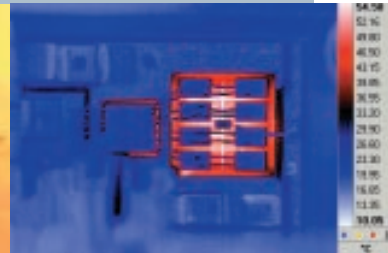
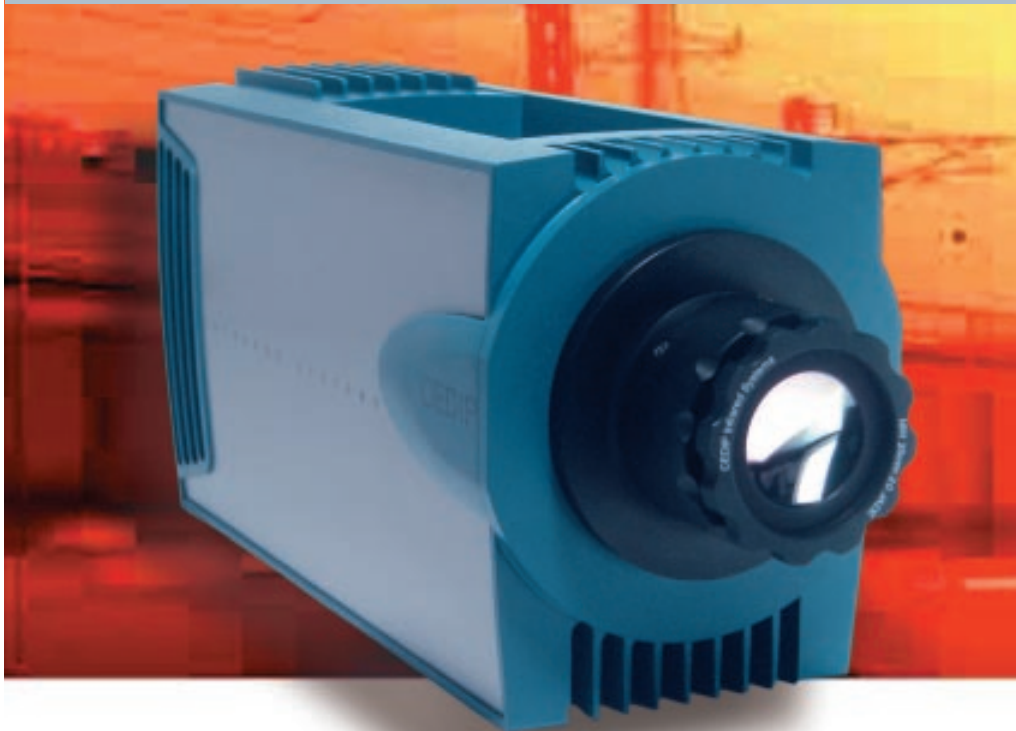
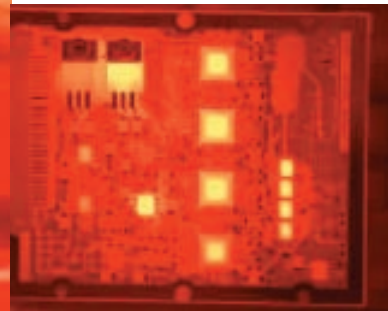


# JADE ADVANCED THERMOGRAPHY WORKSTATIONS

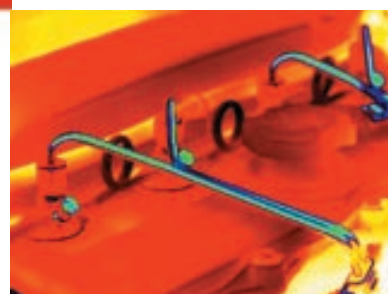
**HIGH RESOLUTION THERMAL RADIOMETERS FOR DEMANDING APPLICATIONS**



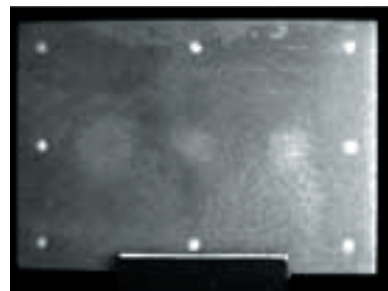
*Design Validation*



*Process Control*



*Thermal Analysis*



*Non Destructive Testing*

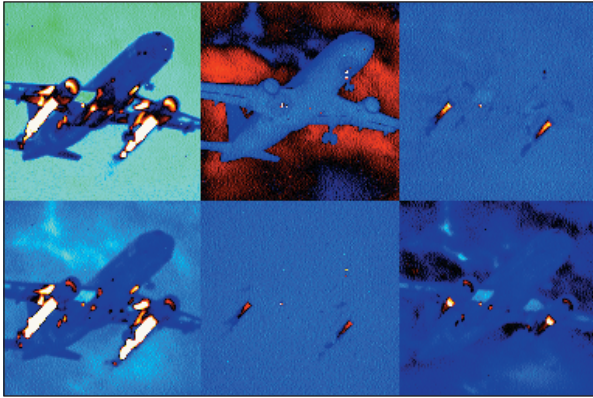
- ◆ **Multispectral capabilities**
  - ◆ **Leading edge sensitivity**
    - ◆ **Ultra fast frame rate**
      - ◆ **Flexible open architecture**
        - ◆ **High spatial resolution**

# JADE ADVANCED THERMOGRAPHY WORKSTATIONS

HIGH RESOLUTION THERMAL RADIOMETERS FOR DEMANDING APPLICATIONS

## Cameras designed to meet high end thermography applications

Designed to meet demanding thermal analysis requirements in scientific, target signature, control process and non-destructive testing applications, the JADE cameras offer superior thermal sensitivity, wide dynamic temperature range and high speed image acquisition capabilities.



Multispectral capabilities

### Multispectral capabilities

The internal filter wheel allows to insert three different optical filters for wavelength selection.

### Leading edge sensitivity

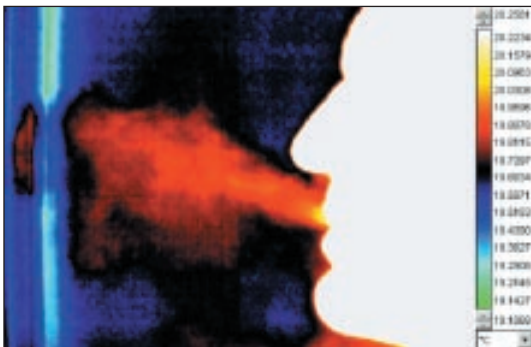
The JADE cameras utilize the highest performance focal plane array available made of InSb or MCT. Sensitivity less than 20mk is achieved even at the highest frame rate.

### Ultra fast frame rate

Frame rate up to 200 Hz in full image format and up to 15 kHz in sub-window mode are available.

### Flexible open architecture

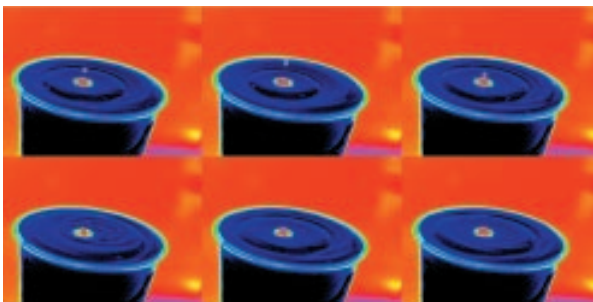
The JADE cameras have digital and analogue outputs, all setup parameters are available to the user.



Leading edge sensitivity

### High spatial resolution

The JADE cameras use high performance detectors with large filling factor ratios and low non uniformity response. Carefully designed optics accurately matching the focal plane array resolution finally provides high resolution imagery.



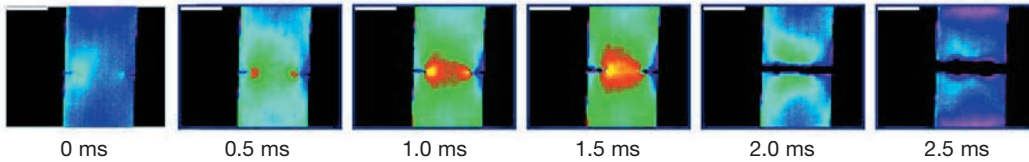
Ultra fast frame rate



High spatial resolution



Flexible open architecture



## Flexible range of options

### Extended Dynamic Temperature Range Option.

This software option allows to extend the temperature range of the camera to offer a single range of measurement even with large temperature variation. As an example, a single dynamic range of 0° to 900°C with a JADE MWIR can be obtained. Analyzing IR images covering a wide temperature range over time is now possible, without losing any information.

### Windowing mode & Variable frame rate.

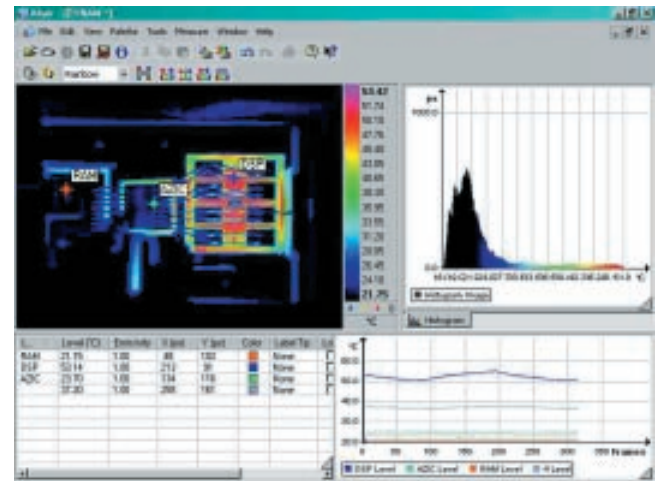
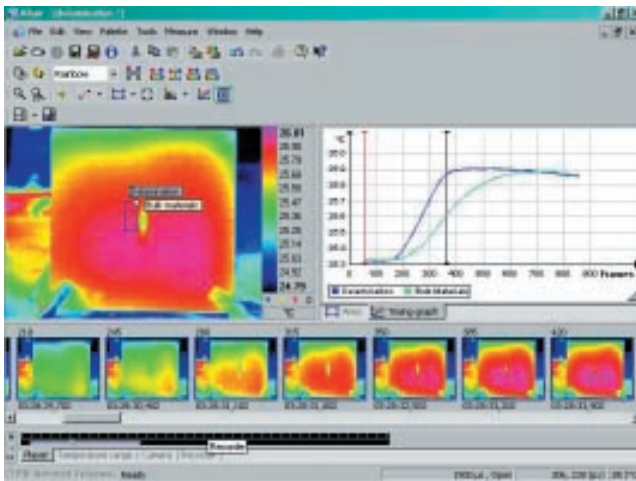
The sub-windowing mode allows reducing the imaged region of interest within the full frame. The frame rate is continuously variable as the integration time.

### Smart Triggering features.

External triggering offers precise control of integration time allowing accurate timed and gated exposures.

### ALTAIR : High performance workstation for IR thermography.

The ALTAIR workstation comprises a digital frame grabber card, a high performance PC computer and the ALTAIR software, which operates under Windows 2000/XP. The ALTAIR workstation will give to the user capabilities to store and analyse sequences of digital images, even when operating at high frame rate. Real time storage in the RAM or the hard disk is provided.



## A wide range of applications

Design application	Typical use	Benefit
Design validation :	Automotive industry Consumer products Aerospace industry	Provide immediate measurement of the surface temperature for correlating with theoretical models.
Process control :	Glass industry Cement industry Food industry Pharmaceutical industry	Provide immediate feedback on the process parameters by offering real time temperature measurement.
IR signature analysis :	Defence industry	The fast frame rate and multispectral features provide accurate and reliable measurement capability.
Heat transfer :	R&D centers	Open architecture and flexible interface offers to researchers instant access to all setup parameters.
Non Destructive Testing :	Aerospace & aeronautic industries Naval industry Automotive industry	High sensitivity and fast frame rate gives the highest performance in defect detection and characterization.



# JADE ADVANCED THERMOGRAPHY WORKSTATIONS

HIGH RESOLUTION THERMAL RADIOMETERS FOR DEMANDING APPLICATIONS

## TECHNICAL SPECIFICATIONS

Model	JADE MWIR	JADE LWIR
Detector type	MCT or InSb	MCT
Spectral range	3-5.2µm	8-9.3µm
Temperature range	-20°C to 1300°C	-20°C to 1500°C
Option for extended temperature range	Yes. Software option	Yes. Software option
Mode of operation	True snap-shot	True snap-shot
Cooling	Closed cycle Stirling cooler	Closed cycle Stirling cooler
Analog to Digital	14 bits	14 bits
Filter wheel	Yes. 3 holders available for 1" diameter filters.	Yes. 3 holders available for 1" diameter filters.
Analog output	RS170 or CCIR	RS170 or CCIR
Digital output	14 bits RS422	14 bits RS422
Frame rate	Variable 1 Hz to 170 Hz, 1 Hz increment	Variable 1 Hz to 200 Hz, 1 Hz increment
Windowing	Yes, 1/2 image 700Hz 1/4 image 2800 Hz Line sync 13 kHz	Yes, 1/2 image 800Hz 1/4 image 3000 Hz Line sync 13 kHz
Integration time	Variable, 1µs to 10ms, 1µs increment	Variable, 1µs to 10ms, 1µs increment
NETD	<25 mK @ 30°C (20 mK typical)	<25 mK @ 30°C
External Synchronization	External TTL signal, jitter < 1µs	External TTL signal, jitter < 1µs
Radiometric measurement capabilities	+/- 2°C up to 100°C +/- 2% FS above	+/- 2°C up to 100°C +/- 2% FS above
Size (mm)	270 (L) x 120 (W) x 150 (H)	270 (L) x 120 (W) x 150 (H)
Weight (w/o lens)	3 kg	3 kg

Focal length	FOV	IFOV
12 mm	38° x 31°	2.1 mrad
25 mm	21° x 16°	1 mrad
50 mm	11° x 8°	0.5 mrad
100 mm	5° x 4°	0.25 mrad
200 mm	2.5° x 2°	0.12 mrad
G1 : microscopic lens	9.6mm x 7.2mm	15µm



CEDIP design and manufactures a full range of infrared systems dedicated to temperature measurement applications. CEDIP uses the latest technologies of cooled and uncooled focal plane arrays, advanced optics and electronics to produce equipments for process control, non destructive testing, IR thermography, night vision driving or target detection and tracking.

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