

# FLIR A65 / A35 / A15 / A5

## Compact Thermal Imaging Cameras For Machine Vision

The FLIR Ax5-Series is the perfect solution for those applications that require the benefits of a thermal image. The FLIR Ax5-Series camera has features and functions that make it the natural choice for anyone who uses PC software to solve problems.

### EXTREMELY AFFORDABLE AND COMPACT

The Ax5-Series are low-cost infrared cameras, with the FLIR A5 being the most affordable. They are ideal tools for putting thermal imaging at work in an automation or machine vision environment. All models are extremely compact. They can easily be integrated in a machine vision environment.

### CHOICE OF IMAGE QUALITY

The FLIR A65 produces crisp thermal images with 640 x 512 pixels. Users that do not need this high image quality for their application can choose for the FLIR A35, which produces thermal images of 320 x 256 pixels; from the FLIR A15, which produces thermal images with 160 x 128 pixels or the FLIR A5, which produces thermal images with 80 x 64 pixels. The FLIR Ax5-Series makes temperature differences as small as 50 mk clearly visible.

### GigE VISION™ STANDARD COMPATIBILITY

GigE Vision is a camera interface standard developed using the Gigabit Ethernet communication interface. GigE Vision is the first standard to allow for fast image transfer using low cost standard cables, even over long distances. With GigE Vision, hardware and software from different vendors can operate seamlessly over Gigabit Ethernet connections.

### GenICam™ PROTOCOL SUPPORT

The goal of GenICam is to provide a generic programming interface for all types of cameras. Regardless of interface technology (Gigabit Ethernet, Camera Link, IEEE-1394 etc) or features implemented, the Application Programming Interface (API) will always be the same. The GenICam protocol also makes it possible to use third party software with the camera.

### 14-BIT TEMPERATURE LINEAR OUTPUT

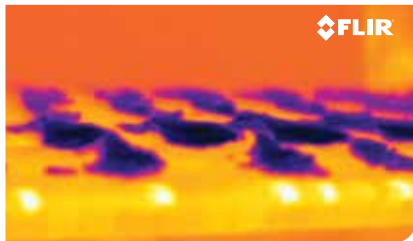
Allows you to do temperature measurements, in a non-contact mode, within any 3<sup>rd</sup> party software. A built-in Gigabit Ethernet connection allows real time 14-bit image streaming to computer.

### SYNCHRONIZATION

Possible to configure one camera to be master and others to be slave(s) for applications that call for more than one camera to cover the object or for stereoscopic applications.



Detecting liquid level in visually opaque bottles.



Quality control of food production line

## Technical specifications

| Imaging & Optical Data    | FLIR A65   | FLIR A35  | FLIR A15  | FLIR A5  |
|---------------------------|--|---|---|--|
| IR resolution             | 640 x 512 pixels   | 320 x 256 pixels  | 160 x 128 pixels  | 80 x 64 pixels   |
| Spatial resolution (IFOV) | 45° (H) x 37° (V) with 13 mm lens<br>25° (H) x 20° (V) with 25 mm lens<br>lenses are not interchangeable and need to be specified at time of order | 48° (H) x 39° (V) with 9 mm lens<br>25° (H) x 19° (V) with 19 mm lens<br>lenses are not interchangeable and need to be specified at time of order | 48° (H) x 39° (V) with 9 mm lens<br>25° (H) x 19° (V) with 19 mm lens<br>lenses are not interchangeable and need to be specified at time of order | 44° (H) x 36° (V) with 5 mm lens<br>25° (H) x 20° (V) with 9 mm lens<br>lenses are not interchangeable and need to be specified at time of order |
| Image frequency           | 7.5 Hz / 30Hz  | 60 Hz   | 60 Hz   | 60 Hz  |
| Detector data             |  |   |   |  |
| Detector pitch            | 17 µm  | 25 µm   | 50 µm   | 50 µm  |
| Measurement               |  |   |   |  |
| Object temperature range  | -25°C to +135°C (-13 to 275°F)   | -25°C to +135°C (-13 to 275°F) /<br>-40°C to +550°C (-40 to 1022°F)   | -25°C to +135°C (-13 to 275°F) /<br>-40°C to +550°C (-40 to 1022°F)   | -25°C to +135°C (-13 to 275°F) /<br>-40°C to +550°C (-40 to 1022°F)  |

| Imaging & Optical Data                   |   |
|--|---|
| Thermal sensitivity/NETD                 | < 0.05°C @ +30°C (+86°F) / 50 mK  |
| Accuracy                                 | Accuracy ±5°C (±9°F) or ±5% of reading  |
| F-number                                 | 1.25  |
| Focus                                    | Fixed   |
| Detector data                            |   |
| Focal Plane Array (FPA) / Spectral range | Uncooled VOX microbolometer / 7.5–13 µm   |
| Detector time constant                   | Typical 12 ms   |
| Ethernet                                 |   |
| Ethernet                                 | Control and image   |
| Ethernet, type                           | Gigabit Ethernet  |
| Ethernet, standard                       | IEEE 802.3 / RJ-45  |
| Ethernet, communication                  | GigE Vision ver. 1.2 Client API GenICam compliant   |
| Ethernet, image streaming                | 8-bit monochrome<br>@ 7.5 / 30 / 60 Hz (variant dependant)<br>Signal linear/ DDE, Automatic/ Manual, Flip H&V<br>14-bit @ 7.5 / 30 / 60 Hz (variant dependent) according to<br>IR camera resolution<br>Signal linear/ DDE, GigE Vision and GenICam compatible |
| Ethernet, power                          | Power over Ethernet,<br>PoE IEEE 802.3af class 0 Power  |
| Ethernet, protocols                      | TCP, UDP, ICMP, IGMP, DHCP, GigE Vision   |
| Digital input/output                     |   |
| Digital input                            | General purpose, 1x opto-isolated, "0" < 2, "1" = 2–12 VDC  |
| Digital output, purpose                  | General purpose output to ext. device (programmatically set)  |
| Digital output                           | 1x opto-isolated, 2–40 VDC, max 185 mA  |
| Digital I/O, isolation voltage           | 500 VRMS  |
| Digital I/O, supply voltage              | 2–40 VDC, max 200 mA  |
| Digital I/O, connector type              | 12-pole M12 connector (shared with Digital Synchronization and External power)  |
| Synchronization In, purpose              | Frame sync In to control camera   |
| Synchronization In                       | 1x, non-isolated  |
| Synchronization In, type                 | LVC Buffer @ 3.3V, "0" < 0.8 V, "1" > 2.0 V.  |
| Synchronization Out, purpose             | Frame sync Out to control another Ax5 camera  |
| Synchronization Out                      | 1x, non-isolated  |
| Synchronization Out, type                | LVC Buffer @ 3.3V, "0" = 24 MA max, "1" = -24 mA max.   |
| Digital Synchronization, connector type  | 12-pole M12 connector (shared with Digital I/O and External power)  |

| Power system                     |  |
|----------------------------------|--|
| External power operation         | 12/24 VDC, < 3.5 W nominal < 6.0 W absolute max  |
| External power, connector type   | 12-pole M12 connector (shared with Digital I/O and Digital Synchronization)  |
| Voltage                          | Allowed range 10–30 VDC  |
| Environmental data               |  |
| 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) | 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 40 (IEC 60529)  |
| Bump                             | 25 g (IEC 60068-2-27)  |
| Vibration                        | 2 g (IEC 60068-2-6)  |
| Physical data                    |  |
| Weight                           | 0.200 kg (0.44 lb.)  |
| Camera size (L x W x H)          | 106 x 40 x 43 mm (4.2 x 1.6 x 1.7 in.)   |
| Tripod mounting                  | UNC ¼"-20 (on three sides)   |
| Base mounting                    | 4 x M3 thread mounting holes (bottom)  |
| Housing material                 | Magnesium and aluminum   |
| Scope of delivery                |  |
| Packaging, contents              | Cardboard box, thermal imaging camera with lens, focus adjustment tool, printed documentation, user documentation CD-ROM, FLIR Tools download card |

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