



Two-Color High Temperature IR Scene Projector

The **BAT IR2 4300 Two-Color High Temperature IR Scene Projector**, developed by Kent Optronics, represents the most advanced animation tool in infrared scene simulation. It generates dynamic motion pictures in both Mid-Wave Infrared (MWIR) and Long-Wave Infrared (LWIR).

This 2-color IR projector is a stand-alone and turnkey instrument for users in hardware-in-the-loop (HWIL) and IR sensor test and evaluation (T&E). It *displays scenes from stored memory or accepts rendered motion images from a rendering computer and radiometrically simulates the thermal pictures to the sensor.*

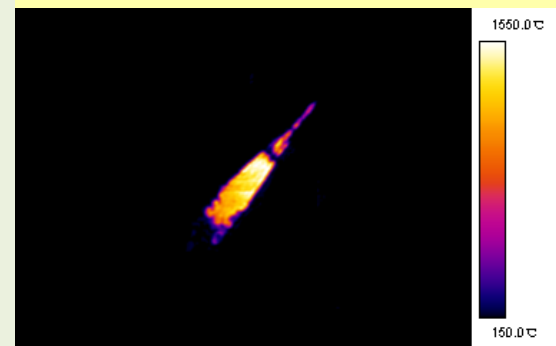
Superior to alternative dynamic scene projector products, the **BAT IR2 4300 features** an unprecedented capability of reaching a **blackbody apparent temperature (BAT) over 3,000°C**, which breaks the 800°K BAT limit imposed by the most popular scene projector based on Resistive Emitter Array (REA). The BAT can be increased further by increasing the illuminator power.

The instrument consists of a high power illumination engine, a high speed Liquid Crystal on Silicon (LCoS) display engine, and a variable aperture variable focal length optical projection engine (OPE). It uses standard video interfaces.

The illumination engine consists of one MWIR and one LWIR light sources. The light from the illumination engine is directed to the LCoS display engine via an optical relay train. The high power light sources enable the high BAT.



Rendered image from computer



Captured LWIR thermal image at 10.6 μm having a BAT as high as 1500°C

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The display engine consists of two sets of LCoS display panels, one for MWIR and one for LWIR. Each LCoS is a 512 by 512 array with individually addressed liquid crystal pixels. The thermal image is created by electro-optically modulating the optical phase of individual pixels such that the reflected light energy amplitude is dynamically modulated. The modulated imaging beam is coupled to optical projection engine.

The optical projection engine is built with reflective components to avoid refractive aberrations. It features variable aperture operation up to 15 cm (6") in diameter and variable image size up to 10 cm (4"). It projects the imaging beam directly onto the sensor under test.

The systems outstanding performance is enabled by key innovations in our design and proprietary liquid crystal material - the result: >140 Hz frame rate, >12 bits amplitude dynamic range, >99.99% operatable pixels, and low loss in both IR bands.

In addition to the **BAT IR2 4300**, we also offer a series of **IR** products for different IR regions and temperatures:

- **Single color display in SWIR, MWIR, LWIR**
- **Single/Multi-color display in VNIR, SWIR, MWIR & LWIR (new), &**
- **Multispectral Polarized Scene Projector**

The instruments provide a vital display tool for scene simulation in Hardware-in-the-Loop (HWIL) and low cost IR sensor test and evaluation (T&E).

BAT IR2 4300 Specifications

Parameter	Specification
Spectral Band	MWIR and LWIR
Pixel Image Format	512 x 512 Pixels
Pixel Pitch	37.5 μm
Pixel Effective Fill Factor	83.4%
Pixel Operability	> 99.9%
Maximum Binary Frame Rate	200 Hz
Address Mode	High Speed (868Hz Toggle Frequency)
Maximum Duty Factor	Up to 100%
Amplitude dynamic range	>12 bits
Amplitude Resolution	<u>MWIR</u> : 0.2 $^{\circ}\text{C}$ at 1000 $^{\circ}\text{C}$ <u>LWIR</u> : 0.2 $^{\circ}\text{C}$ at 1500 $^{\circ}\text{C}$
Maximum Apparent Temperature	<u>MWIR</u> : >1,500 $^{\circ}\text{C}$ <u>LWIR</u> : >3,000 $^{\circ}\text{C}$
Maximum 12 Bit Frame Rate	>140 Hz
Post-correction nonuniformity	<1%
Response Time	< 5 milliseconds
Clear Aperture	Up to 15 cm (variable)
Projected Imaging Beam	Collimated
Projected Image Size	Up to 10 cm \times 10 cm (variable)
Projector Assembly Size	92 cm \times 71 cm \times 30 cm
Projector Assembly Weight	~85 kg