

ThermoVision® A40M RESEARCHER



The ThermoVision® A40M Researcher is an affordable, accurate, intelligent infrared imaging and temperature measurement camera system for industrial process development and monitoring, product verification, and security applications. The ultra-compact, rugged A40M features built-in logic, intuitive menu-driven configuration, multiple cursors and independent alarms, real-time color video output, numerous connectivity interfaces, and plug-and-play network configuration.

The fully integrated A40M Researcher system features an ultra-compact, rugged, high-resolution IR imaging camera with FireWire® connectivity and comes packaged with FLIR Researcher™ software. It provides immediate, precise visual understanding of thermal performance. With its family of interchangeable lenses and other accessories, the A40M Researcher system is a complete process development and monitoring solution.



- Affordable, fully-integrated thermal measurement solution
- Maintenance-free, uncooled, longwave microbolometer detector
- Precision non-contact temperature measurement
- Rugged and compact
- Plug and Play setup
- FireWire (IEEE 1394) connectivity
- Multiple users can access data from multiple cameras anywhere, anytime
- Real-time (60 Hz) 14-bit digital video output
- Multiple independent target spots and alarms
- LabVIEW Toolkit and C++ Visual Basic support

QUICKLY FIND FAULTS

Infrared thermal images quickly reveal conditions that simply cannot be detected by any other sensor technology. Subtle temperature variations that signal a process problem stand out clearly in a thermal image. Finding, assessing, and resolving problems early can improve product quality and significantly reduce scrap or warranty costs.

INSTANT NON-CONTACT TEMPERATURE MEASUREMENT

The A40M was designed from the beginning—at the detector level—to deliver accurate radiometric imaging and repeatable temperature measurement. Each thermal image is built from 76,800 individual picture elements that are sampled 60 times per second by the camera's on-board electronics and software to measure temperature. The data can then be used by the operator to monitor or control a production process, or can be processed by the camera's on-board intelligence to autonomously generate multiple independent digital alarms or even control process equipment.

OUTSTANDING IMAGING AND HIGH THERMAL SENSITIVITY

The A40M features an advanced, uncooled microbolometer FPA detector technology that delivers crisp, longwave images in a multitude of palettes that allow you to see temperature variations as small as 0.08° C. Real-time image acquisition at standard video rates (60 Hz) can reveal rapid, thermally transient events and generate clear images of moving objects.

PLUG-AND-PLAY SETUP

The A40M features plug-and-play setup. You can simply connect the camera to a standard monitor and immediately produce high quality, real-time radiometric thermal images that accurately show heat patterns and thermal anomalies.

EXTENSIVE CONNECTIVITY OPTIONS

The A40M Researcher features FireWire (IEEE 1394) connectivity. Each A40M can be equipped with its own unique IP address allowing it to be addressed independently via its network connection. This provides instant access to A40M thermal images by any authorized user via the LAN, WAN, or Internet using a Web browser. The camera can be configured via the network, or with its on-board soft button interface.

EASY TO CONFIGURE AND OPERATE

The user-intuitive A40M is extremely easy to operate. Its onboard logic and menu-driven configuration controls enables you to select and control multiple target spots, temperature range, image color palettes, and multiple alarms, quickly and easily.

ULTRA-COMPACT, RUGGED AND LIGHTWEIGHT

Built to operate unattended for long periods in harsh industrial environments, the A40M has an IP40 rating. Its compact design and light weight (less than 3 lbs.) allows it to be mounted in hard-to-get-at locations that may be optimal for data collection. Fully configurable I/O functionality allows the A40M to be integrated quickly and easily into your control systems.

POWERFUL SOFTWARE FOR IN-DEPTH ANALYSIS AND DIGITAL RECORDING

Coupled with ThermoCAM Researcher software, the most flexible, powerful digital storage, measurement and analysis package available, the A40M Researcher system allows detailed real-time digital analysis. Researcher collects data directly from the A40M at a rate of 60 frames per second through a high-speed FireWire IEEE 1394 connection. It is ideal for analysis of dynamic objects and high-speed thermal events. Researcher displays real-time graphics and thermal statistics, satisfying virtually all data collection, post-analysis and research needs.

MACHINE VISION PROGRAMMING OPTIONS

The A40M can be easily leveraged to control a process with LabVIEW and FLIR's LabVIEW Developers toolkit. This SDK allows programmers to access numerous measurement functions that can then be used to turn the A40M into a powerful machine vision tool.

Or, work in your own programming environment with the ThermoVision System Developers Kit (SDK) based on ActiveX and Visual Basic C++. The SDK provides full access to camera functions and includes source code examples that will dramatically reduce the time it takes to program a custom solution.



IMAGING PERFORMANCE

Field of view/min focus distance	24° x 18° / 0.3 m
Spatial resolution (IFOV)	1.3 mrad
Thermal sensitivity @ 50/60Hz	0.08°C at 30 °C
Focusing	Built-in focus motor
Detector type	Focal Plane Array (FPA), uncooled microbolometer
Spectral range	7.5 to 13 µm

IMAGE PRESENTATION

FireWire output	IEEE-1394 8/16-bit monochrome and 8-bit color
Video output	RS170 EIA/NTSC or CCIR/PAL composite video

MEASUREMENT

Temperature ranges	Range 1: -40°C to +120°C (-40 to +248°F) Range 2: 0°C to +500°C (+32 to +932°F) Optional: Up to +1500°C (+2732°F) Optional: Up to +2000°C (+3632°F)
Accuracy (% of reading)	± 2°C or ± 2%
Measurement modes	Spot, Area, Isotherm, Difference
Automatic emissivity correction	Variable from 0.1 to 1.0
Individual emissivity settings	Individually settable
Measurement corrections	Reflected ambient, distance, relative humidity, external optics. Automatic, based on user input

SUPPLEMENTARY LENSES*

Field of view/min. focus distance	7° Telescope (7° x 5.3°/4m) 12° Telescope (12° x 9°/1.2m) 45° Wide angle (45° x 34°/0.1m) 80° Wide angle (80° x 60°/ 0.1m) Close-up: 64/150 mm (FOV=64 x 48 mm at 150 mm); 34/80 mm (FOV=34 x 25 mm at 80 mm) Macro: 50 micron (14.3 to 18.7 mm focus; FOV=14.3 x 10.8 mm at 14.3 mm; FOV=15.1 x 11.2 mm at 18.7 mm; IFOV=45 µm at 14.3 mm; 47 µm at 18.7 mm)
Lens recognition	Automatic lens recognition and measurement corrections

POWER SOURCE

AC operation (included)	AC adapter 110/220 VAC, 50/60Hz
DC operation	8-30V nominal, <6W

ENVIRONMENTAL

Operating temperature range	-15°C to +50°C (5°F to 122°F)
Storage temperature range	-40°C to +70°C (-40°F to 158°F)
Humidity	Operating and storage 10% to 95%, non-condensing
Encapsulation	IP 40 (Determined by connector type)
Shock	Operational: 25G, IEC 68-2-29
Vibration	Operational: 2G, IEC 68-2-6

PHYSICAL CHARACTERISTICS

Weight	1.4 kg (3.0 lbs)
Size	207mm x 92mm x 109mm (8.1" x 3.6" x 4.3")
Tripod mounting	1/4" – 20

USER CONFIGURATION TABLE

TYPE	FUNCTION	REMARK
Digital Input	TTL level • Shutter disable • Store image • Batch enable	Isolation and relay function in external module
Digital Output	TTL level • Spot/Area threshold ALARM • Internal temperature sensor ALARM • V-sync	Isolation and relay function in external module
Analog Output	• Spot/Area out: 0-5V • Internal temperature sensor out: 0-5V	Scaled to T _{low} – T _{high} Isolation in external module
Analog Input	• External temperature sensor in: 0-5V	Scaled to T _{low} – T _{high} Isolation in external module

CAMERA INTERFACES

- Digital I/O ports—jackable screw terminal**
3 output/1 input, 1 input/output selectable; function is user configurable**
- Analog I/O ports—jackable screw terminal**
2 output/1 input; function is user configurable**
- RS-232 (DB-9)—connection to PC**
Digital image output (8 and 16 bit), camera control
- DC power in—2-pin jackable screw terminal**
8-30V nominal



- 8-button keyboard**
- FireWire jack (IEEE-1394)**
- BNC—C-Video (NTSC/PAL)**
- 2.5 mm DC power in**
8-30V Nominal; camera needs only one power source

*All attach to standard built-in 24° lens
**See Configuration Table above