PCE Instruments PCE-VM 22 Vibration Analyzer User Manual

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Contents

General

Safety Precautions
To prevent possible electrical shock, fire, personal injury or the device damage:

- Carefully read user's manual.
- Do not place sensor on the objects which exposed to high voltages.
  These voltages could cause personal injury or death.
- The Analyzer could not be used in potentially explosive environments.
- Take measures to prevent cables and straps become entangled by rotating part of machines at measurement site.
- Do not expose PCE-VM 22 parts to heavy impacts, high humidity and extreme temperature.
- Do not try to open the display unit – this can damage the system, and your after-sales service warranty will come void.

Overview

The PCE-VM 22 Vibration Analyzer (Device, Analyzer) is a compact yet powerful, vibration analyzer designed to measure overall vibration parameters, FFT spectrum analysis of the rotating machinery, immediate evaluation against ISO 10816 standard, condition monitoring by route based measurements and data collection.
Route files and data files exchange via email makes it ideal for data collection at remote sites. Simple in use, with free firmware upgrades, comes with data management and reporting software.

Kit Content

The PCE-VM 22 kit includes:

- 1 x Accelerometer PCE-VM 22
- 1 x Vibration sensor with connection cable and magnetic holder
- 1 x Infrared sensor with speed sensor
- 1 x Magnetic holder

- 1 x USB charging adapter
- 1 x Micro USB cable
- 1 x Transport case
- 1 x Instruction manual

Specifications

- **Inputs:** IEPE or charge type accelerometers with known sensitivity, switchable.
  Optical RPM transducer with IR pyrometer sensor (optional)
- **AD conversion:** 24 bits
- **Dynamic range:** 106 dB
- **Frequency range:** 1…10000 Hz
  Vibration measurement range:
- **Acceleration:** 200 m/s2
- **Velocity:** 200 mm/s
- **Displacement:** 2000 uM
- **Accuracy:** ±5%
- **Temperature measurement range:** -70°C to 380°C
- **Accuracy:** ±0.5% (0…+60°C), ±1% (-40…+120°C), ±2% (-70…+180°C), ±4% (-70…+380°C)
- **Tachometer measurement range:** 10…200,000 rpm
- **Accuracy:** ±0.1% and ±1rpm
- **FFT spectrum resolution:** 400, 800, 1600 lines
- **Data storage:** 4GB micro SD card, built-in
- **PC interface:** USB
- **Display:** color, sunlight readable 128×160 dots
- **Battery:** Li-Po rechargeable, up to 8 hrs continuous operation
- **Operating Temperature:** 0°C to 50°C
- **Storage Temperature:** -20°C to 60°C
- **Operating Humidity:**
- **Dimensions:** 132 x 70 x 33 mm
- **Weight:** 150 g

Measurement functions

- **Vibration mode:** analyzer measures overall level of vibration acceleration, velocity and displacement and FFT spectrum, route or off-route measurements.
- **Tachometer:** analyzer measures speed of rotation by means of contactless optical sensor.
  The measurement result is displayed in RPM and Hz.
- **IR thermometer:** contactless measurement of object temperature.
  The measurement result is displayed in °C and °F.

Operation

Keyboard

	Press and hold for 3 sec to turn device ON, short press to turn OFF
	Enter, confirm selection, start measurement
	Navigation arrow keys
	Menu
	Back space, quit
	Option key

Settings

This menu is used to setup:

- Date/Time
- Sensors parameters
- Units Metric/Imperial units
- Auto OFF delay
- English interface language
- Brightness Low/Mid/High display brightness
- MUX input multiplexer to use triaxial sensors (optional

Date/Time

Use arrow keys  to set date.

Hold  then press  or  for month decrement/increment.

Confirm by  when correct date is set.

Use keys  to set minutes and hours.

Use  key to switch focused field. Focused field is indicated by red frame.

Confirm by  when correct time is set.

Sensors

Use  keys to choose sensor, which will be used for measurements.
Drop down menu offers two types – IEPE or charge type sensors to choose from.

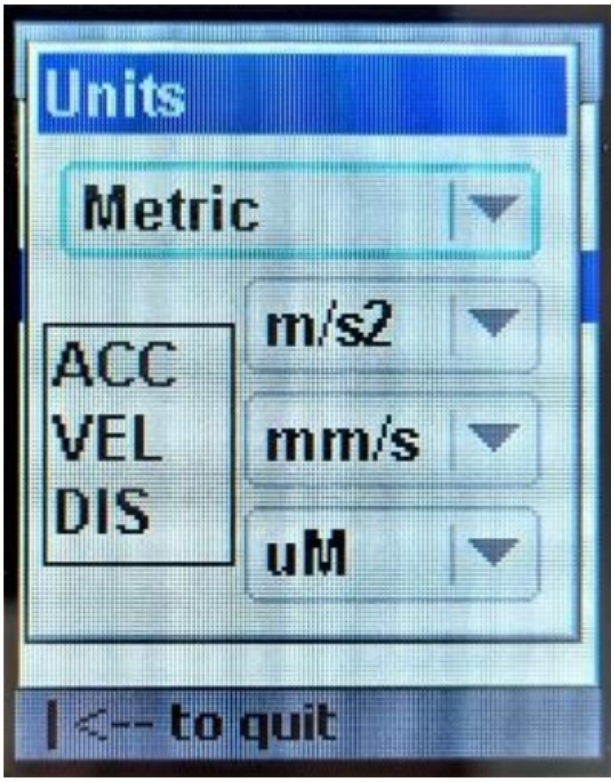
Confirm choice by  key.

Type, S.N. and Sensitivity fields are editable.

Use  key to choose field to edit.

Then use arrow keys  to edit the field value.

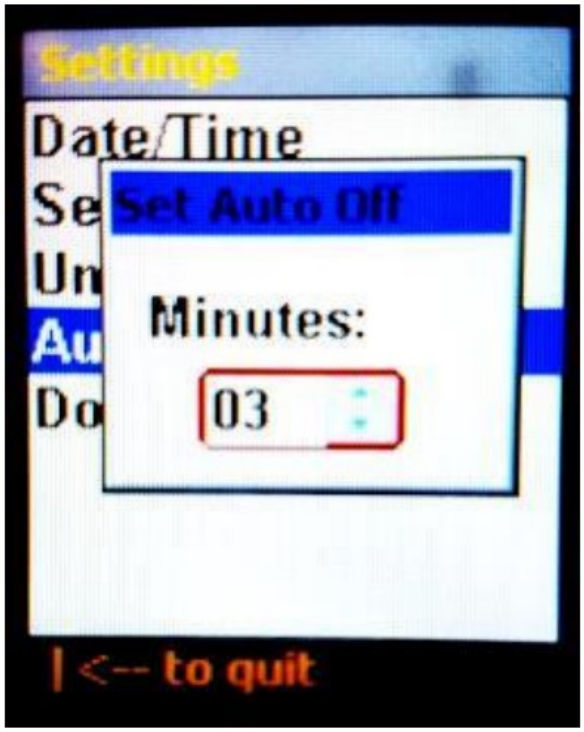
Units
Metric/Imperial units setup.



Auto OFF

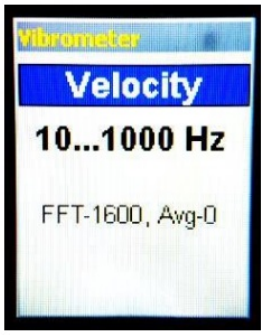
Use keys to set auto OFF delay (minutes).

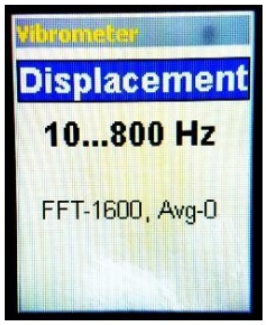
Press or key to confirm and quit menu.

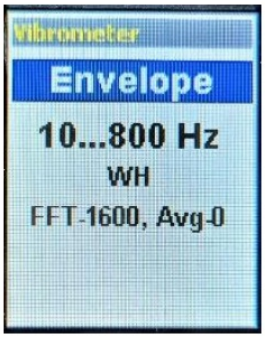


Vibration

Analyzer measures vibration Acceleration, Velocity and Displacement.
In ISO 10816 mode measurement result is compared to the built-in table of vibration severity grades according to ISO 10816-3.







Use  keys to choose measurement mode.

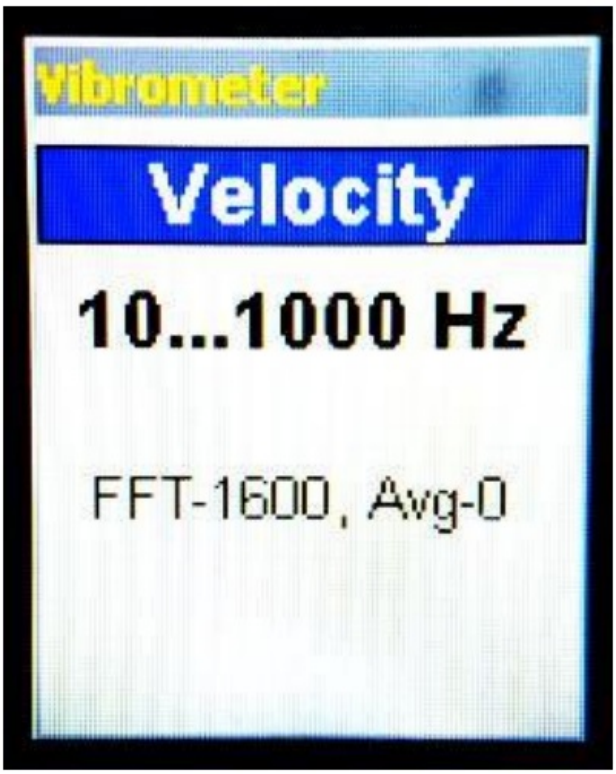
Vibration measurement settings

- Press  key to enter Settings menu.
- Use  to choose parameter to setup.
- Use  to change parameter value.
- **Low Freq:** lower frequency limit. Can be set to 1, 2, 10 Hz.
- **Hi Freq:** upper frequency limit. Can be set:
  - from 200 to 10000 Hz for Acceleration;
  - from 200 to 5000 Hz for Velocity;
  - from 200 to 800 Hz for Displacement;
- **FFT lines:** FFT spectrum resolution. Can be set to 400, 800, 1600 lines.
- **Trigger:** not implemented yet..
- **Averaging:** measurement averaging. Can be set in range of 0 to 64.
  Zero means that averaging is OFF.
- **Window:** weighting function. Can be set to Henning or Rectangular.

Taking Measurements

Choose vibration parameter e.g.

Velocity, edit settings if needed, then press key to start measurement.



When measurement is running:

- Use key to toggle FFT spectrum / waveform display.
- Press key to stop/resume measurement.

When measurement is stopped:

- **Press**

- 
- **key for Options:**
- **Save:** to save measurement data.

  Press  key to proceed.
- **Format:** Linear/Logarithmic amplitude display.

  Use  to change parameter value.
- **Zoom:** frequency axis display zoom change.

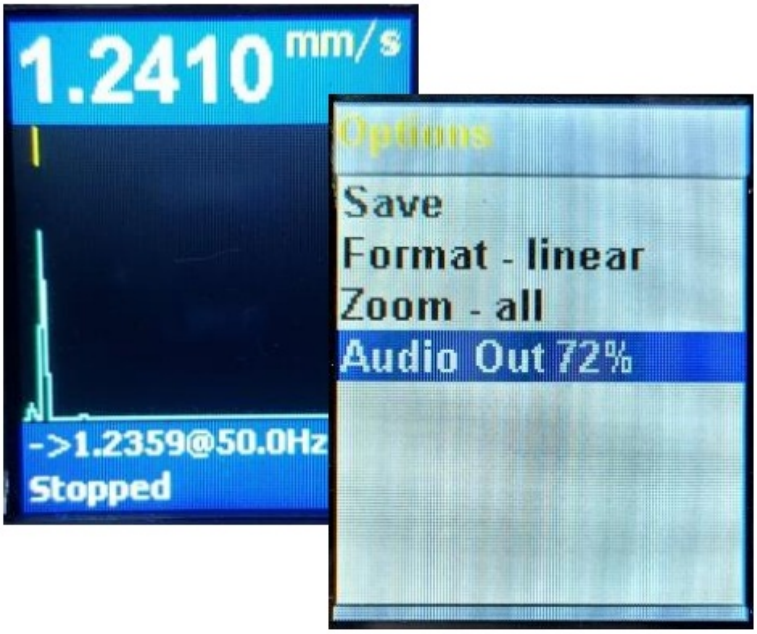
  Use  to change parameter value

To save measurements

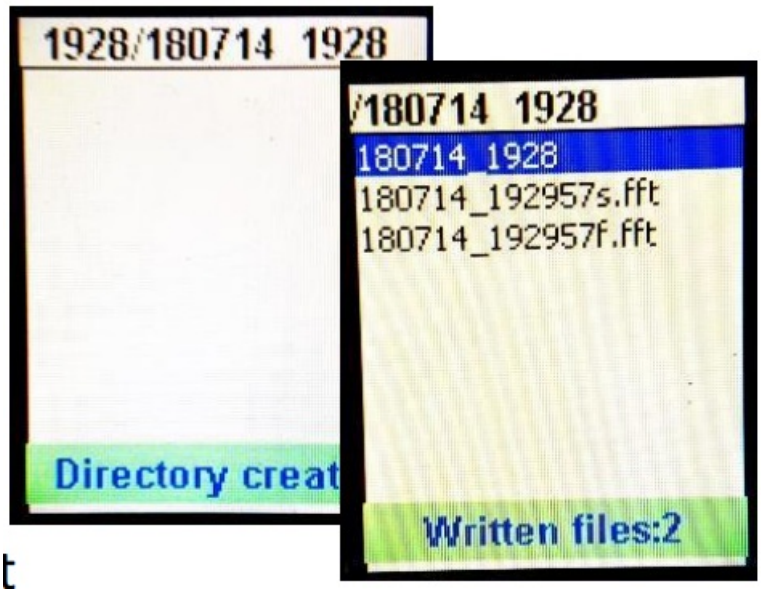
Press  key to stop measurement

Press  key for Options

Choose Save.. and press  key



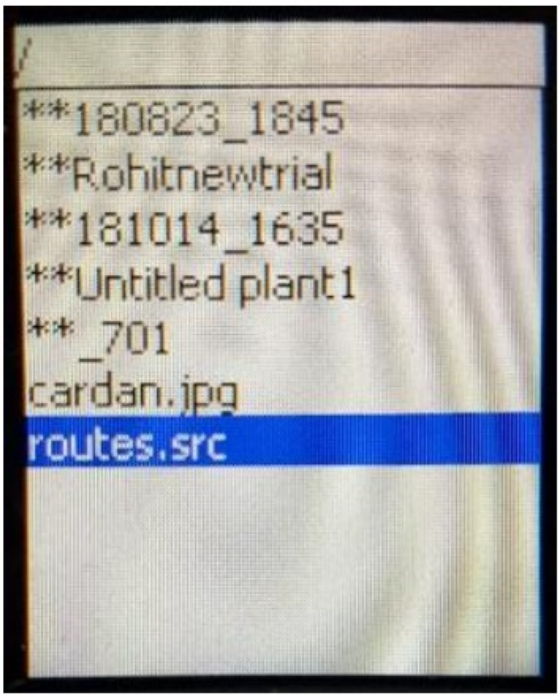
Device will enter My documents menu Browse to the destination folder, then press  key save measurement.
Device writes two files at a time – FFT spectrum file and waveform file.
Device remembers path to the last written files.



To create new folder – press F1 key.
Date/time stamp is used as a default name for new folder.
To create folders with meaningful names – connect device to the PC via USB as external flash drive, then create folders using PC keyboard.

Route based measurements

- Using Con Spect software create route file and download it to the device
- Go to Documents menu, move cursor to the route file and press ↵ key.



- Use ↑ ↓ to browse route points.

- Attach sensor at the measurement point and press key.
  Device takes measurement with preset parameters and saves files to proper destination folder.

Tachometer

Connect optical probe to the device Enter Tachometer menu.
Aim optical probe to the rotating machine part with attached reflective tape.

Press key to start/stop measurement.
Device displays measurement result in RPM and Hz.

Connect optical probe to the device Enter Thermometer menu.
Aim optical probe to the machine.

Press  key to start/stop measurement.
Device displays measurement result in °C and °F

CUSTOMER SUPPORT

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Documents / Resources

	PCE Instruments PCE-VM 22 Vibration Analyzer [pdf] User Manual PCE-VM 22 Vibration Analyzer, PCE-VM 22, Vibration Analyzer, Analyzer

References

- Make an offer on the domain instruments.co.uk - Domains.co.uk
- Industrial Measurement Products and Solutions | PCE Instruments
- PCE Americas Inc. : Test Instruments | PCE Instruments