ThermoVision® A40M

INDUSTRIAL AUTOMATION

The ThermoVision A40M is an affordable, accurate, intelligent infrared imaging and temperature measurement camera for industrial process monitoring, product verification, and security applications.

The ultra-compact, rugged A40M features high-resolution imaging, 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. With its family of interchangeable lenses and other accessories, the A40M systems is a complete machine vision and remote monitoring solution that can immediately identify thermal problems that are otherwise undetectable.

- 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) and RJ-45 Ethernet connection options
- 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
- Multiple I/O options
- LabVIEW Toolkit and C++ Visual Basic support

QUICKLY FIND FAULTS

Infrared thermal images quickly highlight problems and 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 save thousands of dollars in scrap or warranty expense.

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.

EXTENSIVE CONNECTIVITY OPTIONS

The A40M is available in FireWire (IEEE 1394) or RJ-45 Ethernet models that are ideal for individual or networked multiple camera installations. Each A40M can be equipped with its own 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 the Internet using a Web browser. The camera can be configured via the network, or with its on-board soft button interface.

FAST 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.

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, multiple alarms and more, 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.

MULTIPLE 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 with a minimal investment in machine vision software development.

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 measurements and includes source code examples that will dramatically reduce the time it takes to program a custom solution.

FLIR SYSTEMS™

THERMOVISION® A40M TECHNICAL SPECIFICATIONS

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/Ethernet output	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

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

8-button keyboard

Ethernet jack (RJ45) or FireWire jack (IEEE-1394)

BNC—C-Video (NTSC/PAL)

2.5 mm DC power in
8-30V Nominal; camera needs only one power source

FLIR SYSTEMS
The Global Leader in Infrared Cameras