



# 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 full resolution, commercially-available thermal camera. 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 26,000 frames of full resolution data to on-camera RAM with a guarantee of zero dropped frames. Play back from RAM or save to the removable solid state drive (SSD) in just 90 seconds, enabling you to quickly rearm for a new recording. The X6900sc also streams high speed 14-bit data simultaneously over Gigabit Ethernet, Camera Link, and CoaXPress for live viewing, analysis, or recording.

### Advanced Filtering Options

The FLIR X6900sc incorporates an easy access, four-position motorized filter wheel that permits filter exchange in any environment. With automatic filter recognition, the camera knows the filter location, spectral band, and associated calibrations, making it easy to select a filter and load a custom calibration and configuration to the camera. Additionally, FLIR supports custom cold filters for more tailored spectral filtering requirements.

### Synchronization and Triggering

The camera can trigger using an external BNC input, a software trigger, or an IRIG-B time stamp, offering maximum versatility for synchronizing and triggering to external events or instrumentation. The trigger and sync input can be customized based on polarity and timing to improve compatibility. The camera supports pre-trigger recording using an on camera RAM buffer, allowing you to capture frames leading up to an event.

### Software

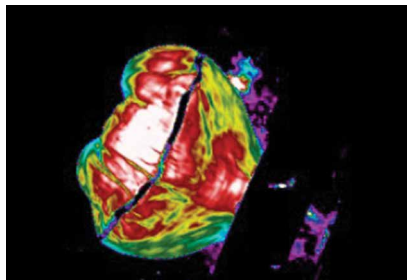
The X6900sc camera works seamlessly with FLIR ResearchIR Max software, enabling intuitive viewing, recording, and advanced processing of the thermal data. The GigE Vision/GenICam compliant Ethernet allows you to plug and play with ResearchIR or third-party software programs, such as Mathworks® MATLAB. 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 GenICam support over GigE and CXP interfaces
- Filter wheel with auto filter recognition



F-15 jet



Initial airbag deployment

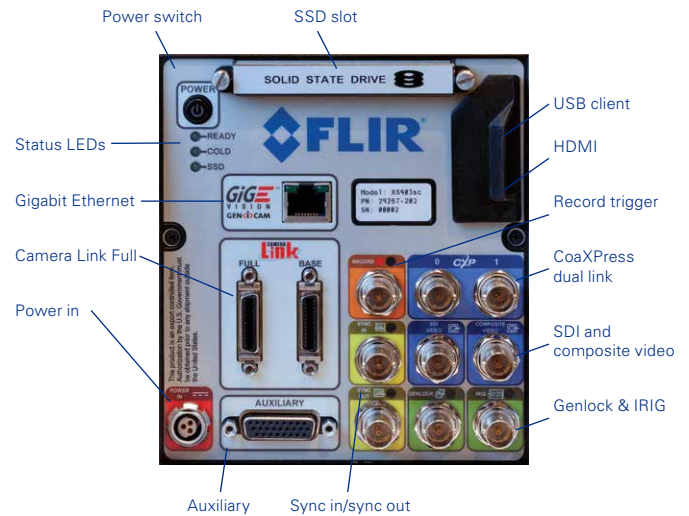


Munitions testing



## Specifications

System Overview	X6900sc MWIR
Detector Type	FLIR Indium Antimonide (InSb)
Spectral Range	3.0 – 5.0 $\mu\text{m}$ or 1.5 – 5.0 $\mu\text{m}$
Resolution	640 x 512
Detector Pitch	25 $\mu\text{m}$
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, Sync-in, Sync-out
Image Time Stamp	Internal IRIG-B decoder clock TSPI accurate time stamp
Integration Time	270 ns to 687 sec
Pixel Clock	355 MHz
Frame Rate (Full Window)	Programmable; 0.0015 Hz to 1004 Hz
Subwindow Mode	Flexible windowing down to 64 x 4 (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 (GenICam 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 $\mu\text{m}$ : 17 mm, 25 mm, 50 mm, 100 mm, 200 mm Broadband (1-5 $\mu\text{m}$ ): 25 mm, 50 mm, 100mm
Close-up Lenses/Microscopes	1x, 4x (3-5 $\mu\text{m}$ , 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/50/59.9 Hz, 1080p/25/29.9 Hz
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	249 x 158 x 147 mm (9.8 x 6.2 x 5.8 in.)
Mounting	2 x $\frac{1}{4}$ in. -20 1 x $\frac{3}{8}$ in. -16 4 x #10 -24 Side: 3x $\frac{1}{4}$ in. -20 (each side)



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