# Thermal imaging cameras for security and surveillance

FLIR FC-Series S

FLIR SR-Series

FLIR F-Series

FLIR PT-Series

FLIR Compact D-Series

FLIR A310pt

FLIR A310f

FLIR
310

## FLIR Systems: the world leader in thermal imaging cameras

FLIR Systems is the world leader in the design, manufacturing and marketing of thermal imaging systems for a wide variety of commercial, industrial and government applications.

FLIR Systems' thermal imaging systems use state-of-the-art infrared imaging technology that detects infrared radiation - or heat - enabling the user to see in total darkness, in practically all weather conditions. We design and manufacture all of the critical technologies inside our products, including detectors, electronics, and special lenses ourselves.

### Rapidly emerging markets and organization

Interest for thermal imaging has grown considerably over the last few years in a large variety of markets. To face this increased demand FLIR Systems expanded its organization drastically. Today we employ more than 3,200 people. Together, these infrared specialists realize a consolidated annual turnover of more than 1 billion US dollars. This makes FLIR Systems the largest manufacturer of commercial thermal imaging cameras in the world.

### Manufacturing capabilities

FLIR Systems currently operates 5 manufacturing plants: three in the USA (Portland, Boston and Santa Barbara, California) one in Stockholm, Sweden and one in Paris, France.

### Thermal imaging: more than building a camera

There is more to the world of thermal imaging than building a camera. FLIR Systems is not only committed to providing you with the best camera, we are also able to offer you the best software, service and training to suit your thermal imaging needs.

*FLIR Systems, Stockholm*

*FLIR Systems, Portland*

*FLIR Systems, Boston*

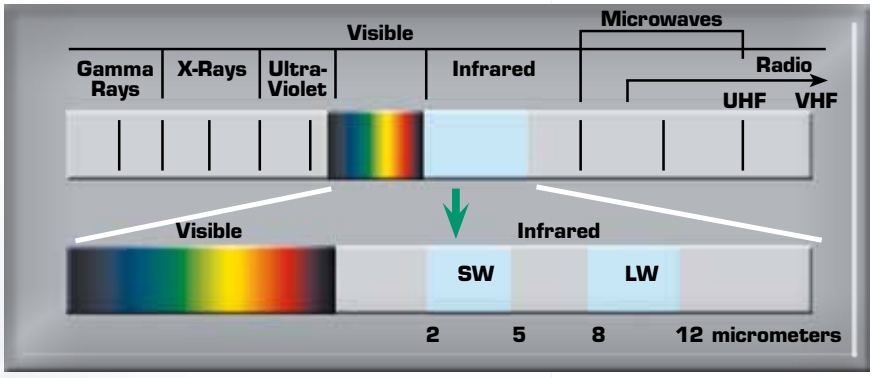
*FLIR Systems, Santa Barbara*

# Infrared:
## more than meets the eye

### Infrared - part of the electromagnetic spectrum

Our eyes are detectors that are designed to detect visible light (or visible radiation). There are other forms of light (or radiation) that we cannot see. The human eye can only see a very small part of the electromagnetic spectrum. At one end of the spectrum we cannot see ultraviolet light, while at the other end our eyes cannot see infrared. Infrared radiation lies between the visible and microwave portions of the electromagnetic spectrum. The primary source of infrared radiation is heat or thermal radiation.

Any object that has a temperature above absolute zero (-273.15 degrees Celsius or 0 Kelvin) emits radiation in the infrared region. Even objects that we think of as being very cold, such as ice cubes, emit infrared radiation. We experience infrared radiation every day. The heat that we feel from sunlight, a fire or a radiator is all infrared. Although our eyes cannot see it, the nerves in our skin can feel it as heat. The warmer the object, the more infrared radiation it emits.

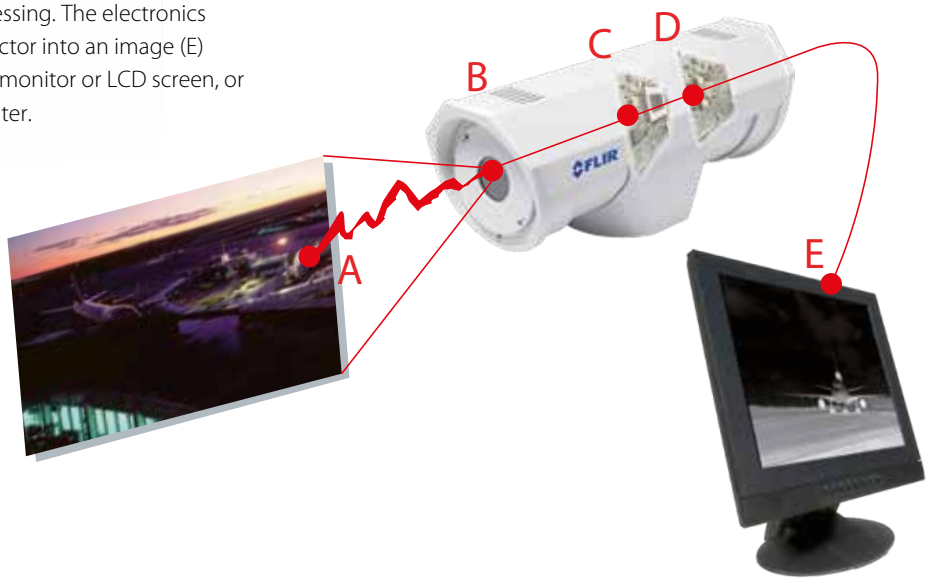


**Thermal security cameras see heat**

Thermal security cameras make pictures from heat energy that is invisible to the naked eye. Everything in the color image above 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 hand.

### The thermal imaging camera

Infrared energy (A) coming from an object is focused by the optics (B) onto an infrared detector (C). The detector sends the information to sensor electronics (D) for image processing. The electronics translate the data coming from the detector into an image (E) that can be viewed on a standard video monitor or LCD screen, or anywhere on a network-enabled computer.



# Thermal imaging cameras:

## a cost effective solution for perimeter protection

Today, the challenge to CCTV professionals is to make sure that video footage is effective on a 24/7 basis, 365 days a year. Securing an area during the daytime is one thing. But what happens during the night? And in weather conditions like fog, rain and snow? What can be detected if CCTV cameras are blinded by the sun?

Whatever solution or technology is chosen for securing an area, they all have their advantages and disadvantages and some technologies are more expensive than others. To get a full picture of the Total Cost of Ownership (TCO) for a certain solution, not only the initial installation cost but also the maintenance cost needs to be taken into account.

Quite a number of technologies are available to help detect potential intruders in the dark.

## Deciding which technology to use

Security managers are more familiar with certain technologies than with others. Before making a final decision about which technology will be implemented to secure a perimeter at night, it is a good idea to have a look at the advantages and disadvantages of each technology.

| | Advantages | Disadvantages |
|---|---|---|
| **CCTV with traditional lighting or LED** | - Good visibility during daytime<br>- Relatively low initial cost | - A lot of cameras need to be installed to cover a large perimeter<br>- Limited detection at night. Light illuminates only certain small area.<br>- Limited capabilities in fog, rain, …<br>- Civil works need to be carried out to install light poles<br>- High power consumption<br>- High maintenance cost for replacing the lights: material and manpower |
| **Electrified Fence** | - Creates a physical barrier<br>- Allows to stop intruders<br>- Works during the night as well | - High installation cost<br>- Full civil works needed<br>- Power consumption<br>- Needs to be complemented with CCTV to see if alarm is false or not.<br>- Light or infrared illumination needed during the night to do this. |
| **RAFID or Sensor Cable** | - Fully automated system<br>- Works in total darkness | - High installation cost<br>- Full civil works needed<br>- Troubleshooting and maintenance after installation<br>- Many false alarms<br>- Needs to be complemented with CCTV to see if alarm is false or not.<br>- Light or infrared illumination needed during the night to do this. |
| **Thermal imaging** | - Full awareness<br>- Can be used day and night<br>- Works in practically all weather conditions.<br>- Can see through light fog, rain, smoke, ...<br>- No downtime, low maintenance<br>- Low power consumption<br>- Extremely difficult to hide from since thermal contrast in practically impossible to mask | - No physical barrier<br>- Potential intruders are easily spotted but not identified |

All technologies have advantages and disadvantages but thermal imaging is a very good and a very cost effective solution for protecting a perimeter. This is definitely true if the perimeter needs to be protected during the night.

Although a thermal imaging camera is a bit more expensive than a CCTV camera, less cameras need to be deployed to cover the same area. The civil works that need to be carried out are minimal. Furthermore, since thermal imaging cameras produce a clear image in the darkest of nights, no complimentary technologies like light or infrared illuminators need to be installed. This limits the amount of civil works that needs to be carried out but is it also reducing the maintenance cost.

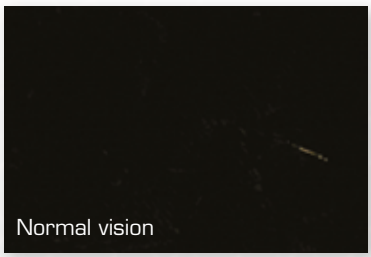
Thermal imaging cameras also generate fewer false alarms which is a common problem with CCTV cameras combined with Video Motion Detection or Video Content Analysis softwares.

Although thermal imaging cameras are a bit more expensive than CCTV cameras at initial purchase, they are often not only the best, but also the most cost effective solution.

# Thermal imaging cameras:
## a wide variety of applications

### See in total darkness

*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 color 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, while visible cameras, which rely on color contrast, fail.*

## Perimeter intrusion or areas too large to illuminate

*Border applications, power 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.*

## 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 do not have this limitation.*

## Situations where lighting is unwelcome

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

# How far can you see with a thermal imaging camera?

## With thermal cameras you can clearly see anything you would see with a conventional camera, and more, day and night. But, how far can you see?

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 camera's range performance is a combination of many factors including target size, lens focal length and atmospheric conditions, to name just a few.

No other manufacturer offers a wider variety of lenses than FLIR Systems. This means that whatever your application might be FLIR Systems has a thermal imaging camera that is perfectly tailored to your individual needs.

*How far you can see depends on many factors including the size of the object you're looking at, and the focal length of the lens you're using. These three images all show people and cars from 2 km away, but they look very different because they use different lenses.*

## Resolution matters

When people talk about a thermal imaging camera's resolution, they're talking about the number of pixels that are forming an image. Just like in photography more pixels means a better image quality.

A higher resolution camera will typically let you see more detail and smaller objects. A higher resolution camera also has a wider field of view. This means that you can see more of the environment and increase situational awareness.

*The 320x240 pixel resolution image on the left shows less image detail than the 640x480 pixel resolution image on the right.*

# With thermal imaging cameras, image quality matters.

## The simple fact is: not all thermal security cameras are created equal.

One of the most important parts of a thermal imaging camera is the detector. Most of FLIR Systems' thermal imaging cameras for security and surveillance applications contain an uncooled Vanadium Oxide (VOx) microbolometer detector. Although other material can be used for producing microbolometer detectors Vanadium Oxide outperforms all of them. Vanadium Oxide microbolometers offers superior image quality in every environment. They even allow you to look directly at the sun or to have the sun in the field of view of the thermal imaging camera and still produce a high contrast thermal image.

*The image on the left was taken by a FLIR thermal imaging camera, which uses a Vanadium Oxide (VOx) microbolometer detector. The one on the right was taken with a camera that uses an Amorphous Silicon detector. Both images were taken at 6pm at the end of a sunny day, but the FLIR image has greater contrast, shows more small details (note the areas outlined in red), and is in focus throughout the entire depth of the image.*

*But just using a VOx microbolometer detector is not enough to ensure you get the best image quality. Without FLIR's proprietary Automated Contrast Enhancement image processing, even a VOx detector will give you a soft, low-detail image when improperly adjusted (right). Compare that to the FLIR image on the left and the difference is clear.*

## Wide Dynamic Range

Delivers high contrast thermal images in the most diverse conditions. FLIR thermal imaging cameras provide high quality thermal images even when the sun is in the field-of-view but also in cold and low contrast thermal scenes. Ideal for working together with video analytics that need properly contrasted images in order not to generate false alarms.

*Thermal image without Wide Dynamic Range*

*Thermal image with Wide Dynamic Range*

# FLIR Application examples

FLIR thermal imaging cameras are used for a wide variety of security and surveillance applications. Ports, airports, warehouses, (petro)chemical installations, and many others, they can all benefit from the power of thermal imaging cameras. Following are just a few examples of how our customers are using FLIR thermal imaging cameras for perimeter protection.

If you would like to know more about any of these applications or if you would like to read about other applications for thermal imaging, please ask for our full application leaflets.

## BASF - Germany

FLIR thermal imaging cameras help secure the perimeter at BASF

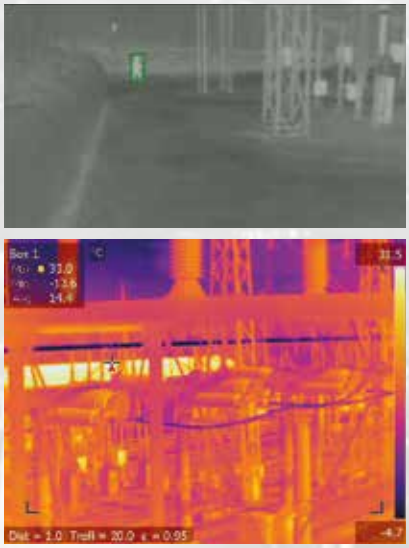
*With over 200 chemical production plants, several hundred laboratories, technical centers, workshops and offices, the BASF headquarters in Ludwigshafen, Germany, is the largest integrated industrial complex in Europe, covering an area of over 10 square kilometers.*

*FLIR SR-Series thermal imaging cameras have been placed at strategic locations along the area's perimeter.*

## Noralarm Lyse - Norway

Thermal imaging cameras protect the perimeter and monitor critical equipment in electrical substation Stavanger, Norway

*By combining the advantages of FLIR thermal imaging security cameras with thermographic on-line condition monitoring Noralarm has provided the Lyse Energy substation with the best all round security solution currently available. With this security system Lyse Energy can ensure that its end users receive a continuous energy supply, undaunted by vandalism, terrorism or breakdowns caused by failing components.*



*By combining thermal imaging security cameras with a thermographic alarm system this electrical substation is provided with the ideal security solution.*

## Solar park - United Kingdom

Solar farm surveillance enhanced with FLIR thermal imaging cameras

*The number of solar parks in Europe is increasing as the demand for renewable energy is rising. To ensure good visibility of intruders in the surveillance system, even at night or in adverse weather conditions, they included thermal imaging cameras in its solar park protection system.*

*The FLIR PT-313 thermal imaging camera can be used to detect a man-sized target from a distance of up to 880 meters, ensuring that no intruder will go unseen.*

## Fossil - Germany

FLIR thermal imaging cameras help secure Fossil Europe headquarters

*To secure its European headquarters – located near Grabenstätt, Germany – Fossil opted for FLIR thermal imaging security cameras.*

*The FLIR SR-334 thermal imaging camera produces detailed high contrast thermal images that allow easy and reliable intruder detection.*

## Estate - United Kingdom

Extremely affordable, maintenance free and environmentally friendly, FLIR thermal imaging cameras can be the ideal security solution for home protection.

*All over the world the perimeters of industrial parks, airports and harbors are being protected with the help of thermal imaging cameras from FLIR Systems, but the security solution big companies choose to protect their assets can be used for home security as well.*

*From their high vantage point these FLIR SR-313 thermal cameras can make the most of their excellent range performance.*

# FLIR Thermal imaging cameras for security and surveillance

Thermal imaging cameras create a virtual security fence. Nuclear plants, petrochemical installations, warehouses, ports and airports, they are all vulnerable to theft or even worse terrorist attacks, and can be protected by thermal imaging cameras. Thermal imagers can detect potential threats for assets and personnel in total darkness, in all weather conditions. You can spot intruders, without being seen yourself.

FLIR Systems offers a full range of thermal imaging cameras for industrial security and surveillance applications. Whatever your needs, FLIR Systems offers you the perfect solution.

Some of our cameras are fixed mount, others are integrated on a robust Pan/Tilt mechanism to further increase situational awareness. Multi-Sensor systems combining a thermal imaging camera and a daylight/low light camera are also available.

FLIR offers a wide variety of choice with regard to lenses and image resolution. Cameras can be installed either in an analog or TCP/IP network.

# FLIR features

## All FLIR thermal imaging cameras for security and surveillance have the following features.

**Crisp thermal images – choice of image quality**
The user can choose for a version equipped with an uncooled Vanadium Oxide (VOx) microbolometer producing crisp images of up to 640 x 480 pixels. Users that do not need this image quality can choose for a 320 x 240 pixels version. Models with a 160 x 120 pixels detector are also available.

More pixels allow the user to see more detail and to detect more and smaller objects. Advanced internal camera software delivers a crisp image without the need for user adjustments. It provides high quality thermal imaging in any night- or daytime environmental conditions.

**Excellent range performance**
Depending on the focal length of the lens thermal imaging cameras can detect targets several kilometers away.

**Digital Detail Enhancement**
Providing high contrast imagery optimized to get the most out of video analytics software. Digital Detail Enhancement ensures clear, properly contrasted thermal images in all weather conditions.

*High contrast scene with standard AGC algorithm applied.*

*DDE applied - all targets can be observed simultaneously.*

**Wide dynamic range**
Delivers high contrast thermal images in all conditions. FLIR thermal imaging cameras provide high quality images even when the sun is in the field-of-view but also in cold and low contrast thermal scenes. Ideal for working together with video analytics.

**Easy to use**
Equipped with an "athermal lens", all thermal imaging cameras are able to maintain focus no matter what the environmental temperature is. There is no need for user adjustments.

**No maintenance needed**
The absence of a motorized focus mechanism prevents mechanical break downs. This guarantees an extremely low total cost of ownership.

**Easy-to-install**
All cameras can be easily connected to common power and video interfaces found in existing and new security systems. They can be easily integrated into any existing CCTV infrastructure. The images can be displayed on virtually any existing display that accepts composite video.

**Serial control interface**
For easy integration in analog video environments. Serial control and analog composite video output enable ready integration into legacy network designs.

**Extremely affordable**
Price is no longer an object to integrate thermal imaging into your new or existing video security networks.

Additional features for each model are specified on the following product pages

# FLIR FC-Series S

## Extremely affordable, network-ready fixed mount cameras

FC-Series S thermal security cameras let you see intruders and other threats to your facility clearly in total darkness and in bad weather. Fully enabled for control and operation over digital and analog networks, FC-Series S thermal imaging cameras are available in high-resolution 640 × 480, and 320 × 240 formats.

**PoE (Power over Ethernet)**
Communication and power supplied with only one cable.

- Standard PoE - IEEE 802.3af PSE – provides full operation with anti-icing
- PoE+ – IEEE 802.3at PSE supports de-icing for extreme cold and/or icy areas where 100% up-time is critical.

**IP control**
The FC-Series S can be integrated in any existing TCP/IP network and controlled and viewed by a wide range of networked devices, including a PC, NVR, smart phone or tablet using FLIR or third-party products.. No additional cables are required. Using this configuration, you can monitor all activity over the network, even when you are thousands of kilometers away. An intuitive web interface allows for easy controlling and adjusting of the camera.

**Video Streaming**
Multiple channels of streaming digital video are available in H.264, MPEG-4, or M-JPEG formats. Simultaneous digital and composite video output is possible.

**Sunshield**
Allows for protection against solar energy and precipitation.

**Designed for use in harsh environments**
The FC-Series S is rated IP66.

**FLIR Sensors Manager**
Each FC-Series S camera comes with a single sensor copy of FLIR Sensors Manager. This intuitive software allows users to manage and control an FC-Series S camera in a TCP/IP network.

ONVIF

YEAR 3 FULL PRODUCT WARRANTY*

YEAR 10 DETECTOR WARRANTY*

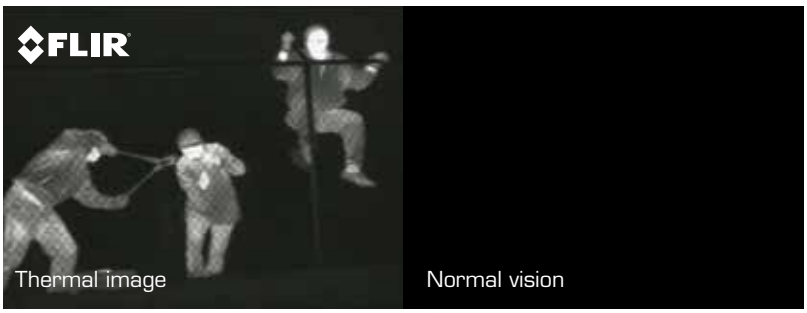
** After product registration on www.flir.com*

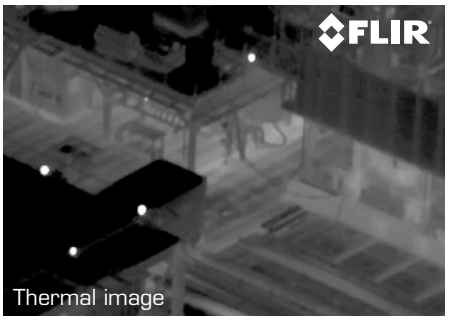
## Different lens options available

The following table gives an overview of the available FC-Series S versions

| | **Available lens options** |
|---|---|
| **320 x 240 pixels*** | FC-363 S : 7.5 mm lens – FOV : 63° (H) x 50° (V) |
| | FC-348 S : 9 mm lens – FOV : 48° (H) x 39° (V) |
| | FC-334 S : 13 mm lens – FOV : 34° (H) x 28° (V) |
| | FC-324 S : 19 mm lens – FOV : 24° (H) x 19° (V) |
| | FC-313 S : 35 mm lens – FOV : 13° (H) x 10° (V) |
| | FC-309 S : 35 mm lens – FOV : 9° (H) x 7° (V) |
| **640 x 480 pixels** | FC-690 S : 7.5 mm lens – FOV : 90° (H) x 69° (V) |
| | FC-669 S : 9 mm lens – FOV : 69° (H) x 56° (V) |
| | FC-645 S : 13 mm lens – FOV : 45° (H) x 37° (V) |
| | FC-632 S : 19 mm lens – FOV : 32° (H) x 26° (V) |
| | FC-618 S : 35 mm lens – FOV : 18° (H) x 14° (V) |

* All 320 x 240 pixels FC-Series S thermal imaging cameras are equipped with an uncooled microbolometer detector with 25µm pixel pitch except for the FC-309 S which is equipped with an uncooled microbolometer detector with a 17µm pitch.



Different installation options exist for the FC-Series S. This optional pedestal mount is Ideal for installation on ledges, walls and from overhead locations such as eaves, tunnel ceilings and bridge decks.

The FC-Series S is available with an optional concealed cable mounting arm bracket. This flexible mount supports simple installation in every environment. When this bracket is used for installation the camera is rated IP66.

# FLIR SR-Series

## Extremely affordable, analog thermal security cameras with excellent range performance

The SR-Series feature the same thermal imaging technology found in many of FLIR's most sophisticated security and surveillance systems, but are packaged for users who have mid-range security and surveillance as their primary application. The SR-Series are excellent tools to install in new or existing security installations. They just need power input and video output connections.

IP66

**Designed for use in harsh environments**
Extremely rugged systems. Their vital core is well protected, meeting IP66 requirements, against dust and water ingress.

*SR-645* *SR-612* *SR-606*

YEAR 3 FULL PRODUCT WARRANTY*

YEAR 10 DETECTOR WARRANTY*

** After product registration on www.flir.com*

160 x 120 320 x 240 640 x 480

## Different lens options available

The following table gives an overview of the available SR-Series versions

| | Available lens options |
|---|---|
| **160 x 120 pixels** | SR-124: 9 mm lens – FOV: 24°(H) x 20°(V) |
| | SR-117: 13 mm lens – FOV: 17°(H) x 14°(V) |
| | SR-112: 19 mm lens – FOV: 12°(H) x 10°(V) |
| **320 x 240 pixels** | SR-348: 9 mm lens – FOV: 48°(H) x 39°(V) |
| | SR-334: 13 mm lens – FOV: 34°(H) x 28°(V) |
| | SR-324: 19 mm lens – FOV: 24°(H) x 19°(V) |
| | SR-313: 35 mm lens – FOV: 13°(H) x 10°(V) |
| | SR-309: 50 mm lens – FOV: 9°(H) x 7°(V) |
| | SR-304: 100 mm lens – FOV: 4.6°(H) x 3.7°(V) |
| **640 x 480 pixels** | SR-645: 13 mm lens – FOV: 45°(H) x 37°(V) |
| | SR-625: 25 mm lens – FOV: 25°(H) x 20°(V) |
| | SR-618: 35 mm lens – FOV: 18°(H) x 14°(V) |
| | SR-612: 50 mm lens – FOV: 12°(H) x 10°(V) |
| | SR-606: 100 mm lens – FOV: 6.2°(H) x 5°(V) |

# FLIR F-Series

## Network-Ready fixed mount cameras

F-Series thermal security cameras let you see intruders and other threats to your facility clearly in total darkness and in bad weather. Fully enabled for control and operation over digital and analog networks, F-Series thermal imaging cameras are available in 640 × 480, 320 × 240, and 160 × 120 formats, providing up to sixteen times the image clarity and longer threat detection range performance than lower resolution cameras.

**Exchangeable camera cassettes**
Exchangeable camera cassettes allow for quick upgrade or repair of sensors and optics. There is no need to send your camera back to the factory if you want to upgrade to better image quality or more range performance. This can easily be done in the field.

**IP control**
The F-Series can be integrated in any existing TCP/IP network and controlled over a PC. No additional cables are required. Using this configuration, you can monitor all activity over the network, even when you are thousands of kilometers away.

**Video Streaming**
Multiple channels of streaming digital video are available in H.264, MPEG-4, or M-JPEG formats. Simultaneous digital and composite video output is possible.

**Continuous E-zoom**
Provides enhanced alarm assessment and optimization of camera field of view. Optionally available on all 640 x 480 pixel models.

**Designed for use in harsh environments**
Extremely rugged systems. Their vital core is well protected, meeting IP66 requirements, against dust and water ingress.

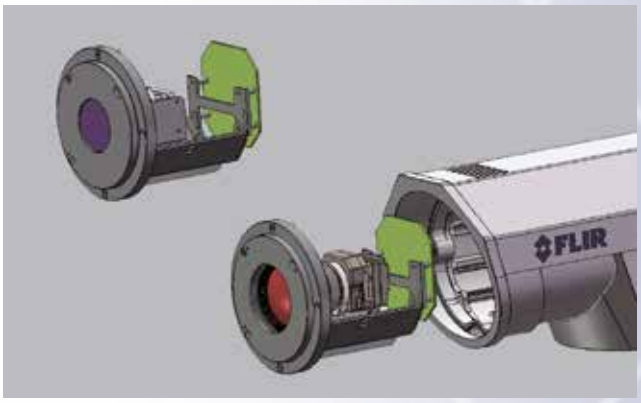
**FLIR Sensors Manager**
Each F-Series camera comes with a single sensor copy of FLIR Sensors Manager. This intuitive software allows users to manage and control an F-Series camera in a TCP/IP network.

ONVIF

YEAR 3 FULL PRODUCT WARRANTY*

YEAR 10 DETECTOR WARRANTY*

** After product registration on www.flir.com*



*Thanks to an "exchangeable cassette" system, the F-Series are field upgradeable. Whether you want to upgrade your existing F-Series to better image quality or if you want more range performance, there is no need to send the camera back to the factory.*

## Different lens options available

The following table gives an overview of the available F-Series versions

| | **Available lens options** |
|---|---|
| **160 x 120 pixels** | F-124: 9 mm lens – FOV: 24°(H) × 20°(V) |
| | F-117: 13 mm lens – FOV: 17°(H) × 14°(V) |
| | F-112: 19 mm lens – FOV: 12°(H) × 10°(V) |
| **320 x 240 pixels** | F-348: 9 mm lens – FOV: 48°(H) x 39°(V) |
| | F-334: 13 mm lens – FOV: 34°(H) x 28°(V) |
| | F-324: 19 mm lens – FOV: 24°(H) x 19°(V) |
| | F-313: 35 mm lens – FOV: 13°(H) x 10°(V) |
| | F-307: 65 mm lens – FOV: 7°(H) x 5°(V) |
| | F-304: 100 mm lens – FOV: 4.6°(H) x 3.7°(V) |
| **640 x 480 pixels** | F-645: 13 mm lens – FOV: 45°(H) × 37° (V) |
| | F-625: 25 mm lens – FOV: 25° (H) × 20°(V) |
| | F-618: 35 mm lens – FOV: 18° (H) × 14°(V) |
| | F-612: 50 mm lens – FOV: 12° (H) × 10°(V) |
| | F-610: 65 mm lens - FOV: 10º (H) x 8º(V) |
| | F-606: 100 mm lens – FOV: 6.2° (H) × 5°(V) |

# FLIR PT-Series

## Network-ready pan-tilt, Multi-sensor thermal security cameras

PT-Series thermal security cameras let you see intruders and other threats to your facility's security clearly in total darkness and in bad weather. The PT-Series precision pan/tilt mechanism gives operators accurate pointing control while providing fully programmable scan patterns, radar slew-to-cue, and slew-to-alarm functionality.

Fully enabled for control and operation over digital and serial networks, PT-Series thermal cameras are available in 160 × 120, 320 × 240, and high-resolution 640 × 480 formats, providing up to sixteen times the image clarity and longer threat detection range performance than lower resolution thermal cameras. Multi-sensor configurations also include a day/night 36× zoom color CCD camera on the same pan/tilt package.

**Precise Pan/Tilt mechanism**
All PT-Series thermal imaging cameras are installed on a precision pan/tilt mechanism. It allows the user to rotate the camera 360° continuously and to tilt it +90° or -90°. This drastically increases situational awareness. The Pan/Tilt has 128 preset postions. Ideal if you want to scan an area continuously.

**Radar Connection – "Slew to cue"**
The PT-Series can be connected by the integrator to a radar system. If the radar detects an object, the PT-Series will automatically turn in the right direction and give you a visual image so that you can instantly see what the blip on the radar screen really means.

**Daylight camera**
All versions are equipped with a long range daylight/low light camera. The video output of the thermal imaging and daylight/low light camera are simultaneously available. The daylight camera offers an 36x optical zoom.

**Exchangeable camera cassettes**
Exchangeable camera cassettes allow for quick upgrade or repair of sensors and optics. There is no need to send your camera back to the factory if you want to upgrade to better image quality or more range performance. This can easily be done in the field.

**IP control**
The PT-Series can be integrated in any existing TCP/IP network and controlled over a PC. No additional cables are required. Using this configuration, you can monitor all activity over the network, even when you are thousands of kilometers away.

**Video Streaming**
Multiple channels of streaming digital video are available in H.264, MPEG-4, or M-JPEG formats. Simultaneous digital and composite video output is standard.

**Continuous E-zoom**
Provides enhanced alarm assessment and optimization of camera field of view. Optionally available on all 640 x 480 pixel models.

**Designed for use in harsh environments**
Extremely rugged systems. Their vital core is well protected, meeting IP66 requirements, against dust and water ingress.

**FLIR Sensors Manager**
Each PT-Series camera comes with a single sensor copy of FLIR Sensors Manager. This intuitive software allows users to manage and control a PT-Series camera in a TCP/IP network.

ONVIF

2 YEAR FULL PRODUCT WARRANTY*

10 YEAR DETECTOR WARRANTY*

*After product registration on www.flir.com

160 x 120 320 x 240 640 x 480

## Different lens options available

The following table gives an overview of the available PT-Series versions

| | Available lens options |
|---|---|
| **160 x 120 pixels** | PT-124: 9 mm lens – FOV: 24°(H) × 20°(V) |
| | PT-117: 13 mm lens – FOV: 17°(H) × 14°(V) |
| | PT-112: 19 mm lens – FOV: 12°(H) × 10°(V) |
| **320 x 240 pixels** | PT-348: 9 mm lens – FOV: 48°(H) x 39°(V) |
| | PT-334: 13 mm lens – FOV: 34°(H) x 28°(V) |
| | PT-324: 19 mm lens – FOV: 24°(H) x 19°(V) |
| | PT-313: 35 mm lens – FOV: 13°(H) x 10°(V) |
| | PT-307: 65 mm lens – FOV: 7°(H) x 5°(V) |
| | PT-304: 100 mm lens – FOV: 4.6°(H) x 3.7°(V) |
| **640 x 480 pixels** | PT-645: 13 mm lens – FOV: 45°(H) × 37° (V) |
| | PT-625: 25 mm lens – FOV: 25° (H) × 20°(V) |
| | PT-618: 35 mm lens – FOV: 18° (H) × 14°(V) |
| | PT-612: 50 mm lens – FOV: 12° (H) × 10°(V) |
| | PT-610: 65 mm lens - FOV: 10º (H) x 8º(V) |
| | PT-606: 100 mm lens – FOV: 6.2° (H) × 5°(V) |

Normal vision

Thermal image

# FLIR D-Series

## Multi-Sensor thermal security cameras in networked, outdoor dome enclosures

The D-Series outdoor dome enclosure provides precision pan/tilt control while providing fully programmable scan patterns, radar slew-to-cue, and slew-to-alarm functionality. Fully enabled for control and operation over IP and serial networks, D-Series systems deploy a 640 x 480 or 320 × 240 pixel thermal imager along with a day/night 36× zoom color CCD camera. FLIR's D-Series thermal multi-sensor security dome cameras are the perfect replacement for day/night dome cameras, providing clear 24/7 imaging capability in an attractive, discrete dome-style enclosure.

**Precise Pan/Tilt mechanism**
All D-Series thermal imaging cameras come with a precision pan/tilt mechanism. It allows the user to rotate the camera 360° continuously and to tilt it +20° to -90°. This drastically increases situational awareness. The Pan/Tilt has 128 preset positions. Ideal if you want to scan an area continuously.

**Daylight camera**
All versions are equipped with a long range daylight/low light camera. The daylight camera offers an 36x optical zoom.

**IP control**
The D-Series can be integrated in any existing TCP/IP network and controlled over a PC. No additional cables are required. Using this configuration, you can monitor all activity over the network, even when you are thousands of kilometers away.

**Radar Connection – "Slew to cue"**
The D-Series can be connected by the integrator to a radar system. If the radar detects an object, the D-Series will automatically turn in the right direction and give you a visual image so that you can instantly see what the blip on the radar screen really means.

**Continuous E-zoom**
Provides enhanced alarm assessment and optimization of camera field of view. Optionally available on all 640 x 480 pixel models.

**Video Streaming**
Multiple channels of streaming digital video are available in H.264, MPEG-4, or M-JPEG formats. Simultaneous digital and composite video output is standard.

**FLIR Sensors Manager**
Each D-Series camera comes with a single sensor copy of FLIR Sensors Manager. This intuitive software allows users to manage and control a D-Series camera in a TCP/IP network.

ONVIF

YEAR 2 FULL PRODUCT WARRANTY*

YEAR 10 DETECTOR WARRANTY*

** After product registration on www.flir.com*

320 x 240 640 x 480

NEW

# FLIR Compact D-Series

The FLIR D-Series is now also available as a compact network-enabled enclosure. It can be mounted in ball up and ball down position, giving you more flexibility

## D-Series outdoor domes: different lens options available

The following table gives an overview of the available D-Series versions

| | Available lens options |
|---|---|
| **320 x 240 pixels** | D-348: 9 mm lens – FOV: 48°(H) x 39°(V) |
| | D-334: 13 mm lens – FOV: 34°(H) x 28°(V) |
| | D-324: 19 mm lens – FOV: 24°(H) x 19°(V) |
| | D-313: 35 mm lens – FOV: 13°(H) x 10°(V) |
| **640 x 480 pixels** | D-645: 13 mm lens – FOV: 45°(H) x 37°(V) |
| | D-625: 25 mm lens – FOV: 25°(H) x 20°(V) |
| | D-618: 35 mm lens – FOV: 18°(H) x 14°(V) |

# FLIR A310f/A310pt

## Thermal imaging cameras able to measure temperatures. Monitor critical equipment and protect your perimeter with the same camera

FLIR A-Series can be installed almost anywhere to monitor your critical equipment and other valuable assets. They will safeguard your plant and measure temperature differences to assess the criticality of the situation. This allows you to see problems before they become costly failures, preventing downtime and enhancing worker safety. They can also be used for Security & Surveillance.

Although most of the thermal imaging cameras that are being used in a Security & Surveillance environment do not need to measure temperatures there are some cases in which the ability to measure temperature offers advantages. Definitely when Security & Surveillance needs to be combined with temperature monitoring of critical installations.

A typical example is substation monitoring. With a thermal imaging camera that is able to measure temperatures you can monitor transformers and other substation equipment during daytime. At night, the same thermal imaging camera can be used for perimeter security.

Other examples include waste bunker or coal pile monitoring and any other application where fire prevention needs to be combined with security and surveillance.

**Built-in extensive analysis functions**
Spot, area measurement. Difference temperature functions (FLIR A310f only)

**Built-in alarm functions**
As function of analysis or internal temperature.
As function of digital input (FLIR A310f only).

**Ethernet/IP and Modbus TCP compliance (only FLIR A310f)**
Easy sharing of analysis, alarm results to PLC's.

**Messaging functionality (only FLIR A310f)**
The camera automatically sends analysis results, IR images and more as an e-mail on schedule or at alarm. Autonomous dispatch of files or e-mails, acting as an FTP- or SMTP-client.

**MPEG-4 streamed video**
MPEG-4 streamed video output over Ethernet to show live images on a PC, 640x480 with overlay up to 30 Hz, system dependent.

**PoE (Power over Ethernet, only FLIR A310f)**
Communication and power supplied with only one cable.

**Digital inputs/outputs (only FLIR A310f)**
For alarms and control of external equipment.

**Video output**
Composite video output, PAL and NTSC compatible.

**Lens**
The FLIR A310f and FLIR A310pt come standard with a built-in 25 degree lens with both motorized focus and autofocus. Optional lenses are available.

**High sensitivity < 50 mK**
< 50 mK thermal sensitivity captures the finest image details and temperature difference information.

**Remote control**
Remote control of the camera over the Web and TCP/IP protocol.

**16 bit image (only FLIR A310f)**
16 bit radiometric image streaming to PC for analysis.

**Built-in 100 Mb Ethernet connection**
100 Mb Ethernet.

**Designed for use in harsh environments**
Extremely rugged systems. Their vital core is well protected, meeting IP66 requirements, against dust and water ingress.

**FLIR Sensors Manager**
Each FLIR A310f and FLIR A310pt 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.

**FLIR A310f**
The A310f is a fixed mounted camera. Once installed it always looks in the same direction. It is ideal for monitoring critical installations and to protect the perimeter at the same time.

**FLIR A310pt**
The FLIR A310pt pan/tilt has all the necessary features and functions to build single- or multi-camera solutions. The FLIR A310pt can pan +/- 360º continuous and tilt +/- 45º. It is ideal to cover large areas. Typical application examples are coal pile, waste bunker and sub-station monitoring.

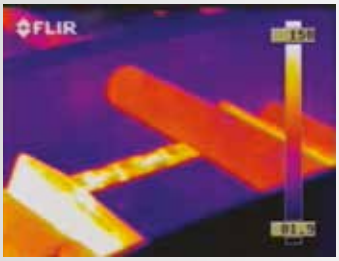
The FLIR A310 pt is a multi-sensor and includes a lowlight 36x zoom color CCD camera. It can be connected to a radar in a so called "slew-to-cue" configuration.

## Who can benefit from FLIR thermal imaging cameras with temperature measurement capabilities?

Anyone that has an application where temperatures need to be monitored and for whom perimeter security is also important. Typical examples are:

*Digital photo and thermal image of a substation showing a transformer with excessive temperature.*

- Power Generation and Distribution
- Sub-station monitoring
- Critical equipment monitoring
- Natural gas processing, transport and storage
- Fire prevention in storage areas
- Flare detection
- Fire prevention on coal piles
- Fire prevention in wood storage areas
- Fire prevention in waste storage areas




*Thermal imaging offers another pair of "eyes" to see through the steam into the log vat for proper log alignment.*

*Operators cannot see through the steam cloud caused by condensation in cooler air temperatures.*

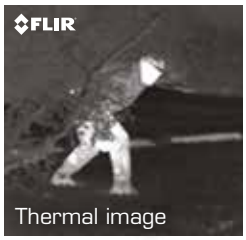
*FLIR A310 f and A310 pt-Series thermal imaging cameras can not only be used for temperature monitoring but for security applications as well. Monitor your equipment and protect your perimeter with one camera.*

# FLIR Networked Systems

## Your partner for intelligent TCP/IP sensor networks

Modern security systems are becoming more and more complex. A security network consists of various types of sensors that need to work together in order to offer maximum performance. Radar, perimeter and ground sensors, CCTV cameras, thermal imaging cameras and other sensors need to be geo-referenced and interconnected in "slew to cue" configurations.

FLIR Systems thermal imaging cameras can be configured for standalone use. But they are also "intelligent sensors". They can be easily deployed as plug & play elements in a TCP/IP network.

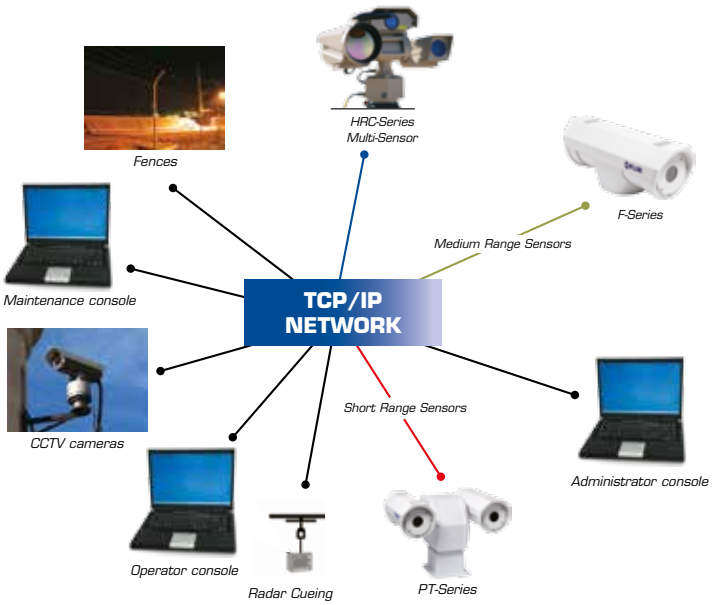


**FLIR Networked Systems**
The mission of FLIR Networked Systems is to support systems integrators that want to include FLIR Systems thermal imaging cameras and third party sensors in modern security networks.

FLIR Networked Systems is a group of highly skilled professionals that can help systems integrators, product manufacturers, government agencies and commercial end users to focus on their core business activities and quickly respond to changing market conditions.

**Your experienced partner**
FLIR Networked Systems delivers components and services for critical security and surveillance applications to companies around the world. We have built stable relationships with commercial and technological partners and work closely together with the engineering teams of many systems integrators and product manufacturers.

Basing their solutions on our tools, solution providers can reduce software development costs and integration risks.




*FLIR Networked Systems offers tools and expertise to help systems integrators deploy professional sensor networks.*

# FLIR Networked Systems offers a wide variety of products to help you set up a professional security network:

## Software

**Middleware / OEM**

Our software agents or servers turn each sensor into a plug & play manageable network object in TCP/IP networks. The server resides in each of the sensors in the network making it a network manageable node. Drivers are available for devices such as: thermal imaging and CCTV Cameras, Radars, Alarm Contacts, Fence & Ground Sensors, Vehicles, UAV or Meteo Stations.

**Client Applications**

FLIR Networked Systems also offers client applications that make our sensor servers become visible and easy-to-use by operators. These are all based on FLIR Networked Systems' developers tools.

- FLIR Sensors Manager
- Console Plug-ins: (VMD, Target Acquisition and Tracking, Video Filters and Electronic Stabilization, Advanced Cartography, Radar Tracks Display)
- Software based VideoWall

## Developers Tools

These allow developers to build their own Command and Control applications to manage and control sensors. Our toolkits include libraries for communications, image processing and video display or moving maps..

## SDK - "easy-to-integrate"

SW developers can use the Nexus SDK and technical support to easily develop their own command & control or sensor and video management applications.

**FLIR Video Player**

ActiveX control that provides a set of functions to display and process video from different sources. The FLIR Video Player provides video functions to be integrated in high level software applications.

## Professional Services

Our past experience as systems integrators and with the devices allows us to help you minimize your network challenges and reduce your operating costs. We offer consulting, training and support services based on this know-how in the following fields:

- System Architecture Design and Networking
- Training & On Site Support and New Products

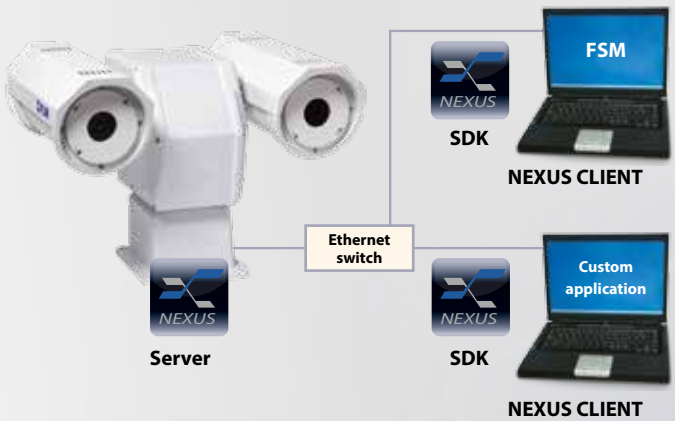
## FLIR Networked Systems: serving different types of customers

**End Users:**

They demand open, flexible and scalable architectures that allow them to manage their security network and use multiple vendors.

**Systems Integrators:**

Want to integrate and deploy complex systems and need "easy-to-integrate" sensors and low-level tools (SDK) that can make their job easier, reducing risks, schedules and software development costs.




**FLIR Developers Network (FDN)**

FDN was created as a support framework for integrators and software developers that are using Nexus software Developers Kit (SDK) and FLIR Video Player to program their own applications. Standard on-line registration to FLIR Developers Network is available free of charge to all customers.

Some customers want to have some extra support when using our developers tools to embed FLIR Systems thermal imaging cameras into their software architecture. These customers can now count on software specialists from FLIR Networked Systems. Different support packages are available. Contact your local FLIR Systems office for more information.

NEW

# FLIR Sensors Manager 2012

## Software to manage and control FLIR Systems thermal imaging cameras.

FLIR Sensors Manager offers powerful and efficient management capabilities for any security installation with FLIR Systems thermal imaging cameras. FLIR Sensors Manager allows to automatically locate FLIR Systems thermal imaging cameras in the network and to easily control them. Just connect the thermal imaging camera to the network, install FLIR Sensors Manager and hit the "discover" button and you will be able to manage and control the camera. Thanks to FLIR Sensors Manager, the management of FLIR Systems thermal imaging cameras over a network will become extremely easy. The 2012 version adds new features and usability.

**Easy to use**

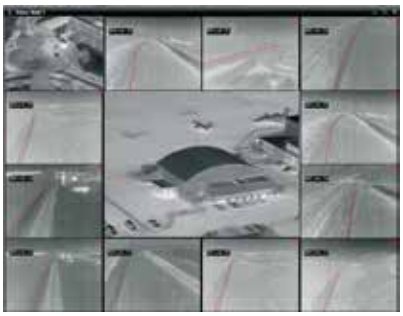
FLIR Sensors Manager is a commercial "Out of the Box" software. Fully designed and supported by FLIR Systems, this application guaranties an intuitive and simple user experience. Just install the software and you will be ready to use it immediately. You can even tailor the layout to your own needs.

**Different packages available**

FLIR Sensors Manager 2012 is available in two different packages: Basic Video Security and Pro bundle. Depending on your exact needs and network complexity, you can choose the version that best fits your system's requirements. A free Demo version is available and can be downloaded at support.flir.com

*Geo-mapping allows to geo-calibrate a map so that any geo-referenced Nexus sensor can be managed and displayed on it. This feature adds usability and situational awareness and is included in the Pro version of FLIR Sensors Manager.*

*Manage & display internal and external alarm events, including video analytics.*



*Video walls and other video management features allow for effective display of video and information, including alarms.*

### BASIC VIDEO SECURITY:

The new Basic version of FLIR Sensors Manager allows to:

- Discover sensors in the network
- Command and control of multiple networked sensors: focus, pan/tilt, zoom…
- Display network video
- Manage presets and scan lists
- Create panoramas
- Configure user profiles (toolbars, layout, permissions, …)
- Display video on multiple monitors
- Capture images
- Video Walls and other video management features

**PRO:**
Contains a number of useful modes that will help you make the most out your security network.

**Video analytics**
- Video Motion Detection: FLIR´s proprietary algorithm will work on thermal or visible video
- Target detection with alarms based on spatial rules like trip wires crossing or areas triggered by enter, exit or both events
- Software based video-tracking of moving objects for control of PTZ sensors
- Step, Stare and Alarm functionality

**E-stab**
Provides a steady image. Can be extremely useful when cameras are installed on high poles where they can be affected by wind or vibration

**Radar cueing and radar tracks display**
Allows display of real-time position and classification information of radar targets (ID, course, speed, lat/lon, classification, …) coming from Nexus enabled radars.

Allows users to command cameras in advanced radar slave modes (ARPA tracking).

**Video walls and advanced video modes**
Allows fully configurable video mosaic layouts, supporting both network and analog frame grabber sources.

The Analytics capabilities of the Pro version add new functions to Video Walls, such as the new Analytics Scheduler or the Step, Stare and Alarm mode.

NEW

**FLIR nDVR software included**
The Pro version of FLIR Sensors Manager allows for simple nDVR management. There is no need to install a separate nDVR. You can now use a PC to record video streams. Recording can be started manually or scheduled.

**Geo-mapping**
Integrated map features include, among others:
- Real-time sensor status display
- Sensor command and control
- Waypoints management
- Customizable datum, units, etc.

**Connect a large number of sensors**
Both the Basic and the Pro versions of FLIR Sensors Manager allow multiple users to share monitoring and control of multiple FLIR Systems thermal imaging cameras.

Packages can be upgraded so that FLIR Sensors Manager can grow together with your security network.

**Control a wide variety of sensors**
FLIR Sensors Managers not only works together with FLIR Systems thermal imaging cameras. Using Nexus technology, it can also be used to control a wide variety of other sensors like radars, ground sensors and many others and to make these sensors interact with FLIR Systems thermal imaging cameras in so called "slew-to-cue" configurations.

**Support for multiple languages**
FLIR Sensors Manager can be configured to work in different languages, including English, French, German, Italian, Spanish, Chinese, Japanese, Russian, Arabic, Portuguese and Polish

## FLIR Sensors Manager Demo, Basic and Pro Features Comparison Chart

| Features | Demo | Basic | Pro |
|---|---|---|---|
| Discover sensors in the network | • | • | • |
| Point-to-point sensor control: focus, pan/tilt, zoom… | • | • | • |
| Display network video | • | • | • |
| Define presets and manage scan lists | • | • | • |
| Create panoramas | • | • | • |
| Customizable user profiles (toolbars, layout, etc) | • | • | • |
| Work on multiple monitors | • | • | • |
| Capture images | • | • | • |
| Video walls and video management tools | | • | • |
| Geo-mapping | | | • |
| Video analytics | | | • |
| e-stab (electronic stabilization) | | | • |
| Radar cueing / radar tracks display | | | • |
| Workstation status monitoring | | | • |
| User triggered alarms | | | • |
| Export video alarms | | | • |
| FLIR nDVR software | | | • |
| Maximum number of managed sensors | 1 | 10 | 100 |

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NEW

# FLIR Sensors manager supports thermal imaging cameras with temperature measurement capabilities

FLIR Sensors manager does not only allow controlling F-, PT- and D-Series thermal imaging cameras. It is also suited for managing thermal imaging cameras with temperature capabilities like the FLIR A310f and FLIR A310pt.

FLIR Sensors Manager allows you to get the most out of your thermal imaging camera with temperature measurement capability. It is ideal for monitoring critical infrastructure and for preventing fires.

FLIR Sensors Manager allows to automatically locate FLIR A310pt and FLIR A310f cameras in the network. They can be easily controlled and set-up in a distributed multi-camera environment.

**STEP, STARE AND CHECK TEMPERATURE**

Allows to look at Regions Of Interest periodically. If the temperature rises above a by the operator set value, an alarm will go off.

**IMAGE AND SETTINGS**

You can change the color palette, choose appropriate image quality, manage image adjustments and select overlay graphics.

**WIDE RANGE OF ANALYSIS POSSIBILITIES**

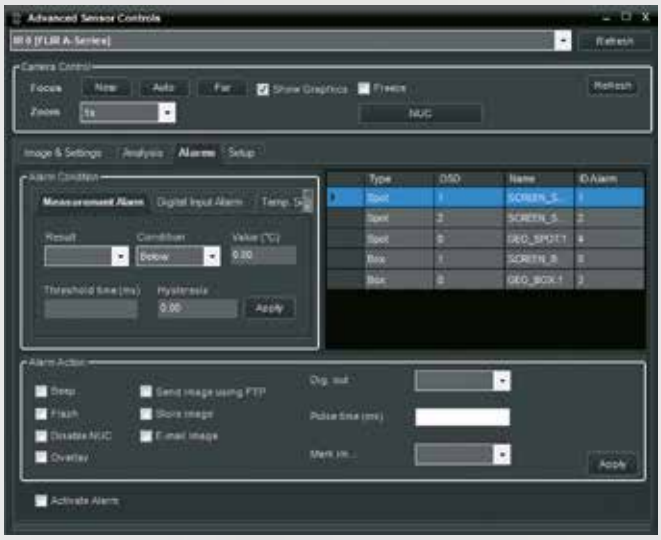
FLIR Sensors Manager allows for putting spots or boxes on the thermal images so that temperature values can be read. You can also create geo-referenced spots and areas when using a FLIR A310pt thermal imaging camera.

**ALARMS SETTINGS**

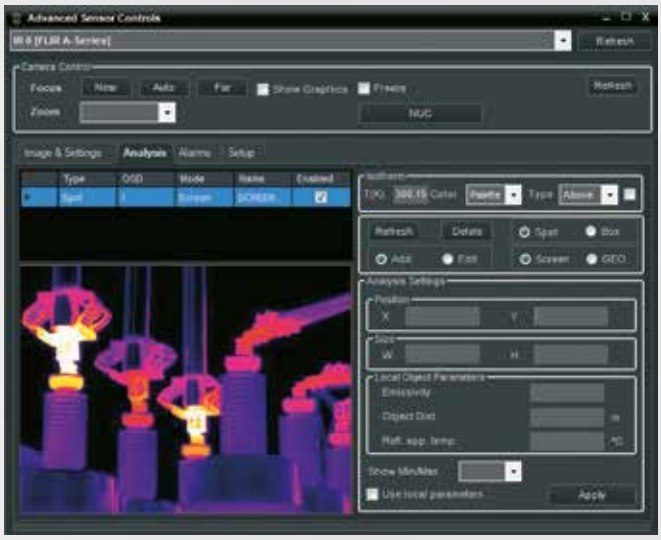
Allows configuring alarm conditions. Measurement alarms, digital input alarms, temperature sensors alarms.

All features are included in the Basic version of FLIR Sensors Manager. All the functionality that is necessary for protecting your perimeter will be available as well.

Combined with FLIR Sensors Manager your FLIR A310f and FLIR A310 pt thermal imaging cameras will become real dual use systems: temperature monitoring of critical installations and perimeter security.



*FLIR Sensors Manager allows for easy setting of alarm conditions and alarm actions*



*With FLIR Sensors Manager you can geo-reference your thermal imaging camera and easily change image settings, alarm conditions,...*

# ITC

## FLIR Infrared Training Center

The Infrared Training Center (ITC) offers the world's leading infrared training.

Although all our cameras are designed for easy installation and operation, there is a lot more to thermal imaging than just knowing how to handle the camera. As the leading company for thermal imaging technology, we like to share our knowledge with our customers and other interested parties.

We therefore organize regular courses and seminars. We also organize in-company training on request, so that you, or your staff, can gain familiarity with thermal imaging and its applications.

The ITC not only welcomes FLIR Systems customers but also users of other brands of cameras. In fact, anyone who wants to learn more about thermal imaging for any applications, before deciding to purchase a camera, is also invited.

The mission of the ITC is to make our customers and partners successful by enhancing their knowledge of IR technology, thermal imaging products, and relevant security and surveillance applications. The ITC offers a portfolio of courses that presents the right mix of theoretical and practical content to help professionals quickly apply thermal imaging technology to real life applications.

All courses are a perfect mix between theoretical fundamentals and practical excercises. For our customers, this means that attending one of the ITC's courses will give you a real hands-on learning experience.

**Follow one of our courses and become a thermal imaging expert.**

*Each ITC course is a pefect combination of theoretical fundamentals and practical excercises. It guarantees participants a real hands-on learning experience.*

# AFTER SALES

## FLIR After Sales

At FLIR Systems, building a relationship with a customer takes more than just selling a thermal imaging camera. After the camera has been delivered, FLIR Systems is there to help meet your needs.

Once purchased, thermal imaging camera are vital pieces of equipment. The safety and security of assets and people depends on it. To keep them running at all times, we operate a worldwide service network. In EMEA we have subsidiaries in France, Germany, Italy, the Netherlands, Sweden and the United Kingdom.

If there should be a problem with one of our camera systems, these local service centers have all the know-how and equipment to solve it within the shortest possible time. Local camera service gives you the assurance that your system will be ready for use again within an extremely short timeframe.

Buying a thermal imaging camera is a long-term investment. You need a reliable supplier who can provide you with support over a long period of time.

Our service personnel regularly follows training programs at our production facilities in Sweden or the USA. Not only to learn about the technical aspects of the products, but also to familiarize themselves with your individual customer requirements and the latest applications.

Different types of maintenance contracts can be offered to make sure that, whatever happens, your thermal imaging camera is always available for use.

**CUSTOMER CARE is not just a slogan.**
**We write it in capital letters at FLIR.**

# Range Performances

## Range performances for FC-S, SR-, F-, PT-, and D-Series with 320 x 240 pixels detector

### Detection, Recognition, Identification of Human Target

| | |
|---|---|
| 9 mm lens | Detection approx. 230 m<br>Recognition approx. 57 m<br>Identification approx. 28 m |
| 13 mm lens | Detection approx. 330 m<br>Recognition approx. 82 m<br>Identification approx. 41 m |
| 19 mm lens | Detection approx. 490 m<br>Recognition approx. 124 m<br>Identification approx. 62 m |
| 35 mm lens | Detection approx. 880 m<br>Recognition approx. 225 m<br>Identification approx. 112 m |
| 35 mm lens with 17µm pixel pitch | Detection approx. 1,080 m<br>Recognition approx. 320 m<br>Identification approx. 160 m |
| 50 mm lens | Detection approx. 1,280 m<br>Recognition approx. 320 m<br>Identification approx. 160 m |
| 65 mm lens | Detection approx. 1,650 m<br>Recognition approx. 410 m<br>Identification approx. 205 m |
| 100 mm lens | Detection approx. 2,400 m<br>Recognition approx. 600 m<br>Identification approx. 300 m |

### Detection, Recognition, Identification of Vehicle with 2.3 m critical dimension

| | |
|---|---|
| 9 mm lens | Detection approx. 700 m<br>Recognition approx. 175 m<br>Identification approx. 88 m |
| 13 mm lens | Detection approx. 1,000 m<br>Recognition approx. 250 m<br>Identification approx. 125 m |
| 19 mm lens | Detection approx. 1,500 m<br>Recognition approx. 375 m<br>Identification approx. 190 m |
| 35 mm lens | Detection approx. 2,700 m<br>Recognition approx. 680 m<br>Identification approx. 340 m |
| 35 mm lens with 17µm pixel pitch | Detection approx. 3,250 m<br>Recognition approx. 950 m<br>Identification approx. 495 m |
| 50 mm lens | Detection approx. 3,800 m<br>Recognition approx. 970 m<br>Identification approx. 490 m |
| 65 mm lens | Detection approx. 4,900 m<br>Recognition approx. 1,250 m<br>Identification approx. 630 m |
| 100 mm lens | Detection approx. 7,100 m<br>Recognition approx. 1,840 m<br>Identification approx. 920 m |

## Range performances for FC-S, SR-, F-, PT- and D-Series with 640 x 480 pixels detector

### Detection, Recognition, Identification of Human Target

| | |
|---|---|
| 13 mm lens | Detection approx. 440 m<br>Recognition approx. 112 m<br>Identification approx. 56 m |
| 19 mm lens | Detection approx. 640 m<br>Recognition approx. 160 m<br>Identification approx. 80 m |
| 25 mm lens | Detection approx. 930 m<br>Recognition approx. 230 m<br>Identification approx. 116 m |
| FC-Series S 35 mm lens | Detection approx. 1,080 m<br>Recognition approx. 272 m<br>Identification approx. 136 m |
| 35 mm lens other models | Detection approx. 1,280 m<br>Recognition approx. 320 m<br>Identification approx. 160 m |
| 50 mm lens | Detection approx. 1,700 m<br>Recognition approx. 430 m<br>Identification approx. 215 m |
| 65 mm lens | Detection approx. 2,200 m<br>Recognition approx. 550 m<br>Identification approx. 275 m |
| 100 mm lens | Detection approx. 2,950 m<br>Recognition approx. 750 m<br>Identification approx. 380 m |

### Detection, Recognition, Identification of Vehicle with 2.3 m critical dimension

| | |
|---|---|
| 13 mm lens | Detection approx. 1,340 m<br>Recognition approx. 340 m<br>Identification approx. 170 m |
| 19 mm lens | Detection approx. 1,950 m<br>Recognition approx. 500 m<br>Identification approx. 250 m |
| 25 mm lens | Detection approx. 2,800 m<br>Recognition approx. 710 m<br>Identification approx. 360 m |
| FC-Series S 35 mm lens | Detection approx. 3,250 m<br>Recognition approx. 835 m<br>Identification approx. 410 m |
| 35 mm lens other models | Detection approx. 3,850 m<br>Recognition approx. 950 m<br>Identification approx. 495 m |
| 50 mm lens | Detection approx. 5,100 m<br>Recognition approx. 1,320 m<br>Identification approx. 660 m |
| 65 mm lens | Detection approx. 6,500 m<br>Recognition approx. 1,650 m<br>Identification approx. 840 m |
| 100 mm lens | Detection approx. 8,800 m<br>Recognition approx. 2,300 m<br>Identification approx. 1,160 m |

*Actual range may vary depending on camera set-up, environmental conditions, user experience and type of monitor or display used.*
*Assumptions: 50 % probability of achieving objective at specified distance given 5°C temperature difference and 0.95 / km atmospheric attenuation factor.*

# FC-SERIES S

## Technical specifications

### FC-Series S: general specifications

| Imaging performance | |
|---|---|
| Detector type | Focal Plane Array (FPA), uncooled Vanadium Oxide (Vox) microbolometer |
| Spectral range | 7.5 to 13.5µm |
| Thermal sensitivity | <50 mK f/1.0 |
| Image frequency | NTSC: 30Hz or 7.5Hz<br>PAL: 25Hz or 8.33Hz |
| Focus | Focus free, athermal lens |
| Image processing | Automatic Gain Control (AGC),<br>Digital Detail Enhancement (DDE) |

| System features | |
|---|---|
| Automatic heater | Clears ice from windows<br>Automatic deicing, tested according to MIL-STD-810F Method 521.1 |

| Image presentation | |
|---|---|
| Video output | PAL or NTSC, hybrid IP and analog |
| Video over Ethernet | Two independent channels of streaming MPEG-4, H.264, or M-JPEG |
| Streaming Resolutions | D1: 720x576, 4CIF: 704x576, Native: 640x512, Q-Native: 320x256, CIF: 352x288, QCIF: 176x144 |
| Thermal AGC Modes | Auto AGC, Manual AGC, Plateau Equalization AGC, Linear AGC, Auto Dynamic Detail Enhancement (DDE), Max Gain Setting |
| Thermal AGC Region of Interest (ROI) | Default, Presets and User definable to insure optimal image quality on subjects of interest |
| Image Uniformity Optimization | Automatic Flat Field Correction (FFC) - Thermal and Temporal Triggers |

| Power* | |
|---|---|
| Requirements | Power over Ethernet<br>PoE IEEE 802.3af-2003 or<br>PoE+ (IEEE 802.3at-2009 standard)<br>12-38 VAC<br>11-56 VDC |
| Consumption | 5 W nominal at 24 VDC<br>8 VA nominal at 24 VAC<br>21 W peak at 24VDC, with heaters<br>29VA peak at 24VAC, with heaters |

| Environmental specifications | |
|---|---|
| Operating temperature range | -50°C to +70°C (Cold start: -40ºC to +70ºC) |
| Storage temperature range | -55ºC to +85ºC |
| Encapsulation | IP66 (IEC 60529) |
| Shock | Mil-Std-810F |
| Vibration | IEC 60068-2-27 |

| Physical characteristics | |
|---|---|
| Camera Weight | 1.8 kg without sunshield<br>2.2 kg with sun shield |
| Camera Size (L x W x H) | 259 mm x 114 mm x 106 mm without sunshield<br>282 mm x 129 mm x 115 mm with sun shield |
| Shipping weight (camera + packaging) | 2.8 kg |
| Shipping size (camera + packaging) (L x W x H) | 366 mm x 188 mm x 178 mm |

| Interfaces | |
|---|---|
| TCP/IP | Yes |

| Network | |
|---|---|
| Supported Protocols | IPV4, HTTP, Bonjour, UPnP, DNS, NTP, RTSP, RTCP, RTP, TCP, UDP, ICMP, IGMP, DHCP, ARP, SCP |
| Network Application Programming Interfaces (APIs) | Nexus SDK for comprehensive system control and integration<br>Nexus CGI for http command interfaces<br>ONVIF 2.0 Profile S |

**Approvals**

EN55022:2010, Class A
EN 61000-3-3: 2008
EN 61000-3-2: 2006+A1: 2009 & A2 2009
EN55024:2010
EN51030-4: 2011
FCC Part 15, Subpart B, Class A
IP 66 (IEC 60529)
IEC 60068-2-27

**Standard package**

Thermal imaging camera, sun shield, operator manual, FLIR Sensors Manager single sensor CD

** Please consult product installation and operation guides for details of system power requirements*

### FC-Series S: version specific specifications

| Sensor resolution | 320 x 240** | 640 x 480 |
|---|---|---|
| Name/Focal length/ Field of view | FC-363 S:<br>7.5 mm lens – FOV : 63° (H) x 50° (V)<br>FC-348 S:<br>9 mm lens – FOV : 48° (H) x 39° (V)<br>FC-334 S:<br>13 mm lens – FOV : 34° (H) x 28° (V)<br>FC-324 S:<br>19 mm lens – FOV : 24° (H) x 19° (V)<br>FC-313 S:<br>35 mm lens – FOV : 13° (H) x 10° (V)<br>FC-309 S:<br>35 mm lens – FOV : 9° (H) x 7° (V) | FC-690 S:<br>7.5 mm lens – FOV : 90° (H) x 69° (V)<br>FC-669 S:<br>9 mm lens – FOV : 69° (H) x 56° (V)<br>FC-645 S:<br>13 mm lens – FOV : 45° (H) x 37° (V)<br>FC-632 S:<br>19 mm lens – FOV : 32° (H) x 26° (V)<br>FC-618 S:<br>35 mm lens – FOV : 18° (H) x 14° (V) |
| Electronic zoom | up to 4x continuous | up to 4x continuous |

** All 320 x 240 pixels FC-Series S thermal imaging cameras are equipped with an uncooled microbolometer detector with 25µm pixel pitch except for the FC-309 S which is equipped with an uncooled microbolometer detector with a 17µm pitch.

*Specifications are subject to change without notice.*
*Sizes and weights are indicative.*

# SR-SERIES

## Technical specifications

### SR-Series: general specifications

| Imaging performance | |
|---|---|
| Detector type | Focal Plane Array (FPA), uncooled Vanadium Oxide microbolometer |
| Spectral range | 7.5 to 13.5 µm |
| Thermal sensitivity | <50 mK f/1.0 |
| Image frequency | NTSC: 30Hz or 7.5Hz<br>PAL: 25Hz or 8.33Hz |
| Focus | Focus free, athermal lens |
| Image processing | Automatic Gain Control (AGC),<br>Digital Detail Enhancement (DDE) |

| System features | |
|---|---|
| Automatic heater | Clears ice from windows<br>Automatic deicing, tested according to MIL-STD-810F Method 521.1 |

| Image presentation | |
|---|---|
| Video output | NTSC or PAL composite video |
| Connector types | BNC (1) provides video output |
| Thermal AGC Modes | Auto AGC, Manual AGC, Plateau Equalization AGC, Linear AGC, Auto Dynamic Detail Enhancement (DDE), Max Gain Setting, |
| Thermal AGC Region of Interest (ROI) | Default, Presets and User definable to insure optimal image quality on subjects of interest |
| Image Uniformity Optimization | Automatic Flat Field Correction (FFC) - Thermal and Temporal Triggers |

| Power | |
|---|---|
| Requirements | 14-32 V DC or 18-27 V AC |
| Consumption | Nominal:<br>3 W at 24 V DC / 5 VA at 24 V AC<br>Peak at 24 V DC:<br>6 W for SR-313<br>6 W for SR-618<br>10 W for SR-112, SR-117, SR-124, SR-324, SR-334, SR-348, SR-625, SR-645<br>11 W for SR-309, SR-612<br>25 W for SR-304, SR-606<br>Peak at 24 V AC:<br>11 VA for SR-313<br>11 VA for SR-618<br>21 VA for SR-112, SR-117, SR-124, SR-324, SR-334, SR-348, SR-625, SR-645<br>29 VA for SR-612<br>30 VA for SR-309<br>48 VA for SR-304, SR-606 |

| Environmental specifications | |
|---|---|
| Operating temperature range | -50°C to +70°C<br>(Cold start: -40ºC to +70ºC) |
| Storage temperature range | -50°C to +85°C |
| Encapsulation | IP66 (IEC 60529) |
| Shock | Mil-Std-810F transportation |
| Vibration | IEC 60068-2-27 |

| Physical characteristics | |
|---|---|
| Camera Weight | |
| SR-304, SR-309, SR-606, SR-612 | 3.3 kg |
| All other models | 2.1 kg |
| Camera Size (L x W x H) | |
| SR-304, SR-309, SR-606, SR-612 | 361 mm x 127 mm x 145 mm |
| All other models | 267 mm x 127 mm x 145 mm |
| Shipping weight (camera + packaging) | 2.8 kg (SR-304, SR-309, SR-606, SR-612 4.3 kg) |
| Shipping size (camera + packaging) (L x W x H) | 366 mm x 235 mm x 235 mm<br>(SR-304, SR-309, SR-606, SR-612 470 x 235 x 235 mm) |

| Interfaces | |
|---|---|
| RS-422 | Yes |
| RS-232 | Yes |

| Approvals |
|---|
| EN 61000-6-4: 2007 Class A/CISPR 22: 1997 Class A<br>EN 6100-3-3: 1995+A1:2001,+A2: 2005,<br>EN 50130- 4: 1996+A1-1998+A2-2003,<br>FCC Part15, Subpart B, Class A, IP66<br>IP 66 (IEC 60529)<br>IEC 60068-2-27 |

| Standard package |
|---|
| Thermal imaging camera, operator manual |

### SR-Series: version specific specifications

| Sensor resolution | 160 x 120 | 320 x 240 | 640 x 480 |
|---|---|---|---|
| Name/Focal length/ Field of view | SR-124:<br>9 mm lens – FOV: 24°(H) x 20°(V)<br>SR-117:<br>13 mm lens – FOV: 17°(H) x 14°(V)<br>SR-112:<br>19 mm lens – FOV: 12°(H) x 10°(V) | SR-348:<br>9 mm lens - FOV: 48°(H) x 39°(V)<br>SR-334:<br>13 mm lens - FOV: 34°(H) x 28°(V)<br>SR-324:<br>19 mm lens - FOV: 24°(H) x 19°(V)<br>SR-313:<br>35 mm lens - FOV: 13°(H) x 10°(V)<br>SR-309:<br>50 mm lens - FOV: 9°(H) x 7°(V)<br>SR-304:<br>100 mm lens - FOV: 4.6°(H) x 3.7°(V) | SR-645:<br>13 mm lens - FOV: 45°(H) x 37°(V)<br>SR-625:<br>25 mm lens - FOV: 25°(H) x 20°(V)<br>SR-618:<br>35 mm lens - FOV: 18°(H) x 14°(V)<br>SR-612:<br>50 mm lens - FOV: 12°(H) x 10°(V)<br>SR-606:<br>100 mm lens - FOV: 6.2°(H) x 5°(V) |
| Electronic zoom | 2x | 2x and 4x | 2x and 4x |

*Specifications are subject to change without notice.*
*Sizes and weights are indicative.*

# F-SERIES

## Technical specifications

### F-Series: general specifications

| Imaging performance | |
|---|---|
| Detector type | Focal Plane Array (FPA), uncooled Vanadium Oxide (Vox) microbolometer |
| Spectral range | 7.5 to 13.5 µm |
| Thermal sensitivity | <50 mK f/1.0 |
| Image frequency | NTSC: 30Hz or 7.5Hz<br>PAL: 25Hz or 8.33Hz |
| Focus | Focus free, athermal lens |
| Image processing | Automatic Gain Control (AGC),<br>Digital Detail Enhancement (DDE) |

| System features | |
|---|---|
| Automatic heater | Clears ice from windows<br>Automatic deicing, tested according to MIL-STD-810F Method 521.1 |

| Image presentation | |
|---|---|
| Video output | PAL or NTSC, hybrid IP and analog |
| Video over Ethernet | Two independent channels of streaming MPEG-4, H.264, or M-JPEG |
| Streaming Resolutions | NTSC: D1 (720x480), 4SIF (704x480), VGA (640x480), SIF (352x240) and QVGA (320x240) PAL: D1 (720x576), 4CIF (704x576), CIF (352x288) |
| Thermal AGC Modes | Auto AGC, Manual AGC, Plateau Equalization AGC, Linear AGC, Auto Dynamic Detail Enhancement (DDE), Max Gain Setting, |
| Thermal AGC Region of Interest (ROI) | Default, Presets and User definable to insure optimal image quality for subjects of interest |
| Image Uniformity Optimization | Automatic Flat Field Correction (FFC) - Thermal and Temporal Triggers |

| Power* | |
|---|---|
| Requirements | 24 VAC (21-30 VAC)<br>24 VDC (21-30 VDC) |
| Consumption | 24 VAC: 51 VA max w/heater<br>24 VDC: 46 W max w/heater<br><br>24 VAC: 15 VA max without heater<br>24 VDC: 10 W max without heater |

**Please consult product installation and operation guides for details of system power requirements*

| Environmental specifications | |
|---|---|
| Operating temperature range | -50°C to +70°C (Cold start: -40ºC to +70ºC) |
| Storage temperature range | -55ºC to +85ºC |
| Encapsulation | IP66 (IEC 60529) |
| Shock | Mil-Std-810F transportation |
| Vibration | IEC 60068-2-27 |

| Physical characteristics | |
|---|---|
| Camera Weight | 4.8 kg |
| Camera Size (L x W x H) | 460 mm × 140 mm × 160 mm |
| Shipping weight (camera + packaging) | 5.7 kg |
| Shipping size (camera + packaging) (L x W x H) | 510 mm x 204 mm x 229 mm |

| Interfaces | |
|---|---|
| TCP/IP | Yes |
| RS-422 | Yes |
| RS-232 | Yes |
| Pelco D | Yes |
| Bosch | Yes |

| Network | |
|---|---|
| Supported Protocols | IPV4, HTTP, Bonjour, UPnP, DNS, NTP, RTSP, RTCP, RTP, TCP, UDP, ICMP, IGMP, DHCP, ARP, SCP |
| Network Application Programming Interfaces (APIs) | Nexus SDK for comprehensive system control and integration<br>Nexus CGI for http command interfaces<br>ONVIF |

| Approvals |
|---|
| EN 61000-6-4: 2007 Class A/CISPR 22: 2005 Class A<br>EN 61000-3-3: 1995+A1:2001+A2:2005<br>EN 61000-3-2: 2006<br>EN 50130-4: 1996+A1:1998+A2:2003<br>FCC Part 15, Subpart B, Class A<br>IP 66 (IEC 60529)<br>IEC 60068-2-27 |

| Standard package |
|---|
| Thermal imaging camera, operator manual, FLIR Sensors Manager single sensor CD |

### F-Series: version specific specifications

| Sensor resolution | 160 x 120 | 320 x 240 | 640 x 480 |
|---|---|---|---|
| Name/Focal length/ Field of view | F-124:<br>9 mm lens – FOV: 24°(H) × 20°(V)<br>F-117:<br>13 mm lens – FOV: 17°(H) × 14°(V)<br>F-112:<br>19 mm lens – FOV: 12°(H) × 10°(V) | F-348:<br>9 mm lens - FOV: 48°(H) x 39°(V)<br>F-334:<br>13 mm lens - FOV: 34°(H) x 28°(V)<br>F-324:<br>19 mm lens - FOV: 24°(H) x 19°(V)<br>F-313:<br>35 mm lens - FOV: 13°(H) x 10°(V)<br>F-307:<br>65 mm lens - FOV: 7°(H) x 5°(V)<br>F-304:<br>100 mm lens - FOV: 4.6°(H) x 3.7°(V) | F-645:<br>13 mm lens – FOV: 45°(H) × 37° (V)<br>F-625:<br>25 mm lens – FOV: 25° (H) × 20°(V)<br>F-618:<br>35 mm lens – FOV: 18° (H) × 14°(V)<br>F-612:<br>50 mm lens – FOV: 12° (H) × 10°(V)<br>F-610:<br>65 mm lens – FOV: 10° (H) × 8°(V)<br>F-606:<br>100 mm lens – FOV: 6.2° (H) × 5°(V) |
| Electronic zoom | 2x | 2x and 4x | 2x and 4x<br>Up to 4x continuous E-zoom optional available |

*Specifications are subject to change without notice.*
*Sizes and weights are indicative.*

# PT-SERIES

## Technical specifications

### PT-Series: general specifications

| Imaging performance | |
|---|---|
| **Thermal:** | |
| Detector type | Focal Plane Array (FPA), uncooled Vanadium Oxide microbolometer |
| Spectral range | 7.5 to 13.5 µm |
| Thermal sensitivity | <50 mK f/1.0 |
| Image frequency | NTSC: 30Hz or 7.5Hz<br>PAL: 25Hz or 8.33Hz |
| Focus | Focus free, athermal lens |
| Image processing | Automatic Gain Control (AGC),<br>Digital Detail Enhancement (DDE) |
| **Visual:** | |
| Built-in digital video | 1/4" Exview HAD CCD |
| Effective pixels | 380.000 |
| Standard lens performance | FOV: 57.8° (H) to 1.7° (H)<br>f=3.4mm (wide) to 122.4 mm (tele),<br>F1.6 to F4.5 |
| Optical zoom | 36x |
| Electronic zoom | 12x |

| Pan- Tilt | |
|---|---|
| Az Range; Az velocity | 360° continuous, 0.1 to 60°/sec max. |
| El Range; El velocity | +/- 90°, 0.1 to 30°/sec. Max. |
| Programmable presets | 128 |

| System features | |
|---|---|
| Automatic heater | Clears ice from windows<br>Automatic deicing, tested according to MIL-STD-810F Method 521.1 |

| Image presentation | |
|---|---|
| Video output | PAL thermal and visible - NTSC thermal and visible. Hybrid IP and analog |
| Video over Ethernet | Two independent channels for each camera (4 total) of streaming MPEG-4, H.264, or M-JPEG |
| Streaming Resolutions | NTSC: D1 (720x480), 4SIF (704x480), VGA (640x480), SIF (352x240) and QVGA (320x240)<br>PAL: D1 (720x576), 4CIF (704x576), CIF (352x288) |
| Thermal AGC Modes | Auto AGC, Manual AGC, Plateau Equalization AGC, Linear AGC, Auto Dynamic Detail Enhancement (DDE), Max Gain Setting, |
| Thermal AGC Region of Interest (ROI) | Default, Presets and User definable to insure optimal image quality for subjects of interest |
| Image Uniformity Optimization | Automatic Flat Field Correction (FFC) - Thermal and Temporal Triggers |
| Requirements | 24 VAC (21-30 VAC)<br>24 VDC (21-30 VDC) |
| Consumption | 24 VAC: 85 VA max without heaters<br>215 VA max w/heater<br>24 VDC: 65 W max without heaters<br>195 W max w/heater |

**Please consult product installation and operation guides for details of system power requirements*

| Environmental specifications | |
|---|---|
| Operating temp. range | -40°C to +70°C |
| Storage temperature range | -55°C to +85°C |
| Encapsulation | IP66 (IEC 60529) |
| Shock | Mil-Std-810F transportation |
| Vibration | IEC 60068-2-27 |

| Physical characteristics | |
|---|---|
| Camera Weight | 16.8 kg |
| Camera Size (L x W x H) | 348 mm × 467 mm × 326 mm |
| Shipping weight (camera + packaging) | 20.1 kg |
| Shipping size (camera + packaging)<br>(L x W x H) | 572 mm x 375 mm x 381 mm |

| Interfaces | |
|---|---|
| TCP/IP | Yes |
| RS-422 | Yes |
| RS-232 | Yes |
| Pelco D | Yes |
| Bosch | Yes |

| Network | |
|---|---|
| Supported Protocols | IPV4, HTTP, Bonjour, UPnP, DNS, NTP, RTSP, RTCP, RTP, TCP, UDP, ICMP, IGMP, DHCP, ARP, SCP |
| Network Application Programming Interfaces (APIs) | Nexus SDK for comprehensive system control and integration<br>Nexus CGI for http command interfaces<br>ONVIF |

| Approvals |
|---|
| EN 61000-6-4: 2007 Class A/CISPR 22: 2005 Class A<br>EN 61000-3-3: 1995+A1:2001+A2:2005<br>EN 61000-3-2: 2006<br>EN 50130-4: 1996+A1:1998+A2:2003<br>FCC Part 15, Subpart B, Class A<br>IP 66 (IEC 60529)<br>IEC 60068-2-27 |

| Standard package |
|---|
| Thermal imaging camera, operator manual, FLIR Sensors Manager single sensor CD |

### PT-Series: version specific specifications

| Sensor resolution | 160 x 120 | 320 x 240 | 640 x 480 |
|---|---|---|---|
| Name/Focal length/ Field of view | PT-124:<br>9 mm lens – FOV: 24°(H) × 20°(V)<br>PT-117:<br>13 mm lens – FOV: 17°(H) × 14°(V)<br>PT-112:<br>19 mm lens – FOV: 12°(H) × 10°(V) | PT-348:<br>9 mm lens - FOV: 48°(H) x 39°(V)<br>PT-334:<br>13 mm lens - FOV: 34°(H) x 28°(V)<br>PT-324:<br>19 mm lens - FOV: 24°(H) x 19°(V)<br>PT-313:<br>35 mm lens - FOV: 13°(H) x 10°(V)<br>PT-307:<br>65 mm lens - FOV: 7°(H) x 5°(V)<br>PT-304:<br>100 mm lens - FOV: 4.6°(H) x 3.7°(V) | PT-645:<br>13 mm lens – FOV: 45°(H) × 37° (V)<br>PT-625:<br>25 mm lens – FOV: 25° (H) × 20°(V)<br>PT-618:<br>35 mm lens – FOV: 18° (H) × 14°(V)<br>PT-612:<br>50 mm lens – FOV: 12° (H) × 10°(V)<br>PT-610:<br>65 mm lens – FOV: 10° (H) × 8°(V)<br>PT-606:<br>100 mm lens – FOV: 6.2° (H) × 5°(V) |
| Electronic zoom | 2x | 2x and 4x | 2x and 4x<br>Up to 4x continuous E-zoom optional available |

*Specifications are subject to change without notice.*
*Sizes and weights are indicative.*

# D-SERIES

## Technical specifications

### D-Series: general specifications

| Imaging performance | |
|---|---|
| **Thermal:** | |
| Detector type | Focal Plane Array (FPA), uncooled Vanadium Oxide microbolometer |
| Number of pixels | 640 x 480 or 320 x 240 |
| Spectral range | 7.5 to 13.5 µm |
| Thermal sensitivity | <50 mK f/1.0 |
| Image frequency | NTSC: 30Hz or 7.5Hz<br>PAL: 25Hz or 8.33Hz |
| Focus | Focus free, athermal lens |
| Electronic zoom | 2x, 4x |
| Image processing | Automatic Gain Control (AGC),<br>Digital Detail Enhancement (DDE) |
| **Visual:** | |
| Built-in digital video | 1/4" Exview HAD CCD |
| Effective pixels | 380.000 |
| Standard lens performance | FOV: 57.8° (H) to 1.7° (H)<br>f=3.4mm (wide) to 122.4 mm (tele),<br>F1.6 to F4.5 |
| Optical zoom | 36x |
| Electronic zoom | 12x<br>Up to 4x continuous E-zoom for 640 x 480 models optional available |

| Pan- Tilt | |
|---|---|
| Pan angle / speed | Continuous 360°; 0.1° to 60°/sec |
| Tilt angle / speed | +45° to -180°; 0.5° to 60°/sec |
| Programmable presets | 128 |

| System features | |
|---|---|
| Automatic heater | Clears ice from windows<br>Automatic deicing, tested according to MIL-STD-810F Method 521.1 |

| Image presentation | |
|---|---|
| Video output | PAL thermal and visible - NTSC thermal and visible |
| Video over Ethernet | Two independent channels for each camera (4 total) of streaming MPEG-4, H.264, or M-JPEG |
| Streaming Resolutions | NTSC: D1 (720x480), 4SIF (704x480), VGA (640x480), SIF (352x240) and QVGA (320x240)<br>PAL: D1 (720x576), 4CIF (704x576), CIF (352x288) |
| Thermal AGC Modes | Auto AGC, Manual AGC, Plateau Equalization AGC, Linear AGC, Auto Dynamic Detail Enhancement (DDE), Max Gain Setting, |
| Thermal AGC Region of Interest (ROI) | Default, Presets and User definable to insure optimal image quality for subjects of interest |

| Power | |
|---|---|
| Requirements | 24 VAC (21-30 VAC)<br>24 VDC (20-30 VDC) |
| Consumption | 24 VAC: 85 VA max.<br>24 VDC: 75 W max. |

| Environmental specification | |
|---|---|
| Operating temperature range | -25°C to +70°C |
| Storage temperature range | -55°C to +85°C |
| Encapsulation | IP56 (IEC 60529) |
| Vibration | Mil-Std-810F transportation |
| Shock | IEC 60068-2-27 |

| Physical characteristics | |
|---|---|
| Camera Weight | 8.3 kg |
| Camera Size (W x H) | 203 x 432 mm |
| Shipping weight (camera + packaging) | 9.5 kg |
| Shipping size (camera + packaging)<br>(L x W x H) | 495 mm x 305 mm x 305 mm |

| Interfaces | |
|---|---|
| TCP/IP | Yes |
| RS-422 | Yes |
| RS-232 | Yes |
| Pelco D | Yes |
| Bosch | Yes |

| Network | |
|---|---|
| Supported Protocols | IPV4, HTTP, Bonjour, UPnP, DNS, NTP, RTSP, RTCP, RTP, TCP, UDP, ICMP, IGMP, DHCP, ARP, SCP |
| Network Application Programming Interfaces (APIs) | Nexus SDK for comprehensive system control and integration<br>Nexus CGI for http command interfaces<br>ONVIF |

**Approvals**

EN 61000-6-4: 2007 Class A/CISPR 22: 2005 Class A
EN 61000-3-3: 1995+A1:2001+A2:2005
EN 61000-3-2: 2006
EN 50130-4: 1996+A1:1998+A2:2003
FCC Part 15, Subpart B, Class A
IP 56 (IEC 60529)
IEC 60068-2-27

**Standard package**

Thermal imaging camera, operator manual, FLIR Sensors Manager single sensor CD

### D-Series: version specific specifications

| Sensor resolution | 320 x 240 | 640 x 480 |
|---|---|---|
| Name/Focal length/ Field of view | D-348:<br>9 mm lens - FOV: 48°(H) x 39°(V)<br>D-334:<br>13 mm lens - FOV: 34°(H) x 28°(V)<br>D-324:<br>19 mm lens - FOV: 24°(H) x 19°(V)<br>D-313:<br>35 mm lens - FOV: 13°(H) x 10°(V) | D-645:<br>13 mm lens - FOV: 45°(H) x 37°(V)<br>D-625:<br>25 mm lens - FOV: 25°(H) x 20°(V)<br>D-618:<br>35 mm lens - FOV: 18°(H) x 14°(V) |

*Specifications are subject to change without notice.*
*Sizes and weights are indicative.*

# A-SERIES

## Technical specifications

### A-Series: general specifications

| | |
|---|---|
| **Environmental data** | |
| Operating temperature range | –25°C to +50°C |
| Encapsulation | IP 66 (IEC 60529) |
| Bump | 5 g, 11 ms (IEC 60068-2-27) |
| **Measurement analysis** | |
| Spotmeter | 10 |
| Area | 10 boxes with max./min./average/position |
| Isotherm | 1 with above/below/interval |
| Measurement option | Measurement Mask Filter<br>Schedule response: File sending (ftp), email (SMTP) |
| Difference temperature | Delta temperature between measurement functions or reference temperature |
| Reference temperature | Manually set or captured from any measurement function |
| 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, Digital In, Camera temperature, timer |
| **Ethernet** | |
| Ethernet | Control, result and image |

### FLIR A310f / A310pt: version specific specifications

| | **FLIR A310f** | **FLIR A310pt - Pan/tilt** |
|---|---|---|
| **Physical data** | | |
| Weight | 5 kg | 17.9 kg |
| Camera size (L × W × H) | 460 × 140 × 159 mm | 460 x 467 x 326 mm |
| Tripod mounting | N/A | N/A |
| Base mounting | TBA | TBA |
| **System features** | | |
| Automatic heaters | Clears ice from window | Clears ice from window |
| **Pan/tilt** | | |
| Azimuth range | N/A | Az velocity 360º continuous, 0.1 to 60º/sec max. |
| Elevation range | N/A | El velocity +/- 45º, 0.1 to 30º/sec. max. |
| Programmable presets | N/A | 128 |
| **Ethernet video streaming** | | |
| Ethernet, video streaming | MPEG-4, ISO/IEC 14496-1 MPEG-4 ASP@L5 | Two independent channels for each camera -MPEG-4, H.264 or M-JPEG |
| **Power system** | | |
| External power operation | 12/24 VDC (10-30 VDC), 24 W absolute max | 24 VAC (21-30 VAC) 24 VDC (21-30 VDC) |
| Consumption | | 24 VAC: 215 VA max w/heater<br>24 VDC: 195 W max w/heater |
| **Alarm** | | |
| Alarm output | Digital Out, log, store image, file sending (ftp), email (SMTP), notification | N/A |
| **Ethernet** | | |
| Ethernet, protocols | Ethernet/IP, Modbus TCP, TCP, UDP, SNTP, RTSP, RTP, HTTP, ICMP, IGMP, ftp, SMTP, SMB (CIFS), DHCP, MDNS (Bonjour), uPnP | TCP, UDP, SNTP, RTSP, RTP, HTTP, ICMP, IGMP, ftp, SMTP, DHCP, uPnP |
| Ethernet, image streaming | 16-bit 320 x 240 pixels at 7-8 Hz<br>-Radiometric | N/A |

# Accessories

## FC-Series S

**Concealed Cable Mounting Arm**
The concealed cable mount allows installation of all cabling to be routed inside of the mounting arm. Seals on the camera body insure IP66 protection. The arm can also be used with cables routed to the enclosure through the rear gland.

**Pole Mount adapter**
Pole mount adapter for use with FC-Series concealed arm mount. Suitable for use with 4"-8" diameter poles.

**PoE+ Power Supply**
Provides power for maximum de-icing in the most severe conditions.

**24VAC Exterior Power Supply**
Suitable for single or multiple camera installations. Supports full de-icing. Designed for installation outdoors.

**24VDC Power Supply**
Suitable for short distance cable runs where the power supply will be protected from the elements. Supports full de-icing.

**Pedestal Mount**
Ideal for installation on ledges, walls and from overhead locations such as eaves, tunnel ceilings and bridge decks.

## SR-Series

**Power supply**
Power supply to power an SR-Series thermal imaging camera.

**Hard transport case for SR-Series thermal imaging camera**
Rugged, watertight plastic shipping case. Holds all items securely. The case can be locked with padlocks and features a breather valve to prevent pressure build-up in airplane cargo holds.

## F-Series

**F-Series pedestal mount**
Mount to install an F-Series network-ready fixed mount thermal imaging camera.
Typically used on a flat horizontal surface such as a wall or the top of a pole.

**F-Series wall mount**
Mount to install an F-Series network-ready fixed mount thermal imaging camera against a wall.

**F-Series pole mount adapter**
Can be used to mount an F-Series network-ready thermal imaging camera against a new or existing pole.

**F-Series power supply**
Power supply to power an F-Series network-ready thermal imaging camera.

**Hard transport case for F-Series thermal imaging camera**
Rugged, watertight plastic shipping case. Holds all items securely. The case can be locked with padlocks and features a breather valve to prevent pressure build-up in airplane cargo holds.

# Accessories

## D-Series

**D-Series corner mount**
Can be used to install a D-Series network-ready Multi-Sensor in the corner of a building.

**D-Series power supply**
Power supply to power a D-Series network-ready thermal imaging camera.

**Hard transport case for D-Series thermal imaging camera**
Rugged, watertight plastic shipping case. Holds all items securely. The case can be locked with padlocks and features a breather valve to prevent pressure build-up in airplane cargo holds.

**FLIR Sensors manager Joystick**
USB joystick that can be connected to your PC to control the D-Series.

## PT-Series

**PT-Series wall mount**
Can be used to mount a PT-Series network-ready Multi-Sensor against a wall.

**PT-Series pole mount adapter**
Adapts the PT-Series wall mount for installation on a pole.

**PT-Series adapter plate**
Can be used to mount a PT-Series network-ready Multi-Sensor to a wide variety of existing mounts.

**PT-Series pedestal mount**
Mount to install a PT-Series network-ready Multi-Sensor. Typically used on a flat horizontal surface such as a wall or the top of a pole.

**PT-Series power supply**
Power supply to power a PT-Series network-ready thermal imaging camera.

**Hard transport case for PT-Series thermal imaging camera**
Rugged, watertight plastic shipping case. Holds all items securely. The case can be locked with padlocks and features a breather valve to prevent pressure build-up in airplane cargo holds.

**FLIR Sensors manager Joystick**
USB joystick that can be connected to your PC to control the PT-Series.

# Accessories

## Af-Series

**Af-Series pedestal mount**
Mount to install an Af-Series network-ready fixed mount thermal imaging camera. Typically used on a flat horizontal surface such as a wall or the top of a pole.

**Af-Series wall mount**
Mount to install an Af-Series network-ready fixed mount thermal imaging camera against a wall.

**Af-Series pole mount adapter**
Can be used to mount an Af-Series network-ready thermal imaging camera against a new or existing pole.

**Af-Series power supply**
Power supply to power an Af-Series network-ready thermal imaging camera.

## Apt-Series

**Apt-Series pedestal mount**
Mount to install an Apt-Series network-ready fixed mount thermal imaging camera. Typically used on a flat horizontal surface such as a wall or the top of a pole.

**Apt-Series wall mount**
Mount to install an Apt-Series network-ready fixed mount thermal imaging camera against a wall.

**Apt-Series pole mount adapter**
Can be used to mount an Apt-Series network-ready thermal imaging camera against a new or existing pole.

**Apt-Series power supply**
Power supply to power an Apt-Series network-ready thermal imaging camera.

**Apt-Series adapter plate**
Can be used to mount a Apt-Series network-ready Multi-Sensor to a wide variety of existing mounts.

# NOTES

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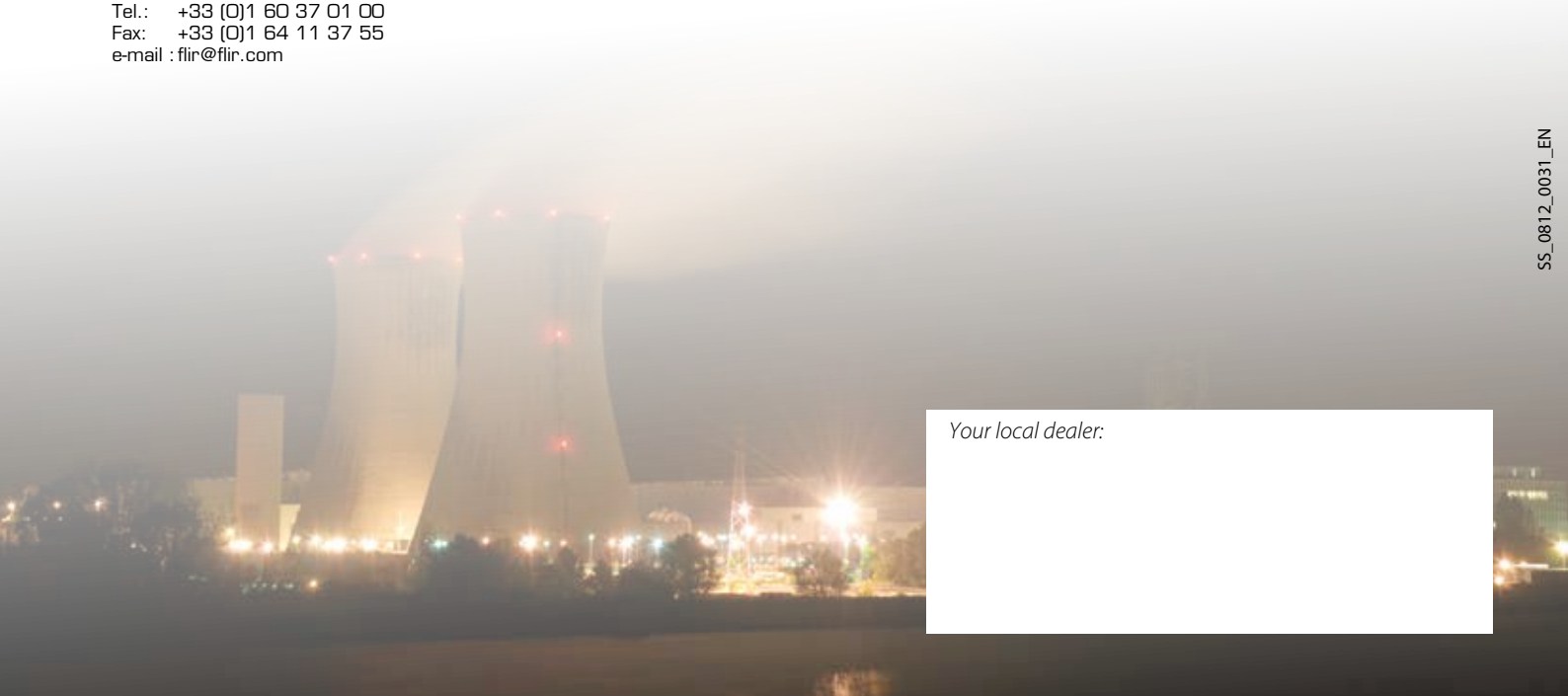

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