

FLUKE®

572/574/576

Precision Infrared Thermometers

Getting Started

This booklet includes the description of the basic functions of the units and the software. The complete manual is on the companion CD.

March 2005

© 2005 Fluke Corporation, All rights reserved.

All product names are trademarks of their respective companies.

LIMITED WARRANTY AND LIMITATION OF LIABILITY

This Fluke product will be free from defects in material and workmanship for one year from the date of purchase. This warranty does not cover fuses, disposable batteries, or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Fluke's behalf. To obtain service during the warranty period, contact your nearest Fluke authorized service center to obtain return authorization information, then send the product to that Service Center with a description of the problem.

THIS WARRANTY IS YOUR ONLY REMEDY. NO OTHER WARRANTIES, SUCH AS FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSED OR IMPLIED. FLUKE IS NOT LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

Safety Information

Warning

A Warning identifies conditions and actions that pose hazards to the user. To avoid electrical shock or personal injury, follow these guidelines:

-  Do not point laser directly at eye or indirectly off reflective surfaces.
- Before using the thermometer inspect the case. Do not use the thermometer if it appears damaged. Look for cracks or missing plastic.
- Replace the batteries as soon as the battery indicator  two or less segments.
- Do not use the thermometer if it operates abnormally. Protection may be impaired. When in doubt, have the thermometer serviced.
- Do not operate the thermometer around explosive gas, vapor, or dust. (see the special warning for the NI model)
- Do not connect the optional external probe to live electrical circuits.
- To avoid a burn hazard, remember that highly reflective objects will result in lower than actual temperature measurements.
- Do not use in a manner not specified by this manual or the protection supplied by the equipment may be impaired.

Caution

To avoid damaging the thermometer or the equipment under test protect them from the following:

- EMF (electro-magnetic fields) from arc welders, induction heaters, etc.
- Static electricity
- Thermal shock (caused by large or abrupt ambient temperature changes- allow 30 minutes for thermometer to stabilize before use).
- Do not leave the thermometer on or near objects of high temperature.

Table of Contents

Introduction	6
Warning for the Model 574 NI	7
Symbols and Safety Markings	8
Laser Warning and Serial Number Labels.....	9
Features and Requirements	10
Delivery Content.....	11
Batteries	12
Measurement.....	13
Field of View and Emissivity	14
Spot Size	15
Additional Functions.....	16
DIP Switches	17
Hardware and Software Setup	18
Using the Camera (Model 576).....	20
Uploading Data and Pictures (Model 576)	22
Troubleshooting.....	23
Maintenance.....	24
CE Confirmity	25
Specification of the Thermometers	26
Specification of the Camera (Model 576).....	27
Factory Defaults	28

Introduction

The Fluke Models 572, 574, and 576 Infrared Thermometers (“the thermometers”) are for non-contact temperature measurement. These thermometers determine an object’s surface temperature by measuring the amount of infrared energy radiated by the object’s surface.

Contacting Fluke

To contact Fluke, call one of the following telephone numbers:

USA: 1-888-44-FLUKE (1-888-443-5853)

Canada: 1-800-36-FLUKE (1-800-363-5853)

Europe: +31 402-675-200

Japan: +81-3-3434-0181

Singapore: +65-738-5655

Anywhere in the world: +1-425-446-5500

For USA Service: 1-888-99-FLUKE (1-888-993-5853)

Or, visit Fluke's Web site at www.fluke.com

To register your product, visit register.fluke.com

Warning for the Model 574 NI

Concerning Factory Mutual Approved Nonincendive Devices: Operation in Environments that Require Nonincendive Devices

WARNING

IN HAZARDOUS LOCATIONS DO NOT use serial port connections, change batteries or open serial port cover. To reduce risk of explosion in hazardous locations, use only Fluke temp probe part 2432508 and do not use other accessories, such as power supply and cables.

A nonincendive rating (NI) indicates that this infrared thermometer has been tested to standards for preventing explosions in hazardous areas by limiting the ability of equipment to ignite a specified flammable gas or vapor-in-air mixture. Nonincendive equipment is incapable of releasing sufficient electrical or thermal energy to ignite flammable gases or vapors under NORMAL operation and environmental conditions.

This noncontact thermometer has a Factory Mutual Nonincendive rating. The rating from this USA organization reads: "Nonincendive, Class I, Division 2, Groups A, B, C, D; Class I, Zone 2 IIC; T4 Ta = 50°C when used with 1.5V alkaline batteries."

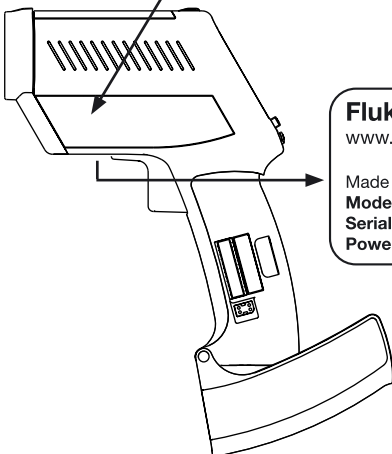
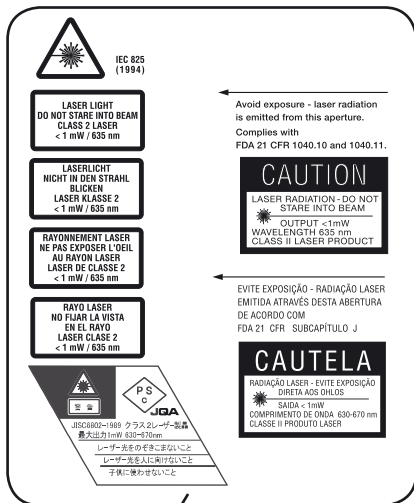
A Class I, Division 2 location is a location:

- where volatile flammable liquids or flammable gases or vapors exist, but are normally confined within closed containers;
- where ignitable concentrations of gases, vapors or liquids are normally prevented by positive mechanical ventilation; or
- adjacent to a Class I, Division 1 location, where ignitable concentrations might be occasionally communicated
- groups A, B, C, D refers to: Acetylene, Hydrogen, Ethylene, and Propane.

Symbols and Safety Markings

Symbol	Explanation
	Risk of danger. Important information. See Manual.
	Hazardous voltage. Precedes warning
	Warning. Laser.
	Conforms to requirements of European Union and European Free Trade Association (EFTA)
	Celsius
	Fahrenheit
	Battery

Laser Warning and Serial Number Labels



Fluke Corporation
www.fluke.com

Made in Germany Month Year
Model: Fluke xxx
Serial: xxxx xxx
Power Requirements: 3V

Features and Requirements

Note! The factory default setting of your unit is Centigrade. This can be changed into Fahrenheit by switching the appropriate DIP switch. See Chapter “DIP Switch Settings”.

Your thermometers include:

- Coaxial Laser sighting
- Adjustable emissivity
- High Alarm
- 7 Second Hold
- Trigger Lock
- Tripod Mount
- Graphic Display
- Low Alarm (574/576)
- MAX, MIN, DIF, AVG (574/576)
- Data Logger (574/576)
- Probe Jack (574/576)
- Companion Software (574/576)
- Digital Camera (576)

Requirements to use the software of the thermometers (Models 574/576)

- 200 Mhz processor (400 Mhz recommended)
- CD/DVD drive
- RS232 COM port (model 574)
- USB 1.1 - port (model 576)
- 15 MByte free disk space on the hard drive

The software works with Microsoft® Windows® NT (for model 574 only), 2000, or XP.

Delivery Content

All models:

- The unit
- Getting Started
- Two AA batteries
- Manual on CD



Model 572

Additionally with the Models 574/576

- Thermocouple type K probe
- Windows-based software on CD
- RSB-232 cable (model 574)
- Power supply (model 574)
- USB cable (model 576)



Model 574

Model 576



Batteries



To open the battery compartment, press gently on the top part of the handle to release the catch and pivot the grip as shown in the figure. Orient the batteries (two alkaline R6 (AA, UM3)) as shown on the housing.

Note!

With a fresh set of batteries, model 576 can store photographs for up to 2,000 hours. However, we recommend that you download photographs soon after you have taken them.

To avoid the loss of photos, you should change the batteries within two minutes after the unit has shut down completely.

Measurement



All models:

To take a temperature measurement, hold the unit as shown. Aim at the target. Pull the trigger. The temperature of the object being measured is shown on the display.

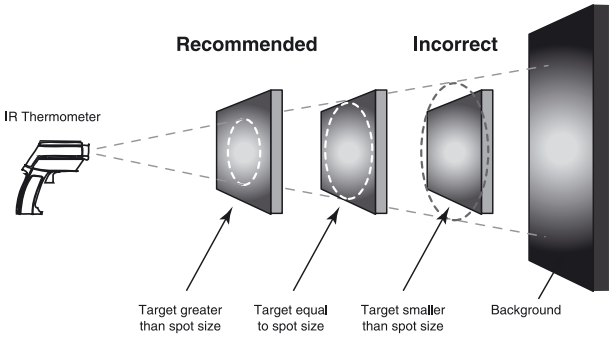
The temperature will be displayed for seven seconds after the trigger is released.

Models 574/576:

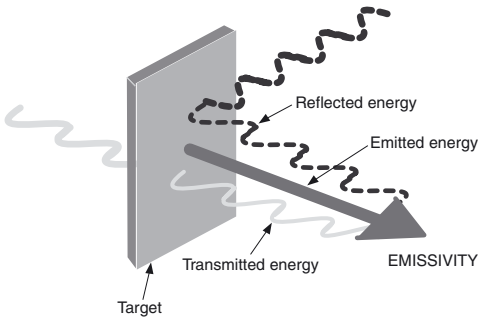
The unit automatically switches “off” after 7 seconds if a function key is not pressed. The last settings are stored. The display returns to the last mode selected.

To recall the last reading, press ENTER without pulling the trigger.

Field of View and Emissivity



Make sure that the target is larger than the unit's spot size. The smaller the target, the closer you should be to it.

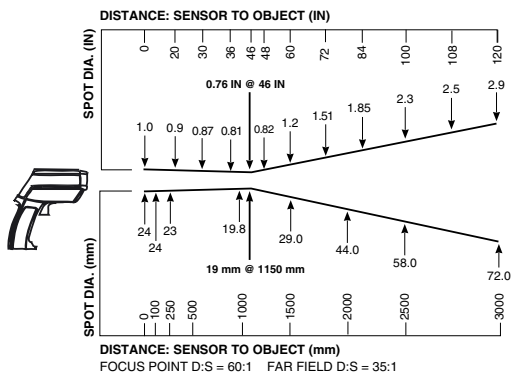


The amount of infrared energy radiated by an object depends on its emissivity and its temperature. The emissivity depends on the material and its surface characteristics. For more accurate readings, adjust the emissivity value for the type of material being measured.

Spot Size

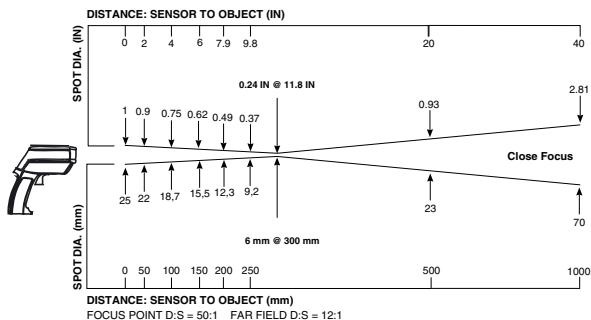
STANDARD MODEL

Optical Chart



CLOSE FOCUS MODEL

Optical Chart



The measured spot size depends on the distance between the object you are measuring and the infrared thermometer.

The relationship between distance and spot size is 60:1 (Standard Focus) or 50:1 (Close Focus) at the focus point. The D:S in the far field (>33ft/10m) is 35:1 (Standard) or 12:1 (Close Focus).

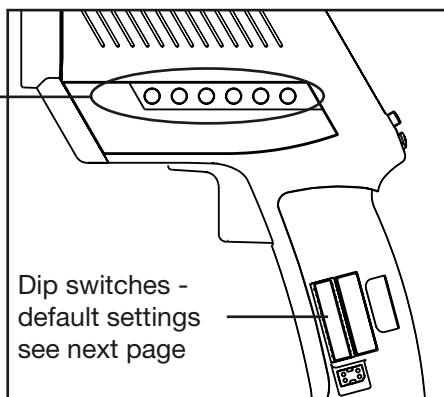
Additional Functions

All models have additional functions. These can be accessed by using the DIP switches inside the battery compartment and the additional function buttons. A complete explanation of these switches is in the manual on the CD. The factory default settings of the DIP switches are on the next page.

Additional Function Buttons (models 574/576)

These additional function buttons are located on the left side of the unit.

You find an overview about the several features of these buttons inside the back cover. With the use of these buttons you can customize the configuration of the thermometers to fit your needs.



DIP Switches

Factory defaults

Model 572

ON	
	Lock
	C/ F
	Buzzer
	Backlight
	Set Default
	Setup
	Laserflash
	Laser

Model 574

ON	
	Lock
	C/ F
	Buzzer
	Backlight
	Set Default
	Ltd. Access
	Laserflash
	Printer
	Digi/Ana
	Time/Date
	NTC/TC
	TC-J/TC-K

Model 576

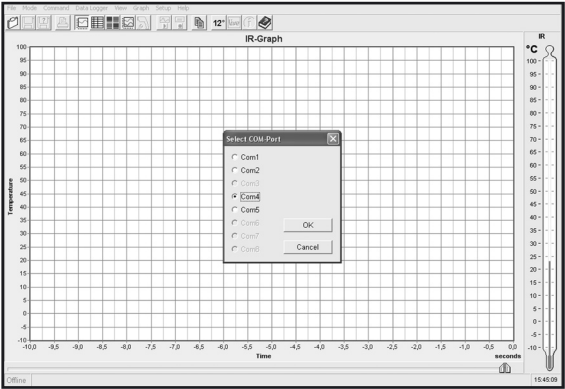
ON	
	Lock
	C/ F
	Buzzer
	Backlight
	Set Default
	Ltd. Access
	Laserflash
	Photoflash
	Auto/All
	Time/Date
	NTC/TC
	TC-J/TC-K

Hardware and Software Setup

Model 574:

Insert the CD into the CD-ROM drive.
If the CD-ROM does not start automatically, double-click launch.exe on the CD-ROM.
Then follow the information on the screen.
Start the software with a double-click on the IRGraph icon on the desktop.

The following screen appears



Connect the unit with the RS232-cable to a COM interface of your PC. Then pull the trigger of the unit. If “Connected” appears you have choosen the correct COM port. If not change the comports until “Connected“ appears, when the trigger of the thermometer is pulled.

The complete description of the software features is in the help files of the software.

Model 576:

IMPORTANT! Before you install the software you must connect the unit with the PC to configure the USB interface.

Proceed as follows:

Connect the unit to the PC via USB. New Hardware will be found. You have to install three different device drivers - two for USB ports and one for the camera. A driver is software needed by your PC to communicate with the thermometer and the camera. You will be asked three times to install a driver.

Note! During the driver installation, a message window could appear, indicating that a particular driver is not supported or authorized by Microsoft. Please ignore this message and continue with the installation.

The Windows Hardware Assistant will guide you through the installation process. If you are asked where to look for the drivers choose CD-ROM. In most cases, Windows will find the drivers automatically. If Windows asks for the file STV680u.dll please point to the driver's folder of the CD.

Now you can install the IRGraph software as described for the Model 574.

After launching the software you will be asked for the right COM port. This number can be found in the Hardware manager of Windows.

The Hardware Manager is located in the "Control Panel" of the Computer (On some versions of Windows, it is found under System\Hardware).

Using the Camera (Model 576)

In addition to the thermometer functionality the Model 576 comes with a digital built-in camera to documentate the measured places. The pictures include the measured values and additional information. the additional information is customizable via the IRGraph software.

How to use the camera?

1. To switch on the unit, pull the trigger.
2. Press the “Enter” button to activate the camera while the display is active.
3. First the word “LOG” flashes and then the camera icon appears.

The unit is ready to use now. It is preset to take 26 high-resolution (640x480 pixel) pictures.

4. Pull the trigger and hold it. The laser circle shows where you are measuring.
5. Aim at the target. Be sure that the laser sighting is inside the target.
6. Gently release the trigger to record the photo and the temperature. Successful recording of picture and temperature is indicated by two short beeps and a green blinking LED above the display. The next location will be shown on the display.

Caution:

If you hear a longer beep and the LED above the display is shining red, look at the display. If you see “Use Flash!” and a flash symbol, repeat your last measurement. A green LED above the camera symbol

signals: “Flash has charged”. The flash will now fire automatically.

7. For the next measurement, repeat points 5 and 6.
8. Once you have taken all your photos, connect the unit to the PC via USB.

See software and hardware set up on the next two pages.

Focusing the Camera

To get sharp and clear pictures simply turn the focus ring depending on the distance of your target.

Between 0.2 m (8 in) and 0.3 m (12 in.) adjust the lens to the flower symbol.



Between 0.5 m (19 in) and infinity adjust the lens to the mountain symbol.

Between 0.25 m (10 in.) and 0.6 m (23 in.) adjust the lens in the middle of both symbols.

The View Finder Guide

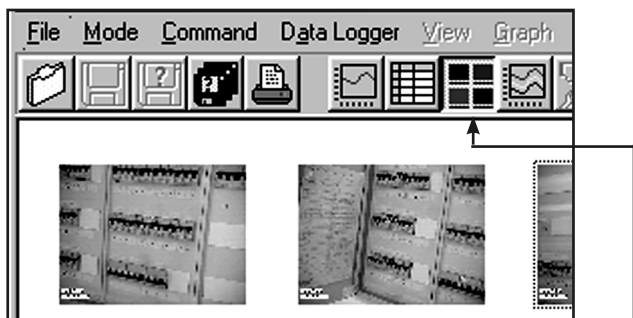


Rotate the cap to a horizontal position and look over it, as shown below. The embossed triangle will show you the approximate width of the photo.

Uploading Data and Pictures (Model 576)

Once you have configured your PC and the software is running and the thermometer is connected to the PC, the data download begins automatically after a few seconds. Click on “OK” if a message about logger file and unit configuration incompatibility appears. Click on “Yes” if you are asked to download all images.

See your pictures and data as a thumbnail collection.



If this doesn't display automatically, click on this button. _____

For a complete overview of the software features please read the help files of the software.

Troubleshooting

Symptom or Display code	Problem	Action
-O- -U-	Target temperature is over or underranged	Select target within unit's specs
EEPROM-Err CalAreaErr ProbCalEr	EEPROM error calibration errors	Contact factory
Blank display	Battery is dead	Replace Batteries
Laser won't work	Low or dead battery Ambient above 45°C (113°F)	Replace batteries Operate unit in 45°C (113°F) ambient or below

Maintenance



Lens Cleaning:
Blow off loose particles using clean compressed air. Brush remaining debris away with a camel's hair brush.

Wipe the surface with a moist cotton swab. The swab may be moistened with water or a water based glass cleaner.

NOTE: DO NOT use solvents to clean the plastic lens.



Cleaning the Housing:
To clean the exterior housing, use soap and water or a mild commercial cleaner. Wipe with a damp sponge or soft rag.

CE Conformity



This instrument conforms to the following standards:

EMC: - EN 61326-1:1997+A1:1998+A2:2001

Safety: - EN 61010-1:2001

- EN 60825-1:2001

This product herewith complies with the requirements of the EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/EEC.

This instrument conforms to the Standards of the European Community.

Certification

The temperature sources used to calibrate this instrument are traceable to the U.S. National Institute of Standards and Technology (NIST) and the Deutscher Kalibrierdienst (DKD).

Calibration certificates are available as an option.

Specification of the Thermometers

Temp. Range	- 30 to 900°C (- 25 to 1600°F)
Display Resolution	0.1°C (0.2°F)
Accuracy (Infrared) at 25°C (77°F) ambient temperature	± 0.75% of reading or ± 0.75°C (± 1.5°F), whichever is greater ± 2°C (± 4°F) for targets below -5°C (23°F)
Ambient Derating	< 0.05K/K or < 0.05%/K, whichever is greater at + 25°C (77°F) ± 25° (± 45°F)
Optical Resolution (Standard Focus)	60:1 (19mm spot size at 1.15 m) (0.75in. spot size at 3.8 feet)
Optical Resolution (Close Focus)	50:1 (6mm spot size at 0.3 m) (0.24in. spot size at 0.98 feet)
Accuracy (Thermocouple K & J)	± 2°C or ± 0.75%, whichever is greater
Accuracy (Thermistor)	-30 to 0°C (-22 to 32°F) ± 0.6K 0 to 70°C (32 to 158°F) ± 0.4K 70 to 100°C (158 to 212°F) ± 1K 100 to 120°C (212 to 248°F) ± 1.5K
Repeatability (Infrared)	± 0.5% of reading or ± 0.5°C (1°F), whichever is greater, ± 1°C (± 2°F) for targets below -5°C (23°F)
Response Time (95%)	250 mSec
Hot Spot Detection (30%)	85 mSec
Spectral Range	8 to 14 μm
Ambient Operating Range	0 to 50°C (32 to 122°F)
Storage Temperature	-20 to 50°C (-4 to 122°F) without batteries
Relative Humidity	10 to 90% at 30°C (86°F), non condensing
Analog Output (optional cable needed)	1 mV/°C (°F)
Digital Output	RSB232 (Model 574) USB 1.1 (Model 576)
Power	2 x 1.5 V Alkaline Type AA
Dimensions	240 x 170 x 50 mm (7.9 x 6.7 x 2 inches)
Tripod Mount	1/4"-20 UNC

Specification of the Camera (Model 576)

Maximum Picture Number 640x480 Pixels (VGA)	26
Maximum Picture Number 320x240 Pixels (1/4 VGA)	100
Recharge Time for Flash	approx. 5 sec
Useful Flash Range: Standard Focus Close Focus	0.5 to 2 m (19 to 79 in.) 0.2 to 1 m (8 to 40 in)
Camera Lens	6 mm (app. equal to 42 mm on a 35 mm camera)
Focal Points	200 mm (8 in.)(Close-up) Infinity (Far Distance)
Light Sensitivity	6 lux
Shutter Speed	variable, max. 1/15 sec
Data Interface	USB 1.1
Image File Format	JPG

Factory Defaults

	Default	Range
Emissivity/Gain	0.95	0.10 to 1.50 in steps of 0.01
Emissivity Table	Free	30 materials (574/576)
Mode	Normal	
Hi Alarm	900°C (1600°F)	-30 to 900°C (-25 to 1600°F)
Lo Alarm (574/576)	-30°C (-25°F)	-30 to 900°C (-25 to 1600°F)
Offset Adjust (574/576)	0°C (0°F)	-10 to 10°C (-18 to 18°F)
Graphic Display	Auto Range	Auto Range / Man Range (574/576)
Cycle Time	0.2 sec	0.1 sec to 300 sec (574/576)
	Preset with emissivity 0.95	