



FLIR X6900sc

High Speed MWIR Science-Grade Infrared Camera

The FLIR X6900sc is an extraordinarily fast, highly sensitive MWIR camera designed for scientists, researchers, and engineers. With advanced triggering, on-camera RAM/SSD recording, and a four-position motorized filter wheel, this camera offers the functionality to stop motion on high speed events, whether they're in the lab or on the test range.

High Speed, High Sensitivity

The X6900sc captures full 640 x 512 images at 1000 frames per second, making it the world's fastest commercial thermal camera at that resolution. Windowing allows for even faster frame rates of up to 29,134 Hz, while the output frame rate is adjustable from 0.0015 Hz to the maximum for the selected window. The cooled FLIR Indium Antimonide (InSb) detector offers a sensitivity of < 20 mK for the detection of subtle temperature changes at any frame speed.

On-Camera Recording or Digital Streaming

Save up to 26000 frames of full resolution data to on-camera RAM without worrying about dropped frames. View on the camera or store to the removable solid state drive (SSD) for faster off-loading and quick declassification. For playback, analysis, and sharing from your computer, the X6900sc streams high speed 14-bit digital data simultaneously over Gigabit Ethernet, Camera Link, and CoaXpress.

Advanced Filtering Options

The FLIR X6900sc incorporates an easy access, four-position motorized filter wheel that permits filter exchange in any environment. The camera automatically determines filter ID and corresponding calibrations. Add custom cold filters for more tailored spectral filtering requirements.

Synchronization and Triggering

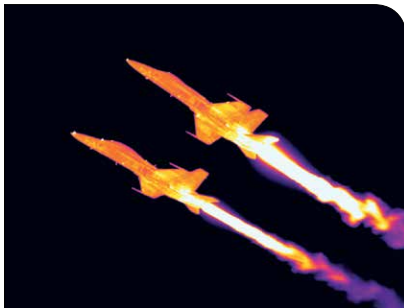
This camera can trigger using an external BNC; through a software trigger; or with an IRIG-B time stamp, making it ideal for high speed, high sensitivity applications. Customize the trigger features to your needs and use an available pre-trigger buffer to capture frames leading up to an event. Sync In/Out allows for precisely coordinated image capture of each frame of data.

Software

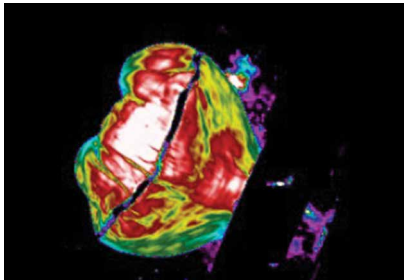
The X6900sc camera works seamlessly with FLIR ResearchIR Max software, enabling intuitive viewing, recording, and advanced processing of the thermal data. The GigE Vision/Gen<i>i</i>Cam compliant Ethernet allows you to plug and play with ResearchIR or third-party software programs, such as Mathworks® MATLAB. An optional Software Developers Kit (SDK) is available, or use industry-standard GigE Vision toolkits.

Key Features

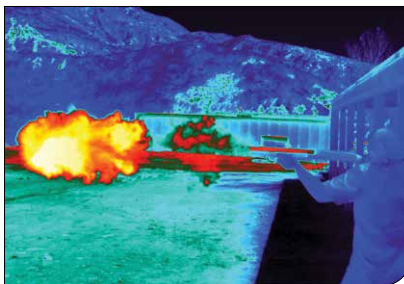
- 1,000 Hz full-frame high speed imaging
- On-camera RAM recording
- Synchronization with other instruments and events
- Full Gen<i>i</i>Cam support over GigE and CXP interfaces
- Four-position motorized filter wheel



F-15 jet



Initial airbag deployment

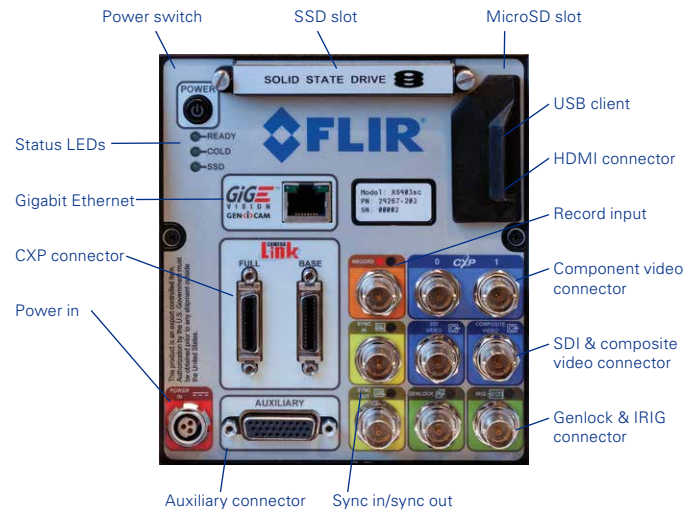


Munitions testing



Specifications

System Overview	X6900sc MWIR
Detector Type	FLIR Indium Antimonide (InSb)
Spectral Range	3.0 – 5.0 μm or 1.5 – 5.0 μm
Resolution	640 x 512
Detector Pitch	25 μm
Thermal Sensitivity/NETD	< 20 mK
Well Capacity	11.0 M electrons
Operability	> 99.8% (> 99.95% typical)
Sensor Cooling	Closed cycle rotary
Electronics	
Readout Type	Snapshot
Readout Modes	Asynchronous integrate while read Asynchronous integrate then read
Synchronization Modes	Genlock, IRIG-B, Sync-in, Sync-out
Image Time Stamp	Internal IRIG-B decoder clock TSPI accurate time stamp
Integration Time	480 ns to 687 sec
Pixel Clock	355 MHz
Frame Rate (Full Window)	Programmable; 0.0015 Hz to 1004 Hz
Subwindow Mode	Flexible windowing (steps of 32 columns, 4 rows)
Dynamic Range	14-bit
On-Camera Image Storage	RAM (volatile): 16 GB, up to 26000 frames, full frame SSD (non-volatile): >4 TB
Radiometric Data Streaming	Simultaneous Gigabit Ethernet (GigE Vision), Camera Link, CoaXPress (CXP)
Standard Video	HDMI, SDI, NTSC, PAL
Command and Control	GigE, USB, RS-232, Camera Link, CXP (Gen<i>i</i>Cam protocol supported over GigE or CXP)
Temperature Measurement	
Standard Temperature Range	-20°C to 350°C (-4°F to 662°F)
Optional Temperature Range	Up to 1,500°C (2,732°F) Up to 2,000°C (3,632°F)
Accuracy	$\pm 2^\circ\text{C}$ or $\pm 2\%$ of reading
Optics	
Camera f/Number	f/2.5 or f/4.1
Available Lenses (Uses FLIR HDC Optics)	3-5 μm : 17 mm, 25 mm, 50 mm, 100 mm, 200 mm Broadband (1-5 μm): 25 mm, 50 mm, 100mm
Close-up Lenses/Microscopes	1x, 4x (3-5 μm , requires f/4.1 camera)
Lens Interface	FLIR HDC (4-tab bayonet)
Focus	Manual
Filtering	Filter wheel, standard 1-inch filters
Image/Video Presentation	
Palettes	Selectable 8-bit
Automatic Gain Control	Manual, Linear, Plateau, Equalization, ROI, DDE
Overlay	Customizable (IRIG-B, Date, Integration time, Internal temp, Frame rate, Sync mode, Cooler hours)
Video Modes	HD: 720p/25/29.9/50/59.9 Hz, 1080p/25/29.9 Hz Composite: NTSC, PAL
Digital Zoom	1x, 4x, 4:3
General	
Operating Temperature Range	-20°C to 50°C (-4°F to 122°F)
Storage Temperature Range	-40°C to 80°C (-40°F to 176°F)
Shock/Vibration	40 g, 11 msec $\frac{1}{2}$ sine pulse/4.3 g RMS random vibration, all 3 axes
Power	24 VDC (< 50 W steady state)
Weight w/Handle, w/o Lens	6.35 kg (14 lbs)
Size (L x W x H) w/o Lens, Handle	241 x 165 x 152 mm (9.5 x 6.5 x 6 in.)
Mounting	2 x $\frac{1}{4}$ in. -20 1 x $\frac{3}{8}$ in. -16 4 x 10/24



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