

GUIDE[®] EasIR-4 Thermal Camera

User Manual

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GUIDE® EASIR-4 Thermal Camera complies with current European directives relating to electromagnetic compatibility and safety. (EMC directive 89/336/EEC; Low voltage directive 73/23/EEC).

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Introduction

This publication provides the necessary information required to safely operate the **GUIDE® EASIR-4** Thermal Camera. It is important to fully check all equipment with which you have been supplied.

The equipment should be used, maintained and serviced by suitably trained personnel, capable of carefully following the procedures and guidelines given in this User Manual.

All User Manuals and leaflets should be read thoroughly before proceeding with operation of the equipment.

It is also advisable that all User Manuals and Instruction Leaflets supplied are kept readily available, for reference when the equipment is in general use.

Precautions

The following precautions must be adhered to at all times and must be considered in addition to any advised precautions issued at the relevant worksite or work area.

- Keep the **GUIDE® EASIR-4** Thermal Camera steady during operation.
- Do not use the **GUIDE® EASIR-4** Thermal Camera in temperature exceeding its working and storage temperature ranges.
- Do not direct the **GUIDE® EASIR-4** Thermal Camera at very high intensity radiation sources such as the sun, carbon dioxide lasers or arc welders etc.
- Do not expose the **GUIDE® EASIR-4** Thermal Camera to dust and moisture. When operating the unit near water, ensure that the unit is adequately guarded against splashes.
- When the **GUIDE® EASIR-4** Thermal Camera is not in use or is to be transported, ensure that the unit and its accessories are stored in the protective carry case.
- Do not jam the holes or loudspeaker on the camera body.
- Do not re-switch on the camera until 15 seconds later after switching it off.
- Do not throw, knock or vibrate intensely the camera and its components in order to keep them from damage.
- Do not attempt to open the camera body, as this action will void the warranty.
- Keep the SD memory card for the exclusive use of the camera.

Maintenance

To ensure that the **GUIDE® EASIR-4** Thermal Camera is kept in good working condition and remains fully operational, the following guidelines should be adhered to at all times.

Non-optical surfaces

The non-optical surfaces of the camera can be cleaned when required, with a soft cloth dampened with water and a mild detergent.

Optical surfaces

The optical surfaces of the camera lens should only be cleaned when visibly dirty. Care should be taken to avoid touching the exposed lens surface, as skin acid left behind from fingerprints can be damaging to coatings and lens substrates. Use only a proprietary lens cleaning tissue.

Calibration and Repair Philosophy

To ensure the accuracy and reliability of the **GUIDE® EASIR-4** Thermal Camera, it is highly recommended that the instrument be calibrated at 12 monthly intervals.

Calibration or repair for the instrument can be obtained by either contacting the address/ telephone number on the cover of this User Manual, or by email to the following addresses: overseas@guide-infrared.com

Caution

The **GUIDE® EASIR-4** Thermal Camera does not incorporate any user serviceable parts. Never attempt to disassemble or modify the camera. Opening the unit invalidates the warranty.

Technical Support

Technical support for your **Wuhan Guide** Thermal Imaging System can be obtained by either contacting the address / telephone number on the cover of this User Manual or by email to the following address: overseas@guide-infrared.com

Feedback to Us

We have tested and verified the information in this manual to the best of our abilities. Yet as we are committed to continuous development and progress, you might find features of the product have been changed since the time of printing. You are appreciated to let us know about any error you find, and your suggestions for further editions by either contacting the address/telephone number on the cover of this User Manual or by email to the following address: overseas@guide-infrared.com

System Overview

GUIDE® EASIR-4 is a new infrared camera of Guide infrared, breaks the IR world with its lowest price and high performance. Designed for tough work environments and entry-level users, EASIR-4 is far more robust and shock-resistant for any tough working environment and it is easy to operate and allows for the learners to operate without being trained and take the inspection work easily with one hand .Featured with latest IR Fusion technology, it helps you pinpoint the problem exactly with the most efficiency. Power on the EASIR-4, let the 3.6" LCD bring you into the fresh IR world

System Configuration

Please ensure that the following items have been correctly supplied:

- IR Camera with visual camera, laser locator
- 11mm IR lens
- 3.6" TFT LCD with high resolution
- 2GB SD card & card reader
- 6 AA rechargeable batteries and battery charger

- AC Adapter & cable
- USB extension cable
- USB driver
- Guide IrAnalyser® Software
- User manual
- Carry case & strap

Options

- 30mm Tele lens
- 7mm wide angle lens
- Extended temperature range up to +350°C
- Sun Shield

Technical Specification

Imaging Performance	
THERMAL	
Detector type:	Uncooled FPA microbolometer (160× 120 pixels, 25µm)
Spectral Range:	8-14µm
Thermal Sensitivity:	≤100mk at 30°C
Field of View/ Focus:	20.6° X 15.5°/ 11mm
Focus:	Automatic or motorized
VISUAL	
Built-in Digital Video:	CMOS Sensor, 1600x1200 pixels, 2 ²⁴ true colors
Image Presentation	
External Display:	3.6" TFT LCD with high resolution
Video Output:	PAL/ NTSC
IR fusion:	Visual and IR blending
Man-Machine Communication	
Buttons:	Respond as per operators' operation
Menu:	Microsoft® Windows style
Measurement	
Temperature Range:	-20°C to 250°C (350°C optional)
Accuracy:	±2°C or ±2% of reading
Emissivity Correction:	Variable from 0.01 to 1.00 (in 0.01 increment)

Measurement Features:	Automatic correction based on distance, relative humidity, atmospheric transmission and external optics
Optics Transmission Correction:	Auto, based on signals from sensors
Image Storage	
Type:	Removable 2GB SD card & built-in memory
File Format:	JPG with analysis records
Voice Annotation:	Up to 60 seconds
Laser Locator	
Classification	Semiconductor A1 GaInP Diode Laser
Power System	
Battery Type:	AA rechargeable battery, field-replaceable, AA Alkaline battery also usable
Charging System:	In camera or in battery charger
Battery Operating Time:	Over 2 hours continuous operation
External Power Operation:	AC adapter 110/ 220 VAC, 50/ 60Hz
Environmental Specification	
Operating Temperature:	-10°C to 50°C
Storage Temperature:	-20°C to 60°C
Humidity:	Operating and storing 10% to 95%, non- condensing
Encapsulation:	IP54 IEC 529 housing
Shock:	Operational: 25G, IEC 68-2-29
Vibration:	Operational: 2G, IEC 68-2-6
Interfaces	
USB 2.0:	Real-time image (thermal & visual) , measurement, and voice transfer to PC; Live video transfer to PC
Physical Characteristics	
Weight:	0.73KG(including battery)
Size:	111mmx124mmx240mm
Colors	Yellow&blue interlaced or red&grey interlaced alternative

System Features

Unique Features

- Rugged housing and rubber protection offers high effective operation even in harsh environment
- Big 3.6" LCD plus three-button button system make for a friendly navigation with the push of a thumb
- Unique ergonomically handle presents the comfortable feeling

- IR Fusion technology allows the overlay of the thermal image directly to the corresponding visual image
- 2.0 Megapixels CMOS delivers extremely crisp visual image.
- Auto gate which works as both shutter and intelligent lens cap prevents all disturbing heat radiation caused by optics and electronics inside, delivers crisp and uniform images and protects the precise lens.
- Auto focus function enables the auto focus of IR and visual image with simply pressing one button
- Ultra large capacity SD memory card and built-in flash memory offer easy in-field storage.
- High-speed USB2.0 interface enables real-time data transfer and camera control.
- Robust on board analysis enhances operators' efficiency & productivity.
- High availability of AA Alkaline battery ensures the uninterrupted high efficient work
- Low cost enables the ownership of everyone.

Imaging Performance

- Auto or motorized focusing of IR lens.

Temperature Measurement

- Auto calibration ensures high accuracy.
- Auto hot-spot tracing and center-cursor temperature measurement pinpoint the problem.

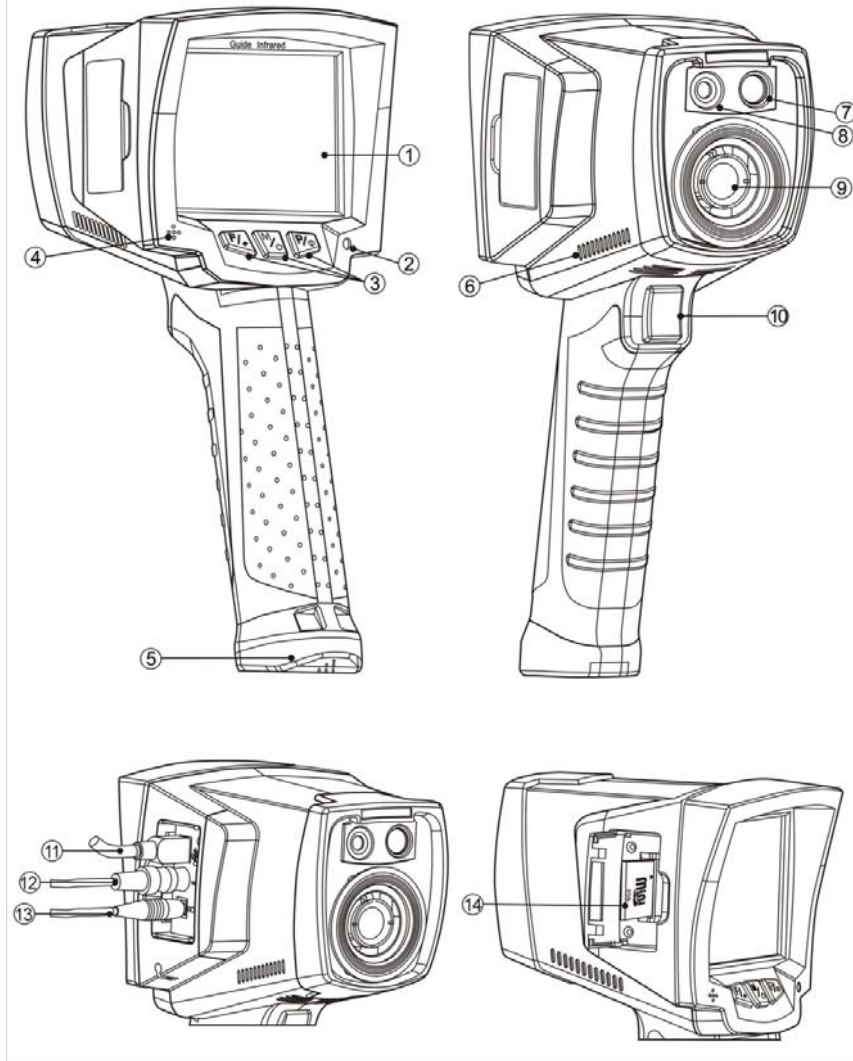
Image Storage

- Live images can be frozen to be static images
- Frozen images, comprising radiometric data, infrared image, visual image, voice annotation can be saved into 2GB SD card or the built-in flash memory in standard JPG format.
- Up to 60-second digital clip of voice can be recorded and saved for each image.
- SD card can accommodate 2000 images and the built-in flash memory can store 200 images.

Image Playback

- Images saved into SD card or the built-in flash memory can be replayed on the camera.
- Temperature measurement can be done on replayed images.
- Voice annotation and visual images saved together with thermal images can be replayed as well.
- Images saved in SD card and the built-in flash memory can be downloaded to PC for further analysis and report generation with software Guide IrAnalyser[®]

Parts Described



1	LCD Display
2	Charging Indicator
3	Function Softkeys
4	Microphone
5	Battery Cover
6	Speaker
7	Visual Camera
8	Laser
9	IR Lens
10	Trigger Button
11	USB Interface
12	Video Interface
13	AC Adapter/Charging Input Terminal
14	SD Card Slot



EASIR-4 Charging Instruction



Note:

- “Instruction” is only for 2704C PCB
- “slow flicker” in the text is about 1Hz, “quick flicker” is about 3Hz

How to use the adapter


- The red indicator light will flicker when the adapter is connected with camera. Keep press the button  for 2 seconds to power on the camera with the green and red light flicker alternatively. When entering self-check interface, the indicator turns to be red and constant on
- Press button  to power off the camera, the adapter indicator will be constant on.



Note:

- When using the adapter, the indicator will be constant red for both powering on and off.

How to use the batteries


- Insert the batteries, the indicator will not flicker at once. Press button  to make the red indicator flicker , after 2 seconds , the indicator will alternatively flickers as green and red and stop when entering the self-check interface. (If the camera is powered on when battery is low, the red indicator will flicker quickly and power off automatically.
- When using the camera, if the batteries consume to the lowest limitation, the red indicator will flicker for a moment then power off automatically.



Note:

- When using the battery, only when powering on and in the low battery condition, the indicator will light on.


How to charge with batteries

- Charge when power off
 - Insert the batteries and connect the camera with the adapter to start charging when the red indicator flicker slowly
 - (Charge when power off) Press button  for 2 seconds, the indicator will alternatively flickers as green and red and the red indicator will flicker slowly when entering the self-check interface
 - When the batteries are fully charged, the green indicator will flicker slowly.



Note:




- When charging, red indicator flickering means there is errors in charging process, please check out whether the batteries are correctly inserted into the camera and meet the battery requirement or exceed the highest temperature limitation. (the limitation is about 60℃)

- Charge when power on
 - Power on when using the batteries, then connect the camera with adapter, the red indicator will flicker slowly.
 - (When charging Press button  to power off, the red indicator will flicker slowly
 - After charging, green indicator flickers slowly.




 Note:

- The batteries cannot be taken out of the camera in the power-on charging process.
- Defect: When there is a circuit break or damage in the thermal resistor which detects the charging temperature of the batteries, the batteries cannot be charged.


Buttons Introduction




There are three functional buttons of **GUIDE® EASIR-4** (From left to right, they are ,  and ) and a trigger button “T”.




Power on /off the camera

The input voltage is 12V, keep button  depressed for more than 3 seconds to power on. When powering off, keep the button  depressed until the switch off bar runs fully. To release the button  at any time before the switch off bar runs fully to leave the power off state.



Focus




In the non-menu state, press  to enter focus menu, the following info will be displayed on the screen:


Far	Near	Auto
		




According to the attention, press  to focus far, press  focus near, press  to auto focus. Press T to exit. When doing auto focus, please keep the camera steady, to ensure high accuracy




Quick function


In the non-function state, long-pressing the  to switch between the manual mode and automatic mode, and press  shortly to enter key functional menu, the following info will be displayed on the screen :



Visual	Spot	Fusion
		

- Press  to enter spot analysis mode


↑/←	↓/→	L/R / U/D
		

- Press  to switch between the X or Y coordinate
- Press  or  to adjust the value of X or Y's coordinate..
- Press T to exit the spot analysis and return the real-time IR mode.


- Press  to enter visual light/IR fusion mode:

- On the fusion mode, press  or  to adjust the proportion of fusion
- On the fusion mode, press T to return the real-time IR mode. The proportion will be saved as the default value when start up the fusion mode next time.

Laser On/Off

On the non-menu mode, keep  depressed for 2 seconds to turn on /off the laser(Ensure the Laser is "On" in the menu of Parameter)

Manual calibration

On the non-menu mode, keep pressing "T" button and then press  button to run shutter calibration

Selecting Span







- Keep button  depressed for 3 seconds to bring up span selecting mode.
- Press  to select AutoSpan
- Press  to select ManualSpan


Image frozen and save

On the non-menu mode, press T to freeze the image, the following info will be displayed on the screen:




Save	Voice	Visual /IR
		


Press T again to exit frozen mode and return to the real-time IR mode, or


- Press  to save the image and return to live thermal image

- Press  to add the voice annotation, the following info will be displayed on the screen:




xx s


Record	Stop	Play
		


Press  to start recording voice annotation:

Press  to stop recording voice annotation, the following info will be displayed on the screen:


xx S




Record	Save	Play
		

Press  to play the voice annotation

- Press  to enter visual light mode, press again to return real-time IR mode.
- Press T to return to real-time IR mode.

Main menu operation


On the non-menu mode, press  to bring up Main menu, the following info will be displayed on the screen:

Parameter	File	Setup
		

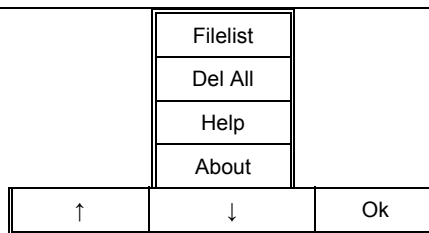
Press T in the main menu to return real-time IR mode;


- On the main menu mode, press  to enter sub-menu of parameter setting:

Emiss		
Tamb		
Distance		
Palette		
RelHum		
Laser		
↑	↓	OK

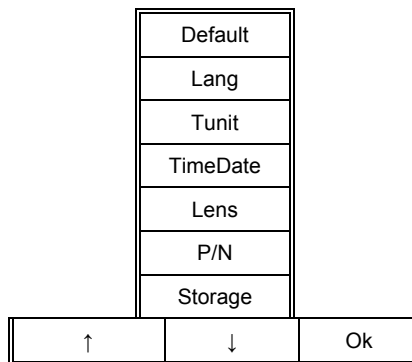
On the sub-menu mode, press  to confirm selecting the highlighted option and enter the next sub-menu, press T to exit main menu operation and return to real-time IR mode.


- On the main menu mode, press  to enter file operation sub-menu :



On this sub-menu mode, press  to enter next sub-menu, press T to exit main-menu operation and return real-time IR mode.

- On the main menu mode, press  to enter system setting sub-menu:




On the sub-menu mode, press  to confirm selecting the highlighted option and enter the next sub-menu, press T to exit main-menu operation and return real-time IR mode.

Function operation

Thermal camera focusing

There are two methods to adjust focus: motorized and automatic

To motorizedly focus:

- Aim the lens at the target
- Press  to activate the menu
- Press the softkey labeled "Far" and "Near" until the image on the LCD is as clear as possible

To automatically focus:






- Aim the lens at the target
- Press  to activate the menu
- Make sure the target is in the middle of the LCD, and then press the softkey labeled "Auto" until the image on the LCD is as clear as possible.






Image capturing and saving

- Aim the lens at the target of interest and adjust the focus motorizedly or automatically above to get a clear image on the LCD, and then pull the trigger to capture an image. The image will be frozen and bring up the image capture menu.
- Press the softkey labeled “Save”. If the SD card is in the camera, the image data will be acquiescently saved in the SD card.

Selecting the Palette






- Press  to display main menu.
- Press the softkey labeled Parameter
- Press the softkey labeled Palette
- Press  or  to shift among different palettes
- Press  to confirm.



Setting Tmin and Tmax

- Keep button  depressed to bring up span selecting mode.
- Press  to select Manual Span
- Press  to increase the Tmax value, press  to decrease the value, press  to switch to Tmin adjustment mode.
- The same operation for Tmin adjustment.
- After setting, press button “T” to save and exit.

Picture Mode and IR Fusion


The **EASIR-4** could be displayed in full visual mode, full thermal mode and the confusion mode, they could be switched.

- In real-time thermal status, press the button of  to go into the picture mode, it would appear “Visual”, “Spot” and “Fusion” on the button of the LCD screen
- Press the button of  to enter into the visual mode
- Press “Trigger” to switch to the real-time thermal status
- In the picture mode with the menu of “Visual”, “Spot” and “Fusion” displayed on the screen, press  to go into the fusion mode.
- Press button  and button  to adjust the fusion percentage, from full visual to full fusion.

- Press “Trigger” to switch to the full thermal image.
- In real-time status, press “Trigger” to froze thermal image, it would appear “Save”, “Voice” and “Visual” at the button of the LCD screen. Press  to switch between thermal image and visual image
- When replaying a thermal image, there would appear “Delete”, “Voice” and “Visual” at the bottom of the LCD screen, Press  to switch between the thermal image and visual image

Reviewing and Deleting Stored Images


To view stored images on the SD card:

- Press  activate the menu.
- Press the softkey labeled “File” to reveal the review menu “Filelist”.
- Press the softkey labeled “OK” to enter the file list.
- Press the softkey labeled “←” and “→” to toggle between different images, and press the softkey labeled “Select” to choose the selected image.

To delete a single image from the SD card

- Perform the steps under viewing stored images above to bring the desired image to the display.
- Press the softkey labeled “Delete”
- Press the softkey labeled “Yes”.

To delete all the images from the SD card

- Press  to activate the menu.
- Press the softkey labeled “File”.
- Select “Del All” by pressing softkey labeled “↑” and “↓”, and “OK” to confirm.
- Press the softkey labeled “Yes”.

Adding Voice Annotation to Saved Data

Voice annotation can only be added to an image prior to storing it. After capturing an image, the Image Capture menu appears. To add a voice annotation to the image:

- Press the softkey labeled “Voice”.
- Press the softkey labeled “Record” to start the recording.
- Speak into the Imager’s microphone opening. When done recording, press the softkey labeled “Stop”. Up to 60 seconds of voice annotation can be recorded for each image. Once it reaches 60 seconds, recording will stop automatically.
- Press the softkey labeled “Play” to replay the voice annotation before saving.
- Press the softkey labeled “Save” to save the video annotation.

Listening to Voice Annotation




To play the voice annotation already stored with an image on the UFlash or SD card:

- Perform the steps in the “Reviewing and Deleting Stored Images” section to bring the desired image to the EASIR-4’s display.
- Press the softkey labeled “Voice”.
- Press the softkey labeled “Play”

The saved voice annotation will be replayed through the imager’s speaker.






Changing the Temperature Units

The EASIR-4 will display temperature in Fahrenheit or Celsius. To change the temperature units:

- Press  to display main menu
- Press the softkey labeled Setup
- Press the softkey labeled Tunit
- Press  for Celsius or  for Fahrenheit.

Doing spot analysis

EASIR-4 supports single spot measurement. The location of center spot can be adjusted in live image:

- Press  button and then  button to bring location adjustment mode of center spot.
- The default adjustment mode is “L/R” mode, press  and “M” button can move the center spot to left and right under this mode; press “P” button to switch into “U/D” mode, then press  and  button can move the center spot to up and down under this mode. Press “P” button can switch between the above two modes freely.
- Press “trigger” button can save and exit the location adjustment mode of center spot.

How to get accurate temperature?





There are a lot of factors affecting temperature accuracy.

Here is a brief introduction to some typical parameters: emissivity, background temperature, distance, humidity and etc.

 **Note:**

To get accurate temperature, you shall hold the camera stably and focus the camera well.


- **Emissivity:** All objects radiate infrared energy. The amount of energy radiated is based on two primary factors: the surface temperature of the object and the emissivity of object’s surface.
The default emissivity is 0.98, which is applicable to most surfaces.
For some special materials or surfaces, please refer to the emissivity table to find a right emissivity value.
You can change emissivity between 0.01 and 1.00 in menu Para and Emissivity.
- **Tamb:** To display and adjust the real-time comparative scene temperature of target. The default setting of this parameter is automatic adjusted by the internal temperature sensor. If needed, this setting can be adjusted manually according to real temperature of some special scenes (like sky or snow) of measured target.

Press  button and  button to bring the submenu of parameter setting, then choose “Tamb” and select “Set” option to set the value manually by press  button and  button. The new measurement will be based on the saved tamb value until re-enter the “Tamb” option and exit, which will activate the default automatic mode.

- **Distance:** To set the proper distance from target, the distance range is from 0.1 meter to 50 meters.
- **Relative Humidity:** To set relative humidity percentage value between 0 and 100 according to the practical environment.

Video Output

Composite video output (PAL or NTSC mode) option is available in EasIR-4. With this option you can view the live image captured by the camera on a monitor or a recording device. Before trying to use this option, ensure that the EasIR-4 camera is switched off.

- Properly connect the camera to the monitor (or recording device) with the video cable supplied together with the camera..
- Power on the monitor.
- Power on the camera.
- Press  to activate the menu.
- Press the softkey labeled “Setup” to reveal the menu “P/N”.
- Press the softkey labeled “↑” and “↓” to select “P/N”, and “OK” to confirm.
- Press the softkey labeled “PAL” or “NTSC” to select different output systems.
- When viewing the live image, you can still use the buttons to control the camera.
- After viewing the live image, power off the camera, monitor (or recording device) and disconnect the cable.



Note:

It is required to power off the camera before connecting it to a monitor or a recording device.

Transferring Data from the Camera to PC

- Before transferring data from the EasIR-4 camera to PC, ensure that the PC offers USB2.0 interface and the USB driver for the camera has been successfully installed in the PC.
- Power on the camera.
- Press the softkey labeled “File” to reveal the menu “Storage”.
- Press the softkey labeled “↑” and “↓” to select “Storage”, and “OK” to confirm.
- Press the softkey labeled “UFlash” to select the storage medium as UFLASH. Press the softkey labeled “SD Card” to select the storage medium as SD Card.
- If the storage medium is set as “UFLASH”, no hint will display on either the PC or the **EasIR-4** screen. Image export, image analysis, live video recording etc. can be done in the PC. Images saved in UFLASH can be transferred to PC

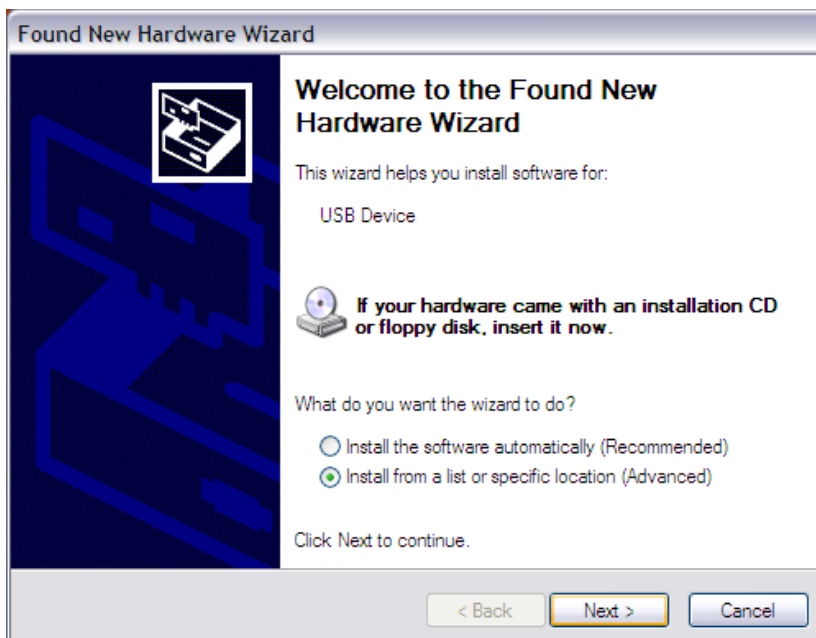
via IrAnalyser.

- If SD card is inserted in EASIR-4, the PC will identify the EASIR-4 as a removable hard disk, you can copy the saved data to PC or delete them from the card, or even format the SD card and etc. But you cannot operate on it in the Guide IrAnalyser software.
- If without SD card in EASIR-4, you have to install the camera USB Driver to PC, and use the Guide IrAnalyser software to transfer images to PC.

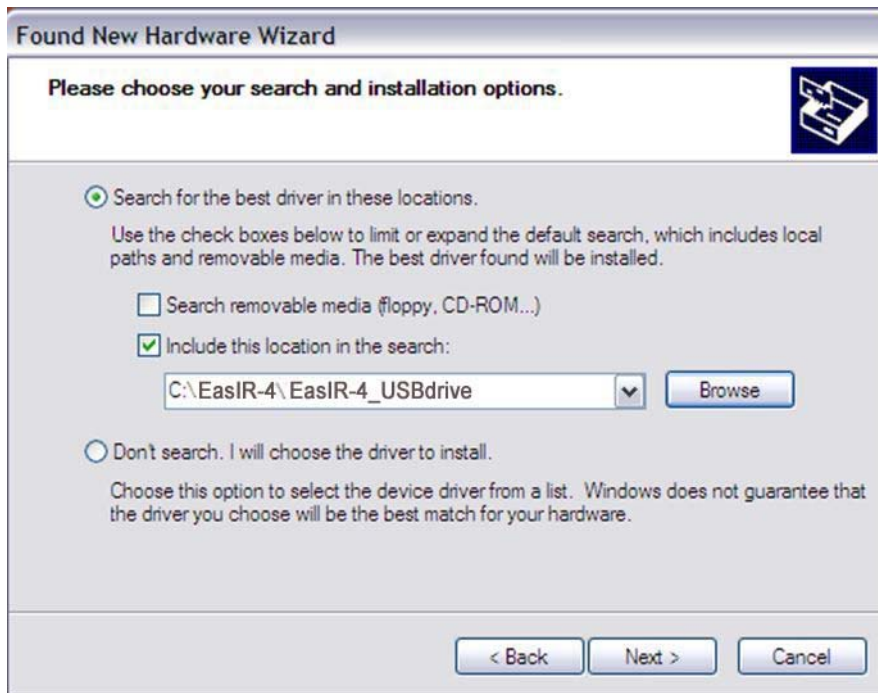
Install USB driver to PC

When there is no menu in the live thermal image, properly connect the USB interfaces of the camera to a USB2.0 port of your PC with the USB extension cable.

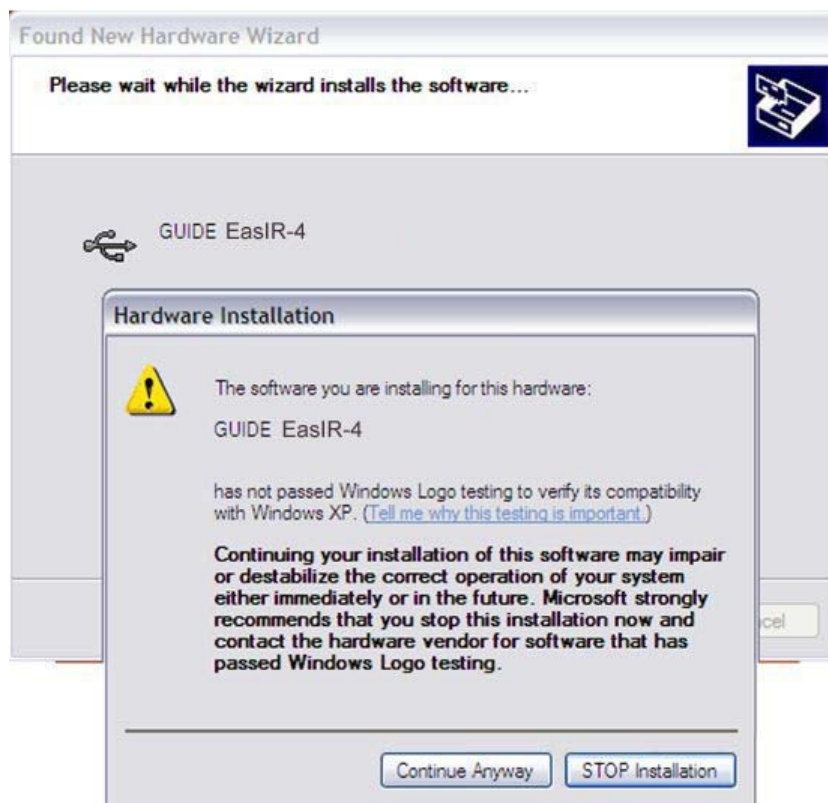
Microsoft® Windows launches a Found New Device Wizard to guide you to install the driver as follows:



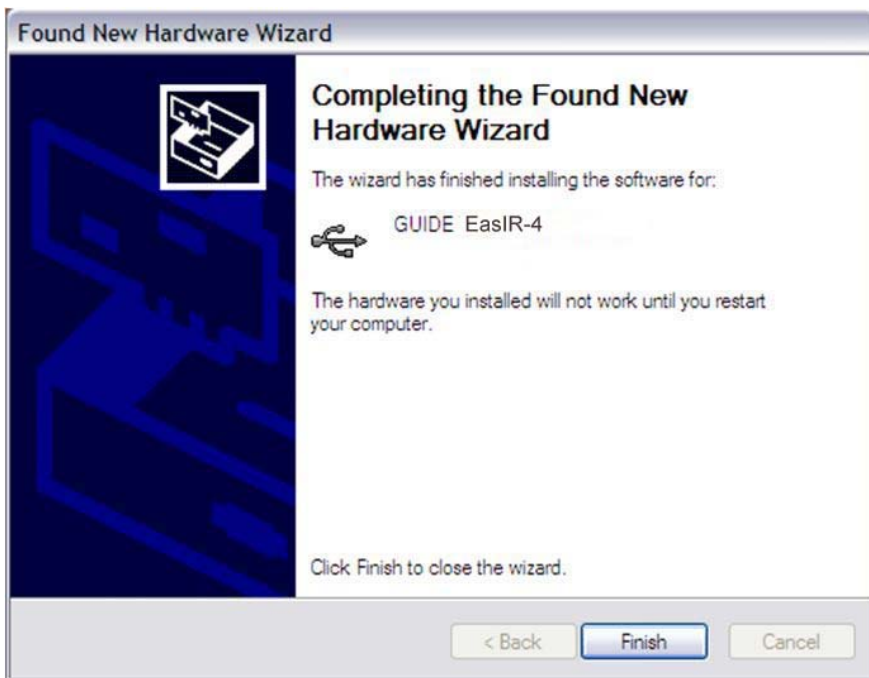
- Choose “Install from a list or specific location (advanced)” and include the folder where you save the driver program. Then Click button next to go further.



- Installation starts. When getting to the step as shown below, choose “Continue anyway” to proceed further.



- Installation continues and finishes quickly. Click button Finish.



- Go to Device Manager to check and confirm whether the driver has been successfully installed. If there is “GUIDE EASIR-4” listed under Universal Serial Bus Controller, it indicates the driver has been properly installed and you can transfer data from the camera to PC now.
- The procedures to go to Device Manager is as follows: Clicking My Computer-> Clicking the right mouse and choosing Property-> Choosing menu Hardware in the System Property dialog box-> Choosing option Device Manager under the menu Hardware.

