English



User Manual

PCE-TC 30N Thermal Imaging Camera

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Contents

1 Safety notes 1

2 Specifications 2

2.1 Technical specifications 2

2.2 Delivery scope 3

3 System description 4

3.1 Device 4

3.2 Getting started 5

3.3 Display description 6

3.4 Control panel 7

4 Menu 8

4.1 Image overlapping 8

4.2 Show saved images 8

4.3 Colour palettes 9

4.4 Emissivity 10

4.5 Settings 11

5 Maintenance 15

5.1 Cleaning 15

6 Troubleshooting 15

7 Contact 16

8 Disposal 16

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1 Safety notes

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. Damage or injuries caused by non-observance of the manual are excluded from our liability and not covered by our warranty.

- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, …) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not expose the device to shocks or strong vibrations.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet.
- You must not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth. Use only pH-neutral cleaner, no abrasives or solvents.
- The device must only be used with accessories from PCE Instruments or equivalent.
- Before each use, inspect the case for visible damage. If any damage is visible, do not use the device.
- Do not use the instrument in explosive atmospheres.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.
- Never aim the laser beam at people or animals.
- Never look directly into the laser beam.
- If the product is found to have smoke, sparks and a burning smell during use, stop using it immediately.
- In such a case, first disconnect the meter from the power supply. After the smoke and the peculiar smell have completely disappeared, contact PCE Instruments.

We do not assume liability for printing errors or any other mistakes in this manual.

We expressly point to our general guarantee terms which can be found in our general terms of business.

If you have any questions please contact PCE Instruments. The contact details can be found at the end of this manual.

2 Specifications

2.1 Technical specifications

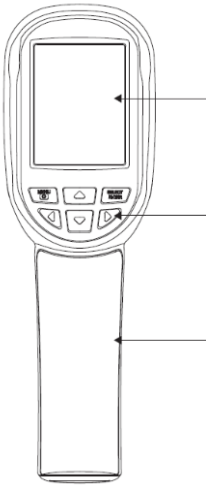
Optical specifications	
Temperature range	-20 ... +450 °C (-4 °F ... +842 °F)
Accuracy	±2 °C or ±2 % of reading up to 300 °C ±5 % of reading at >300 °C
Field of view (FOV)	35 ° x 26 °
Smallest focus distance	0.15 m
Infrared resolution	160 x 120 pixels
Thermal sensitivity	0.07 °C
Wavelength range	8 ... µm
Focus	fixed focus
Calibration of the measurement	Auto
Number of spots	3
Representation	
Display	2.8" TFT; resolution: 240 x 320 pixels
Picture-in-picture function	Adjustable: 25%, 50%, 75%, 100%
Frame rate	9 Hz
Colour palettes	Spectrum / Iron / Cold / White / Black
Emissivity	Variable 0.01 ... 1.0
Memory	
Image memory	Internal SD card 3 GB for more than 20000 images
Image format	JPG
Settings	
Setting options	Automatic Shutdown, intensity (brightness), language, temperature unit, time, spot
Languages	English, German, Chinese, Italian
Power supply	
Battery	Internal rechargeable battery, approx. 2800 mAh
Operating time	2 ... 3 h
Voltage supply	100...240 VAC 50/60 Hz
Interface	Micro USB for charging and memory readout on a PC
Automatic Shutdown	Adjustable, after 5 or 20 minutes or off
Environmental conditions	
Temperature	Operation: 0 ... +45 °C Storage: -20 ... +60 °C
Relative humidity	< 85 % r. RH (non-condensing)
Dimensions	96 x 72 x 226 mm / 3.8 x 4.1 x 8.9 in
Weight	389 g / / <1 lb

2.2 Delivery scope

1 x thermal imaging camera PCE-TC 30N
1 x USB cable
1 x USB mains adaptor
1 x user manual
1 x carrying bag

3 System description

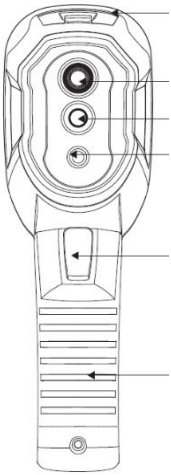
3.1 Device



1. Display

2. control panel

3. Handle



6. Micro USB connector under protective cap

7. infrared bolometer

8. Digital camera

9. LED light

10. Save screen capture / switch LED on or off

11. Internal rechargeable battery

3.2 Getting started

Please note that the instrument should acclimatise to the current environmental conditions before connecting it to the charger. Do not charge the instrument in hot or cold places. Charging in extreme temperatures will reduce the capacity of the battery. The micro USB cable can be used for charging but also for transferring images.

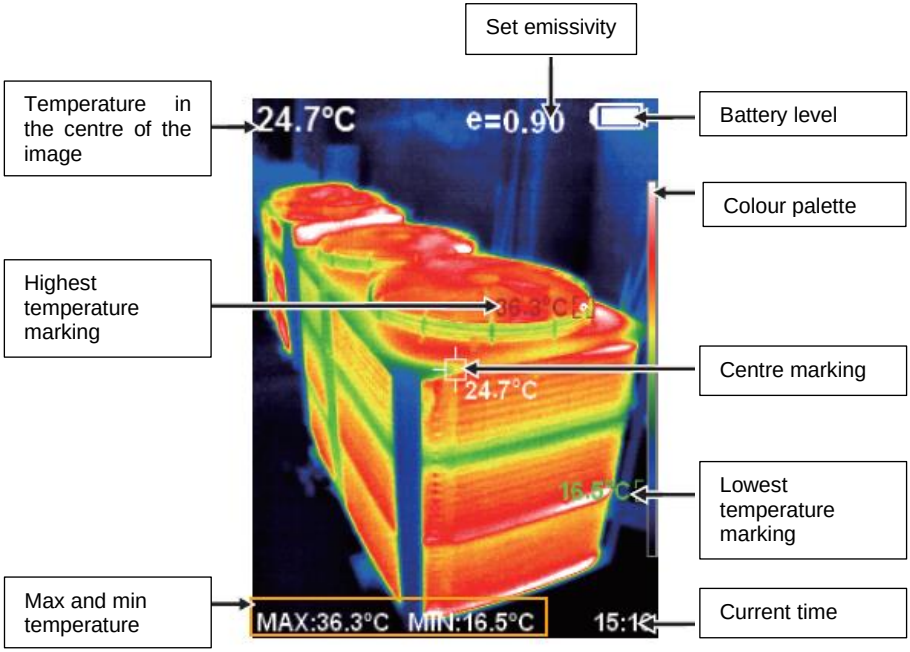
3.2.1 Charging the battery

The PCE-TC 30N thermal imaging camera has a built-in rechargeable Li-Ion battery.
If the battery level is low, this is indicated by the symbol  at the top right of the screen. Charge the thermal imaging camera via the micro USB interface.
To do this, proceed as follows:

- Connect the supplied USB cable to the micro USB interface of the thermal imaging camera.
- Connect the other side of the USB cable to the supplied mains adaptor.
- Now plug the mains adaptor into a protected contact socket designed for this purpose.

Note
Before charging, make sure that the battery, charger and camera are acclimatised to the current environmental conditions. Charging under extreme temperatures can have a negative impact on the battery life.
Do not charge the battery for more than 24 hours.

3.3 Display description



3.3.1 Colour palette

The colour palette is used to distinguish the temperature zones from high to low. Different colour palettes are available. The colour scale on the right edge of the screen automatically scales between the highest and lowest measured temperature in the screen section.

3.3.2 Temperature in the centre of the image

The white crosshairs in the centre of the image indicate the temperature at the focus of the thermal imaging camera.

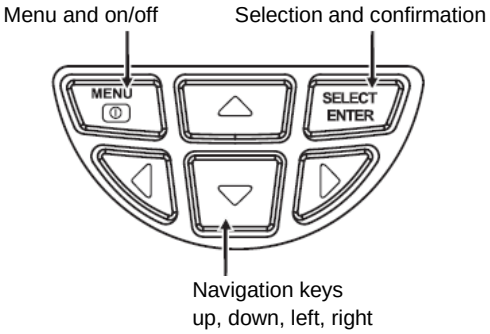
3.3.3 Maximum temperature in the current image section

The red mark appears where the highest temperature is measured in the current image section. At the same time, this is shown in the lower left area of the display.

3.3.4 Minimum temperature in the current image section

The green mark appears where the lowest temperature is measured in the current image section. At the same time, this is shown in the lower left area of the display.

3.4 Control panel



3.4.1 Switching the instrument on and off

Press and hold the menu key for more than 3 seconds to switch the thermal imaging camera on or off. After switching on, the display shows the last selected image mode.

3.4.2 Switching the LED on and off

Press and hold the trigger key for at least 5 seconds to turn the LED on or off.

3.4.3 Picture-in-picture function

This function enables the IR image to overlap the image from the integrated digital camera. In this way, measured objects can be clearly assigned. The overlapping can be adjusted in 25 % steps by pressing the left or right navigation key in normal measuring mode.

3.4.4 Saving images

To do this, press the key on the handle of the thermal imaging camera in normal measuring mode. A dialogue window appears, which can be confirmed with the menu key or cancelled with the select/enter key.

Note

If the thermal imaging camera is connected to a PC via USB, it is not possible to save screen captures.

3.4.5 Show/hide the minimum and maximum temperature

To do this, press the upper navigation key in normal measuring mode. In addition to the minimum or maximum measured temperature, the current time is also shown or hidden in the lower right corner of the display.

4 Menu

4.1 Image overlapping

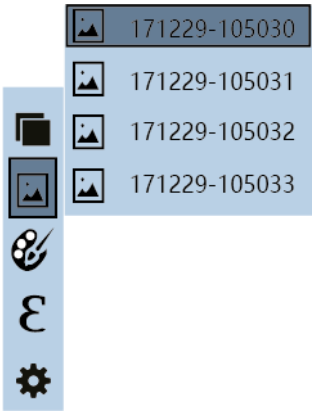
To exactly overlap the real image of the integrated digital camera with the images from the infrared camera, carry out the following steps:
First open the menu with the menu key. Select the menu item "Image registration" and confirm it with the select/enter key. A large crosshair appears in the centre of the screen. Now the infrared image can be adjusted exactly to the image of the digital camera using the navigation keys (up, down, left, right).

Note
For very precise adjustment of the infrared image, it is recommended to set image overlapping to a maximum of 50 % as otherwise, no digital image may be recognisable. Furthermore, the exact positioning of the infrared image depends on the distance of the object to be examined.

4.2 Show saved images

Open the menu with the menu key and navigate with the navigation keys up or down to the menu item "Image". Pressing the navigation key on the right takes you to the submenu. All saved pictures are now displayed here as a continuous list. The following functions are now available:

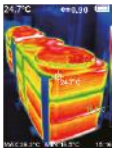
- Navigation key up or down: scroll through the list
- Select/enter key: view the highlighted image
  - Navigation key left or right: view previous or next image
  - Navigation key to: delete current image; confirm dialogue window with menu key; cancel with select/enter key
  - Select/enter key: Exit view
- Navigation key left: Exit submenu
- Menu key: back to measuring mode



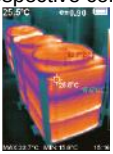
4.3 Colour palettes

5 different colour palettes are available for displaying thermal gradients on targeted objects. The gloss or surface texture of objects may require a change of colour palette so that distinct thermal gradients become visible. The colour palettes rainbow, iron, cold, white and black are available. If the temperature differences of the targeted object are high, a coloured palette should be selected.

See several example images with the respective colour palettes below:


Rainbow


Iron


Cold

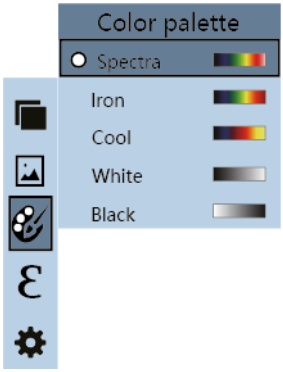

White


Black

4.3.1 Set colour palette

Open the menu using the menu key and use the navigation keys up or down to highlight the menu item “Color palette”. Pressing the navigation key on the right takes you to the submenu. Here, all available colour palettes are displayed in a list. The following functions are available:

- Navigation key up or down: scroll through the list
- Select/enter key: apply currently selected colour palette
- Navigation key left: exit submenu
- Menu key: back to measuring mode



4.4 Emissivity

Every object with a temperature above absolute zero emits thermal radiation. The emissivity is the indicator of how much thermal radiation this object emits in contrast to an ideal thermal radiator, the black body. The emissivity is therefore always between 0 ... 1 (0 ... 100 %).

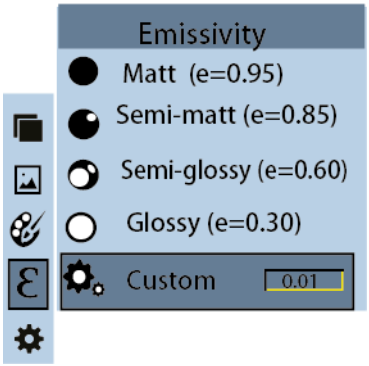
4.4.1 Set emissivity

Open the menu using the menu key and use the navigation keys up or down to highlight the menu item “Emissivity”. Pressing the navigation key on the right takes you to the submenu. Here, all available emissivities are displayed in a list. The following functions are available:

- 4 standard emissivities are available:
  - matt (e=0.95)
  - semi-matt (e=0.85)
  - slightly glossy (e=0.60)
  - glossy (e=0.30)
  - individual (e=0 ... 1)
- Navigation key up or down: scroll through the list
- Select/enter key: accept currently selected emissivity
- Navigation key left: exit submenu
- Menu key: back to measuring mode

Note

When selecting individual emissivity, the emissivity can be set between 0 ... 1 with the navigation keys up or down; the decimal place can be changed with the navigation keys left or right; to accept, press the select/enter key.



4.4.2 Emissivities of common materials

Material	Emissivity	Material	Emissivity
Bitumen	0.90 … 0.98	Black cloth	0.98
Concrete	0.94	Human skin	0.98
Cement	0.96	Foam	0.75 … 0.80
Sand	0.90	Charcoal dust	0.96
Earth	0.92 … 0.96	Paint	0.80 … 0.95
Water	0.92 … 0.96	Matte paint	0.97
Ice	0.96 … 0.98	Black rubber	0.94
Snow	0.83	Plastic	0.85 … 0.95
Glass	0.90 … 0.95	Timber	0.90
Ceramics	0.90 … 0.94	Paper	0.70 … 0.94
Marble	0.94	Chromium hemitrioxide	0.81
Gypsum	0.80 … 0.90	Copper oxide	0.78
Mortar	0.89 … 0.91	Ferric oxide	0.78 … 0.82
Brick	0.93 … 0.96	Textile	0.90

4.5 Settings

Open the menu using the menu key and use the navigation keys up or down to highlight the menu item “Setting”. Pressing the navigation key on the right takes you to the submenu. All available settings are displayed here in a list. The following functions are available:

Autom. off ▶	Setting the automatic shutdown	No 5 min 20 min
Intensity ▶	Setting the display backlight	Low Medium High
Language ▶	Setting the language	English Chinese Italian German
°C Unit ▶	Setting the temperature unit	Celsius Fahrenheit
24h Time format ▶	Setting the time format	24 hours AM/PM
Time setting ▶	Setting the date and time	Year Month Day Hour Minute Second
Spot ▶	Setting the autom. spots for the maximum or minimum temperature	Off On

4.5.1 Automatic shutdown

Use the navigation keys up or down to highlight the menu item “Automatic Shutdown”. Pressing the navigation key on the right takes you to the submenu. All available settings are displayed here in a list.

- Navigation key up or down: scroll through the list
- Select/enter key: accept current selection
- Navigation key left: exit submenu
- Menu key: back to measuring mode

4.5.2 Brightness

Use the navigation keys up or down to highlight the menu item “Brightness”. Pressing the navigation key on the right takes you to the submenu. All available settings are displayed here in a list.

- Navigation key up or down: scroll through the list
- Select/enter key: accept current selection
- Navigation key left: exit submenu
- Menu key: back to measuring mode

4.5.3 Language

Use the navigation keys up or down to highlight the menu item “Language”. Pressing the navigation key on the right takes you to the submenu. All available settings are displayed here in a list.

- Navigation key up or down: scroll through the list
- Select/enter key: accept current selection
- Navigation key left: exit submenu
- Menu key: back to measuring mode

4.5.4 Unit

Use the navigation keys up or down to highlight the menu item “Unit”. Pressing the navigation key on the right takes you to the submenu. All available settings are shown here in a list.

- Navigation key up or down: scroll through the list
- Select/enter key: accept current selection
- Navigation key: exit submenu
- Menu key: back to measuring mode

4.5.5 Time format

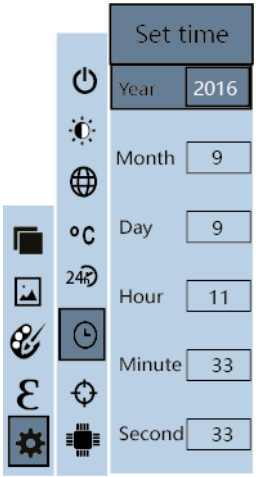
Use the navigation keys up or down to highlight the menu item “Time format”. Pressing the navigation key on the right takes you to the submenu. All available settings are displayed here in a list.

- Navigation key up or down: scroll through the list
- Select/enter key: accept current selection
- Navigation key left: exit submenu
- Menu key: back to measuring mode

4.5.6 Time

Use the navigation keys up or down to highlight the menu item “Set time”. Pressing the navigation key on the right takes you to the submenu. All available settings are displayed here in a list.

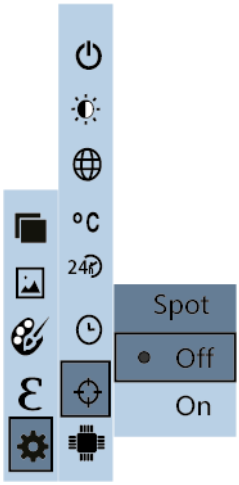
- Navigation key up or down: scroll through the list
- Select/enter key: edit current selection
  - Navigation key up or down: change number at marked decimal place
  - Navigation key left or right: change decimal place
  - Select/enter key: save edit
- Navigation key left: exit submenu
- Menu key: back to measuring mode



4.5.7 Spot

Use the navigation keys up or down to highlight the menu item “Cold/hotspot”. Pressing the navigation key on the right takes you to the submenu. All available settings are displayed here in a list.

- Navigation key up or down: scroll through the list
- Select/enter key: accept current selection
- Navigation key left: exit submenu
- Menu key: back to measuring mode



5 Maintenance

5.1 Cleaning

The meter should be stored at room temperature. The lens of the infrared sensor is the most sensitive part of the instrument. Make sure that it is always clean. If the lens ever becomes dirty, it should only be cleaned with a soft cotton cloth or stick. Use only water or medical alcohol for cleaning. The lens should be completely dry before the meter is used again. Do not immerse the instrument in water.

6 Troubleshooting

The following problems may occur during operation of the thermal imaging camera. If the suggested solutions are not helpful, please contact PCE Instruments.

Problem	Cause	Solution
The thermal imaging camera cannot be switched on	The battery is discharged	Fully charge the thermal imaging camera with the supplied USB cable (see 3.2.1)
The thermal imaging camera switches itself off during operation	The battery is discharged	Fully charge the thermal imaging camera with the supplied USB cable (see 3.2.1)
	Automatic shutdown is activated	Switch on the thermal imaging camera again and change the setting of the automatic shutdown, if necessary (see 4.5.1).

7 Contact

If you have any questions, suggestions or technical problems, please do not hesitate to contact us. You will find the relevant contact information at the end of this user manual.

8 Disposal

For the disposal of batteries in the EU, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.

www.pce-instruments.com

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