

First Mate II MS-Series Thermal Imager

Operator's Manual

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If you have questions that are not covered in this manual, or need service, contact FLIR Commercial Systems, Inc. customer support at 805.964.9797 for additional information prior to returning a camera.

This documentation is subject to change without notice.



This equipment must be disposed of as electronic waste. Contact your nearest FLIR Commercial Systems, Inc. representative for instructions on how to return the product to FLIR for proper disposal.

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Important Safety Instructions

- Read these instructions!
- Follow all instructions!
- Heed all warnings!
- Only use the attachments/accessories specified by the manufacturer!
- Refer all servicing to qualified service personnel.

Caution!

Danger of explosion if battery is incorrectly replaced. return the equipment to the manufacturer for battery replacement.

The battery used in this device may present a risk of fire or chemical burn if mistreated. Do not disassemble the camera, store above 60°C, or incinerate. The battery is factory replaceable only and must be replaced with the identical battery pack.

1 Introduction

The First Mate II MS-Series handheld thermal imaging camera gives every mariner the power to see at night like never before.

The First Mate II MS-Series camera gives you the power to see more—and to see farther—than every other night vision technology around:

- When you have the First Mate II MS-Series camera on deck, at night in dark anchorages you will be able to see your surroundings, even when it is cloudy and there is no moonlight or starlight.
- See clearly in total darkness—unlike other night vision systems, First Mate II MS-Series cameras require no light at all
- See logs, rocks, land, and other hazards that radar can miss
- Boat with confidence at night knowing that you can see harbor entrances and waterways in total darkness
- See with FLIR's award-winning maritime thermal night vision technology in the palm of your hand



Visible Image



First Mate II MS-Series Camera Image

1 – 1 First Mate II MS-Series Camera Features



- Rugged design—Built to withstand the demands of outdoor use.
- 240×180 or 320×240 microbolometer sensor for excellent image quality and clarity
- 19 mm lens with 24° field of view
- Palm-Sized Portability and Light Weight—Only 12 Ounces
- Embedded LED Tasklight
- USB Cable for battery charging
- Rechargeable Internal Li-Ion battery—Provides up to 5 hours of camera operation on a single charge.

Caution!

Do not disassemble the camera enclosure. Disassembly can cause permanent damage and will void the warranty.

Do not point the camera directly at extremely high-intensity radiation sources, such as the sun, lasers, arc welders, etc.

Be careful not to leave fingerprints on the camera's infrared optics. Clean only with low pressure fresh water and a lens cloth.

2 Getting Started

The First Mate II MS-Series camera is available with the features, options, and accessories described in this manual.

Refer to the packing list enclosed with your camera shipment to determine the actual contents of your camera package.

- **MS-224b and MS-324b Cameras**

In addition to the camera, Quick Start card, and Documentation/ Training CD or DVD; the following items are included in the camera package:



- **MS-224b and MS-324b Camera Options**

The following optional accessories are available for the First Mate II MS-Series camera

Floating Lanyard



Camera Carrying Pouch



Hard Shell Storage Case



3 Operating The Camera

3-1 Camera Features and Controls



3-2 Charging the Camera

Caution!

To assure proper charging, First Mate II MS-Series cameras should be turned OFF throughout the charging cycle. Charging **MUST** only be done when the camera is at temperatures from 0 to 40°C [32 to 104°F] or battery damage may occur.

The battery in the camera should be fully charged prior to use.

To charge the camera, lift the cover from the USB port, plug in the USB cable provided with the camera, and also plug it into a USB power source.



- When charging correctly, the charging indicator will be lit orange.
- When fully charged, the charging indicator will light solid green. The initial charge time is approximately 5 hours.

Plug in USB Charger



Charging indicator orange
when charging

Charging indicator green
when fully charged



3-3 First Mate II MS-Series Power Management

Your First Mate II MS-Series camera is equipped with a power management system that provides up to five hours of continuous operation. When left in the Off state the battery will hold a charge for up to two months. To make the best use of the camera it is important to understand the basic power states of the camera.

- When the camera is turned on from the Off state, it takes about four seconds to become operational. During the Bootup process, the FLIR splash screen is shown and then the software version is displayed briefly. Pressing the Power button will toggle the camera between On and Off.
- The camera shuts down after about five minutes if no buttons are pushed. **Auto shutdown 30s**, is shown in the display, and after counting down for 30 seconds the camera will shutdown.

Camera State	How do you know?
Off	The display is off, the camera buttons are dark, and the LED Tasklight comes on when the Brightness button is pressed.
On	The display is on, the camera buttons are back-lighted, and the LED Tasklight is disabled.

3-4 Buttons and Controls

Power Button

Turn the camera On and Off.



Display Brightness Button

Use this button to cycle through the five levels of display brightness. Each press of the button advances to the next level of brightness.



When the highest brightness level is reached, subsequent button presses advance to the next lower brightness levels. When the lowest brightness level is reached, subsequent button presses advance to the next higher brightness level. One of the following icons is displayed for approximately three seconds after the button is pressed indicating the current brightness level:



Note

When the First Mate II MS-Series camera is powered Off, the Display Brightness button, when held on, turns on the LED Tasklight.

White Hot/Black Hot/Instalert Button

Use this button to toggle between the three video palettes. In the default White Hot palette, hotter objects appear as white or light grey. In Black Hot, hotter objects appear as black or dark grey. In the Instalert™ palettes the hottest objects in the scene are highlighted in red to simplify detection of animals, people, and hot objects (for example, an engine). There are four pre-set levels of Instalert that you can select based on the specific scene being viewed. All of the Instalert palettes are based on the white hot palette.



While white hot is the most commonly used and visually intuitive method of viewing thermal imagery, black hot can often enhance

contrast of certain objects or provide better visual perspective in some conditions. When switching between palettes, the appropriate icon is displayed for approximately 3 seconds.

White hot

Black hot

Instalert™ 1 – 4



Zoom Button—MS-324b models only

Use this button to switch the camera between no zoom (full resolution) and 2× zoom. The central part of the image is magnified twice its normal size when 2× is selected.



When zoom has been selected the icon is continuously shown in the display:



Freeze Frame Button—MS-224b models only

Use this button to freeze the video so that a single frame may be inspected closely.



Diopter Controls



The diopter adjustment lever allows you to adjust for optimum image sharpness in the eyepiece. When the diopter adjustment lever is pointing straight away from the front of the camera, it is in the neutral position.

Adjust the diopter setting for the sharpest image in the viewfinder.

3-5 Battery

Your First Mate II MS-Series camera is equipped with a sophisticated power system using a rechargeable internal Li-Ion battery.

Battery Status Indicator

While the camera is On, a battery status indicator is always shown in the corner of the display image. This indicator provides an estimation of the remaining battery charge.



full charge



half charge



plugged in

3-6 Auto Shutdown Operation

Auto Shutdown is a feature of the First Mate II MS-Series camera that helps to guard against draining the battery prematurely by inadvertently leaving the camera on. Auto Shutdown turns the camera off if the following conditions are met:

- The camera is On
- No buttons have been pressed for about five minutes.

Once these conditions are met you will see the following message in the display: **Auto shutdown 30s**, and after counting down for 30 seconds the camera will shutdown.

Press any button during this countdown to terminate Auto Shutdown and resume normal operation.

Note

Pressing any button during an Auto Shutdown countdown will only terminate the countdown and abort the shutdown. The normal function of the button will not occur.

4 Technical Data

4-1 First Mate II MS-Series Model Features

The First Mate II MS-Series cameras are available with NTSC video output format.

Model	
MS-224b	First Mate II MS-Series Handheld Thermal Camera with video resolution of 240 × 180 pixels
MS-324b	First Mate II MS-Series Handheld Thermal Camera with video resolution of 320 × 240 pixels with 2× digital electronic zoom.
Included with all camera models	Lens Cover, USB Cable, Wrist Strap, Operator's Manual, and Soft Carrying Pouch

Feature	
Start up from stand-by	<5 seconds
Thermal Sensitivity, Waveband	<50 mK @ f/1.0, 7.5 - 13.5 μm
Detector Type	VOx Microbolometer
Resolution	240 × 180 pixels MS-224b
	320 × 240 pixels MS-324b
Image Processing	FLIR Proprietary Digital Detail Enhancement
Focus, Zoom	Fixed focus. 2× electronic zoom on applicable models only.
Video Display	NTSC 7.5 Hz refresh rate

4-2 Power

Battery Types	Internal Li-Ion
Battery Life Operating	Approximately 5 Hours at room temperature

4-3 Environmental

MS-224b and MS-324b	
Operational Temp.	-4°F to 122°F [-20°C to 50°C]
Storage Temp.	-40°F to 140°F [-40°C to 60°C]
Ratings	IP-67, 1 meter drop

4-4 Physical

MS-224b and MS-324b	
Weight	12 oz. (340 g) with battery
Size (L × W × H)	6.70" × 2.31" × 2.44" [172 × 58.7 × 62 mm]

4-5 Field of View

MS-224b and MS-324b	
Field of View (FoV)	24° × 18°

4-6 Range Detection¹

Detect Man (1.8 m × 0.5 m)	
MS-224b	350 yd. (320 m)
MS-324b	500 yd. (450 m)

1. Actual range may vary depending on camera set-up, environmental conditions, and user experience.

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