

FLIR SYSTEMS

Thermal Security Cameras



THE POWER OF THERMAL IMAGING

Thermal imaging compliments and completes your security camera network by turning night into day, and giving you the power to see threats invisible to the naked eye.

Thermal security cameras see heat

Thermal security cameras make pictures from heat energy that is invisible to the naked eye. Everything in the color image below is giving off heat – even the ice cubes she is holding in her left hand, and the circle she traced on the wall with her right.



See in the dark

Because everything generates heat, thermal security cameras can see as well at night as they can during the day. Cameras dependent on visible light are useless at night or in poor visibility without supplementary illumination from lights or lasers.



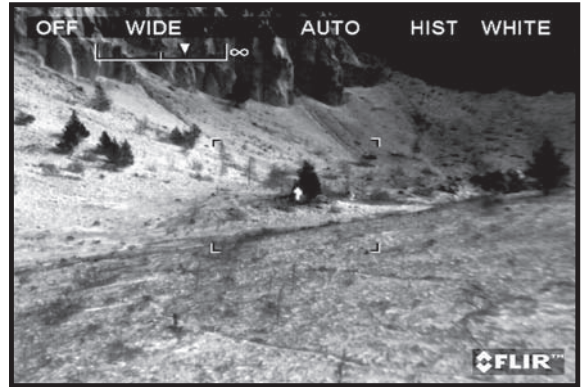
See through obscurants

Thermal energy passes through many obscurants including smoke, dust, modest foliage and light fog. The thermal camera can see this person clearly through the fog, but the standard visible light camera cannot.



Maximize detection

In most cases, thermal energy travels through the atmosphere more effectively than visible light. As a result, thermal imagers can see activity at extreme ranges when visible cameras, which rely on color contrast, fail.



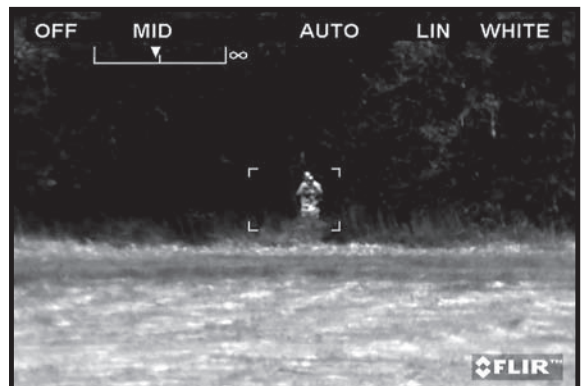
Compliment your daylight cameras

Low-cost infrared illuminated cameras rely on short-wave IR lamps to illuminate threats, resulting in shadows, reflections, backscatter, higher power consumption, narrow areas of illumination and much shorter ranges than passive thermal camera technology.



See more during the day

Conventional TV cameras rely on color contrast to provide enough information for the viewer to detect a threat. Even at moderate ranges, weak contrast can render these cameras useless. Thermal cameras don't have this limitation.



COMMON APPLICATIONS FOR THERMAL IMAGING

New, low-cost thermal imaging systems enable new applications.

Port security

In most cases, it is impossible to adequately light waterways, waterfronts and wetlands. Thermal security cameras provide excellent visibility at long ranges without lighting or other artificial illumination.



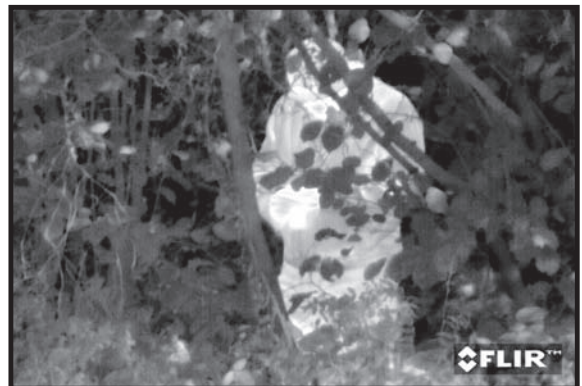
Perimeter intrusion or areas too large to illuminate

Border applications, hydropower generation facilities, refineries and airports have perimeters that can encompass miles of real estate. Thermal security cameras provide an effective, economical solution for securing these vital areas, day and night.



Situations where lighting is unwelcome

In situations where lighting can offend local residents, or where it might draw unwanted attention to your facility, thermal security cameras allow for covert operation.



Long-range detection

Thermal energy travels through many atmospheric obscurants better than visible light. Through smoke, dust, even light fog, thermal security cameras are ideal for detecting activity at extreme ranges.



Applications that require more information than the eye can see

Thermal imaging can provide information about a scene that isn't always visible to the naked eye, like open windows, or recently parked vehicles. Enhancing your situational awareness in this way can prove vital to ensuring your facility's security.



Critical Infrastructure

Thermal security cameras provide the high levels of threat detection capability critical for nuclear power plant security, where there is no margin for error. Lighting complications and extreme detection range needs are challenges thermal security cameras meet.



A THERMAL IMAGER FOR EVERY APPLICATION AND RANGE REQUIREMENT

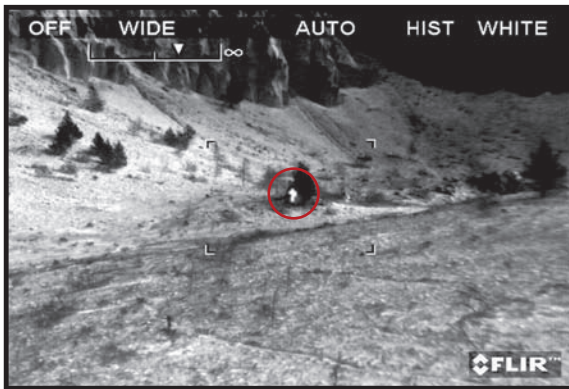
More power to detect and classify threats in the toughest conditions, day and night.

Detection

The ability to detect a threat, or movement in a scene, with a conventional daylight/lowlight TV camera is dependent on scene contrast. If a person is wearing clothes that allow him to blend into his background, it can reduce the camera's detection range. With a thermal camera, the person will normally appear warm against a cooler background, so even with a few pixels on target he is likely to show up.

Classification

Classification is the ability to differentiate a man-sized target from other objects in a scene; an automobile, for example. With a thermal camera, this can be done with several pixels, but you should consider systems that provide a comfortable margin for recognition. Most security camera operators expect an object to occupy more of the screen than the minimum requirements for classification.



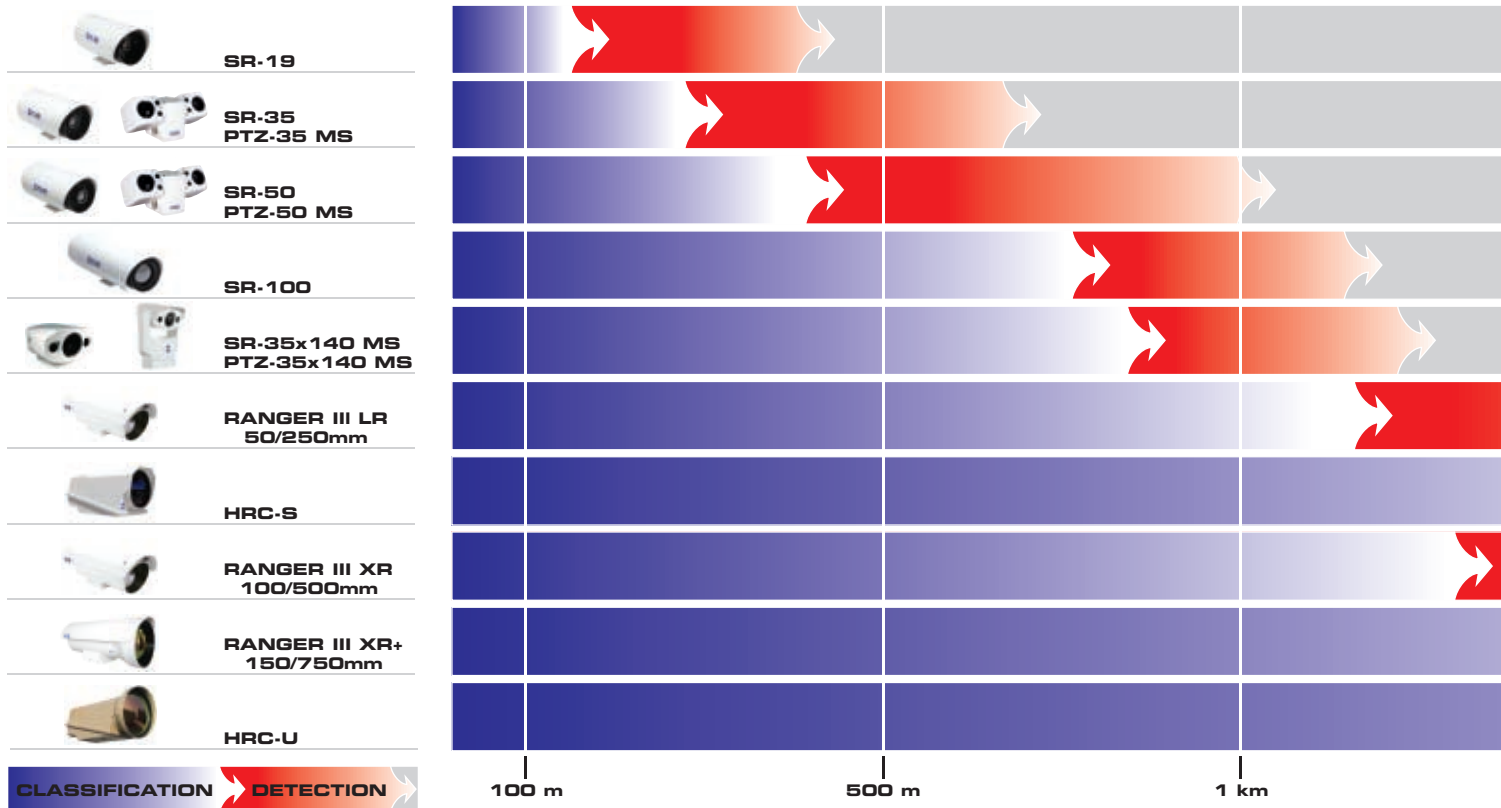
A detected target looks small and indistinct.



When a heat source can be classified as human, it stands out from other objects in the scene.

Range Chart

The chart below shows approximate ranges for threat classification and detection with FLIR's thermal security cameras. The end of the arrow



HOW FAR CAN YOU SEE WITH A THERMAL IMAGER?

With thermal security cameras you can clearly see anything you would see with a conventional camera, and more, day and night.

Camera range performance

We get asked this question more than any other, and it is a reasonable one. Unfortunately, it does not have a simple answer. A thermal security camera's range performance is a combination of many factors including target size, lens focal length, and field-of-view to name just a few.

Most applications have a lens size that will work best for them, that's why FLIR makes so many camera choices. Visit our website and experiment with our online field-of-view calculator to see how a man-sized target fills the screen at a given distance. The sample images below show estimated ranges to provide a reference for comparison.

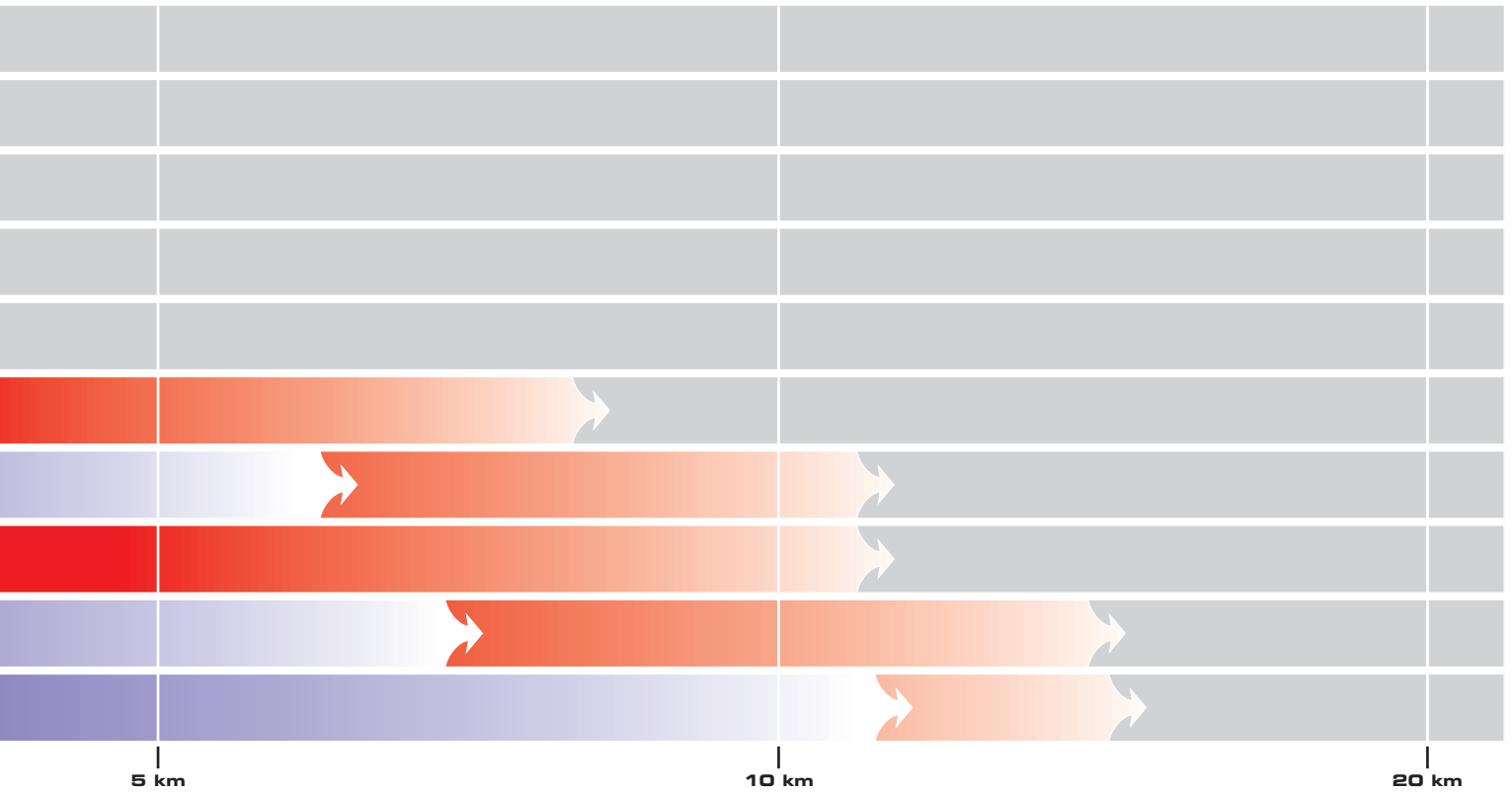


100mm lens at 300'



250mm lens at 300'

identifies the range at which you can either classify (blue arrow) or detect (red arrow) a person under good conditions.



THERMAL CAMERA TECHNICAL SPECIFICATIONS



Camera

D-Series

VSR-6

**SR-19
SR-35**

**SR-50
SR-100**

| | | | | |
|-------------|-----------------|-------|-------|-------|
| Camera Type | Indoor PTZ Dome | Fixed | Fixed | Fixed |
|-------------|-----------------|-------|-------|-------|

Thermal Camera Specs

| | | | | |
|---------------------------------|---|--|---|--|
| Detector Type | Long Life, Uncooled VOx Microbolometer | Long Life, Uncooled VOx Microbolometer | Long Life, Uncooled VOx Microbolometer | Long Life, Uncooled VOx Microbolometer |
| Effective Resolution | 19200 (D-6) 76800 (D-19) | 19200 | 76800 | 76800 |
| Pixel Pitch | 38 µm | 38 µm | 38 µm | 38 µm |
| Focal Length in mm | 6.3 mm (D-6) 19 mm (D-19) | 6.3 mm | 19 mm (SR-19) 35 mm (SR-35) | 50 mm (SR-50) 100 mm (SR-100) |
| Field-of-view in degrees (h, v) | Wide 52° x 40° (D-6) Medium 36° x 27° (D-19) Narrow | 52° x 40° | 36° x 27° (SR-19) 20° x 15° (SR-35) | 14° x 10° (SR-50) 7° x 5° (SR-100) |
| Zoom, Optical, Electronic | Fixed (D-6) 2x E-zoom (D-19) | Fixed | 2x E-Zoom | 2x E-Zoom |
| Spectral Range | 7.5 to 13.5 µm | 7.5 to 13.5 µm | 7.5 to 13.5 µm | 7.5 to 13.5 µm |
| Focus Range | 1 ft. to ∞ (D-6) 6 ft. to ∞ (D-19) | 1 ft. to ∞ | 6 ft. to ∞ (fixed) (SR-19) 21 ft. to ∞ (fixed) (SR-35) | 30 ft. to ∞ (fixed) (SR-50) 6 ft. to ∞ (motorized) (SR-100) |

Outputs

| | | | | |
|-----------------------------|---|---|---|---|
| Composite Video NTSC or PAL | s | s | s | s |
| Video over Ethernet | - | - | - | - |

Control

| | | | | |
|-------------------------------|-----------------|------------|------------|--|
| Point to point (stand alone) | s | s | s | s |
| Ethernet | - | - | - | - |
| Pelco D, RS-232, -422 | RS-485, Pelco D | RS-422/232 | RS-422/232 | RS-422/232 (SR-50) RS-422; Pelco D (SR-100) |
| Nexus Server | - | - | - | - |
| Software Developer's Kit | o | o | o | o |
| External Analytics Compatible | y | y | y | y |

Pan Tilt Performance

| | | | | |
|----------------------|---------------------------------------|---|---|---|
| Pan Angle/speed | Continuous 360°, 0.05° - ~100°/sec | - | - | - |
| Tilt Angle/speed | 0-90°, 0.05° - ~100°/sec | - | - | - |
| Programmable presets | 32 | - | - | - |

General

| | | | | |
|--------------------|--|---|--|--|
| Weight | 3.5 lb. pendant, 6.6 lb. mounted | 4.7 lb. | <6 lb. | <8 lb. |
| Dimensions (L,W,H) | 8" x 6" pendant, 11" dia. trim ring/mounted | 10.5" x 5" x 5.7" | 10.5" x 5" x 5.7" | 10.5" x 5" x 5.7" (SR-50) 14.25" x 5" x 5.7" (SR-100) |
| Power Requirements | 24 VAC +/- 25% | 14-32 VDC or 18-27 VAC | 14-32 VDC or 18-27 VAC | 14-32 VDC or 18-27 VAC |
| Power Consumption | ≤20 W | 3 W nominal at 24 VDC 7 W nominal at 24 VAC 30 W peak AC/DC | 3 W nominal at 24 VDC 7 W nominal at 24 VAC 30 W peak AC/DC (SR-19) 24 W peak AC/DC (SR-35) | 3 W nominal at 24 VDC (SR-50) 7 W nominal at 24 VAC (SR-50) 24 W peak AC/DC (SR-50) 36 W peak, at 24 VAC (SR-100) |

Chart Legend

| |
|--|
| SR = Standard Resolution (320 x 240 thermal) |
| MS = Multi-Sensor (thermal and daylight or other sensor) |
| HRC = High Resolution, Cooled sensor (640 x 480 thermal) |
| PTZ = Pan Tilt Zoom Camera |
| s = Standard |
| o = Option |
| y = Yes |

* = Configuration dependent

As part of FLIR's ongoing development and product improvement efforts, all product specifications are subject to change. Please visit our website for the most current data, or call us at 877.773.3547.



**HRC-S
HRC-U**



**Ranger III
(LR, XR, XR+)**



SR-35x140 MS



**PTZ-35 MS
PTZ-50 MS**



PTZ-35x140 MS



**Ranger MS
HRC MS**

| | Fixed or PTZ | Fixed or PTZ | Fixed | PTZ | PTZ | PTZ |
|--|--|--|---|--|--|---|
| | High Sensitivity Cooled InSb | High Sensitivity Cooled InSb | 2 Long Life, Uncooled VOx Microbolometers | Long Life, Uncooled VOx Microbolometer | 2 Long Life, Uncooled VOx Microbolometers | High Sensitivity Cooled InSb |
| | 307200 | 307200 | 153600 | 76800 | 153600 | 307200 |
| | 15 µm | 15 µm | 38 µm | 38 µm | 38 µm | Choose either of the Long-range Thermal Imagers (Ranger III or HRC) shown at left |
| | 40x500 mm (-S) 60x750 mm (-U) | 50x250 mm (LR) 100x500 mm (XR) 150x750 mm (XR+) | 35 mm 140 mm (2 cameras) | 35 mm, or 50 mm | 35 mm 140 mm (2 Cameras) | |
| | 14.1° x 10.5° to 1.1° x 0.84°(-S) 9.4° x 7.0° to 0.75° x 0.56° (-U) | 11.° x 8.2° to 2.2° x 1.6° (LR) 5.5° x 4.1° to 1.1° x 0.8° (XR) 3.6° x 2.6° to 0.7° x 0.5° (XR+) | 20° x 15° (35 mm) 5° x 3.75° (140 mm) | 20° x 15° (PTZ-35 MS) 14° x 10° (PTZ-50 MS) | 20° x 15° (35 mm) 5° x 3.75° (140 mm) | |
| | 12.5x Continuous Optical; 2x and 4x E-Zoom | 5x Optical; 2x & 4x E-Zoom | 2 Separate cameras Continuous E-Zoom | 2x E-Zoom | 2 Separate cameras Continuous E-Zoom | |
| | 3.4 to 5.1 µm | 3.4 to 5.1 µm | 7.5 to 13.5 µm | 7.5 to 13.5 µm | 7.5 to 13.5 µm | |
| | 30 ft. to ∞ | 3 ft. ∞ (fixed) | 21 ft. to ∞ | 21 ft. or 30 ft. to ∞ (fixed) | 21 ft. to ∞ | |
| | s | s | s | s | s | s |
| | s | o | s | o | s | s |
| | s | s | s | s | s | s |
| | - | o | s | o | s | s |
| | s | s | RS-422; Pelco D | RS-422; Pelco D | RS-422; Pelco D | o |
| | o | o | s | o | s | s |
| | o | o | o | o | o | o |
| | y | y | y | y | y | y |
| | - | - | - | + / - 200°, up to 140°/sec | Continuous 360°, 1°-120°/sec | Continuous 360°, .03°-70°/sec (optional stabilization) |
| | - | - | - | + / - 60°, up to 60°/sec | +/- 60°, 1°-120°/sec | +/- 40°, .03°-30°/sec |
| | - | - | - | 32 | s | s |
| | 21.5 lb. or 30 lb. | 22 lb. or 28.5 lb. | 15 lb. | <11 lb. | <45 lb. | ~77 lb.* |
| | 18.6" x 7.6" x 8.9" (-S) 21.3" x 9.8" x 9.8" (-U) | 22" x 9.0", or 22" x 9.5" | 9" x 12" x 10" | 12" x 9.0" | 23" x 15" | 21.7" x 13.8" x 25.2", or 25.6" x 14.9" x 26.8"* |
| | 18-35 VDC | 12-30 VDC | 18-32 VDC | 24 VDC | 24 VDC or 24 VAC (+/-10%) | 18-32 VDC |
| | 35 W (140 W with heater) | 80 W at 24 VDC (with optional heater) | <12 W nominal, <19 W max., 150 W w/heaters | 50 W nominal at 77 °F | <50 W nominal; <130 W max; 270 W max w/ heaters | 55 W (140 W with heater) |

Daylight Camera Specs
for multi-sensor cameras

| | Sony FCB-EX980S | Sony FCB EX-980S | Sony FCB EX-980S | JVC TK-C1460U |
|-----------------------------------|------------------|------------------|------------------|---------------------------|
| Imaging Device | 1/4" Super HAD | 1/4" Super HAD | 1/4" Super HAD | 1/3" IT CCD; 768 x 494 |
| Day/Night Capable (IR Cut Filter) | s | s | s | s |
| Lens | 26x Optical Zoom | 26x Optical Zoom | 26x Optical Zoom | Fujinon 60x, 12.5 -1500mm |
| Field of view in degrees (h) | | | | |
| Wide | 42° h @ F1.6 | 42° h @ F1.6 | 42° h @ F1.6 | 21.7° x 16.4° |
| Narrow | 1.6° h @ F3.8 | 1.6° h @ F3.8 | 1.6° h @ F3.8 | 0.18° x 0.14° |

THERMAL CAMERA FAMILIES

FLIR's thermal cameras sense and display the tiny differences in heat that are around us all the time. They let users see clearly 24 hours a day, through smoke, in total darkness, and at ranges far beyond daylight and infrared illuminated cameras.

D-Series

When the lights go out, or smoke renders conventional CCTV cameras useless, FLIR's powerful D-Series cameras still see clearly. Available with either a 6mm or a 19mm lens D-Series cameras are flexible enough to meet your range performance requirements. D-series cameras from FLIR are Pelco D compatible; output a standard video signal that works with existing digital video recording devices, video motion detection software, or off-the-shelf mpeg compression, and install easily into existing camera networks. Integrators will appreciate the variety of installation options provided by its industry-standard enclosure. Featuring as many as 32 preset points and up to 100°/second panning speed, D-Series cameras provide maximum coverage and flexibility.



SR-Series

FLIR's powerful SR-Series thermal security cameras complement and complete your security camera network. SR-Series cameras have five available lenses: 6mm (the 52° FOV VSR-6), 19mm (36° FOV), 35mm (20° FOV), 50 mm (14° FOV), & 100mm (7° FOV). The SR-100 is also available in a pressurized enclosure for use in harsher environments. All SR-Series thermal cameras come with Digital Detail Enhancement (DDE), a proprietary algorithm that pulls out image details you might otherwise miss. FLIR's SR-Series thermal security cameras come in industry-standard enclosures, use common mounting hardware, and are compatible with a wide variety of third-party mounts and pedestals. An optional pan/tilt is also available for SR-Series cameras. It is compatible with Pelco D communication protocol, and a wide variety of third-party control solutions.



HRC-Series

High Resolution, Cooled (HRC) cameras are long-range thermal security camera that can detect a man-sized threat from more than 10 miles away. FLIR offers two HRC cameras: the 40x500 HRC-S, and 60x750 HRC-U. Both HRC cameras feature 640x480 cooled InSb detectors for extreme thermal sensitivity and range performance. Security operators can field HRC cameras as portable stand-alone systems, or integrate them into a network of fixed-site sensors through the flexible Nexus server. They are Pelco D compatible, and support both RS-232 and -422 interface communications. Both HRC models feature 12.5x continuous zoom telescopes that provide wide area coverage and long-range, high magnification performance.



MULTI-SENSOR CAMERAS

Coupling visible-light and thermal cameras, FLIR's multi-sensor (MS) systems are flexible, effective tools for 24-hour long-range, high-resolution surveillance. Add some optional components, and MS systems can geo-locate any threat they can see.

PTZ-35 MS / -50 MS

The PTZ-35 MS and PTZ-50 MS are low cost, high-resolution multi-sensor camera systems designed specifically for the security market. These small, pan/tilt systems feature a Sony block color TV camera and powerful thermal cameras with either 35mm or 50mm lens. Also, the thermal cameras provide a 2X e-zoom regardless of your choice in lens configuration. Both systems can be configured for portable or point-to-point use, and are compatible with Pelco D, RS-422, and Nexus communication. They are perfect for security and surveillance applications that demand both compact size and rugged performance. The PTZ-50MS can detect a man-sized threat beyond 3,500 feet.



PTZ-35x140 MS

The PTZ-35x140 MS is a powerful multi-sensor thermal camera system for medium to long-range security applications. The system zooms seamlessly between has two separate thermal imagers: a 35mm camera for short-range situational awareness, and a 140mm camera for long-range threat detection. This gives the PTZ-35x140 MS the performance of military grade imaging systems at a fraction of the cost. Its integrated Sony 980 long-range TV camera is a valuable daylight/low-light imaging tool. A sealed, all-weather pan/tilt enclosure protects the three cameras and allows 360° visibility. The system is fully network enabled, and compatible with Pelco D. The PTZ-35x140MS can detect a man-sized threat at ranges beyond 1.8 miles.



HRC MS and Ranger III MS

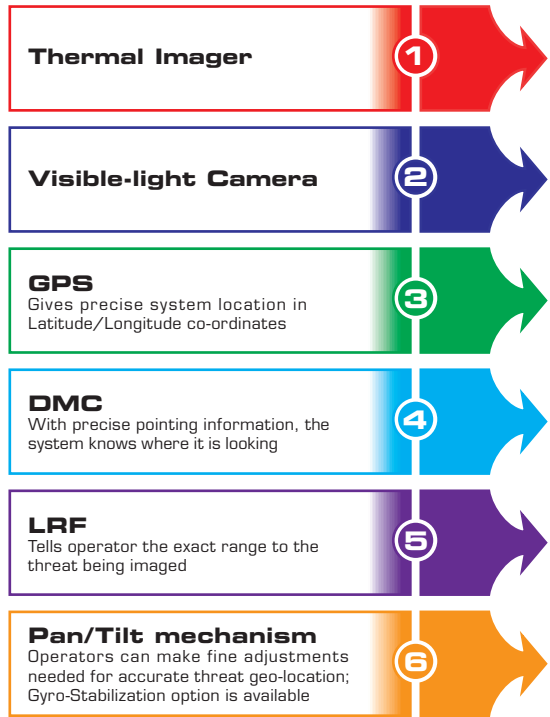
FLIR's Ranger III and HRC high-resolution thermal security cameras provide high-quality thermal video for long-range, 24-hour video security applications. Their operational flexibility gives you both wide-area coverage and long-range, high magnification performance. As multi-sensor systems, the Ranger III and HRC can come with a choice of high performance visible-light cameras, a laser rangefinder, GPS receiver, digital magnetic compass, and stabilized pan/tilt for complete threat detection and location capability. Security operators can field the Ranger III Multi-Sensor or HRC Multi-Sensor as portable stand-alone camera systems, or integrate them into a suite of plug-and-play sensors.



FLIR MULTI-SENSOR SYSTEMS

The power of ultra long-range thermal and visible surveillance coupled with geo-location capability.

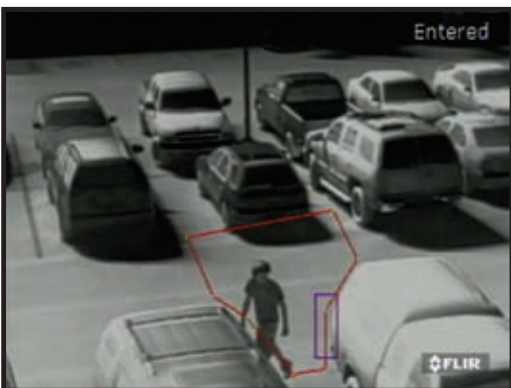
FLIR's family of multi-sensor (MS) systems bring thermal and daylight/lowlight cameras into one package. Our powerful long-range sensors come configured with a variety of optional sensors – including, digital magnetic compass (DMC), laser rangefinder (LRF), and GPS – that provide precision threat geo-location information when coupled with Nexus.



VIDEO ANALYTICS AND THERMAL IMAGING

Intelligent 24-hour automated monitoring matched with best-in-class intruder detection cameras.

Thermal imagers are well suited to video analytics. Day or night, thermal cameras provide excellent scene contrast, critical for high-reliability and reduced false alarms, even during daylight hours.



NEXUS®

Network multiple cameras and multiple users to make your investment in thermal security cameras a truly integrated solution.

Nexus, FLIR's comprehensive software suite, gives security professionals the tools they need to create customizable video and sensor networks quickly and easily.

With an unprecedented level of interconnectivity, Nexus lets end users, OEMs, and integrators alike build intelligent networks, turning a collection of discrete cameras, sensors, and radars into a seamless network. With Nexus, anyone can make FLIR cameras plug and play compatible with existing third-party video and enterprise management systems.

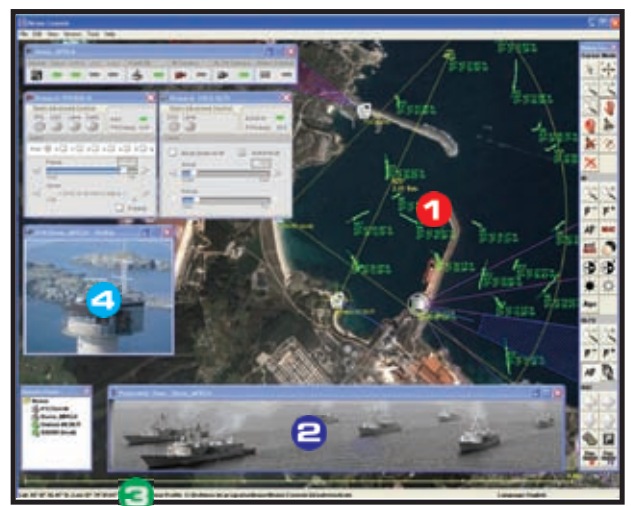
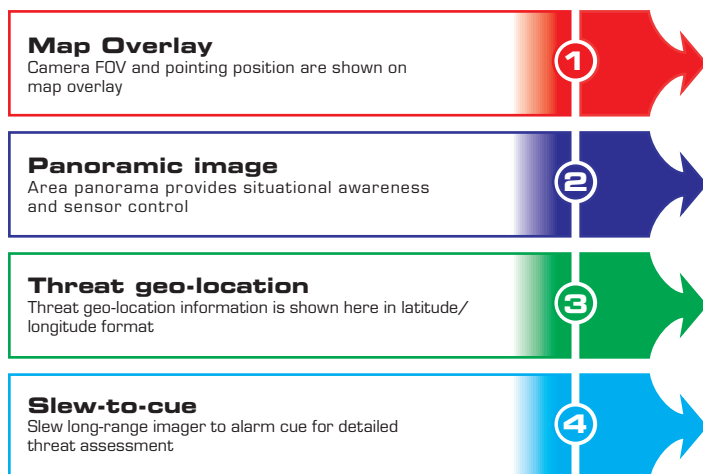
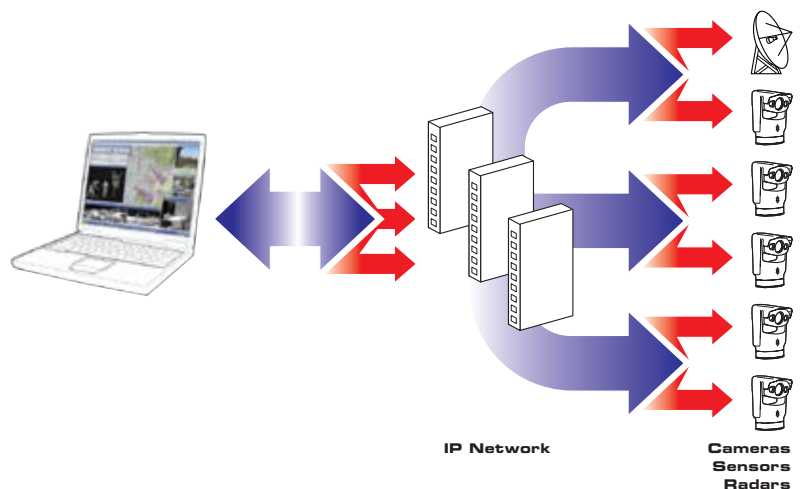
For more demanding installations, OEMs and system integrators can use Nexus tools to build a sophisticated network of cameras, radars, and a wide range of other sensors. Nexus is middleware that facilitates sensor control for your entire security network of thermal and multi-sensor cameras. Integrators can use Nexus as an application layer below a custom user interface, or they can use it right out of the box for a point-to-point installation. Those with advanced software skills and requirements can opt for the software developer's kit for Windows (C and VB) and Linux/Unix using a common, object oriented protocol to all sensors.

Cameras and other sensors in a Nexus environment are precisely geo-referenced, providing operators a high degree of situational awareness using mapping and other advanced display tools. Nexus can provide network interoperability with inter-sensor cueing to radar and fence sensors.

The Nexus middleware solution includes all of the software tools and elements necessary to integrate flexible, reliable sensor network architectures.

FLIR's Nexus Supports Interoperability:

- Plug and play control of FLIR thermal cameras
- Multiple user capability across the network
- Cue cameras to map coordinates
- Supports pre-set tours
- Inter-sensor Cueing
- Audible or e-mail alarm responses
- Geo-referenced maps for Sky Eye View
- Panoramic Mosaic for Situational Awareness



ABOUT FLIR SYSTEMS

FLIR is the world leader in thermal imaging technology.

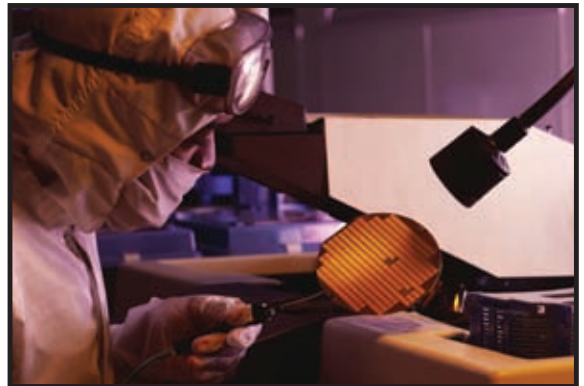
FLIR legacy

With thousands of systems fielded in military, scientific, law enforcement and security applications, FLIR offers unmatched experience and reliability to the security market. FLIR brings military hardened products to the security market at commercial prices.



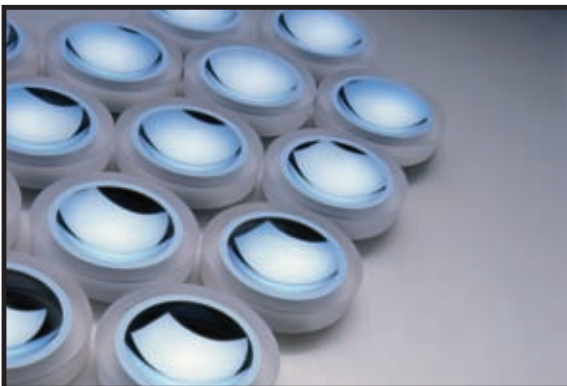
Vertically integrated

FLIR designs and manufactures all of the critical technology inside our products, including detectors and special lenses, and it's all made here in the US. This ensures fast maintenance and support.



Volume production

FLIR thermal security cameras are mass-produced and can be found in a variety of applications including automotive vision enhancement, fire fighting and aviation. Our volume production allows us to extend lower prices to our customers.



A PARTNER FOR SUCCESS

Why choose FLIR as your thermal imaging partner?

As a security solutions provider or security professional, you know how important it is to choose the right partner when you embark on a project. As the largest commercial thermal camera company in the world, FLIR has a long history of standing behind the products we build.

We encourage you to explore the enclosed CD/DVD. In it you will find video from many of FLIR's security products and additional technical material. Because of FLIR's military heritage, many of our products are export controlled, and as such will require export licenses for use outside the US. Some technical content is omitted from this product family overview for export and proprietary reasons. We urge you to contact FLIR by phone to discuss your needs with an Applications Engineer. Additional information can be found at www.FLIR.com.

For basic system questions, pricing, or where to buy locally, call 1.877.773.3547.

Mobile Training Unit Comes To You

Just pick up the phone, and FLIR's Mobile Training Unit (MTU) will be on your doorstep packed with the latest in thermal security cameras. From short-range observation, to precision, long-range threat detection and classification, give us a call to see how FLIR's cameras let you see day and night, in good weather and bad!

Why schedule a free visit from FLIR's MTU? Why wouldn't you? Get hands-on experience with FLIR's advanced and affordable thermal security cameras. Talk with our Security Applications experts and learn how to revolutionize your facility's security. Bottom line: become an expert by learning from the experts. Give us a call today.



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