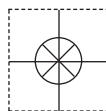


3 YEAR
WARRANTY



Ω OMEGA® **User's Guide**



OSXL-TIC101



OSXL-TIC102
OSXL-TIC103
OSXL-TIC104

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The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, human applications.

Sectional Overview

What you should know and do to ensure your safety and avoid damaging the camera

Read This First

Illustrations and descriptions of all camera components and connectors

Product Overview

How to charge the battery pack; install the mini SD memory card; power the camera on and off; set the date and time; and select a language, TV standard and measurement unit

Setup Instructions

How to read the display; navigate menus; restore default settings

Basic Functions

How to make camera adjustments such as:

- Manual focusing
- Fusing thermal and visual images
- Moving fusion squares and choosing a palette
- Adjusting camera parameters and image settings
- Saving and freezing/activating images
- Using analysis tools and changing analysis settings
- Working with spots, areas, profiles and isotherms
- Voice-annotating images
- Defining trigger functions

Shooting

Locating, viewing and erasing saved images; playing back voice memos.

Playback and Erase

How to: upload images to a computer; charge the battery directly, connect to a TV monitor or PC; use the Bluetooth headset

Camera Connections

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Read This First

Practice Makes Perfect

Before attempting to shoot important subjects, shoot several trial images to confirm that the thermal camera is operating correctly and that you know how to operate it correctly. Omega Engineering, Inc. and its subsidiaries, affiliates and distributors are not liable for any consequential damages arising from any malfunction of the camera or any accessory that results in the failure of an image to be recorded or to be recorded in a format that is machine-readable.

Safety Precautions

Before using the camera, read and understand the safety and precautions described in this section. They are intended to help you operate the thermal camera and its accessories without 1) risking injuries to yourself and others or 2) damaging the camera itself.

Avoid damaging eyesight

Warning: Do not aim the laser pointer at any person or animal. Prolonged exposure may damage eyesight.

Do not disassemble

Do not attempt to disassemble or modify any part of the camera or its accessories.

Stop operating immediately if the camera is dropped, the casing is damaged, or the camera emits smoke or noxious fumes

Failure to do so may result in fire or electrical shock. Immediately turn the thermal camera's power off, remove the battery or unplug the power cord from the power outlet.

Do not use substances containing alcohol, benzene, thinners or other flammable substances to clean or maintain the thermal camera

The use of these substances may start a fire.

Remove the power cord on a regular periodic basis and wipe away the dust and dirt that collects on the plug, the exterior of the power outlet and the surrounding area

In dusty, humid or greasy environments, the dust that collects around the plug over long periods of time may become saturated by humidity and short-circuit, leading to fire.

Do not handle the power cord if your hands are wet

Handling the cord with wet hands may lead to electrical shock. When unplugging the cord, pull on the plug, rather than the cord. Pulling on the cord may damage or expose wires and insulation, creating the potential for fires and electric shocks.

Do not cut, alter or place heavy items on the power cord

Any of these actions may cause an short circuit than can lead to fire or electrical shock.

Use only recommended power accessories

Use of power sources not expressly recommended for this thermal camera may lead to overheating, distortion of the thermal camera, fire, electrical shock or other hazards.

Do not drop the batteries, place them near a heat source, directly expose them to flame, or immerse them in water

Such exposure may damage the batteries and lead to leakage of corrosive liquids, fire, electric shock, explosion or serious injury.

Do not attempt to disassemble, modify or apply heat to the batteries

Any of the actions may cause an explosion. If any part of your body comes into contact with battery acid in any form, immediately flush that area with water. If your mouth or eyes are involved, immediately flush with water and seek medical assistance.

Do not short-circuit the battery terminals with metallic objects, such as keys

Doing so could lead to overheating, burns and other injuries.

Before you discard a battery, cover the terminals with tape or other insulators to prevent direct contact with other objects

Contact with the metallic components of other materials in waste containers may lead to fire or explosions. Discard the batteries in specialized waste facilities if available in your area.

Use only recommended batteries and accessories

Use of batteries not expressly recommended for this equipment may cause explosions or leaks, resulting in fire, injury and damage to the surroundings.

Disconnect the compact power adapter from both the thermal camera and power outlet after recharging and when the thermal camera is not in use

Continuous use over a long period of time may cause the unit to overheat, creating a fire risk.

Exercise caution when detaching or attaching a lens

If the lens falls and breaks as it comes loose, the glass shards may cause an injury.

Use of the camera for prolonged periods may cause its body to become warm

Such heating is normal, and should be considered a minor burn risk

Preventing Damage to the Camera

Avoid damaging the IR detector

Warning: Do not aim the thermal camera directly at the sun or a source of intense heat (such as an arc welder). Doing so for more than a few seconds will permanently damage the camera's IR detector and void the camera's limited warranty.

Avoid Condensation Related Problems

Moving the thermal camera rapidly between hot and cold environments may cause condensation (water droplets) to collect on its external and internal surfaces.

If condensation appears, stop using the camera immediately and power it off. If charging the battery directly, detach the charger from the unit. Then remove the battery and wait until the condensate evaporates completely before resuming use.

To minimize condensation: 1) store the camera in its protective case when not in use, and 2) give the camera time to adjust to its new surroundings before using it.

Extended Storage

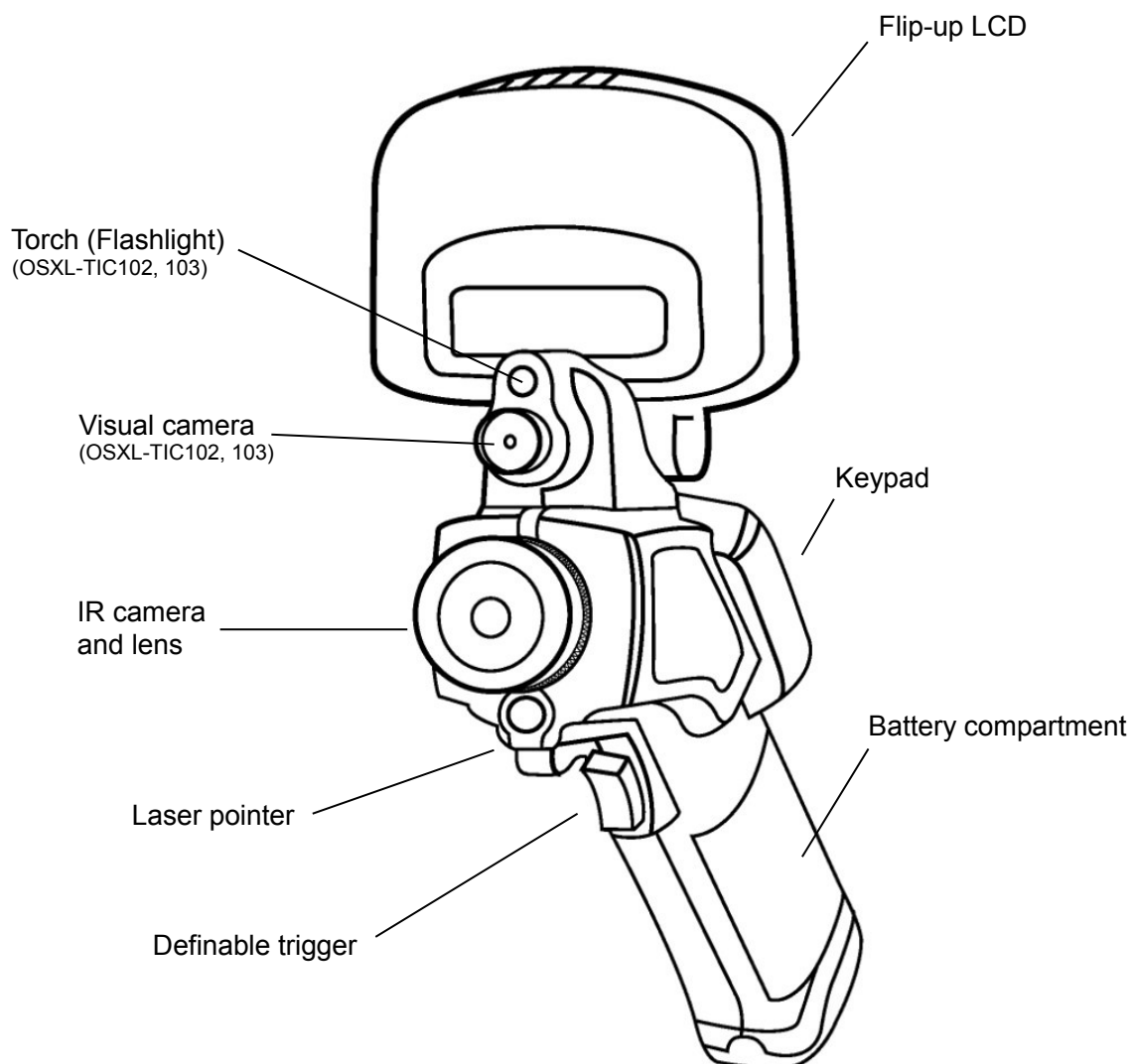
When you do not expect to use the thermal camera for even a few weeks, remove batteries from the camera and the compact battery charger, place the camera in its case and store the case in a safe place. Storing the camera or the compact charger for a long time with a battery inside will completely discharge the battery, creating a risk of damaging leakage.

What's Included

Item	Quantity
Thermal camera	1
Heavy-duty plastic protective case with shoulder strap	1
AC battery charger	1
Rechargeable battery (1 installed in camera, 1 in case)	2
2GB Mini SD memory card with adaptor (pre-installed in camera)	1
Sun shield	1
Video cable with BNC plug	1
USB cable	1
Hand strap (on camera)	1
Lens cap	1
CD containing: Reporting and analysis software (standard version); Software user's manual; Camera user's manual; QuickStart guide, Warranty card	1
Hard copy of calibration certificate	1
Hard copy of QuickStart guide	1
Hard copy of packing list	1
Hard copy of warranty card	1
Bluetooth headset and charger (OSXL-TIC103)	1

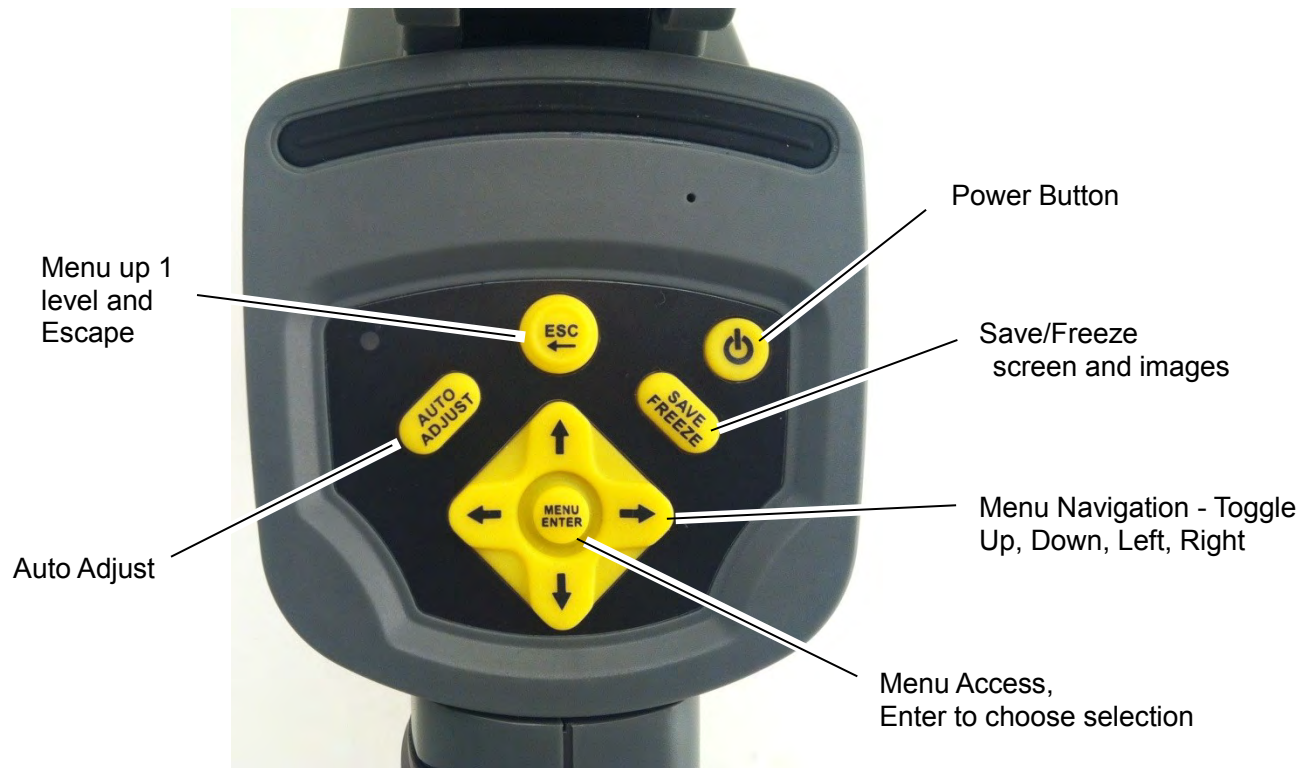
Product Overview

Front View



Product Overview

Keypad and Bottom Views



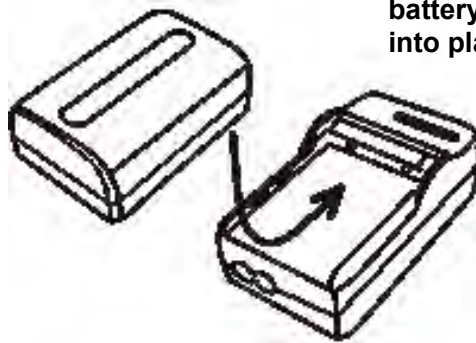
Setup Instructions

Charging the Battery

Use the following procedures to charge the battery pack for the first time and subsequently when the low battery icon appears on the LCD.

1

Position a battery in the compact battery charger so the contacts nearly touch. Push the battery forward until it snaps into place.



2

Plug one end of the power cord into the charger and the other end into a 110VAC outlet.

- The light on the charger will glow red while the battery is charging. It will turn green when charging is complete.
- After charging, unplug the battery charger and remove the charged battery.



- This is a lithium ion battery pack so there is no need to discharge it completely before recharging. It can be recharged at any time. However, since the maximum number of charge cycle is approximately 300 (battery life), to prolong battery life Omega recommends that you only charge the battery pack after it has been discharged completely.
- Charging times will vary according to the surrounding humidity and battery pack charge state.

Setup Instructions

Installing the Battery Pack and Mini SD Card

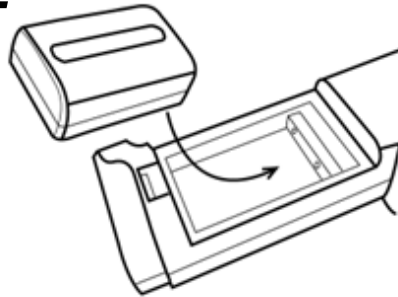
Install the charged battery into the camera as follows:

1



Release the battery compartment latch by pushing it down and forward. Lift and remove the battery compartment cover.

2



Align the battery's edge with the line inside the compartment. Push the battery forward until it click-locks. Replace the battery compartment cover and latch it.

3

Replace the battery compartment cover.

4

To insert the Mini SD card, position it with the printed side up (metal connector side down) in front of the slot at the bottom of the camera. Push the card in gently with your fingertip until you feel and hear a click.

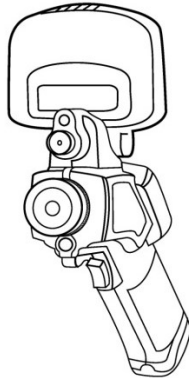
Setup Instructions

Powering On and Off

The LED at the upper left of the keypad will be lit whenever the camera is powered on.

To power on:

1




Remove the lens cap and flip up the LCD to expose the keypad.

2

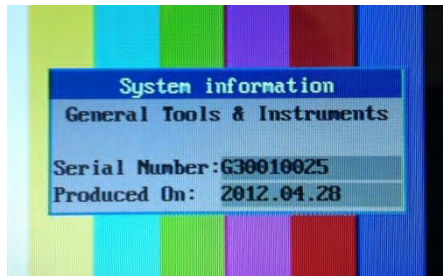


Button

Press and hold the  button for 3 seconds.

- On the OSXL-TIC101 and the OSXL-TIC102 the LED at the upper left of the keypad will glow green. On the OSXL-TIC103, the LED will toggle between green and blue, indicating that the camera is ready for a Bluetooth connection.

3



After a few seconds, this System Information startup screen will appear and take 40 seconds to clear.

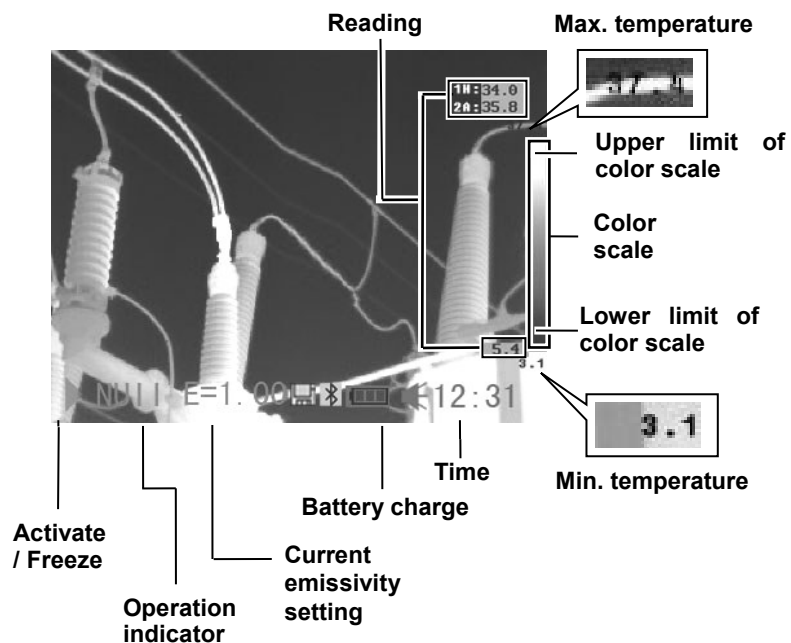
To power off:

Press and hold the power button for three seconds. The LED will extinguish.

Setup Instructions

Reading the Display

The LCD's frame is exactly the same size as the thermal camera's field of view. The following information is available on-screen.



Battery Status Symbols

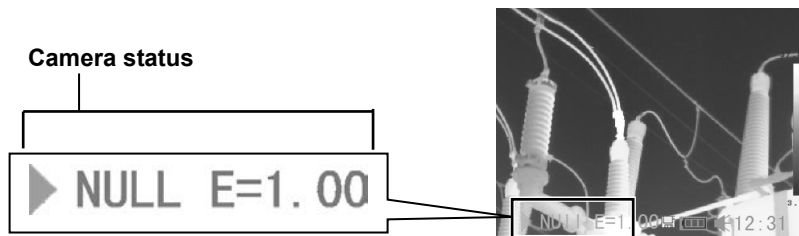
The following icons indicate battery status on the LCD.



			Sufficient battery charge
			Low battery
			Replace or recharge the battery



About the operation indicator

The operation indicator at the lower left of the LCD shows the current operating status of the camera.



Camera operating status	Menu	Indicates operation in Menu Mode.
	Null	Represents operation in a non-menu mode, with no analysis tools selected.
	SP1...9	Indicates that the current analysis tool is spot 1, spot 2... or up to spot 9.
	CAP.	Indicates that the current analysis tool is auto-tracking spot.
	AR1...5	Indicates that the current analysis tool is area 1, area 2... or up to area5.
	PRO.	Indicates that the current analysis tool is profile.
	ISO.	Indicates that the current analysis tool is isotherm analysis.
	E	Current emissivity value
		Indicates that the SD card is inserted.
		Indicates that the Bluetooth headset has been paired.

To enter NULL mode, press the **ESC** button repeatedly until you see **NULL** at the bottom left of the LCD.

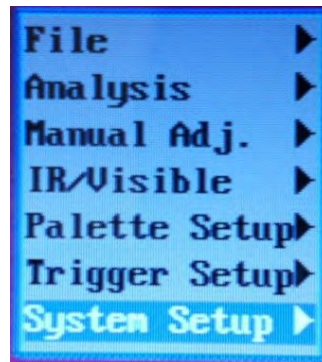
Setup Instructions

Setting the Date and Time

If you intend to record images, you should set the Date and Time when powering 'ON' the thermal camera for the first time.

1 Make sure that the thermal camera is in Null mode (see p.14).

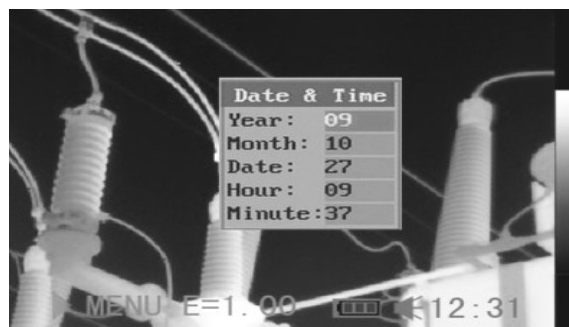
2 Press the MENU/ENTER button to call up the Main Menu. Then press the UP or DOWN key to navigate to the System Setup line. Press the MENU/ENTER button to open the System Setup menu.



3 Press the UP or DOWN arrow to select the Date & Time line, then press the MENU/ENTER button.



4 a) Use the UP and DOWN arrows to select an item to change, and the LEFT and RIGHT arrows to set a new value.
b) Repeat for each date and time parameter.
c) Press the MENU/ENTER button to save the change(s), or the ESC button to return to the System Setup menu without making any changes.



Setup Instructions

Local Settings

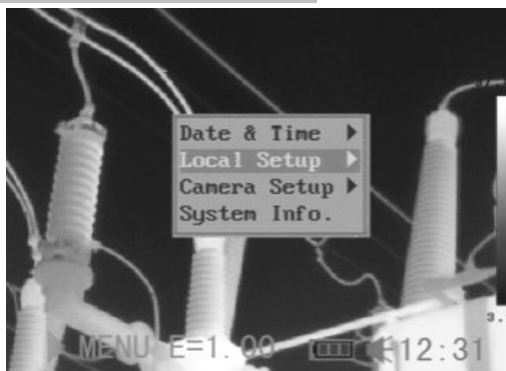
Using this menu item, you can change the language of menus and messages, select either the NTSC or PAL TV standard, and choose metric or Imperial units for temperature and distance readouts.

1 Make sure that the thermal camera is in Null mode (see p.14).

2 Press the MENU/ENTER button to call up the Main Menu. Then press the UP or DOWN arrow to navigate to the System Setup line. Press the MENU/ENTER button to open the System Setup menu.



3 Press the UP or DOWN arrow to select Local Setup, then press the MENU/ENTER button.



4 a) Use the UP and DOWN arrows to select an item to change, and the LEFT and RIGHT arrows to set a new value.
b) Repeat for each parameter you wish to change.
c) Press the MENU/ENTER button to save the change(s), or the ESC button to return to the System Setup menu without making any changes.





About Local Settings

Language	Selects the language of the menus and messages.
Video output	Sets the format of the video output of the camera to PAL or NTSC.
Temp unit	Choose °C or °F as the unit of temperature measurements.
Distance unit	Chooses meter or foot as the unit of distance measurements.

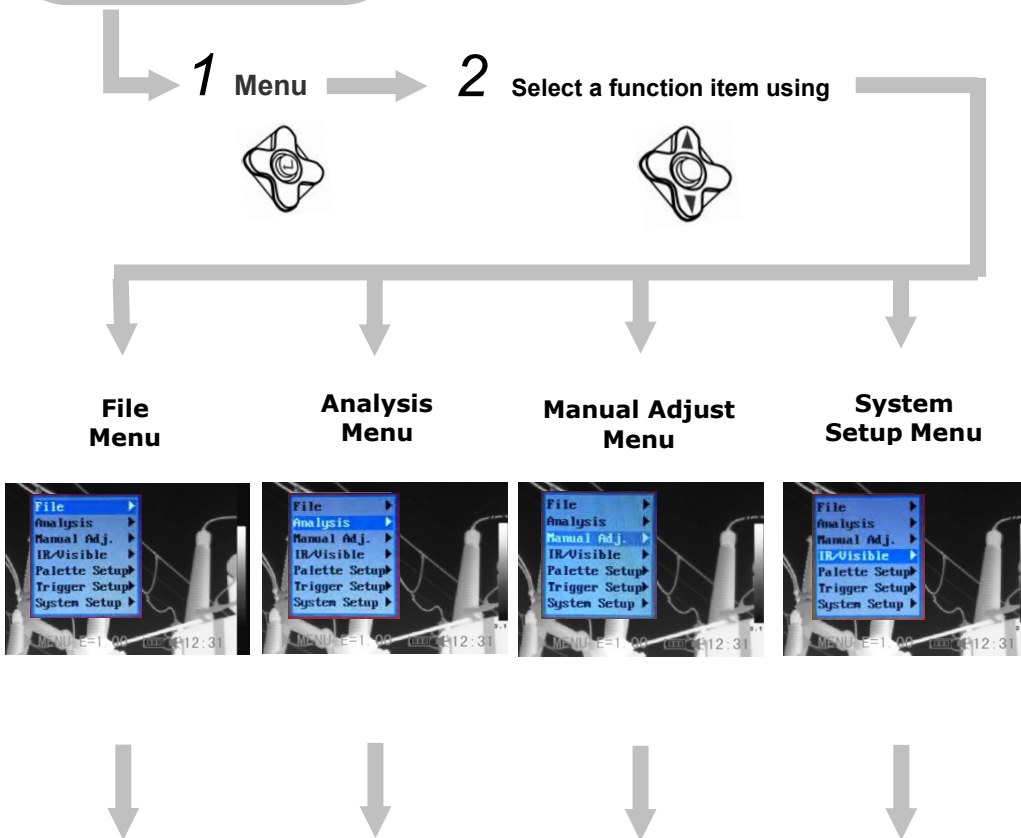
Basic Functions

Selecting Menus and Settings

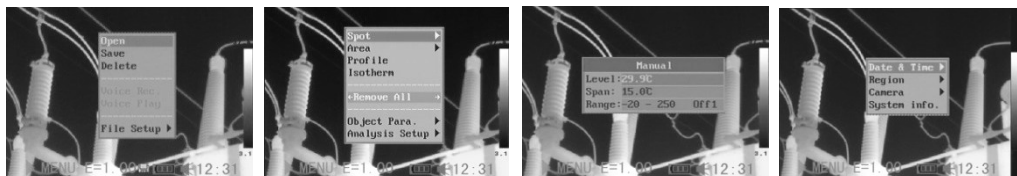
You can select the settings by pressing the **MENU/ENTER** button.



- 1 Press the MENU / ENTER button.
- 2 Press the LEFT or RIGHT arrow.
- 3 Press the UP or DOWN arrow.
- 4 Press the MENU / ENTER button.



3 Select setting contents using



4 Change the settings using



Exit



Displayed menu items will vary according to the operation and setting contents.



*The menu items may vary among different camera models.

Basic Functions

Restoring Default Settings

You can reset the menu and button operation settings to default.

1

Turn off the thermal camera.



 button

2

Press and hold the power button and the ESC button for three seconds.



ESC
button



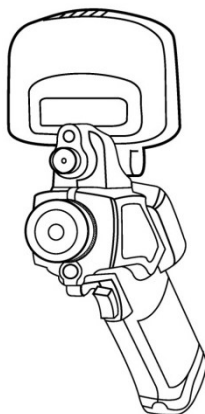
The data in storage will not be deleted when you reset the menu and button operation settings to default.

Shooting

Using the LCD

To use the LCD as your monitor for capturing thermal images, follow the instructions below.

1 Open the flip-up LCD screen



2 Using the trigger to turn on the laser pointer (see p. 46), aim the camera at a subject.



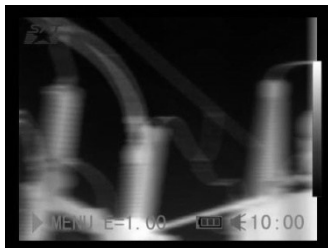
1. For the most-accurate temperature measurements, make sure the target appears in the middle of the LCD.
2. Closing the flip-up screen turns off the LCD and puts the camera to sleep.

Shooting

Making Camera Adjustments

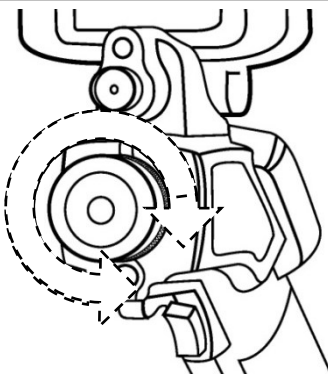
Manual Focus

1



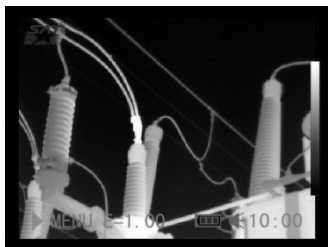
Point the thermal camera at the target.

2



Turn the focus ring until the target slips in and out of focus on the display.

3



Adjust the focus until the image is clearest.

Shooting

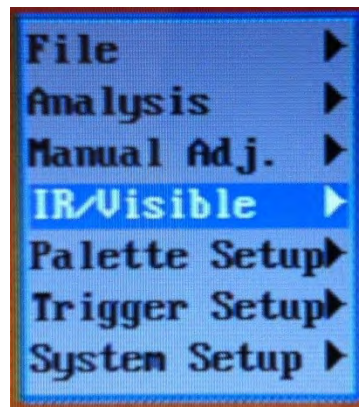
Making Camera Adjustments

Thermal, Visual and BiVision Image Displays

The OSXL-TIC102 and OSXL-TIC103 thermal cameras can also record visual images using a built-in digital camera. The reason to capture a visual image is to use it as a reference for a thermal image.

1 Press the MENU/ENTER button.

2 Press the MENU/ENTER button to call up the Main Menu. Then press the UP or DOWN arrow to navigate to the IR/Visible line. Press the MENU/ENTER button to display the IR/Visible Setup menu.



3 IR/Visible Setup

- a) Use the LEFT or RIGHT arrows to select IR Only, Vision Only, or BiVision.
- b) Press the MENU/ENTER button to save the selection, or the ESC button to return to the System Setup menu without making a change.



About the **Percentage** setting: Sets the ratio of IR image to Visual image to a value between 1% and 100%.

About IR/Visible settings

Sets the ratio of IR image to Visual image to a value between 1% and 100%.

Shooting



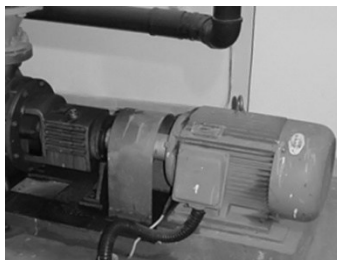
About Fusion Displays

In **BiVision** display mode, you can see thermal images 'fuse' into visible images.



IR Only

In this mode, you can use analysis tools to analyze the target. But what you see is the image with pseudo color.



Vision Only

In this mode, you see the visual image in full color. But you cannot use any analysis tools to analyze the target.



BiVision

In this mode, you see the visual image in the background with its thermal image 'fused' on it in the center square. In this mode you can use any analysis tools to analyze the target.

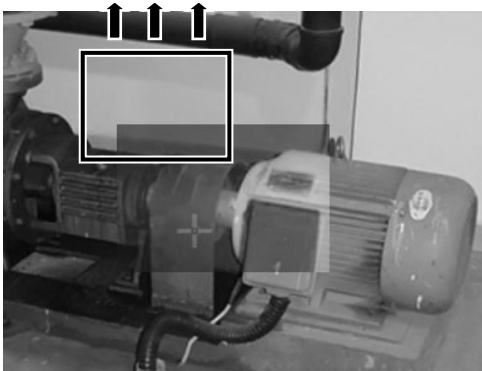


In IR Only and BiVision modes, you use the **UP** and **DOWN** arrows to change the span (contrast) of the IR image and the **LEFT** and **RIGHT** arrows to change its level (brightness).

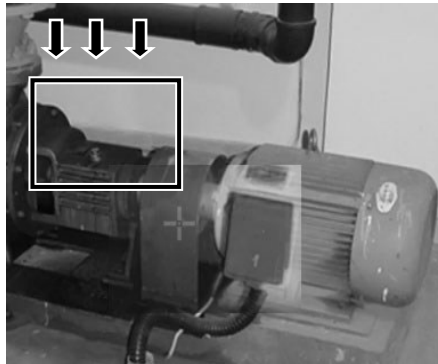
Shooting

In **BiVision** display mode, you can move the fusion area using the arrow keys and see thermal images 'fuse' into visible images.

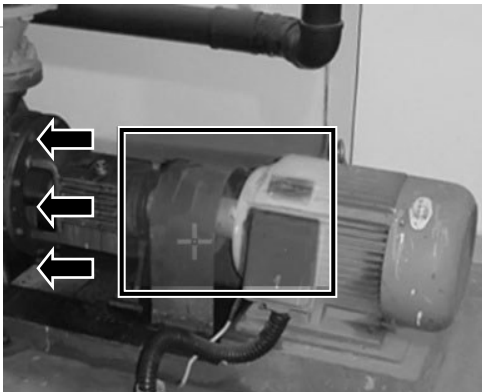
Moving the fusion square



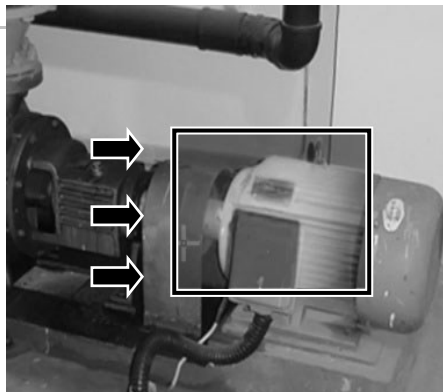
Move the area up
ESC + UP



Move the area down
ESC + DOWN



Move the area left
ESC + LEFT



Move the area right
ESC + RIGHT

Shooting

Making Camera Adjustments

Making Image Adjustments

You can adjust the level (brightness) and span (contrast) of thermal images manually or automatically.

Auto Adjust

The camera will automatically adjust the brightness, span or both parameters when you press the **Auto Adjust** button. How you set the Auto Adjust line of the Camera Setup menu (see p. 30) determines which of the three possible adjustments is made.

Shooting

Making Camera Adjustments

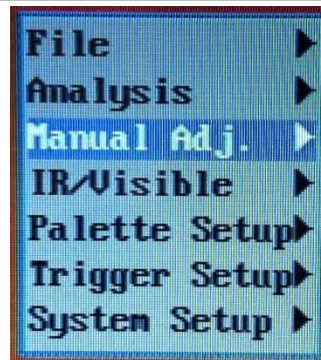
Making Manual Adjustments

You can manually adjust the level and span of thermal images by using a menu or the arrow buttons. Use the **UP** and **DOWN** arrows to change the span (contrast) of an image and the **LEFT** and **RIGHT** arrows to change its level (brightness).

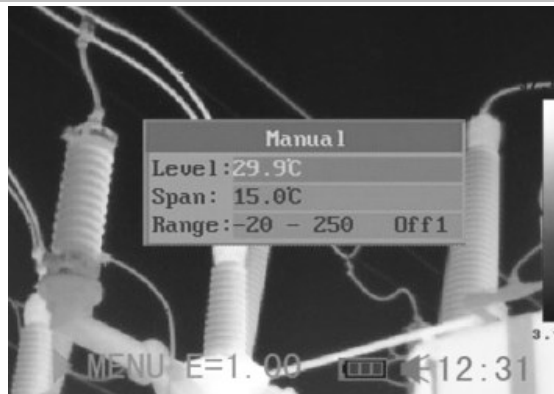
Using the Manual adjust menu

1 Press the MENU/ENTER button to call up the Main Menu.

2 Press the UP or DOWN arrow to navigate to the Manual Adj. line. Then press the MENU/ENTER button to open the Manual Adjust menu.



3 Setting Level and/or Span
a) Use the UP and DOWN arrows to select Level or Span. (Range refers to the Temperature Measurement Range of the camera's lens, which is not adjustable. Appendix I correlates this line to the kind of lens installed)
b) Use the LEFT and RIGHT arrows to adjust the level or span. Then press the MENU/ENTER button to save the change, or the ESC button to return to the System Setup menu without making a change.



Shooting

Making Camera Adjustments

Palette Settings

1 Press the MENU/ENTER button to open the Main Menu.

2 a) Press the UP or DOWN arrow to navigate to the Palette Setup line. Then press the MENU/ENTER button to open the Palette Setup menu.
b) The default palette is Iron. Use the LEFT and RIGHT arrows to change the palette. The other options are Iron Inverted, Rainbow, Feather, Grey and Grey Inverted.



3 After you make your choice, press the MENU/ENTER button to save the selection, or press the ESC button to return to the Main Menu without saving.



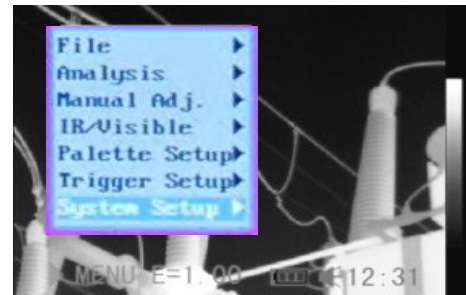
Shooting

Making Camera Adjustments

Image/camera Settings

1 Press the MENU/ENTER button to open the Main Menu.

2 Press the UP or DOWN arrow to navigate to the System Setup line. Then press the MENU/ENTER button to open the System Setup menu.

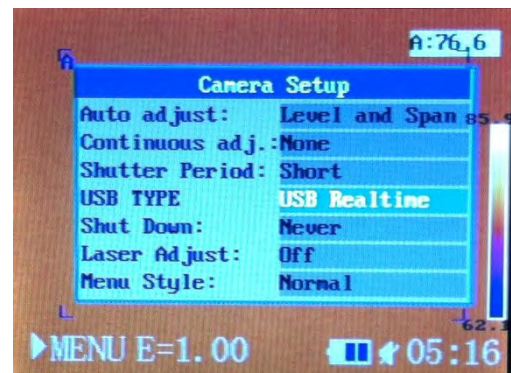


3 Press the UP or DOWN arrow to navigate to the Camera Setup line. Then press the MENU/ENTER button to open the Camera Setup menu.



4 Use the UP and DOWN arrows to select a parameter.

- Use the LEFT or RIGHT arrows to select IR Only, Vision Only, or BiVision.
- Press the MENU/ENTER button to save the selection, or the ESC button to return to the System Setup menu without making a change.



Shooting

Making Camera Adjustments



About Image Settings

Auto adjust	Sets the function of the AUTO ADJUST button	
	Level and Span	The camera will automatically adjust the level (brightness) and span (contrast) of the image to the optimum setting.
	Level	The camera will automatically adjust the level (brightness) of the image.
	Span	The camera will automatically adjust the span (contrast) of the image.
Continuous adj	Determines whether or not the brightness and contrast of images shown on-screen are adjusted automatically	
	Level and span	Brightness and contrast are adjusted automatically.
	Level	Only brightness is adjusted automatically.
	None	Brightness and contrast are NOT adjusted automatically.
Shutter period	Sets the period of auto-adjusting.	
USB TYPE	The options are USB Realtime and USB Remove Disk	
Shut Down	Sets the Auto Power Off interval—the time at which the camera will automatically power off if no keypad entries are made. The options are 2 minutes, 5 minutes, 10 minutes and never.	
Laser Adjust	Turns the laser pointer on or off.	
Menu Style	Sets the menu style. The options are Normal, Translucence and Lucency.	

Shooting

Making Camera Adjustments

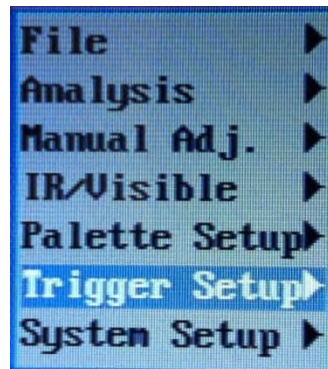
Freezing / Activating an Image

You can activate/freeze a thermal image by configuring the trigger to do so.

- 1** Make sure that the thermal camera is in null mode (see p. 14). Press the MENU/ENTER button to open the Main Menu.

- 2** Press the *UP* or *DOWN* arrow to navigate to the Trigger Setup line. Then press the MENU/ENTER button to open the Trigger Setup menu.

- Use the **LEFT** and **RIGHT** arrows to select **Freeze/Live** among the three options for the trigger. (The other two options are Torch On and Save File.) To set up the trigger for Torch Off, press the **MENU/ENTER** button while the display shows Torch On.



- 3** After this operation, press the MENU/ENTER button to save the selection, or press the ESC button to return to the System Setup menu without saving.

Shooting

Using Analysis Tools

Changing Object/global Settings

- 1 Make sure that the thermal camera is in null mode (see p. 14). Press the MENU/ENTER button to open the Main Menu.

- 2 Press the UP or DOWN arrow to navigate to the Analysis line. Then press the MENU/ENTER button to open the Analysis menu.



- 3 Use the DOWN arrow to navigate down to the Object Para. line. Then press the MENU/ENTER button.



- 4 Set the analysis parameter.
 - a) Use the UP and DOWN arrows to select an item to change, and the LEFT and RIGHT arrows to set a new value.
 - b) Repeat for each item you wish to change.
 - c) Press the MENU/ENTER button to save the setting(s), or the ESC button to return to the Analysis menu without saving.



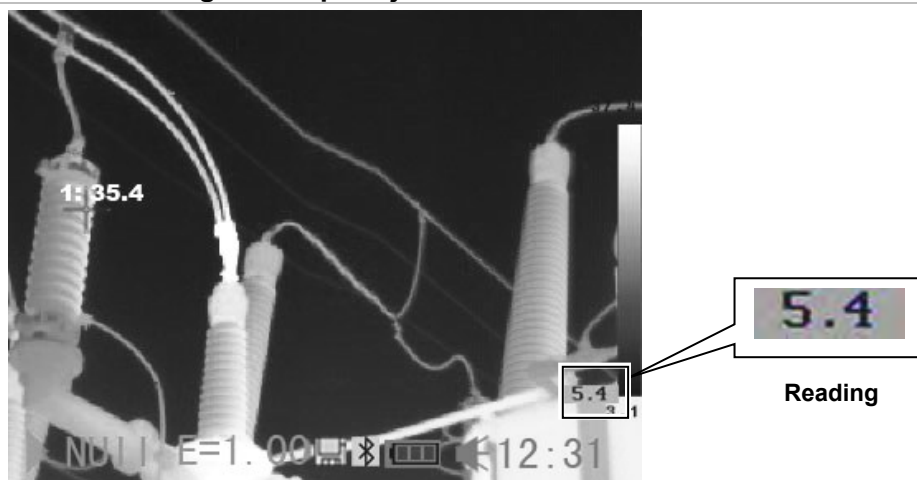


About analysis parameters

Object	Selects the object (a spot or area) whose parameters you wish to measure.
Emiss	Emissivity is a measure of an object's reflectivity in the infrared spectrum. You can optimize the camera's measurement accuracy for a specific object by entering its emissivity within the Analysis menu. Emissivity is a number with no units between 0 and 1. A table in the Appendix lists the emissivities of dozens of common materials.
Distance	Use this field to enter the actual distance of the object from the camera. Doing so improves measurement accuracy.
Amb Temp	Enter the ambient temperature in this field. Doing so improves measurement accuracy.
Humidity	Enter the ambient humidity in this field. Doing so improves measurement accuracy.
Comp. Obj.	Comp Obj1 can be set as any spot or area; Comp Obj2 can be set as a reference temperature (Ref Temp) or as any spot or area. The difference between the temperatures of the two objects will appear at the right bottom corner of the screen.
Ref Temp	Sets a reference temperature to compare with the spot/area/profile tool.



The reading of Comp. Obj.



Shooting

Using Analysis Tools

Setting Analysis Parameters

- 1 Make sure that the thermal camera is in null mode (see p. 14). Press the MENU/ENTER button to open the Main Menu.

- 2 Use the UP or DOWN arrow to navigate to the Analysis line. Then press the MENU/ENTER button to open the Analysis menu.



- 3 Use the UP or DOWN arrow to navigate to the Analysis Setup line. Then press the MENU/ENTER button.



- 4 Setting analysis parameters.
 - a) Use the UP and DOWN arrows to select an item to change, and the LEFT and RIGHT arrows to set a new value.
 - b) Repeat for each parameter you wish to change.
 - c) Press the MENU/ENTER button to save the setting(s), or the ESC button to return to the Analysis Setup menu without saving.





About analysis settings

Alerts	There are two kinds of temp-alert: Upper-limit alert and Lower-limit alert.	
	<p>1.Upper-limit alert If you set the Alert line of the Analysis Setup menu to “on” and the Spot line of the Analysis menu to “Maximum”, the spot analysis tool "max sp10" will automatically capture the hottest spot within the screen. If this temperature is higher than the value you set for the Alert Temp line of the Analysis Setup menu, the value at the top right of the screen will turn red and the beeper will sound.</p> <p>2.Lower-limit alert If you set the Alert line of the Analysis Setup menu to “on” and the Spot line of the Analysis menu to “Minimum”, the spot analysis tool "max sp10" will automatically capture the coldest spot within the screen. If this temperature is lower than the value you set for the Alert Temp line of the Analysis Setup menu, the value at the top right of the screen will turn red and the beeper will sound.</p>	
Alert Temp	Sets the temperature of “Alert”.	
Correct Temp	Corrects the measured temperature value of the camera to improve measurement accuracy under special circumstances.	
Saturation Color	When set to “On”, green takes the place of the color that stands for the highest temperature.	
Isotherm Width	Sets the width of the isotherm interval. The width can be adjusted from 0.1°F to the upper limit of the maximum temperature measurement range under this condition.	
Isotherm Color	Sets the color of the isotherm interval. The options are Transparent, Green, Black and White.	
Isotherm Type	Determines the isothermal analysis mode. Five modes are available: Dual Above, Dual Below, Above, Below and Interval.	
	Dual Above	Displays the isothermal interval in one color and parts whose temperature is above the upper limit of the isothermal interval in a different color
	Dual Below	Displays the isothermal interval in one color and the parts whose temperature is below the lower limit of the isothermal interval in a different color
	Above	Displays the isothermal interval and parts whose temperature is above the upper limit of the isothermal interval in the same color
	Below	Displays the isothermal interval and areas whose temperature is below the lower limit of the isothermal interval of the same color
	Interval	Displays the isothermal interval in one color and all other areas in normal pseudocolor mode
Isotherm Alert	A value from 1 to 100 corresponding to the isotherm interval’s percentage area, relative to the overall screen area screen. For example, for a isotherm span of 35 to 40°F and an isotherm alert of 50, if more than 50% of the isotherm area is between 35 and 40°F, the alarm will sound.	
SpotTemp Color	Use the LEFT and RIGHT arrows to choose the color of the spot temperature box. The options are White, Black, Blue, Red, Purple, Green, Aqua and Yellow	

Shooting

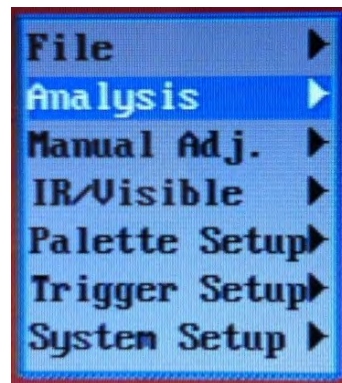
Using Analysis Tools

Setting Spot Analysis Parameters

This section explains how to apply spot analysis tools to the thermal image.

- 1** Make sure that the thermal camera is in null mode (see p. 14). Press the MENU/ENTER button to open the Main Menu.

- 2** Press the UP or DOWN arrow to navigate to the Analysis line. Then press the MENU/ENTER button to open the Analysis menu.



- 3** Use the UP or DOWN arrow to navigate to the Spot line. Then press the MENU/ENTER button to open the Spot submenu.



4 Selecting a spot

- Use the **UP** or **DOWN** arrow to select a spot, and then press the **MENU/ ENTER** button.
- Spot 10 will automatically track the hottest and coldest temperature spot within an area whose shape and size can be set by the user (see p. 45). Use the **LEFT** or **RIGHT** arrow to select the Maximum spot or Minimum spot.

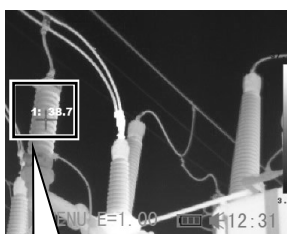


5 Moving the spot

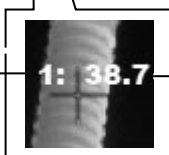
- Start from Step 1 to select a spot to analyze.
- Use the **UP**, **DOWN**, **LEFT** and **RIGHT** arrows to move the spot.
- Press the **MENU/ENTER** button to fix the position of the spot.



The temperature readout of the spot changes in real time.



Spot No.



Temperature reading

6 Removing a spot

- Use Steps 1 through 4 to select a spot.
- Press and hold the **ESC** button to remove the spot.

Shooting

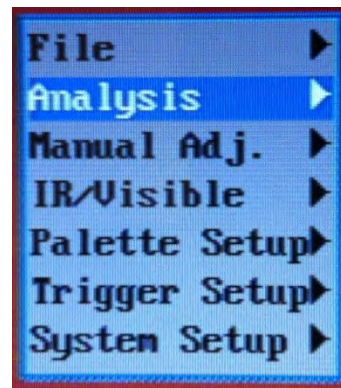
Using Analysis Tools

Setting Area Analysis Parameters

This section explains how to apply area analysis tools to the thermal image.

- 1 Make sure that the thermal camera is in null mode (see p. 14). Press the MENU/ENTER button to open the Main Menu.

- 2 Use the UP or DOWN arrow to navigate to the Analysis line. Then press the MENU/ENTER button to open the Analysis menu.



- 3 Use the UP or DOWN arrow to navigate to the Area line. Then press the MENU/ENTER button to open the Area submenu.



- 4 Setting the analysis area.
 - Press the UP or DOWN arrow to select one or more areas, then press the MENU/ENTER button. A check mark will appear to the left of the selected area(s) and one or more boxes will appear on the screen.
 - A reading in a box with a label at its left will appear at the top right corner. The reading represents the highest/lowest/average temperature of the current area.



- Press the **LEFT** or **RIGHT** arrow to select the maximum, minimum or average temperature for display. The letter in the label to the left of the box indicates which temperature is displayed: H for the highest temperature, L for the lowest, and A for the average.
- If Area 5 is selected, its maximum, minimum and average temperatures will appear in separate boxes at the same time.

5

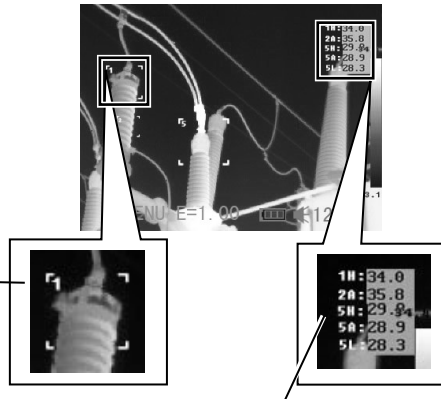
Moving the area.

- Use Steps 1 through 4 to select an area.
- Use the **UP**, **DOWN**, **LEFT** and **RIGHT** arrows to move the area.



The temperature readout of the area changes in real time.

Area No.



Readings

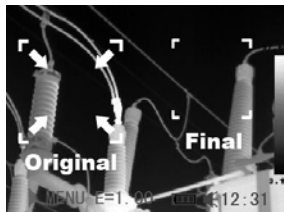
6

Removing an area

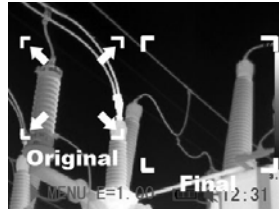
- Use Steps 1 through 4 to select an area.
- Press and hold the **ESC** button to remove the area.



About changing the shape of the analysis area



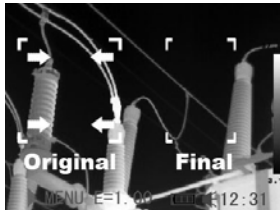
UP and LEFT arrows



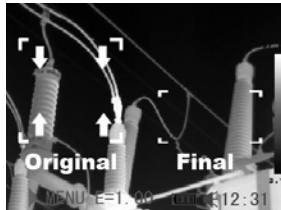
UP and RIGHT arrows



DOWN and LEFT arrows



DOWN and RIGHT arrows



Shooting

Using Analysis Tools

Profile Analysis

- 1 Make sure that the camera is in null mode (see p. 14). Press the MENU/ENTER button to open the Main Menu.

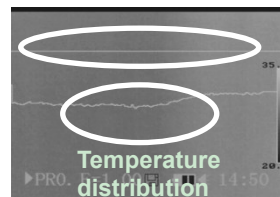
- 2 Press the **UP** or **DOWN** arrow to navigate to the Analysis line. Then press the MENU/ENTER button to open the Analysis menu.



- 3 Use the UP or DOWN arrow to navigate to the Profile line. Then press the MENU/ENTER button to open a profile.



- 4 **Moving a profile.**
 - Start from Step 1 to select profile analysis.
 - Press the **UP** or **DOWN** arrow to move the profile.



- 5 **Removing a profile.**
 - Use Steps 1 through 3 to select a profile.
 - Press and hold the **ESC** button to remove it.

Shooting

Using Analysis Tools

Isotherm Analysis

- 1** Make sure that the camera is in null mode (see p. 14). Press the MENU/ENTER button to open the Main Menu.
- 2** Press the UP or DOWN arrow to navigate to the Analysis line. Then press the MENU/ENTER button to open the Analysis menu.

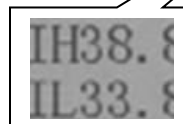
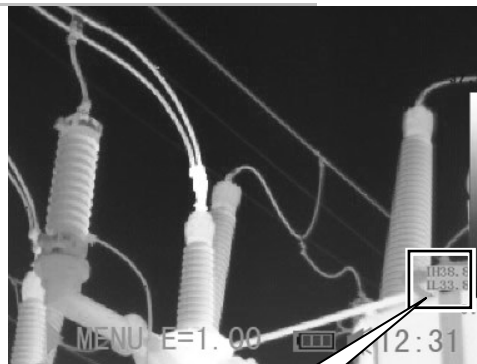


- 3** Use the UP or DOWN arrow to navigate to the Isotherm line, then press the MENU/ENTER key. Areas of concern will be highlighted in color.



- 4** Setting the isotherm range.

- Start from Step 1 to set or select isotherm analysis.
- Press the **UP or DOWN** arrow to select isotherm range. IH and IL will appear at the bottom right corner of the screen. IH is the high limit and IL is the low limit of the isotherm range.
(To change the isotherm type, width, alert and color, see p. 35)



Shooting

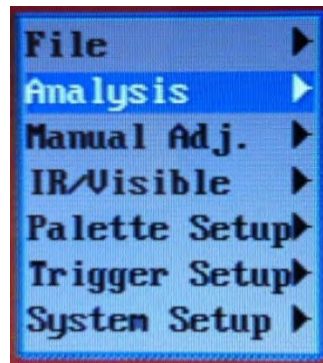
Using Analysis Tools

Removing Analysis Tools

This section explains how to remove analysis tools that you have activated.

- 1** Make sure that the camera is in null mode (see p. 14). Press the MENU/ENTER button to open the Main Menu.

- 2** Press the UP or DOWN arrow to navigate to the Analysis line. Then press the MENU/ENTER button to open the Analysis menu.



- 3** Use the UP and DOWN arrows to navigate to the Remove All line.
 - Press the LEFT or RIGHT arrow to cycle through Remove All, Remove Spot, Remove Area, Remove Profile and Remove Iso



- 4** Press the MENU/ENTER button to save the selection, or the ESC button to return to the Analysis menu without saving.

Shooting

Saving Images

You can save images in either of two ways: 1) by using a pulldown in the File menu or 2) by configuring the trigger to save files.

Using the File menu to save files

- 1** Make sure that the camera is in null mode (see p. 14). Press the MENU/ENTER button to open the Main Menu.

- 2** The Main Menu will open with the File line highlighted. Press the MENU/ENTER button to open the File menu.



- 3** Use the UP or DOWN arrow to navigate to the Save line. Then press the MENU/ENTER button to save the image.



The display mode determines the file type of the saved image (see p. 23).



- 4** The file name of the saved image will be displayed on-screen.



Using the trigger to save files

1

Make sure that the camera is in null mode (see p. 14) Press the MENU/ENTER button to open the Main Menu.

2

Press the UP or DOWN arrow to navigate to the Trigger Setup line. Then press the MENU/ENTER button to open the Trigger Setup menu.



3

Use the LEFT or RIGHT arrow to select Save File.
To use the trigger to save a file, squeeze the trigger and hold it for at least three seconds. The image will be saved in the current folder (see p. 49) and the operation will be confirmed on-screen.

4

After this operation, press the MENU/ENTER button to save the selection, or the ESC button to return to the Main menu without saving.

Shooting

Attaching Voice Memos to Images

Voice recording

You can attach a voice message of up to 30 seconds to any image (OSXL-TIC103)

- 1 Install the Bluetooth headset (included with OSXL-TIC103, optional for OSXL-TIC101 and OSXL-TIC102) using the instructions on p. 58

- 2 Freeze an image (p. 31), then press the MENU/ENTER button to open the Main Menu.

- 3 The Main Menu will open with the File line highlighted. Press the MENU/ENTER button to open the File menu.



- 4 Use the UP or DOWN arrow to navigate to the Voice Rec. line. Then press the MENU/ENTER button

- The message **Voice Recording** will appear on the LCD.



- 5 Speak into the microphone of the headset. To stop recording, press the ESC button.

- 6 Save the image (see p. 44). (Note: Adding a voice message does not increase the size of an image file.)

Shooting

Attaching Voice Memos to Images

Voice recording

You can attach a voice message of up to 30 seconds to any image (OSXL-TIC103)

- 1 Install the Bluetooth headset (included with OSXL-TIC103, optional for OSXL-TIC101 and OSXL-TIC102) using the instructions on p. 58

- 2 Freeze an image (p. 31), then press the MENU/ENTER button to open the Main Menu.

- 3 The Main Menu will open with the File line highlighted. Press the MENU/ENTER button to open the File menu.



- 4 Use the UP or DOWN arrow to navigate to the Voice Rec. line. Then press the MENU/ENTER button

- The message **Voice Recording** will appear on the LCD.



- 5 Speak into the microphone of the headset. To stop recording, press the ESC button.

- 6 Save the image (see p. 44). (Note: Adding a voice message does not increase the size of an image file.)

Shooting

Configuring the Trigger

By default, squeezing the trigger saves the current display as an image file. You can also configure the trigger to:

Freeze/Activate an image

1. Press the **MENU/ENTER** button to open the Main Menu.
2. Press the ▲ or ▼ button to navigate to the **Trigger Setup** line. Then press the **MENU/ENTER** button to open the Trigger Setup Menu.
3. Use the ◀ or ▶ button to highlight **Freeze/Live**. Then press the **MENU/ENTER** button to save the selection.
4. In this configuration, squeezing the trigger freezes the current image.

Turn the torch on and off

1. Press the **MENU/ENTER** button to open the Main Menu.
2. Press the ▲ or ▼ button to navigate to the **Trigger Setup** line. Then press the **MENU/ENTER** button to open the Trigger Setup Menu.
3. Use the ◀ or ▶ button to highlight **Torch On**.
4. Note: Pressing the **MENU/ENTER** button changes the selection from Torch On to Torch off (disabling the torch).
5. In this configuration, squeezing and holding the trigger and then pressing the **Auto Adjust** button turns on the torch. Performing the same actions the next time turns off the torch.

Turn the laser pointer on and off

1. Squeezing and holding the trigger for 3 seconds turns the laser pointer on and off.
2. You can configure the trigger to turn the flashlight (torch) and laser pointer on and off. You can also use the **SAVE/FREEZE** button to change the trigger setting.

Toggle between Save File and Freeze/Live

Pressing the **SAVE/FREEZE** button toggles the trigger's action between Save File and Freeze/Live.

Playback and Erase

Opening Images

You can view and analyze saved images on the LCD monitor.

- 1** Make sure that the camera is in null mode (see p. 14). Press the MENU/ENTER button to open the Main Menu.

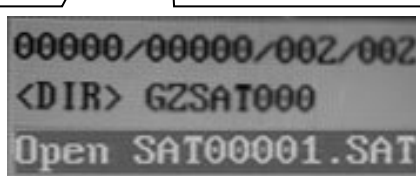
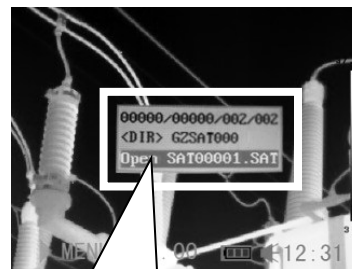
- 2** The Main Menu will open with the File line highlighted. Press the MENU/ENTER button to open the File menu.



- 3** The File menu will open with the Open line highlighted. Press the MENU/ENTER button.



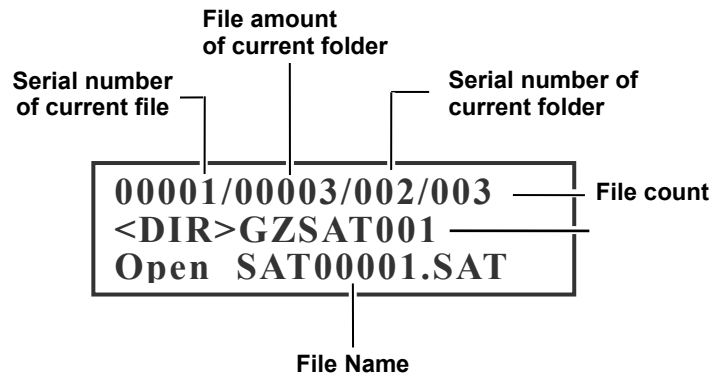
- 4** Use the LEFT and RIGHT arrows to select an image. Then press the MENU/ENTER button to open it.





How to select an image

- 1 If you select **Open** or **Delete** in the **File** menu, a box like the one shown below will appear at the bottom left of the screen.



- 2 If the image you wish to open or delete is not in the current folder, use the **LEFT** and **RIGHT** arrows to browse for it.

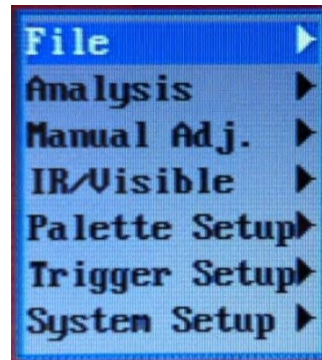
- 3 To activate the image, press the **SAVE/FREEZE** button.



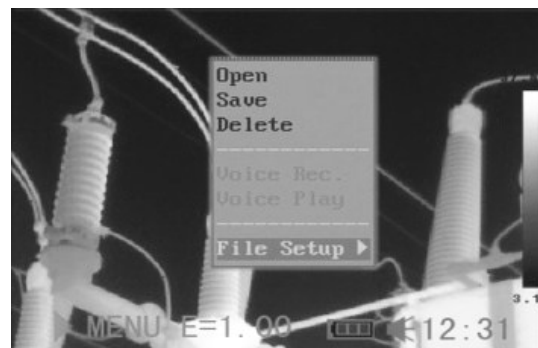
Selecting a folder and filename

- 1 Make sure that the camera is in null mode (see p. 14). Press the MENU/ENTER button to open the Main Menu.

- 2 The Main Menu will open with the File line highlighted. Press the MENU/ENTER button to open the File menu.



- 3 Use the UP or DOWN arrow to navigate to the File Setup line. Then press the MENU/ENTER button to open the File Setup submenu.



- 4 The File Setup submenu will open with the Directory Name line highlighted. Use the LEFT and RIGHT arrows to navigate to the desired folder. On this screen, "File number" represents the number of files in the current folder.



- 5 Use the DOWN arrow to navigate down to the File Name line. Then press the LEFT or RIGHT arrow to select the filename.

Playback and Erase

Playing Back Voice Memos

To play back the voice messages you attach to images:

- 1** Install the Bluetooth headset (included with OSXL-TIC103, optional for OSXL-TIC101 and OSXL-TIC102) using the instructions on p. 58.
- 2** Freeze an image (see p. 31), then press the MENU/ENTER button to open the Main Menu.

- 3** The Main Menu will open with the File line highlighted. Press the MENU/ENTER button to open the File submenu.



- 4** Use the DOWN arrow to navigate to the Voice Play line. Then press the MENU/ENTER button.

- If a voice message is attached to the frozen image, it will play and the message, **"Playing Record"** will appear on the LCD.



- 5** To end the playback of a voice message, press the ESC button.

Playback and Erase

Erasing Images

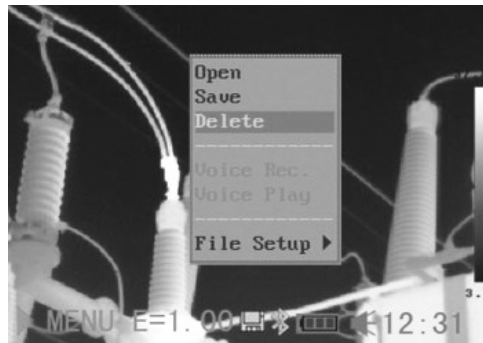
! Erased images cannot be recovered. Exercise caution before erasing an image.

1 Make sure that the camera is in null mode (see p. 14). Press the MENU/ENTER button to open the Main Menu.

2 The Main Menu will open with the File line highlighted. Press the MENU/ENTER button to open the File submenu.



3 Use the DOWN arrow to select the Delete line. Then press the MENU/ENTER button.



3 Select an image (see p. 48), and then press the MENU/ENTER button to delete it.



4 Press the ESC button once to return to the File submenu, and twice to return to the Main Menu.

Uploading Images

Images stored on the camera's Mini SD memory card can be transferred to any computer with a USB port.

- 1** Swing the rubber cover on the bottom of the camera down to expose jacks and the mini SD card in its socket.

- 2** Lightly press on the Mini SD card with the tip of your finger and it will pop out.



MiniSD card

- 3** Insert the card into the supplied SD card reader and plug the card reader into a USB port of your computer.

Camera Connections

Charging the Battery Directly

You can charge the battery directly using the optional power adaptor.

- 1** Swing the rubber cover on the bottom of the camera down to expose the power terminal on the right side. Insert the single-plug end of the power adaptor into the terminal.



- 3** Plug the other end of the adaptor into a 110VAC outlet.
- 4** The LED on the camera's keypad will flicker while the battery is charging. When charging is complete, the LED will stop flickering and steadily glow green.
Unplug the power adaptor from the power outlet after charging.

Camera Connections

Connecting to a TV Monitor

You can increase the size of camera images that you view and analyze by using the supplied video cable to connect the camera to a TV or TV monitor.

1



Swing the rubber cover on the bottom of the camera down to expose the yellow Video Out jack. Insert the RCA mini-plug end of the supplied video cable into the jack.

2

Shown: RCA to BNC connector
Choose appropriate connector for your *Video-In* jack

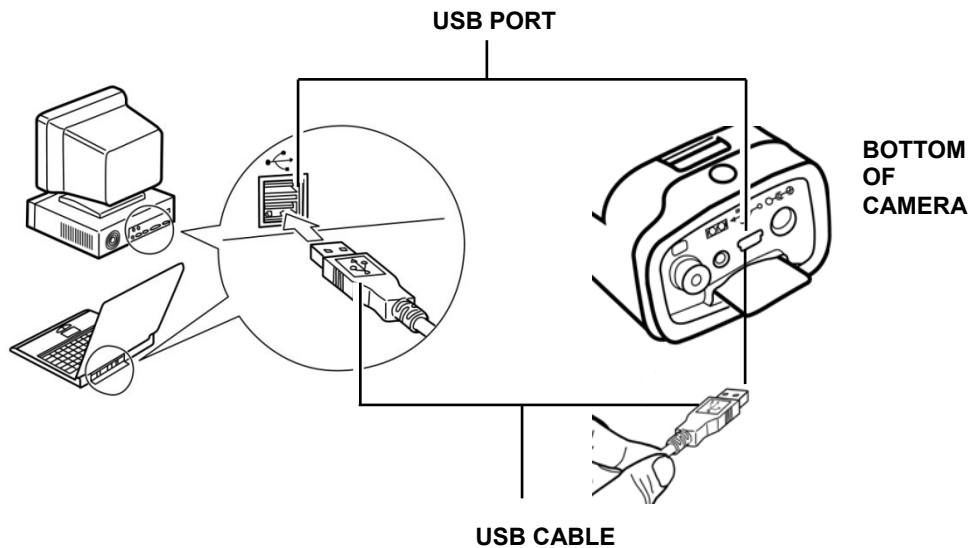


The other end of the cable is also an RCA plug which will mate to the supplied BNC connector if needed. Use the appropriate connector with the *Video In* jack on your TV or TV monitor. Be sure to set the TV's controls to *External Video In*.

Camera Connections

Connecting to a Computer

Images stored on the camera's mini SD card can be transferred to a computer for viewing, analysis and storage without removing the card or turning off the computer or camera. To do so, you connect the camera to the computer by using the supplied USB cable and installing driver software from the supplied disk.



Camera Connections

Installing the driver

To begin, plug the supplied USB cable into the USB ports of the camera and your computer (see p.55). Then insert the supplied disc into your computer's CD/DVD drive.

 Users of Windows XP Professional must log in as an Administrator to install the program.

1



After a few moments, the following dialog box will appear.

2



Select **[No, not this time]** then click **[Next >]**.

3



Select **[Install from a list or location (Advanced)]** then click **[Next >]**.

4



Select **[Include this location in the search]** then click **[browse]**. Locate the directory of the driver, and click **[Ok]** to return to the previous window. Then click **[Next>]**.

5



Click *Continue Anyway*.

6



Click *[Finish]* to finish the driver installation.

Camera Connections

Using the Bluetooth Headset

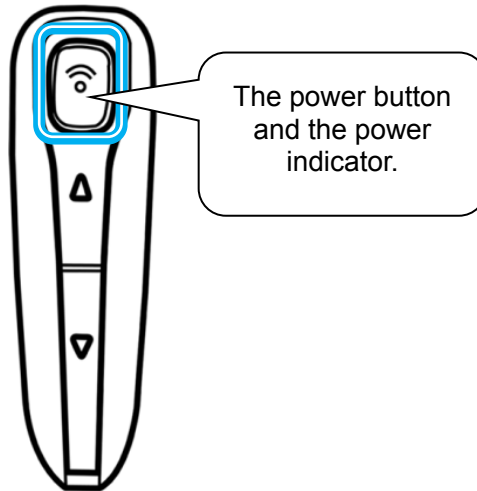
You can use the camera to capture, analyze and save thermal videos as well as thermal images. Doing so requires purchase of optional real-time software and use of the supplied USB cable. The controls for starting and stopping the recording of thermal video clips are on the software, rather than on the camera. A separate user's manual for the software explains how to capture, save, and analyze thermal video clips.

Follow the steps below to install the Bluetooth headset (included with the OXL-TIC103; optional for the OSXL-TIC101 and OSXL-TIC 102) for the first time.


Before beginning, fully charge the Bluetooth headset. If the power indicator is red, the Bluetooth headset needs additional charging. When the Bluetooth piece is fully charged, its power indicator will turn blue.


1 Turn off the camera and Bluetooth headset.

2 Turn on the Bluetooth headset first.
Press and hold the power button for about 4 seconds. You will see the power indicator begin to blink red and blue. The headset will remain in this "pairing" mode for about 90 seconds.



3 Turn on the camera.
When you do, the green LED on the camera keypad and the blue indicator on the Bluetooth headset will begin flashing together. At this point, the camera is preparing to pair up with the Bluetooth headset.

4 Press the power button of Bluetooth headset to execute the pairing. When pairing is complete, the blue LED on the headset will flash slowly, and the Bluetooth icon  will appear on the camera's LCD (see p. 14).

 Make sure that the camera is not too far from the Bluetooth headset. Move the Bluetooth headset as close as possible to the camera before taking step 4.

-
- 5** After you have paired the camera and headset, the next time you want to use the headset, all you need do is turn it on. If the headset's power LED is blinking blue, it is already paired and ready to use.



Press the **ESC** and **MENU/ENTER** buttons at the same time to unpair the camera and the Bluetooth headpiece.

ESC
MENU/ENTER



-
- 6** Put on the headset. You can use it to record (p. 45) or play back (p.50) voice memos now.

Troubleshooting

Problem	Cause	Solution
Camera will not operate	Power is not turned on	<ul style="list-style-type: none"> • Turn on the camera. See <i>Powering On and Off</i> (p.12).
	Insufficient battery voltage	<ul style="list-style-type: none"> • Fully charge the battery.
	Poor contact between camera and battery terminals	<ul style="list-style-type: none"> • Wipe the terminals with a clean, dry cloth.
Camera will not save images	Internal memory is full	<ul style="list-style-type: none"> • If required, download saved images to a computer and erase them from the camera to free up some space.
	Internal memory not formatted correctly	<ul style="list-style-type: none"> • Format the internal memory in FAT32 format.
Battery charge is used up quickly	Battery capacity has been reduced because of lack of use for one year or more after being fully charged.	<ul style="list-style-type: none"> • Replace the battery with a new one.
	Battery life exceeded.	<ul style="list-style-type: none"> • Replace the battery with a new one
Battery will not charge	Poor contact between battery and battery charger.	<ul style="list-style-type: none"> • Clean the battery terminals with a clean cloth. • Connect the power cord to the battery charger and insert its plug firmly into the power outlet.
	Battery life exceeded	<ul style="list-style-type: none"> • Replace the battery with a new one.

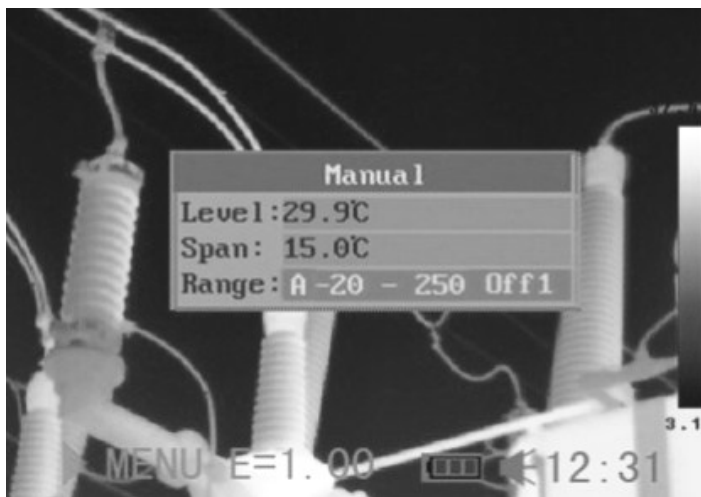
Appendix I

Using an Optional Lens

Optional wide-angle and telephoto lenses for OSXL-TIC series cameras are available from Omega.

Whenever you install an optional lens, do the following to confirm that the camera has automatically configured itself to work with the new lens:

- Open the Manual Adj. menu (see p. 27) and use the **DOWN** arrow to navigate down to the Range line.
- Press the **UP** and **DOWN** arrows at the same time. This will cause a letter to appear on the left of the Range line. The table beneath the image below correlates the letter you should see for various combinations of lenses and OSXL-TIC camera models.



	OSXL-TIC101 102, 103	OSXL-TIC104
Null	20° FOV (Standard)	24° FOV (Standard)
A	12.8°	12°
B	38°	48°
C	3.8°	N/A
D	6.4°	7°
E	9°	N/A

Appendix II

Camera Care and Maintenance

Use the following procedures to clean the camera body, lens, LCD monitor and other parts.

Camera body	Wipe the body clean with soft cloth or an eyeglass lens wiper.
Lens	<p>First use a lens blower to remove loose dust and dirt. Then remove any remaining dirt by wiping the lens lightly with a soft cloth.</p> <ul style="list-style-type: none">• Never use synthetic cleaners, paint thinners, benzene or water the camera body or lens.
LCD	<p>Use a lens blower brush to remove dust and dirt. If necessary, gently wipe the LCD with a soft cloth or an eyeglass lens wiper to remove stubborn dirt.</p> <ul style="list-style-type: none">• Never rub or press forcefully on the LCD.

Appendix III

Emissivity of Common Materials

Material	Temperature (°C)	Emissivity
METAL		
Aluminum		
Polished aluminum	100	0.09
Commercial aluminum foil	100	0.09
Electrolytic chromeplate alumina	25~600	0.55
Mild alumina	25~600	0.10~0.20
Strong alumina	25~600	0.30~0.40
Brass		
Brass mirror (highly polished)	28	0.03
Brass oxide	200~600	0.61~0.59
Chrome		
Polished chrome	40~1090	0.08~0.36
Copper		
Copper mirror	100	0.05
Strong copper oxide	25	0.078
Cuprous oxide	800~1100	0.66~0.54
Liquid copper	1080~1280	0.16~0.13
Gold		
Gold mirror	230~630	0.02
Iron		
Polished cast iron	200	0.21
Processed cast iron	20	0.44
Polished tempered iron	40~250	0.28
Polished steel ingot	770~1040	0.52~0.56
Raw welded steel	945~1100	0.52~0.61
Surface ferric oxide	20	0.69
Completely rusty surface	22	0.66
Rolled iron plate	100	0.74
Oxidized steel	198~600	0.64~0.78
Cast iron (Oxidizing at 600°C)	198~600	0.79
Steel (Oxidizing at 600°C)	125~520	0.78~0.82

Emissivities of Common Materials (Con't)		
Material	Temperature (°C)	Emissivity
Electrolytic ferric oxide	500~1200	0.85~0.89
Iron plate	925~1120	0.87~0.95
Cast iron, heavy ferric oxide	25	0.80
Tempered iron, ferric oxide	40~250	0.95
Melting surface	22	0.94
Melting cast iron	1300~1400	0.29
Melting mild steel	1600~1800	0.28
Liquid steel	1500~1650	0.42~0.53
Pure liquid iron	1515~1680	0.42~0.45
Lead		
Pure lead (Non-oxidization)	125~225	0.06~0.08
Mildly oxidized	25~300	0.20~0.45
Magnesium		
Magnesia	275~825	0.55~0.20
Magnesia	900~1670	0.20
Hg	0~100	0.09~0.12
Nickel		
Electroplate polishing	25	0.05
Electroplate non-polishing	20	0.01
Nickel wire	185~1010	0.09~0.19
Nickel plate (oxidized)	198~600	0.37~0.48
Nickel oxide	650~1255	0.59~0.86
Nickel alloy		
Nickel-chrome (heat-resistance) alloy wire (shining)	50~1000	0.65~0.79
Nickel-chrome alloy	50~1040	0.64~0.76
Nickel-chrome (heat resistance)	50~500	0.95~0.98
Nickel-silver alloy	100	0.14
Silver		
Polished silver	100	0.05
Stainless steel		
18-8	25	0.16
304(8Cr,18Ni)	215~490	0.44~0.36
310(25Cr,20Ni)	215~520	0.90~0.97

Emissivities of Common Materials (Con't)		
Material	Temperature (°C)	Emissivity
Tin		
Commercial tin plate	100	0.07
Strong oxidization	0~200	0.60
Zinc		
Oxidizing at 400°C	400	0.01
galvanized shining iron plate	28	0.23
Ash zinc oxide	25	0.28
Non-metal materials		
Brick	1100	0.75
Fire brick	1100	0.75
Graphite (lamp black)	96~225	0.95
Porcelain enamel (white)	18	0.90
Asphaltum	0~200	0.85
Glass (surface)	23	0.94
Heat-resistance glass	200~540	0.85~0.95
Calcimine	20	0.90
Oak	20	0.90
Carbon piece		0.85
Isolation piece		0.91~0.94
Sheet metal		0.88~0.90
Glass pipe		0.90
Loop type		0.87
Porcelain enamel products		0.90
Porcelain enamel designs		0.83~0.95
Solid materials		0.80~0.93
Ceramics (vase type)		0.90
Film		0.90~0.93
Mica		0.94~0.95
Flume mica		0.90~0.93
Glass		0.91~0.92
Semiconductor		0.80~0.90
Transistor (plastics sealed)		0.30~0.40
Transistor (metal)		0.89~0.90
Diode		
Transmitting loop		
Pulse transmission		0.91~0.92
Level chalkiness layer		0.88~0.93
Top loop		0.91~0.92

Emissivities of Common Materials (Con't)		
Material	Temperature (°C)	Emissivity
Electric materials		
Epoxy glass plate		0.86
Epoxy hydroxybenzene plate		0.80
Gilded sheet copper		0.30
Solder-coated copper		0.35
Tin-coated lead wire		0.28
Brass wires		0.87~0.88
Block talcum terminal		0.87

Specifications

All specifications are based on Omega's testing standards and are subject to change without notice.

OSXL-TIC SERIES FEATURES & SPECIFICATIONS	 OSXL-TIC101	 OSXL-TIC102	 OSXL-TIC103	 OSXL-TIC104
Picture-in-Picture Mode (Visual + Thermal Image Fusion)	No	Yes		
Analysis Tools	2 Movable Spots, Isothermal Analysis	4 Movable Spots, Isothermal Analysis	9 Movable Spots, Isothermal Analysis Profile Analysis, 5 Area Analysis	
LED Flashlight	No	Yes		
Temperature Alarms	No	Yes		
Visual File Format	Prop SAT/JPG	Prop SAT/CCD/JPG		
Visual Image Resolution	N/A	320 x 240 pixels		
Thermal Video Streaming	No		Yes (Via USB)	
Voice Annotation	No		Yes (Via Bluetooth)	
IR Resolution (OSXL-TIC101, 102, 103)	160 x 120 pixels (19,200 pixels)			
IR Resolution (OSXL-TIC104)	320 x 240 pixels (76,800 pixels)			
Refresh Rate	30 frames per second (fps)			
IR Detector Spectral Range	8 to 14um			
Laser Pointer	Yes			
Field of View	20° x 15°			
Spatial Resolution	2.2 mrad			
Temperature Measurement Range	4° to 572°F (-20° to 300°C), upgradeable to 2732°F (1500°C)			
Thermal Sensitivity	±1.4°F (0.08°C) at 86°F (30°C)			
Detector Type	Uncooled focal plane array, manual focusing			
Accuracy	±3°F (2°C) or 2% of reading			
Focusing	Manual			
Measurement Compensation Factors	Emissivity, Ambient Temperature, Humidity, Distance			
Minimum Focal Distance	4 in. (100mm)			
Optional Telephoto and Wide-Angle Lenses	Yes (6.4°, 9° and 38° Field of View available)			
Display	Flip-up 3.5 in. diagonal color LCD			
Auto Hot/Cold Spot Indicator	Yes			
Video Output Formats	NTSC, PAL			
Color Palettes	Ironbow, Iron-Inverted, Rainbow, Feather, Grey, Grey-Inverted			
Image Storage Medium, Capacity	2GB MiniSD memory card (included)			
Thermal File Format	Proprietary SAT, Radiometric, JPG			
Text Input	No			
Battery	Rechargeable Lithium-Ion			
Total Charge Capacity	Up to 5 hours continuous with 2 batteries			
Power Saver Mode	Yes			
Operating Temperature	-4° to 122°F (-20° to 50°C) @ 10 to 90% RH			
Water/Dust/Oil Resistance	IP54			
Shock Resistance	Operational 25G			
Vibration Resistance	Operational 2G			
Weight	1.3 lb. (580g)			
Dimensions	6.8 x 3.1 x 6.4 in. (172 x 80 x 162mm)			
Tripod Mount	Standard Base (Adaptor Optional)			
External Power Source	AC Adaptor & In-Camera charging			
Limited Warranty Duration	3 Years			

NOTES:

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **37 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **three (3) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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