_EXPOSURE227 Sony XC-75 (6-pin connector) Pin namePin no. GND3 TRIGGER2 → • TTL external trigger source should be connected to the TTL Trigger Input of the IMG-7W2-TO-5BNC cable
Special Considerations	Asynchronous shutter mode (S-Donpisha mode) • The delay between the external trigger signal and the start of exposure is 16 lines or 1ms • The exposure time can be set by modifying the DCF at the hardware register level. A hardware register editor is provided by running Intellicam with the -hwreg option (specifically by running INTELCAM -hwreg). An additional menu item, “HW REGISTER EDITOR”, appears on the main menu screen. The PSG_SETVCNT register controls the exposure time: Exposure time = (16381 lines – PSG_SETVCNT) * 63.49µs + 42.2µs Or PSG_SETVCNT = 16381 lines – (exposure time – 42.2µs) / 63.49µs

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Special Considerations Continued

The value of PSG_SETVCNT must be an integer number of linetimes (one linetime = 63.49 μ s) and must be set in hexadecimal. The exposure time can vary from 42.2 μ s to 13ms. An exposure time of 42.2 μ s results when PSG_SETVCNT is set to 3FFD in hex (16381 lines); setting PSG_SETVCNT to 3F32 in hex (16178 lines) yields an exposure time of 13ms. The default exposure time in this DCF is 10ms; the corresponding value of PSG_SETVCNT is 3F60h (16224 lines). The register is set in the following way:

PSG_SETVCNT = 3F60H

When computing the hardware registers, the following question may be asked: "Some registers have been manually edited. Ok to overwrite them all? (y/n)". Answer "no" to this question and to all questions that follow.

IMPORTANT! These instructions must be followed very carefully; *the only register that should be modified is the one mentioned above.* Please consult Matrox Imaging Applications at (514) 822-6061 if assistance is required.

- The time between external trigger signals must be greater than the sum of the exposure time and the frame transfer time (16.7ms); since the default exposure time is 10ms, the trigger rate must be less than 37.5Hz for the current settings of the DCF
- The camera must be modified in order to operate in S-DONPISHA mode. The following settings are required inside the XC-75 head:

MB-403 board:

- ⇒ JR1 must be shorted
- ⇒ JR3 must be shorted
- ⇒ JR2 must be set to the T position

SG-199 board:

- ⇒ JR7 and JR 8 must be open

- The connections described in this document can also be achieved by using the JB-77 junction box. Consult the Sony XC-75 camera manual for a pinout description

The DCF(s) mentioned in this application note can be found on the MIL and MIL-Lite 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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