PCE
INSTRUMENT
S PCE-LES 103
Handheld LED
Stroboscope

PCE INSTRUMENTS PCE-LES 103 Handheld LED Stroboscope User Manual

Contents

PCE INSTRUMENTS PCE-LES 103 Handheld LED Stroboscope

Product Usage Instructions

Safety Information
Ensure to read and understand all safety notes provided in the manual before using the stroboscope.

System Description
The PCE-LES 103 / PCE-LES 103UV stroboscope utilizes high-power UVA LEDs to provide precise lighting at various frequencies and pulse widths.

Getting Started
Power Supply: Connect the stroboscope to a power source following the specified voltage and current requirements provided in the manual.

Operation
To operate the stroboscope, follow these steps:

1. Turn on the device using the power button.
2. Adjust the frequency and pulse width settings as needed.
3. Aim the stroboscope at the target area and activate the light to observe the desired effect.

Contact
If you have any questions or need assistance with the product, feel free to contact our customer support team for help.

Disposal
When disposing of the stroboscope, ensure to follow proper waste disposal regulations to minimize environmental impact.

Frequently Asked Questions (FAQ)

- **Q: Can I adjust the brightness of the display on the stroboscope?**
  - A: Yes, you can adjust the display brightness settings on the stroboscope to suit your visibility preferences.
- **Q: How long does the battery of the stroboscope last on a full charge?**
  - A: The operating time of the stroboscope battery is approximately 4 hours and 30 minutes under specific operating conditions.

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.

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.

Safety symbols
Safety-related instructions the non-observance of which can cause damage to the device or personal injury carry a safety symbol.

Symbol	Name/Description
	Warning: LED beam Non-observance can cause injuries to the eyes.

Specifications

Technical specifications

Specification	PCE-LES 103	PCE-LES 103UV-365	PCE-LES 103UV-385
Lamp technology	3 high power white LEDs	3 high power UVA LEDs	3 high power UVA LEDs
Light color	cool white 6,200 K	UVA light 365 … 370 nm	UVA light 380 … 390 nm
Light power	11730 lx @ 20 cm @ 1000	TBA	635 $\mu W/cm^2$ @ 20 cm @ 1000 Hz,
	Hz, 1 %		1 %
	6160 lx @ 30 cm @ 1000		317 $\mu W/cm^2$ @ 30 cm @ 1000 Hz,
	Hz, 1 %		1 %
	2650 lx @ 50 cm @ 1000		115 $\mu W/cm^2$ @ 50 cm @ 1000 Hz,
	Hz, 1 %		1 %
Measurement range	60 … 300,000 FPM 1 … 5,000 Hz		
Resolution	60 … 9999.99 FPM: 0.01 FPM 10,000 … 300,000 FPM: 0.1 FPM 1 … 5000 Hz: 0.01 Hz		
Accuracy	0.003 % of setting or ± 1 LSD		
Flash duration	0.01 % … 1 % of total flash duration		
range	Resolution: 0.01 %		
	0.01 º … 3.60 º of 360 º		
	Resolution: 0.01 º		
Phase shift	-360 º … 360 º Resolution: 1 º		
Display	2.8" TFT LCD Programmable auto power off		
Battery	Li-ion rechargeable battery 2200 mAh, 7.4 V		
Charging time	approx. 2 h 30 min @ 5 V / 2 A		

Operating time	approx. 4 h 30 min Conditions: Flashing 100 Hz, 1 %, display brightness 70 %
Power adaptor	Input: 100 … 240 VAC, 50/60 Hz, Output: 5 V/2 A
Environmental co nditions	- **Charging temp.:** 0 … 45 °C - **Operating temp.:** -20 … 60 °C - **Storage temp.:** -20 … 60 °C (1 month), -20 … 45 °C (3 months) 35 … 85 % RH, non-c ondensing
Dimensions	165 x 90 x 35 mm
Weight	284 g

Housing	IP52

Delivery contents

- 1 x PCE-LES 103 handheld stroboscope
- 1 x USB-C cable
- 1 x instruction manual
- 1 x carrying bag

Optional accessories
NET-USB-EU charger

System description

Device

1. Display
2. Keypad
3. LED light source
4. USB charging connection (USB-C)

Interfaces

Figure 27. USB charging connection

At the bottom side of the device, there is a USB-C type connector. This connector is used to charge the internal battery of the meter and can also be used to update its firmware by means of our update software which can be downloaded here: **https://www.pce-instruments.com/english/download-win_4.htm**

Note: The stroboscope can also be charged or operated via a power bank

Display
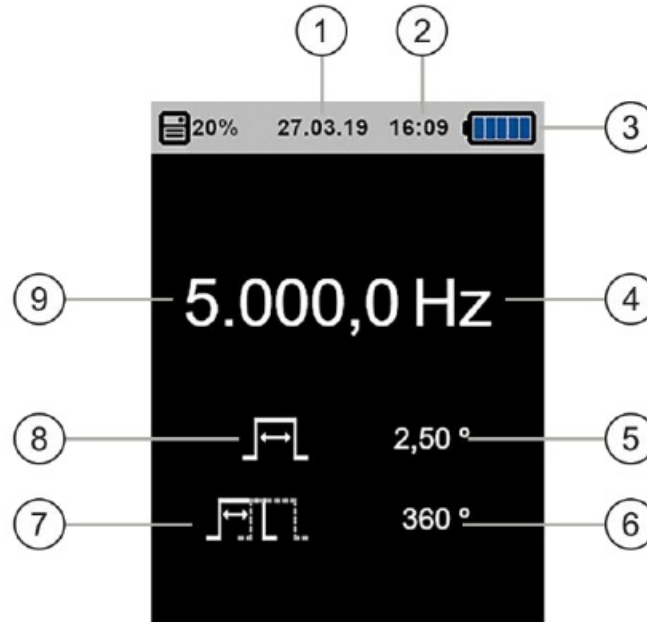
1. Date
2. Time
3. Battery status
4. Flash frequency unit
5. Duty cycle value
6. Phase shift value
7. Phase shift icon
8. Duty cycle icon
9. Flash frequency value

Function keys

KEY	NAME	FUNCTION
⏻	Power	Turn the device on/off
MENU	MENU	Switch to the menu screen
OK	OK	Switch unit (Hz/FPM) / confirm a selection in the menu screen
�	Back	Back to the previous menu screen
▲	Up	Increase a value / move up in the menu screen
▼	Down	Decrease a value / move down in the menu screen
◄÷2	Left - /2	Halve the frequency value
x2►	Right - x2	Double the frequency value
↕1000	Quick	Fine adjustment of the frequency value
LED ON/OFF	LED ON/OFF	Turn the LED lamp on/off

Getting started

Power supply

- The PCE-LES 103 / 103UV is a handheld device powered by a 7.4 V 2400mAh Li-Ion battery that allows it to work without connecting it to any power supply when it is sufficiently charged.
- When the battery is discharged, charge it by connecting the optionally available USB charger to the 240 V AC net and the USB plug to the USB connector of the device. The charger will provide a stable 5 V DC output to charge the battery inside the device. Alternatively, the meter can also be charged via the USB port of your computer.
- The device can work connected to the power supply or with no external connection if the battery is charged. In both cases, the operation will be the same, as described in the next sections of this manual.

Operation

Power the device on/off
To turn on the device, press and hold the Power key for approx. 2 seconds. First, you will see the power on screen (figure 2) and after 2 seconds, the device will show the main screen (figure 3) and will be ready to use.
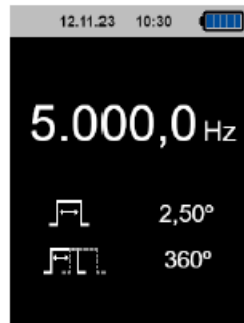
Figure 28. Power on screen

Figure 29. Measurement screen

- After turning it on, the device will load the last configuration values used as well as the frequency, duty cycle and phase shift values selected the last time it was used.
- To turn off the device, press and hold the Power key. A countdown will be displayed as long as the Power key is pressed. When the countdown reaches 0, the device will turn off.

Measurement

Change the flash unit
From the main screen of the device, press the OK key to switch the flash unit. You can select Hertz (Hz) or flashes per minute (FPM) (figure 4).
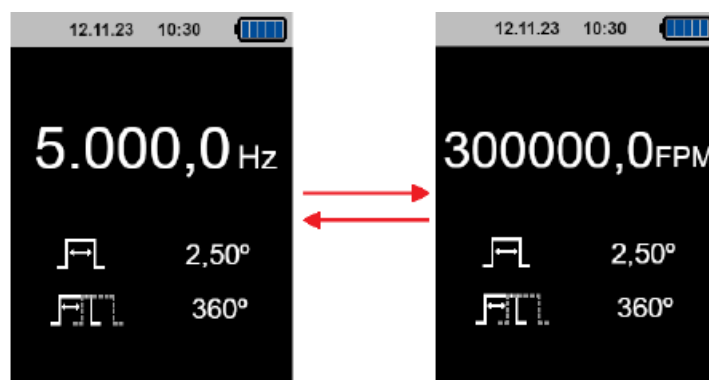

Figure 30. Changing the flash unit

Press the OK key again to switch to the previous unit.

Adjust the flash frequency
The frequency at which the device LEDs will flash can be adjusted by using one of the following keys:

KEY	ACTION
x2 ▶	Multiply frequency / FPM value by 2
◀ ÷2	Divide frequency / FPM value by 2
▲	A single keystroke increases the flash frequency / FPM by 0.01 / press and hold to increase more quickly
▼	A single keystroke decreases the flash frequency / FPM by 0.01 / press and hold to decrease more quickly

Fine parameter adjustment in quick mode

You can perform a fine frequency adjustment by pressing the Quick key. When the Quick key is pressed, fine frequency adjustment mode will be activated. You will see a digit in the frequency value highlighted in orange, as shown in figure 5.

Figure 31. Quick mode

You can then press the Up / Down keys to increase / decrease that digit by 1. Press the Right or Left key to move through every digit of the value and adjust each digit. Once the desired value has been entered, press the OK key and the device will be set to the entered frequency. Once OK has been pressed, the next parameter (duty cycle) can be modified following the same procedure as with the frequency.

Figure 32. Quick mode - duty cycle modification

You can modify the duty cycle now by pressing the Up/Down keys to increase/decrease each digit and using the Right/Left keys to navigate to other digits. Press OK to confirm the entered value for the duty cycle or press Back to return to frequency modification mode. If you press OK, the next parameter (phase shift) can be modified in the same way as the two previous parameters.

Figure 33. Quick mode - phase shift modification

Phase shift can be modified like the duty cycle and frequency. Use the Up/Down keys to increase/decrease the digit and Left/Right to navigate to other digits within the parameter. You can press OK to confirm the entered phase shift, so the device will return to the main screen or press BACK to go to duty cycle modification mode.

Switch the LEDs on/off
You can enable/disable the LEDs from any menu / screen just by pressing the LED ON/OFF key. When the device is in the main screen, the color of the frequency reading will change from white (LEDs off) to orange (LEDs on) when the LED ON/OFF key is pressed.

Figure 34. Main screen - LEDs on

Attention: Avoid direct eye contact with the LED light. Do no look into the light- emitting diodes while these are on.

Further functions

Menu overview
You can access the main menu screen from the main screen by pressing the MENU key. The main menu screen will show the different menus to access (figure 9).
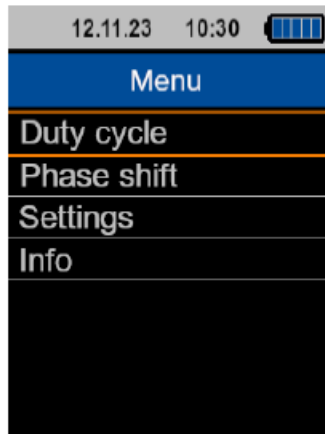
Figure 35.Main menu

- **Duty cycle menu:** this menu allows you to change the duty cycle related parameters.
- **Phase shift menu:** this menu allows you to change the phase shift related parameters.
- **Settings menu:** this menu allows you to change different settings regarding device operation such as power off time, language, screen brightness, units, sound, etc.
- **Info menu:** this menu displays information about the device version and PCE Instruments.

You can select any menu by using the Up/Down keys. The selected menu will be highlighted by an orange frame. Once the desired menu is selected, you can press OK to access it. To go back to the main screen, press the Back or the Quick key.

Duty cycle menu

The duty cycle menu can be accessed from the main menu screen by selecting it with the Up/Down keys and by pressing the OK key once "Duty Cycle" has been selected. To go back to the main menu, press Back. Press the Quick key to go back to the main screen.
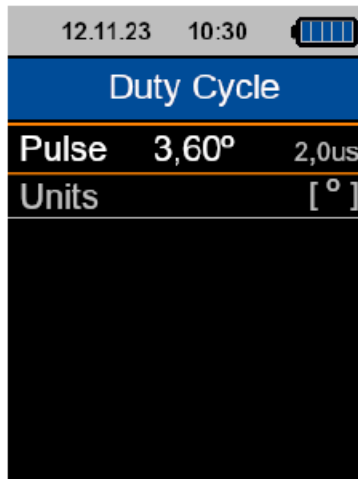

Figure 36. Duty Cycle menu

The duty cycle menu allows you to adjust the duty cycle value as well as the duty cycle units. To adjust the duty cycle value, select "Pulse" by means of the Up/Down keys and press OK. Once OK has been pressed, the number can be modified digit by digit.
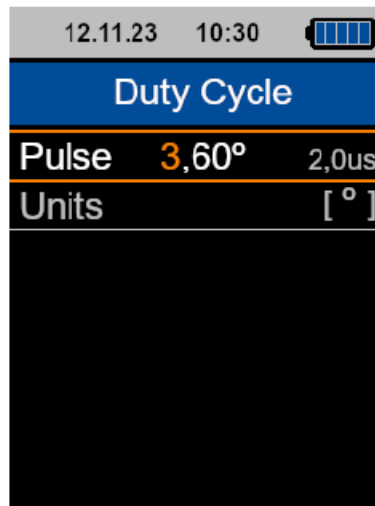
Figure 37. Duty Cycle - modify value

- To increase/decrease the highlighted digit, use the Up/Down keys and to move to the next/previous digit, use the Right/Left keys. Once the desired value has been entered, press the OK key and the flashing duty cycle will be set. A longer flash duration increases the light intensity of the flash.
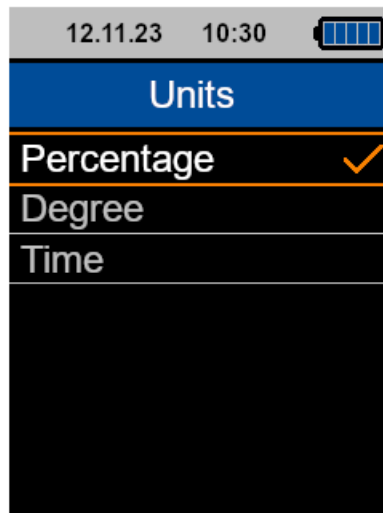- To modify the duty cycle unit, select "Units", using the Up/Down keys. Once the line is highlighted, press OK and a submenu will be displayed.

Figure 38. Duty Cycle - Units

Phase shift menu

The phase shift menu can be accessed from the main menu by selecting it with Up/Down keys and by pressing the OK key once "Phase Shift" has been selected. To go back to the main menu, press the Back key. Press the Quick key to go back to the main screen.
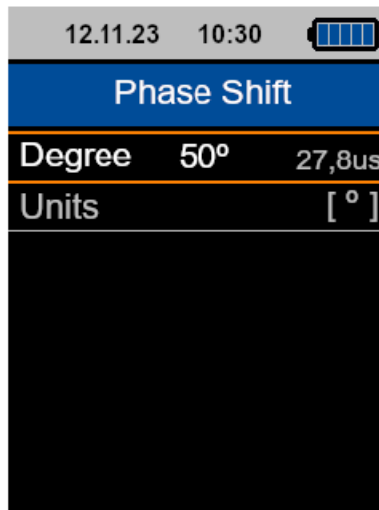
Figure 39. Phase Shift menu

- The phase shift menu allows you to adjust the phase shift value and the phase shift unit. To adjust the phase shift value, select "Degree" using the Up/Down keys and press OK. Once the OK key has been pressed, the number can be modified digit by digit.
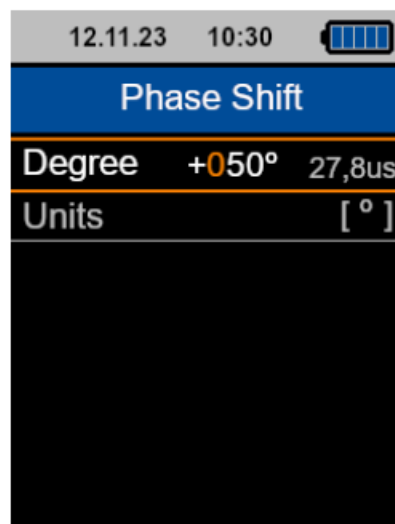

Figure 40. Phase Shift menu - modify value

- To increase/decrease the highlighted digit, use the Up/Down keys and to move to the next/previous digit, use the Right/Left keys. Once the desired value has been entered, press OK and the flashing phase shift value will be set.
- Adjusting the phase shift allows to "move" the flash in time without changing the time between the flashes.
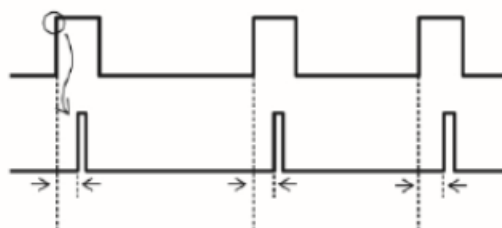

Figure 41. Phase Shift explanation

- To modify the phase shift unit, select "Units", using the Up/Down keys. Once the line is highlighted, press OK
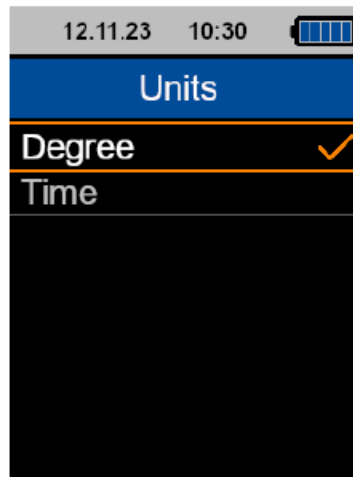
and a submenu will be displayed.

Figure 42. Phase Shift - Units

- An orange tick can be found next to the phase shift unit the device is using at the moment. Use the Up/Down keys to select the desired unit (degree or time) and press OK to set the unit.

- You can go back to the phase shift menu by pressing the Back key. To go directly to the main screen, press the Quick key.

Settings

The settings menu can be accessed from the main menu by selecting it with the Up/Down keys and pressing the OK key once "Settings" has been selected. To go back to the main menu, press the Back key. Press the Quick key to go back to the main screen.
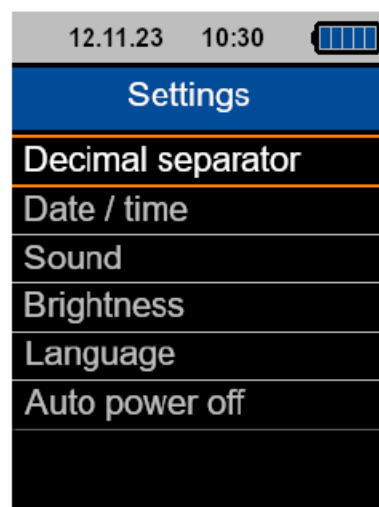

Figure 43. Settings menu

Decimal separator menu

The decimal separator menu can be accessed from the settings menu screen by selecting it with the Up/Down keys and pressing the OK key once "Decimal separator" has been selected. To go back to the settings menu, press the Back key. Press Quick to go back to the main screen.
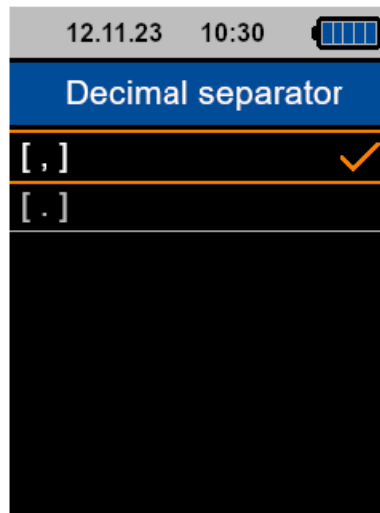
Figure 44. Decimal separator menu

The Decimal separator menu allows you to select the decimal separator used (comma or point). An orange tick can be found next to the separator that is currently used. To change it, select the desired separator using the Up/Down keys and press OK to confirm the selected one.

Date and time menu
The date and time menu can be accessed from the settings menu by selecting it with Up/Down keys and pressing the OK key once "Date / Time" has been selected. To go back to the settings menu, you can press the Back key. Press Quick to go back to the main screen.
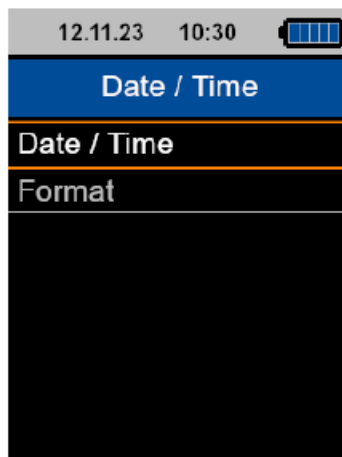

Figure 45. Date / Time menu

- The date and time menu allows you to change the date and time setting of the device and to select the format the device will use to display the date in the upper area of the screen.
- To change the date and time setting, select "Date / Time", using the Up/Down keys and press the OK key to access the sub-menu.
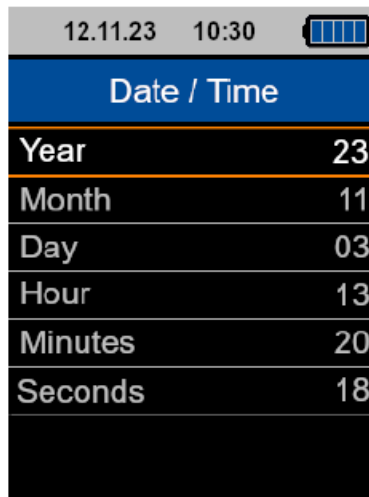
Figure 46. Date / Time submenu

- In this sub-menu, you can set the year, month, day, hour, minute and seconds. To select the parameter to adjust, use Up/Down keys. Once the parameter to adjust is highlighted in orange, press the OK key and the device will enter number modification mode.
- Use the Up/Down keys to adjust the digit and the Right/Left keys to move to the next/previous digit of the number. Once adjusted, press OK and the value will be saved in the device. Repeat the same procedure to adjust any other of the parameters available in the Date / Time settings menu.
- To go back to the Date / Time menu, press the Back key. Press the Quick key to return to the main screen.
- To change the format the device will use to display the date on the upper area of the screen, select "Format" using the Up/Down keys and press OK once it is selected to access the Format settings menu.
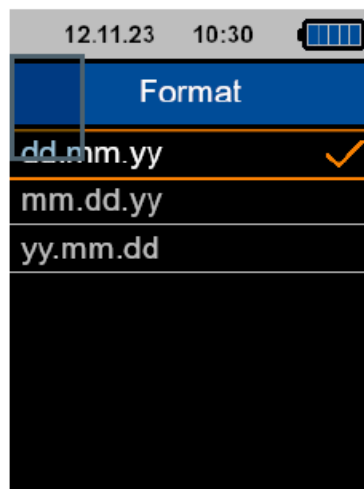

Figure 47. Date and time format

- Here, you can select one of these date formats: dd.mm.yyyy / mm.dd.yyyy / yyyy.mm.dd. An orange tick can be found next to the format currently used by the device. Use the Up/Down keys to select the desired format and press OK once the desired one is highlighted in orange. This will set the date format for the device.
- To go back to the Date / Time menu, press the Back key. Press the Quick key to go back to the main screen.

Sound menu

The sound menu can be accessed from the settings menu by selecting it with the Up/Down keys and by pressing the OK key once "Sound" has been selected. To go back to the settings menu, press the Back key. Press the Quick key to go back to the main screen.
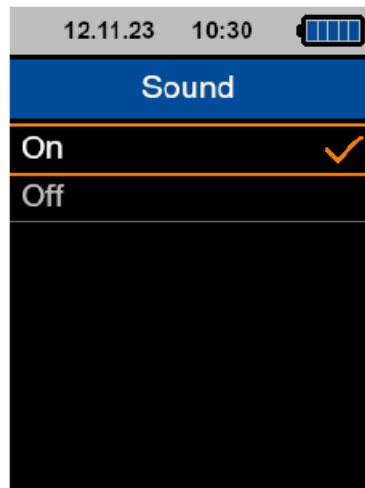
Figure 48. Sound menu

The sound menu allows you to enable/disable the beep sound when a key is pressed. An orange tick can be found next to the currently selected option. To change the sound setting, use the Up/Down key to select On or Off. Once the desired option is highlighted in orange, press OK and the device will save the setting.

Brightness menu
The brightness menu can be accessed from the settings menu by selecting it with Up/Down keys and by pressing the OK key once "Brightness" has been selected. To go back to the settings menu, press the Back key. Press the Quick key to go back to the main screen.

Figure 49. Brightness menu

The Brightness menu allows you to adjust the TFT brightness. Press the OK key and then use the Up/Down keys to increase / decrease the TFT brightness in steps of 10 %. Once the desired value is selected, press OK to save the value. The TFT brightness will change each time you press the Up/Down key.

Language menu
The language menu can be accessed from the settings menu by selecting it with Up/Down keys and pressing the OK key once "Language" has been selected. To go back to the settings menu, press the Back key. Press the Quick key to go back to the main screen.
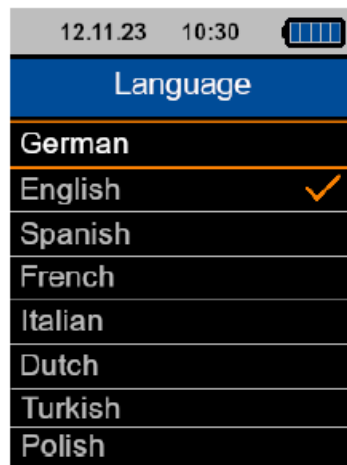
Figure 50. Language menu

An orange tick indicates what menu language is currently selected. To select the desired language, use the Up/Down keys to highlight it in orange. Once highlighted, press OK to change the device language to the selected one.

Auto Power Off menu

The Auto Power Off menu can be accessed from the settings menu by selecting it with the Up/Down keys and by pressing the OK key once "Auto Power Off" has been selected. To go back to the settings menu, press the Back key. Press the Quick button to go back to the main screen.
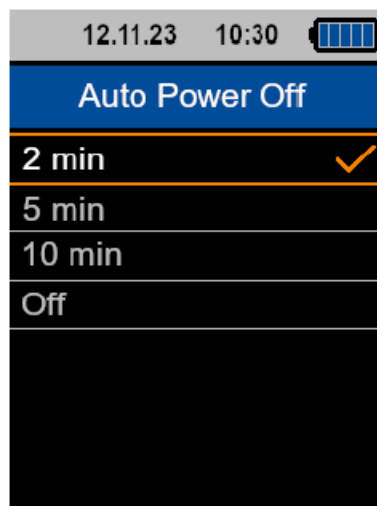

Figure 51. Auto Power Off menu

The Auto Power Off menu allows you to select a time after which the device switches off automatically. You can choose out of 2 minutes, 5 minutes, 10 minutes or disabled. You can see an orange tick next to the currently selected option. Use the Up/Down keys to select the desired option and once it is highlighted in orange, press the OK key to save your selection to the device.

Auto Display Off menu

The Auto Display Off menu can be accessed from the settings menu by selecting it with the Up/Down keys and pressing the OK key once "Auto Display Off" has been selected. To go back to the settings menu, press the Back key. Press the Quick key to go back to the main screen.
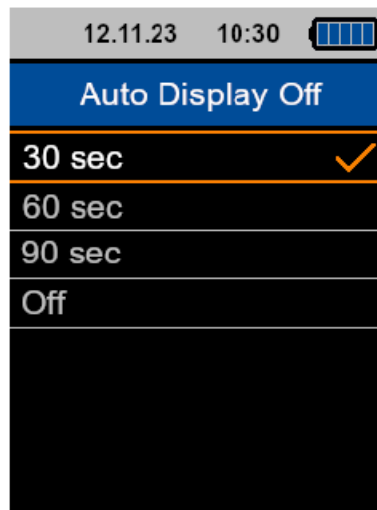
Figure 52. Auto Display Off menu

The Auto Display Off menu allows you to select a time after which the device reduces the TFT brightness to increase the operating life by reducing the power consumption. You can select 30 seconds, 60 seconds, 90 seconds or disabled. You can see an orange tick next to the currently selected option. Use the Up/Down keys to select the desired option and once it is highlighted in orange, press the OK key to confirm and save the selection.

Info menu

- The Info menu can be accessed from the main menu by selecting it with the Up/Down keys and pressing the

  OK key once "Info" has been selected. To go back to the main menu, press the Back key. Press the Quick key

  to go back to the main screen.
- The Info menu shows the device name, firmware version and PCE Instruments contact details.

Software
An update software is available here: **https://www.pce-instruments.com/english/download-win_4.htm**. This can be used to update the firmware of the device in case a new version is released. To do that, connect the device to a PC running the software via USB, then power up the device in boot/update mode. This means when the device is powered on in common operation, press both the Power and MENU keys at the same time. Then first release the Power key and then the MENU key.

The device will then be working in boot mode, so the firmware can find it and update the firmware with a .hex file supplied by us.

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.

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.

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Specifications are subject to change without notice.

Documents / Resources

	PCE INSTRUMENTS PCE-LES 103 Handheld LED Stroboscope [pdf] User Manual PCE-LES 103 Handheld LED Stroboscope, PCE-LES 103, Handheld LED Stroboscope, LED Stroboscope, Stroboscope

References

- 🔴 **Anasayfa - Cihazları**
- 🇫🇷 **France.fr : Explore France and its wonders - Explore France**
- 🌐 **iberica.es**
- 🏠 **Make an offer on the domain instruments.co.uk - Domains.co.uk**
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- **User Manual**