

Thermal imaging cameras  
for security and surveillance applications



## ThermoVision™ 2000 / 3000

Thermal imaging cameras with cooled detector  
for long range surveillance applications



Thermal imaging camera only



Multi-Sensor

# ThermoVision™ 2000 / 3000 Multi-Sensor systems





ThermoVision 2000 / 3000

ThermoVision 2000 / 3000 Multi-Sensor

## ThermoVision™ 2000 / 3000: Thermal imaging cameras for long range surveillance applications

*The ThermoVision 2000 / 3000 are equipped with a long-wave, cooled Quantum Well Infrared Photodetector (QWIP) which provides extremely long range detection in all weather conditions. The camera head is equipped with three different lenses offering each a different field of view. This provides excellent situational awareness while also giving the possibility to have a closer look at suspect activities once they are detected.*

*ThermoVision 2000 / 3000 offer extreme long range detection and excellent image quality, in the darkest of nights, through smoke and dust. Both thermal imaging cameras are extremely suited for border and coastal surveillance but also for mid-range threat detection.*

*Both thermal imaging cameras are also available as a Multi-Sensor system. They can be equipped with a daylight camera, a GPS unit, digital magnetic compass and optionally, a laser range finder.*

### Cooled QWIP detector

Both the ThermoVision 2000 and ThermoVision 3000 are equipped with a cooled Quantum Well Infrared Photodetector (QWIP). A thermal imaging camera with a cooled detector gives you the advantage that you can see and detect potential threats much further away than with an uncooled detector. But there is more. Objects which are at a close distance can be seen with much more detail. You can see what people are carrying. There is no need anymore to send someone out in the field to check things out since small details can clearly be seen on the thermal image.

### Choice of image quality

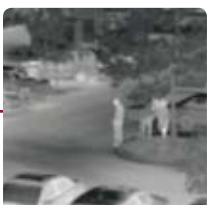
#### **320 x 240 pixels or 640 x 480 pixels**

The ThermoVision 2000 is equipped with a QWIP detector offering crisp thermal images of 320 x 240 pixels. Users that want to see the smallest of detail and are demanding the best possible image quality can choose the ThermoVision 3000. This thermal imaging camera is also equipped with a QWIP detector but delivers images of 640 x 480 pixels. This is a four times better image quality than a 320 x 240 detector. It allows the user to see more detail and detect more and smaller objects from a further distance.

### Triple field of view optics

Both the ThermoVision 2000 and ThermoVision 3000 are equipped with triple field of view optics.

Both systems have the capability to switch from one lens to another within a fraction of a second. The wide angle lens will give you excellent situational awareness. When a potential threat is detected you can easily switch to the medium field of view lens to have a closer look at the situation or even to the extremely narrow field of view lens so that you can see the smallest of details. This way operators can see further, recognize more detail and react more quickly to security threats.



# ThermoVision™ 2000 / 3000



## Advanced image processing

FLIR Systems has developed a powerful algorithm that helps to overcome the problem of finding low contrast targets in high dynamic range scenes. The ThermoVision 3000 contains Advanced Digital Detail Enhancement (DDE). This assures clear, properly contrasted thermal images. It provides high quality thermal imaging in any night or daytime environmental conditions.



High contrast scene with standard AGC algorithm applied



DDE applied - all targets can be observed simultaneously

## Auto focus

Both the ThermoVision 2000 / 3000 contain an exclusive auto focus feature which delivers crisp, clear images at the press of a button or whenever fields of view are changed. The system allows you to experience better situational awareness in the wide field of view, while maintaining detailed recognition and identification capabilities in the narrow field of view.

## Easy and fast to install

Both cameras incorporate easily with common power and video interfaces found in existing and new security systems. They can be easily integrated into any existing infrastructure providing early detection and visibility 24/7 all the year round. The images from the 320 x 240 pixels or 640 x 480 pixels detector can be displayed on virtually any existing display that accepts standard composite video.

## Portability

Both systems are configured to be either fixed mounted or field transportable for fast deployment. They can be mounted on a standard tripod. A single operator can set up the system in minutes, making it ideal for mobile operations and quick deployments.

## Designed for use in harsh environments

The ThermoVision 2000 / 3000 are extremely rugged systems. Their vital core is protected against humidity and water. They both operate between -32°C and +55°C.

## Easy-to-use, fast, accurate "Pan & Tilt"

Optionally, the ThermoVision 2000 and ThermoVision 3000 can be mounted on a rugged Pan & Tilt system. Intuitive joystick operation allows the operator to see 360° horizontal and +/-35° vertically, offering superb situational awareness.

## Radar Connection – "Slew to cue"

If installed on a Pan & Tilt mechanism, the ThermoVision 2000 and ThermoVision 3000 can be connected to a radar system. If the radar detects an object, the camera 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.

## Wide field of view



## Medium field of view



## Narrow field of view

The ThermoVision 2000/3000 switches between 3 fields of view within a fraction of a second.

## Multiple installation options

Various options exist to connect the ThermoVision 2000 and ThermoVision 3000 and integrate them in your existing systems. The ThermoVision 2000 and ThermoVision 3000 can be configured for stand alone use, as part of a network or in a hybrid configuration with local and network based control:

- **Analog configuration:**  
Simply connect the ThermoVision 2000 and ThermoVision 3000 over RS-232 or RS-422 to the remote control panel. A video cable can be connected to any existing display that accepts composite video.
- **TCP/IP configuration:**  
The ThermoVision 2000 / 3000 can be integrated in any existing TCP/IP network and controlled over a PC. No need to add an extra cable. Using this configuration, you can monitor all activity in a protected area over the internet. Even when you are thousands of kilometers away.



# ThermoVision™ 2000 MS / 3000 MS Multi-Sensor

The ThermoVision 2000 MS / 3000 MS Multi-Sensor systems integrate the long range, long wave thermal imaging camera found in the ThermoVision 2000/3000 with a variety of powerful daylight sensors, GPS, and optionally a laser range finder. An array of advanced functions and options are available to meet the most demanding needs. Just like for the common versions the user can choose between 320 x 240 pixels or 640 x 480 pixels detectors. The Multi-Sensor systems are mounted on a Pan & Tilt to increase situational awareness.



## Powerful daylight imaging camera

The Multi-Sensor systems feature a powerful, sensitive daylight camera with excellent zoom and color quality for additional target identification when conditions permit. Displaying both the thermal image and the daylight image at the same time is also possible.

## Advanced Global Positioning System (GPS)

Optionally, the Multi-Sensor systems are equipped with an advanced GPS. This way the systems will know where they are located. This can be extremely important when the Multi-Sensor systems are installed on moving equipment or when they are used as portable systems.

## Digital Magnetic compass

Optionally, a built-in digital magnetic compass, allows to determine in which direction the ThermoVision 2000 / 3000 Multi-Sensor systems are pointing.

## Laser range finder

Optionally the Multi-Sensor systems can be equipped with an eye safe laser range finder. Combined with the GPS systems and the electromagnetic compass, it will allow you to exactly determine where a suspected object is located and how far it is away.

## Pan & Tilt

The Multi-Sensor systems are mounted on a rugged Pan & Tilt mechanism. They can be connected to a RADAR in a "slew to cue" configuration. If the radar detects an object, the camera 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.

## Programmable search

The Multi-Sensor systems can be programmed to scan an entire area automatically. Different spots that need to be monitored periodically can be preset. The system will scan the predefined areas automatically. This not only ensures that the entire area is being monitored but also reduces operator workload.

## Tailored to all needs

Although the Multi-Sensor systems are available with a standard daylight imaging camera, GPS, compass and eventually a laser range finder, the user has the possibility to define his preferred equipment to be included in the system.





## ThermoVision 2000 / 3000: the perfect tools for border security and other surveillance applications.

### ***In complete darkness, in the most diverse weather conditions***

The ThermoVision 2000 / 3000 create a virtual security fence and are finding their way into many security and surveillance applications.



Thanks to their ability to detect man-sized targets several kilometers away, they are extremely suited for border surveillance and protection. Protecting a country's borders is vital to its national security. It is however very challenging to detect potential intruders or smugglers in total darkness, in the most diverse weather conditions. Thermal imaging cameras can help border control professionals to meet the demands they face at night and in other low-light situations.



But also ports and airports, nuclear plants, petrochemical installations, warehouses... are vulnerable to theft, or even worse terrorist attacks, and can be protected by using thermal imaging cameras like the ThermoVision 2000 / 3000.



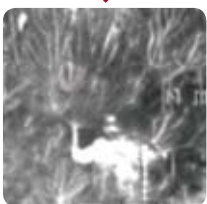
Terrorism, vandalism, and random violence threaten the safety of personnel and the integrity of public and private facilities. A comprehensive security program utilizing thermal imaging cameras like the ThermoVision 2000 / 3000 is the key to asset protection and risk mitigation. The ThermoVision 2000 / 3000 expose threats hidden in the darkness, concealed by adverse weather, and veiled by obscurants like dust, fog, and smoke.

The ThermoVision 2000 / 3000 are new weapons for intrusion detection. They detect intruders sooner, provide more time to react and protect people, assets, and infrastructures. They are operational 24 hours a day even in the darkest of nights, dense fog, snow, smoke, ...



### ***Protect your borders and assets also in broad daylight***

The ThermoVision 2000 / 3000 will not only protect borders and assets against intruders during the darkest of nights. The cameras are also perfectly suited to complement existing surveillance cameras during daytime. The ThermoVision 2000 / 3000 will detect objects that remain invisible to the naked eye. For example people hiding in the shadows or in bushes, will be seamlessly detected.



# ThermoVision™ 2000 / 3000

## Thermal imaging camera only

### Technical specifications

#### IMAGING PERFORMANCE

Detector type

ThermoVision 2000:  
Quantum Well Infrared Photodetector (QWIP): 320 x 240 pixels  
ThermoVision 3000:  
Quantum Well Infrared Photodetector (QWIP): 640 x 480 pixels

Spectral range

8.0 to 9.2µm

Number of fields of view

3

Field of view (FOV) / Spatial resolution (IFOV)

ThermoVision 2000	28 mm lens	116 mm lens	704 mm lens
FOV	25° (H) x 19° (V)	6° (H) x 4.5° (V)	0.99° (H) x 0.74° (V)
IFOV	1.36 mrad	0.33 mrad	0.054 mrad

ThermoVision 3000	37 mm lens	116 mm lens	704 mm lens
FOV	25° (H) x 19° (V)	7.8° (H) x 5.8° (V)	1.3° (H) x 0.96° (V)
IFOV	0.68 mrad	0.22 mrad	0.036 mrad

Thermal sensitivity

30 mK max

Image frequency

ThermoVision 2000: 50 Hz PAL or 60 Hz NTSC  
ThermoVision 3000: 25 Hz PAL or 30 Hz NTSC

Focus

Automatic or Manual

Electronic zoom

2x, 4x

Image processing

Digital Detail Enhancement (DDE): ThermoVision 3000 only

#### SYSTEM FEATURES

Remote Control

By serial link over TCP/IP

Automatic heater

Yes

Built-in Test (BIT)

Yes

Pelco D compliance

Yes

#### IMAGE PRESENTATION

Video output

NTSC or PAL composite video,  
14-bit digital image data

#### POWER

Requirements

18-35 V DC

Consumption

35 W typical - 140 W with heaters

#### ENVIRONMENTAL SPECIFICATIONS

Operating temperature range

-32°C to +55°C

Storage temperature range

-40°C to +70°C

Automatic Window defrost

Yes

Humidity

Mil-Std-810F, 507.4

Rain

Mil-Std-810F, 506.4

Sand/dust

Mil-Std-810F, 510.4

Icing/freezing rain

Mil-Std-810F, 521.2

Shock

Mil-Std-810F, 516.5

Vibration

Mil-Std-810F, 514.5

Solar radiation

Mil-Std-810F, 505.4

#### PHYSICAL CHARACTERISTICS

Camera Weight

18 kg

Camera Size

587 x 312 x 267 mm

Shipping size / weight

Sensor head: 440 x 630 x 580 mm (h x w x l) 30 kg

#### INTERFACES

TCP/IP

Command and control: all functions

RS-232

Command and control: all functions

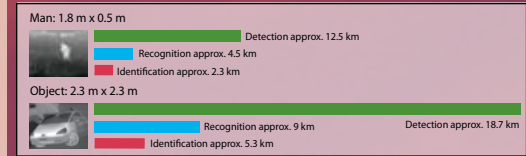
RS-485

Command and control: all functions

#### TYPICAL CONFIGURATION PACKAGE

Thermal imaging camera, power supply, camera cable (7.5 m), hand control, junction box, operator manual, shipping case

#### ThermoVision 3000 performance 704 mm lens



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 2°C temperature difference and 0.85 / km atmospheric attenuation factor.



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# ThermoVision™ 2000 / 3000



## Technical specifications

### IMAGING PERFORMANCE

#### Thermal:

Detector type

ThermoVision 2000:  
Quantum Well Infrared Photodetector (QWIP): 320 x 240 pixels  
ThermoVision 3000:  
Quantum Well Infrared Photodetector (QWIP): 640 x 480 pixels  
8.0 to 9.2µm  
3

Spectral range

Number of fields of view

Field of view (FOV) /

Spatial resolution (IFOV)

ThermoVision 2000	28 mm lens	116 mm lens	704 mm lens
FOV	25° (H) x 19° (V)	6° (H) x 4.5° (V)	0.99° (H) x 0.74° (V)
IFOV	1.36 mrad	0.33 mrad	0.054 mrad

ThermoVision 3000	37 mm lens	116 mm lens	704 mm lens
FOV	25° (H) x 19° (V)	7.8° (H) x 5.8° (V)	1.3° (H) x 0.96° (V)
IFOV	0.68 mrad	0.22 mrad	0.036 mrad

Thermal sensitivity

Image frequency

30 mK max  
ThermoVision 2000: 50 Hz PAL or 60 Hz NTSC  
ThermoVision 3000: 25 Hz PAL or 30 Hz NTSC  
Automatic or Manual  
2x, 4x  
Digital Detail Enhancement (DDE): ThermoVision 3000 only

Focus

Electronic zoom

Image processing

Daylight CCD

Built-in digital video

Sony FCB-EX-980S Color block camera (NTSC)  
Sony FCB-EX-980SP Color block camera (PAL)  
Other types available on request  
Approx. 680,000 pixels NTSC - approx. 800,000 pixels PAL  
Yes  
Yes  
26x, 42° to 1.6° continuous  
12x continuous

Effective pixels

Low light option

Image stabilization

Optical zoom

Electronic zoom

### PAN & TILT

Az Range; Az velocity

El Range; El velocity

Accuracy

Resolution

n x 360°; 0.3° - 65°/sec continuous  
+/-35°; 0.3° - 30°/sec  
1 mrad  
0.1 mrad

### LASER RANGE FINDER

Type / range

Erbium glass, eye safe / 80 m to 20 km

### SYSTEM FEATURES

Geo Positioning

Programmable search

Remote Control

Automatic heater

Built-in Test (BIT)

Pelco D compliance

Internal GPS  
Program multiple preset locations  
By serial link over TCP/IP  
Yes  
Yes  
Yes

### IMAGE PRESENTATION

Video output

NTSC or PAL composite video,  
14-bit digital image data

Connector types

VOIP

BNC  
MPEG-2 or MPEG-4 video

### POWER

Requirements

Consumption

18-35 V DC  
55 W typical - 140 W with heaters

### ENVIRONMENTAL SPECIFICATIONS

Operating temperature range

Storage temperature range

Automatic Window defrost

Humidity

Rain

Sand/dust

Icing/freezing rain

Shock

Vibration

Solar radiation

-32°C to +55°C  
-40°C to +70°C  
Yes  
Mil-Std-810F, 507.4  
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Mil-Std-810F, 521.2  
Mil-Std-810F, 516.5  
Mil-Std-810F, 514.5  
Mil-Std-810F, 505.4

### PHYSICAL CHARACTERISTICS

Camera Weight

Camera Size

Shipping size / weight

25 kg  
503 x 312 x 267 mm  
Sensor head: 440 x 630 x 580 mm (h x w x l) 30 kg  
Pan/Tilt: 320 x 350 x 300 mm (h x w x l): 14 kg  
Accessories: 440 x 630 x 580 mm (h x w x l) 25 - 30 kg  
(weight is depending on system cable length)

### INTERFACES

TCP/IP

RS-232

RS-485

Command and control: all functions  
Command and control: all functions  
Command and control: all functions

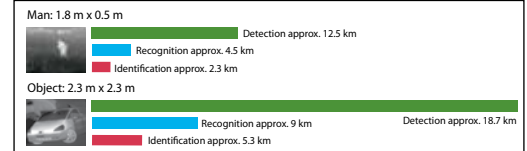
### TYPICAL CONFIGURATION PACKAGE

Thermal imaging camera, daylight camera, Pan/Tilt, JPC (Junction and Protocol Converter) system, power supply with cables, system cable, joy stick, junction box, operator manual, shipping cases (3).

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## ThermoVision 3000 performance 704 mm lens



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 2°C temperature difference and 0.85 / km atmospheric attenuation factor.

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