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# Manual

## Pyrometer

### PCE-IR 1000 series

### PCE-IR 1300 / 1600 / 1800



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Appendix: Emissivity

# 1. Introduction

Welcome to select PCE-IR 1000 Series portable infrared thermometer.

Each single product passed through a quality process. Please read the operator's manual carefully before you start to use the unit.

## 1.1 User interface

### ○ Mode-Button

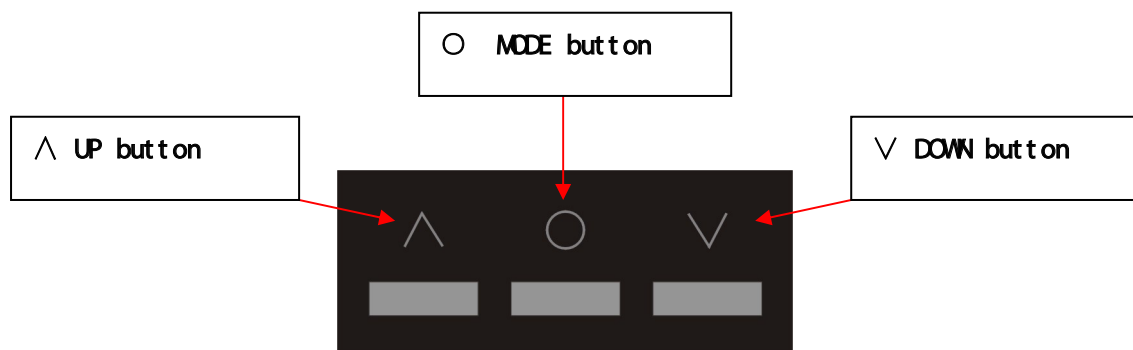
The button in middle that marked with a circle is the mode button. In hold mode, each time you press it, you will enter to another function setup, e.g. press one time to enter to emissivity setup, press it again will save emissivity and enter to MIN/MAX setup and so on.

### ^ Up/Laser

With this button you can setup the laser or increase the chosen value or read MAX/MIN result in **HOLD** mode.

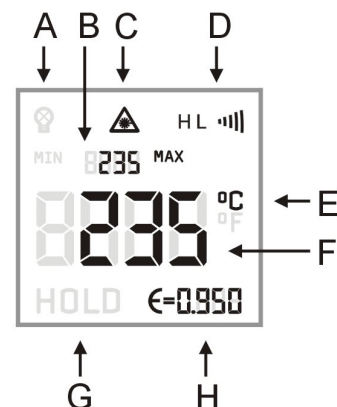
### ∨ Down/Display backlight

With this button to you can setup the backlight or reduce the chosen value.



## 1.2 Display

- A. LCD backlight
- B. MAX/MIN
- C. Laser
- D. Alarm activation
- E. Temperature Unit
- F. Infrared temperature
- G. HOLD
- H. Emissivity



### 1.3 External function introduction

- 1) Trigger
- 2) Battery compartment cover
- 3) USB interface
- 4) Telescope



## 2. Operation

### 2.1 Starting the measurement

**Turn on:** Press the trigger to turn on the unit.

**Measuring:** Aim the thermometer at a target. Pull the trigger and keep it pressed. The display will show the current temperature value.

### 2.2 Hold-Function

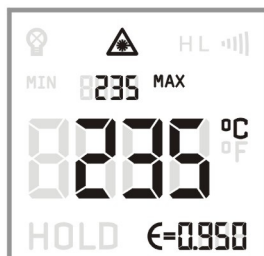
If you release the trigger, the unit will enter to **HOLD** mode. The display shows HOLD.

### 2.3 Switch off

The unit automatically switches off after 7 seconds if no button is pressed..

### 2.4 Setup the laser

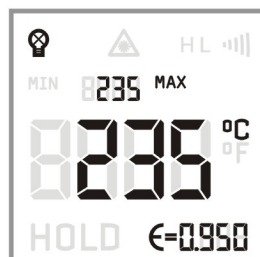
Pull the trigger(keep it pressed) and then press up button ( ) to activate or deactivate the laser. The laser symbol in the display(only if the trigger is pulled) indicates the active laser.



**WARNING:** Do not point the laser directly at the eyes of persons or animals! Do not stare into the laser beam. Avoid indirect exposure via reflective surfaces.

### 2.5 Setup the display backlight

Pull the Trigger(keep it pressed) and then press the down button to activate/deactivate the display backlight. The symbol in the display will indicate that.



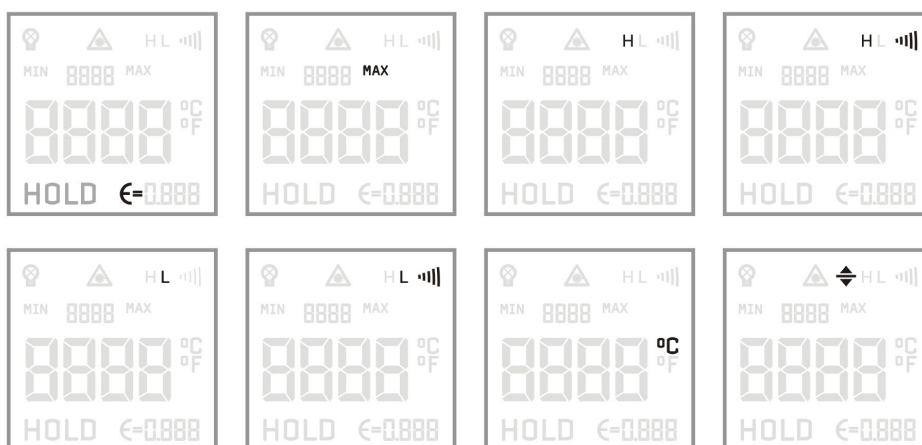
## 2.6 Setup the parameters

You can setup the emissivity, max/min display, high/low alarm, temperature unit, temperature offset as follows:

Release the trigger to enter to the Hold mode. Each time you press the mode button will enter to another function interface. The currently selected mode will show on the display by indicator flashes.

Now, you can choose or modify the requested value by pressing the up and down buttons. Press mode button to save the value and enter to next function. If you have not activated any button for 7 seconds, the unit will not save the current modification value and switches down automatically.

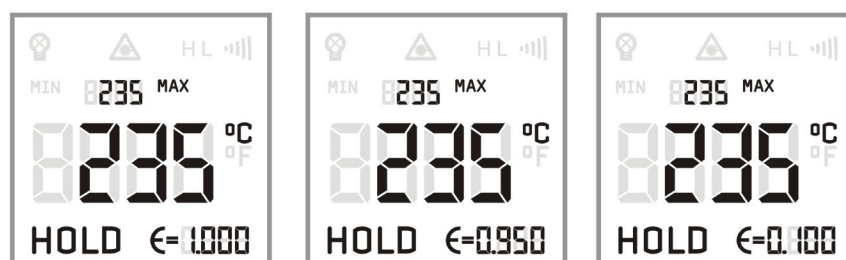
After enter the selecting mode, the following flashing signals will show on the display in turn.



## 2.7 Setup emissivity

In **HOLD** mode, press the mode button (○) to set the emissivity.

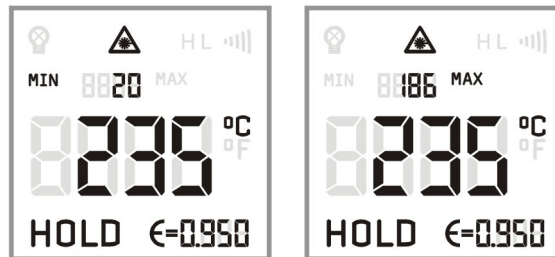
- 1) Emissivity( $\epsilon$ ) flashing
- 2) Press up button ( ) to increase the emissivity
- 3) Press down button ( ) to reduce the emissivity



## 2.8 Setup the Min/Max function

In **HOLD** mode, press the mode button repeatedly until enter into the Min/Max mode. Press the up/down button to setup which mode you want.

**MIN** indicates the minimum value of current measurement; **MAX** indicates the maximum temperature value of current measurement.



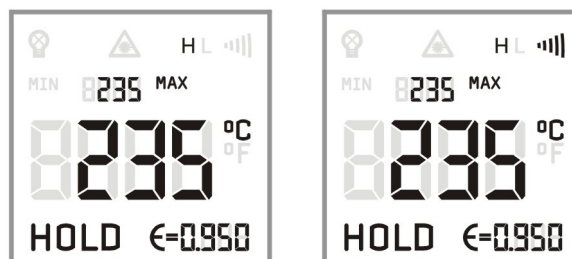
## 2.9 Setup high and low alarm

### 1) High alarm

In Hold mode, press the mode button (○) until enter the high alarm mode. Press the up/down button to set the alarm on or off.

When the signal of “)))” shows on the display, it means the high alarm is activated.

After set high alarm, you can press the mode button to set the temperature alarm value.

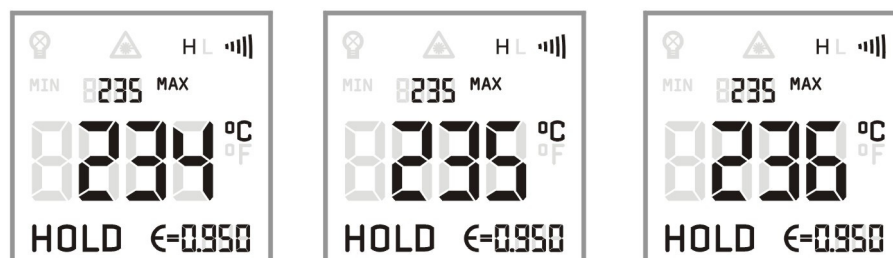


### 2) Low alarm

In Hold mode, press the mode button (○) until enter to the low alarm mode. Press the up/down button to set the alarm on or off.

When the signal “)))” shows on the display, it means the low alarm is activated.

After set low temperature alarm, you can press the mode button to set the temperature alarm value.



## 2.10 Setup the temperature unit

In Hold mode, press the mode button (  $\circ$  ) until enter to the temperature unit selecting mode, and press the up/down button to select the requested temperature unit.



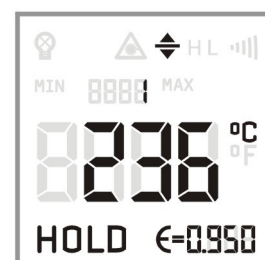
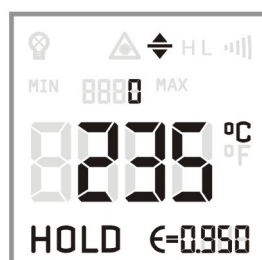
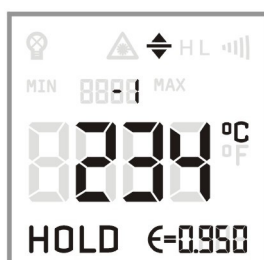
Centigrade scale



Fahrenheit scale

## 2.11 Setup offset

In Hold-mode, press the mode button repeatedly until enter into the temperature offset mode. Then, press the up/down button to setup the temperature offset value.





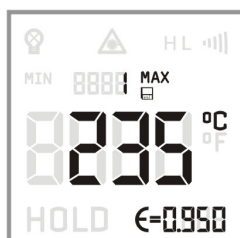
### 3. Data logger

PCE-IR 1000 series thermometer has the internal data logger with a maximum capacity of 2000 measurement protocols.

#### 3.1 Storing data

In measurement mode, release the trigger to enter to HOLD mode, and press the down button, there will be a line of small numbers; an icon showing a disk and an icon of "MAX" appear above the current temperature result.

The small numbers indicate the memory position. You can choose the memory position from 1~2000 with the up/down buttons Press the mode button can save the max temperature of this measurement to the current position.

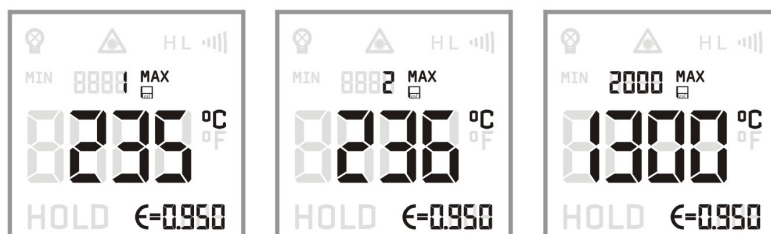


#### 3.2 Datalogger recall

In measuring mode, keep the trigger pressed and then press the mode button to recall the saved data.



Users can choose the memory position by press the up/down buttons.



### 3.3 Clear the memory

In the Storing Data mode, choose the memory position to “0” by pressing the down button. Press the mode button (○) will clear the memory. The three buzzer signals confirms the successful clearing.



## 4. Software

PCE-IR 1000 series portable infrared thermometer has special software and connecting cable. Users can set the unit, download the logged data and recording temperature curve and through the software.

### 4.1 System Requirements

Vista, XP or Windows 2000 operation system  
USB interface  
Hard disk with at least 30MByte free space  
At least 128MByte RAM  
CD-ROM Driver

### 4.2 Installation and connection

Please insert the CD to CD-ROM driver. Please start the SETUP.EXE on the CD-ROM, and install the software follow the instructions of the wizard.

#### USB interface driver installation

- 1) Insert USB Cable into computer's USB port. Computer will find the new hardware, and the following dialogue box appears:
- 2) Choose the option of "NO, not for the time being (T)", click "next" and the following dialogue box appear:
- 3) Choose "install from the list or the designate place (advanced) (S)" click "next", the following dialogue box appear.
- 4) Click "browse" to find the USB file in CD.
- 5) Click "confirm", the following dialogue box appear:
- 6) Click "next", sometimes the system will come up the following the prompt, then click "still continue".

7) After completing the driver installation, it will find new hardware again, repeat the above operations until system prompt "New hardware has been installed successfully, you can use it now".

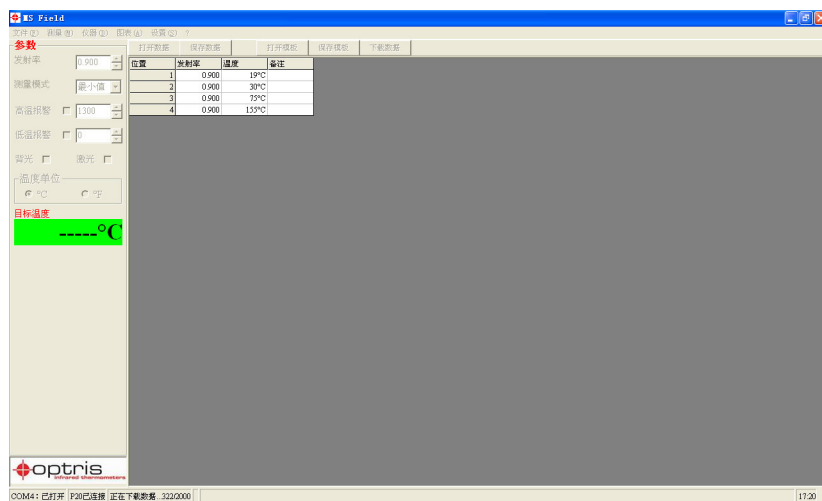
8) Right click "My computer" to see "attributes", choose → hardware → device manager → port as follows:

We can see there is a new port named "Infrared Thermometer Adapter" with the port number behind. By now, the USB Cable Driver installation is completed.

9) After the successful start of the software, the communication will be displayed in the status bar of the windows. Choose the correct COM-Port via: [MENU: Setup\ interface]. There will be a signal of [PCE-IR 1000 connected] show on the left bottom of the windows after connect successfully.

### 4.3 Download the data

To download the logged data from the infrared thermometer, please press the download menu: [measure → download data], and all the logged data will be indicated on the screen.



### 4.4 Software interface

#### 1) Digital display

After PCE-IR 1000 portable infrared thermometer connected to your personal computer and the software is started successfully, the target temperature will show on the left in digital form.

## 2) Starting the measurement

Please press the measuring key: [Measure→ begin]



## 3) Scaling of the temperature axis

**Global scaling:** temperature range of the diagram is automatically adapted to the respective peak values.

**Local scaling:** temperature range of the diagram will be dynamically adapted to the respective peak values.

**Manual scaling:** can be done at any time using the control elements of the temperature axis.

## 4) Stop the measurement

To stop the current measurement, please press the stop key [Menu: measurement/ stop]. The save key [Menu: File\save as] opens an explorer window to select destination and file name.

## 5) Diagram setting

The menu item settings [Menu: diagram\setting] enable the settings for data protection.

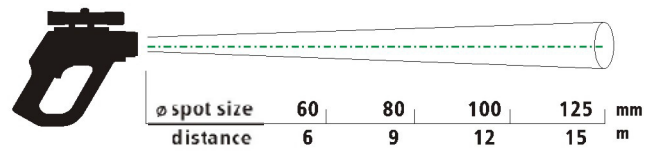
**Color:** temperature graph and digital display.

**Initial time:** time frame on x-axis at the beginning of measurement

## 5. Specifications

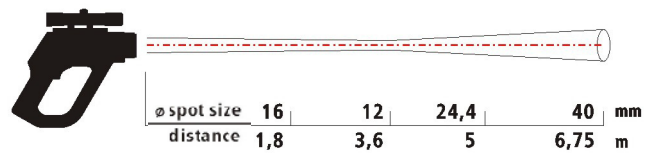
### 5.1 Optical Specifications

**PCE-IR 1300                      D:S=120:1**



**D:S=120:1**

**PCE-IR 1800 / PCE-IR 1600                      D:S=300:1**



**D:S=300:1**

## 5.2 General specifications

|                     |  |
|---------------------|--|
| Model:              | PCE-IR 1300  |
| Temperature range   | 0~1300℃  |
| System accuracy:    | $\pm 2\text{ }^{\circ}\text{C}$ (0~200℃)<br>$\pm 1\%$ (200~1300 ℃)   |
| Repeatability:      | $\pm 1\text{ }^{\circ}\text{C}$ (0~200℃)<br>$\pm 0.5\%$ (200~1300 ℃) |
| Optical resolution  | 120:1  |
| Response time       | 300ms (95%)  |
| Emissivity :        | 0.100~1.000adjustable  |
| Aim mode:           | Laser 、 telescope aim  |
| Signal processing   | MAX/MIN 、 Scan/Hold Function   |
| Alarm functions:    | Audible and visible HIGH/LOW alarm                                   |
| Data storage        | 2000 point   |
| Backlight:          | Three color  |
| Outputs/digital     | USB cable and software   |
| Storage temperature | -20~60℃ (no battery)   |
| Ambient temperature | 0~50℃ (no green laser)   |
| Relative humidity:  | 10~95% , non condensing  |
| Power:              | Ni-MH rechargeable battery   |
| Size :              | 264x203.5x60mm   |

## General specifications

|                     |  |
|---------------------|--|
| Model:              | PCE-IR 1600  |
| Temperature range   | 385~1600 °C  |
| System accuracy:    | $\pm 0.3\% \pm 2^{\circ}\text{C}$ (at ambient temperature $23 \pm 5^{\circ}\text{C}$ ) |
| Repeatability:      | $\pm 0.1\% \pm 1^{\circ}\text{C}$ (at ambient temperature $23 \pm 5^{\circ}\text{C}$ ) |
| Optical resolution: | 300:1  |
| Response time       | 100ms (95%)  |
| Emissivity :        | 0.100~1.000 adjustable   |
| Aim mode:           | Laser 、 telescope aim  |
| Signal processing:  | MAX/MIN 、 Scan/Hold Function   |
| Alarm functions:    | Audible and visible HIGH/LOW alarm   |
| Data storage        | 2000 point   |
| Backlight:          | Three color  |
| Outputs/digital     | USB cable and software   |
| Storage temperature | -20~60 °C (no battery)   |
| Ambient temperature | 0~50 °C  |
| Relative humidity:  | 10~95% , non condensing  |
| Power:              | Ni-MH rechargeable battery   |
| Size :              | 264x203.5x60mm   |



## General specifications

|                     |  |
|---------------------|--|
| Model:              | PCE-IR 1800  |
| Temperature range   | 650~1800 °C  |
| System accuracy:    | $\pm 0.3\% \pm 2^{\circ}\text{C}$ (at ambient temperature $23 \pm 5^{\circ}\text{C}$ ) |
| Repeatability:      | $\pm 0.1\% \pm 1^{\circ}\text{C}$ (at ambient temperature $23 \pm 5^{\circ}\text{C}$ ) |
| Optical resolution: | 300:1  |
| Response time       | 100ms (95%)  |
| Emissivity :        | 0.100~1.000 adjustable   |
| Aim mode:           | Laser 、 telescope aim  |
| Signal processing:  | MAX/MIN 、 Scan/Hold Function   |
| Alarm functions:    | Audible and visible HIGH/LOW alarm   |
| Data storage        | 2000 point   |
| Backlight:          | Three color  |
| Outputs/digital     | USB cable and software   |
| Storage temperature | -20~60 °C (no battery)   |
| Ambient temperature | 0~50 °C  |
| Relative humidity:  | 10~95% , non condensing  |
| Power:              | Ni-MH rechargeable battery   |
| Size :              | 264x203.5x60mm   |

## Appendix: Emissivity

Emissivity: the radiant intensity launched from the object depends on the temperature of the target and the object surface material's radiation characteristic.

**Emissivity table**

| Material    |                   | Emissivity |
|-------------|-------------------|------------|
|             |                   | 8-14μm     |
| Aluminum    | oxidized          | 0.2-0.4    |
| Asbestos    |                   | 0.95       |
| Asphalt     |                   | 0.95       |
| Basalt      |                   | 0.7        |
| Ceramic     |                   | 0.95       |
| Concrete    |                   | 0.95       |
| Copper      | oxidized          | 0.4-0.8    |
| Fabric      |                   | 0.95       |
| Glass       | plate             | 0.85       |
| Gold        |                   | 0.01-0.1   |
| Gravel      |                   | 0.95       |
| Ice         |                   | 0.98       |
| Iron        | oxidized          | 0.5-0.9    |
| Karborundum |                   | 0.9        |
| Lead        | Oxidized          | 0.2-0.6    |
| Paper       | Each color        | 0.95       |
| Plastics    | Transparent>0.5mm | 0.95       |
| Rubber      |                   | 0.95       |
| Sand        |                   | 0.9        |
| Snow        |                   | 0.9        |
| Soil        |                   | 0.9-0.98   |
| Steel       | oxidized          | 0.7-0.9    |
| Water       |                   | 0.93       |
| wood        | Natural           | 0.9-0.95   |