# FLIR A310 pt

## Multi-Sensor Thermal Imaging Camera for Condition Monitoring

FLIR A310 pt thermal cameras can be installed almost anywhere to monitor the condition of your critical equipment and other valuable assets. Designed to help safeguard your plant and measure temperature differences, they allow you to see problems before they become costly failures -- preventing downtime and enhancing worker safety.

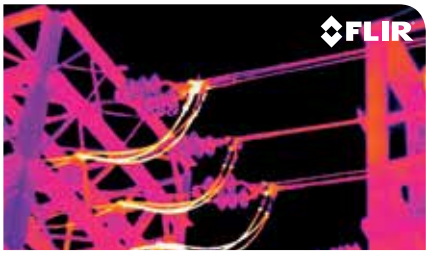
FLIR A310 pt is ideal for various applications that require temperature measurement capabilities including: substation, transformer, waste bunker, and coal pile monitoring.

### MULTI-SENSOR

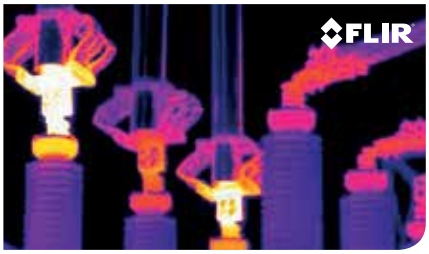
The FLIR A310 pt pan/tilt has all the necessary features and functions to build single- or multi-camera solutions. The FLIR A310 pt can pan +/- 360° continuous and tilt +/- 45°. It is ideal to cover large areas. Typical application examples are coal pile, waste bunker and substation monitoring, utilizing standard Ethernet hardware and software protocols. The FLIR A310 pt is a multi-sensor and includes a lowlight 36x zoom color CCD camera.

### EXCELLENT IMAGE QUALITY

FLIR A310 pt contains an uncooled Vanadium Oxide (VOx) microbolometer detector. It produces crisp thermal images of 320 x 240 pixels and makes temperature differences as small as 50 mK clearly visible. It comes with a built-in 25 degree lens with motorized focus. MPEG-4 streamed video output over Ethernet to show live images on a PC, and 640 x 480 with overlay up to 30 Hz. Composite video outputs, PAL and NTSC compatible are available. Both cameras can be controlled remotely over the Web and TCP/IP protocol.




Continuous monitoring of a high-voltage installation.




Thermal image of a substation showing a transformer with excessive temperature.

### BUILT-IN ANALYSIS AND ALARM FUNCTIONS

FLIR A310 pt comes standard with built-in analysis functions like spot, area measurement and temperature difference. Alarms can be set to go off as function of analysis.

### DESIGNED FOR USE IN HARSH ENVIRONMENTS

A310 pt is an extremely rugged system that meets IP66 requirements, protecting the camera from dust and water.

### FLIR SENSORS MANAGER

Each FLIR A310 pt comes with a single sensor copy of FLIR Sensors Manager. This intuitive software allows users to manage and control the cameras in a TCP/IP network.

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## Imaging Specifications

| Imaging and optical data | |
|---|---|
| IR resolution | 320 × 240 pixels |
| Thermal sensitivity/NETD | < 0.05°C @ +30°C (+86°F) / 50 mK |
| Field of view (FOV) | FLIR A310pt 15°: 15° × 11.25°<br>FLIR A310pt 25°: 25° × 18.8°<br>FLIR A310pt 45°: 45° × 33.8°<br>FLIR A310pt 6°: 6° × 4.5°<br>FLIR A310pt 90°: 90° × 73° |
| Minimum focus distance | FLIR A310pt 15°: 1.2 m (3.93 ft.)<br>FLIR A310pt 25°: 0.4 m (1.31 ft.)<br>FLIR A310pt 45°: 0.20 m (0.66 ft.)<br>FLIR A310pt 6°: 4 m (13.11 ft.)<br>FLIR A310pt 90°: 20 mm (0.79 in.) |
| Focal length | FLIR A310pt 15°: 30.38 mm (1.2 in.)<br>FLIR A310pt 25°: 18 mm (0.7 in.)<br>FLIR A310pt 45°: 9.66 mm (0.38 in.)<br>FLIR A310pt 6°: 76 mm (3.0 in.)<br>FLIR A310pt 90°: 4 mm (0.157 in.) |
| Spatial resolution (IFOV) | FLIR A310pt 15°: 0.82 mrad<br>FLIR A310pt 25°: 1.36 mrad<br>FLIR A310pt 45°: 2.59 mrad<br>FLIR A310pt 6°: 0.33 mrad<br>FLIR A310pt 90°: 6.3 mrad |
| Lens identification | Automatic |
| F-number | 1.3 |
| Image frequency | 9 Hz / 30 Hz |
| Focus | Automatic or manual (built in motor) |
| Zoom | 1–8× continuous, digital, interpolating zooming on images |
| **Detector data** | |
| Detector type | Focal Plane Array (FPA), uncooled microbolometer |
| Spectral range | 7.5–13 µm |
| Detector pitch | 25 µm |
| Detector time constant | Typical 12 ms |
| **Measurement** | |
| Object temperature range | –20 to +120°C (–4 to +248°F)<br>0 to +350°C (+32 to +662°F) |
| Accuracy | ±4°C (±7.2°F) or ±4% of reading |
| **Measurement analysis** | |
| Spotmeter | 10 |
| Area | 10 boxes with max./min./average/position |
| Isotherm | 1 with above/below/interval |
| Atmospheric transmission correction | Automatic, based on inputs for distance, atmospheric temperature and relative humidity |
| Optics transmission correction | Automatic, based on signals from internal sensors |
| Emissivity correction | Variable from 0.01 to 1.0 |
| Reflected apparent temperature correction | Automatic, based on input of reflected temperature |
| External optics/windows correction | Automatic, based on input of optics/window transmission and temperature |
| Measurement corrections | Global and individual object parameters |
| **Alarm** | |
| Alarm functions | 6 automatic alarms on any selected measurement function, camera temperature |
| **Set-up** | |
| Color palettes | Color palettes (BW, BW inv, Iron, Rain) |
| Set-up commands | Date/time, Temperature°C/°F |
| **Imaging and optical data (visual camera)** | |
| Field of view (FOV) | 57.8° (H) to 1.7° (H) |
| Focal length | 3.4 mm (wide) to 122.4 mm (tele) |
| F-number | 1.6 to 4.5 |
| Focus | Automatic or manual (built in motor) |
| Optical Zoom | 36× continuous |
| Electronic Zoom | 12× continuous, digital, interpolating |
| **Detector data (visual camera)** | |
| Focal Plane Array (FPA) | 1/4" Exview HAD CCD |
| Effective pixels | 380.000 |

| Technical specification (pan & tilt) | |
|---|---|
| Azimuth Range | Az velocity 360° continuous, 0.1 to 60°/sec max |
| Elevation Range | El velocity ± 45°, 0.1 to 30°/sec. max |
| Programmable presets | 128 |
| Automatic heaters | Clears window from ice. Switched on at +4°C (39°F). Switched off at +15°C (59°F). |
| **Ethernet** | |
| Ethernet | Control, result and image |
| Ethernet, type | 100 Mbps |
| Ethernet, standard | IEEE 802.3 |
| Ethernet, connector type | RJ-45 |
| Ethernet, communication | TBA |
| Ethernet, video streaming | Two independent channels for each camera - MPEG-4, H.264, or M-JPEG |
| Ethernet, protocols | Ethernet/IP, Modbus TCP, TCP, UDP, SNTP, RTSP, RTP, HTTP, ICMP, IGMP, ftp, SMTP, SMB (CIFS), DHCP, MDNS (Bonjour), uPnP |
| **Composite video** | |
| Video out | Composite video output, PAL /NTSC compatible |
| Video, standard | CVBS (ITU-R-BT.470 PAL),<br>CVBS (SMPTE 170M NTSC) |
| **Power system** | |
| Power | 24 VAC (21-30 VAC; 24 VAC: 215 VA max. with heater) or 24 VDC (21-30 VDC; 24 VDC: 195 W max. with heater). |
| **Environmental data** | |
| Operating temperature range | –25°C to +50°C (-13°F to +122°F) |
| Storage temperature range | –40°C to +70°C (–40°F to +158°F) |
| Humidity (operating and storage) | IEC 60068-2-30/24 h 95% relative humidity +25° C to +40°C (+77°F to +104°F) |
| EMC | • EN 61000-6-2 (Immunity)<br>• EN 61000-6-3 (Emission)<br>• FCC 47 CFR Part 15 Class B (Emission) |
| Encapsulation | IP 66 (IEC 60529) |
| Bump | 5 g, 11 ms (IEC 60068-2-27) |
| Vibration | 2 g (IEC 60068-2-6) |
| **Physical data** | |
| Weight | 17.8 kg (39.3 lb.) |
| Size (L × W × H) | 460 × 467 × 326 mm (18.1 × 18.4 × 12.8 in.) |
| Housing material | Aluminum |
| **Shipping information** | |
| List of contents | Cardboard box, Pan & tilt with infrared camera including lens, and visual camera, FLIR Sensors Manager download card, Lens cap, Printed documentation, Small accessories kit, User documentation CD-ROM |


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