

CHRONOSKOP CHR-9

Digital watch timing machine



ENGLISH

Instruction Manual

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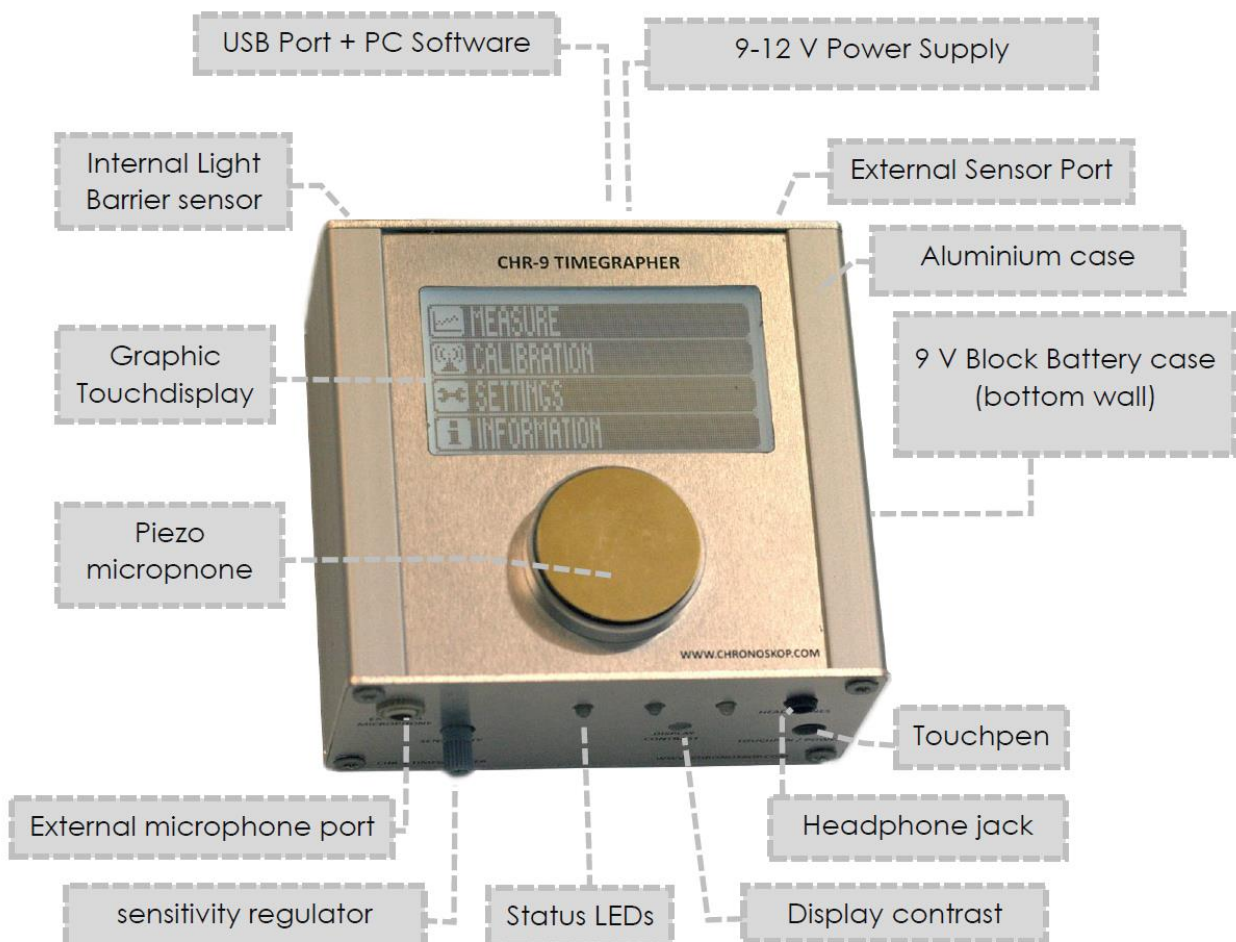
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1. Introduction

1.1. General information on the device function

The Chronoskop CHR-9 timegrapher is an electronic measuring and testing device for the production, repair and service of mechanical watches. The Timegrapher allows as well an acoustic as a light barrier measurement with an external light barrier. Values such as Rate, Beat Number, Beat Error and the average duration of a half-wave can be determined. With sufficient quality of the acoustic signal, the amplitude of the clock can be measured. In a long-term measurement, the temporal behavior of the rate can be observed on a graph. The measurement results are displayed as graphically and as numerical values on the illuminated touch display. During the measurement, you can switch between different display modes. The target rate can be determined automatically, selected manually or individually set and saved.

The acoustic measurement is realized with the built-in or an external piezo microphone. To decouple acoustic noise, the built-in piezo is mounted on a 5 mm thick foam. The signal gain can be adjusted with the rotary knob in the front wall. To measure a watch or a small clock, it is to be placed on the piezo disk of the built-in microphone.



The optical measurement with the light barrier is used to measure pendulum clocks.

The multilingual menu navigation in English, German, Spanish, French, Italian and Polish guides you easily and clearly through the functions.

The Timegrapher can be calibrated with an optional DCF77 radio receiver. The radio signal of the atomic clock in Mainflingen (DCF77) is used as a reference signal for calibration. This calibration method allows a measurement accuracy of a few seconds per year. In order to ensure the highest stability of the quartz frequency and thus also the measuring accuracy, the built-in quartz oscillator is heated in a quartz oven and kept at a constant temperature.

Thanks to the built-in headphone jack, you can directly listen to the clock work. The device also has an external microphone input, an interface for external sensors and active microphones, a microphone sensitivity control, a contrast adjustment knob and a touchpen slot.

The measurement results can be sent via a USB interface to a PC, where they can be saved or printed with the software Chronoport 2.0. All data is constantly sent to the computer and displayed there as numerical values and graphics. Direct data transmission allows the entire measurement to be displayed in a movable endless graphic. You can switch the operating language between the languages English, German and Polish. The measured data are stored together with the graphic. An summary of the measurement is printed on a DIN A4 sheet. The software can be installed on the computer, but can also be started from the disk. System requirements: MS Windows from version Windows 98. The software is available as download on our website. Of course the device works also without a PC.

The use of the latest microcontroller electronics realized with modern SMD technology allows a compact solution (about 9cm x 9cm x 4cm) that gives the device manageability, it is easy to transport and can be used in battery mode in many places. For further actual information, please refer to the user manual, which you can download from our website.

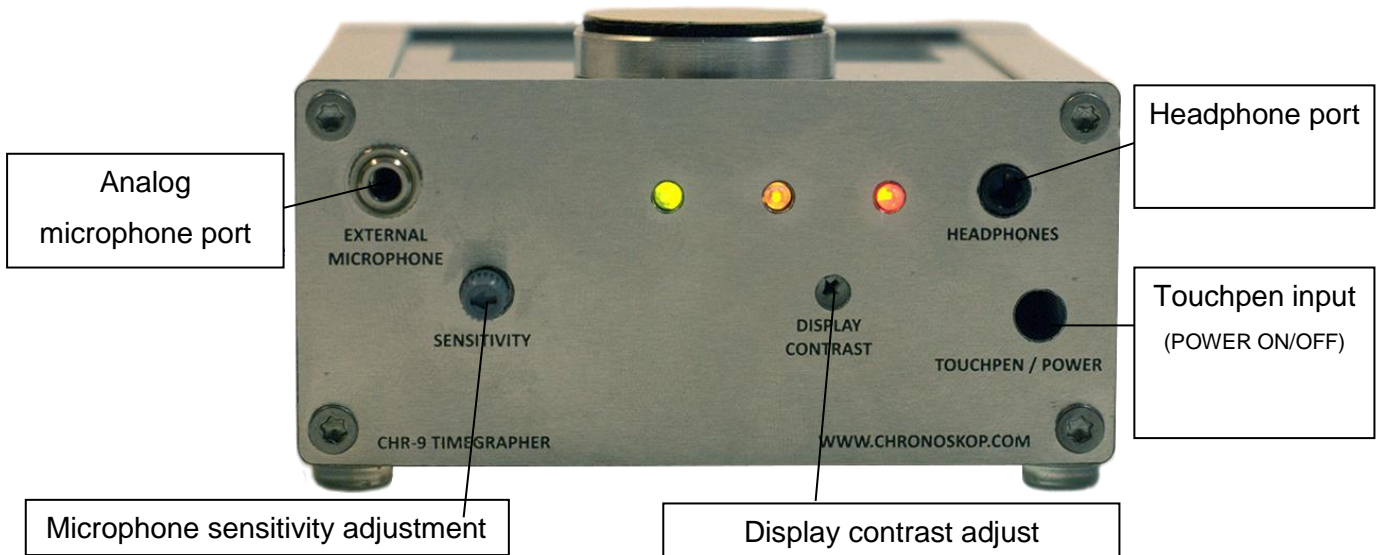
1.2. Connection lines

The device includes the following lines and indicators:

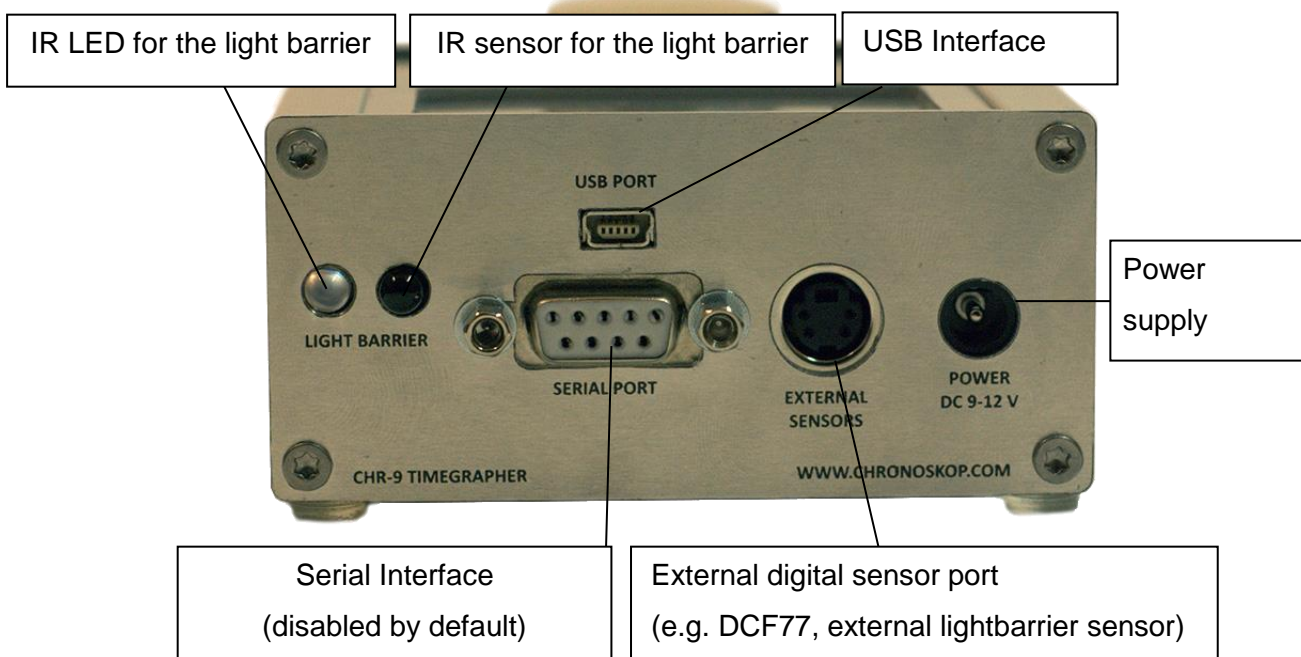
LED Green - Signal of a piezo microphone

LED Yellow - Signal of the radio receiver or heating

LED Red - Error or incorrect signal during the measuring or calibrating



Fron side



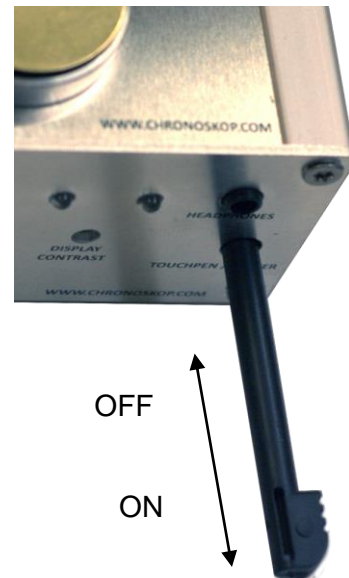
Rear side

1.3. Touchdisplay

The device has a touch display. It should not be confused with greater force than the weight of 100g: Fracture risk! To operate the timegrapher use the included touch pen. Do not use sharp metal objects. You can also use your fingernail or a blunt tip of a plastic pen. Fields with a given touch function in the moment, are always described on display with bright lettering on a dark background.

1.1. Commissioning

For power supply use only the power supply included in the package or our battery pack. Commissioning of the unit should be considered in the ambient temperature in which the instrument has been calibrated (see chapter "calibration"). The timegrapher turns on by pulling the touch pen from the housing. To turn it off insert the touch pen back into the housing.



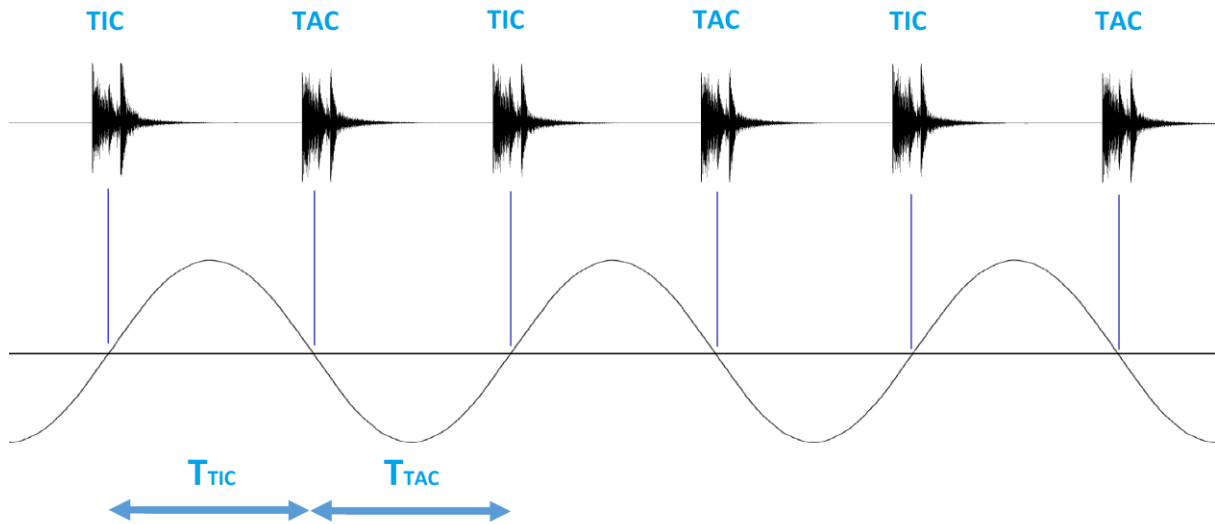
1.2. Battery mode

The device is equipped with a battery case, which is located on the lower side of the device. In battery mode, the Timegrapher is operated with a 9 V block. In order to increase the battery life, the display illumination can be switched off in the settings. It may happen that when the battery power drops, the display contrast must be readjusted when switching to battery operation.

2. Theoretic basics

2.1. Beats / Rate / Period Time

To calculate the rate deviation (R), the measured period is compared with the set or determined reference value. The period or half-cycle duration is the average time between beats.

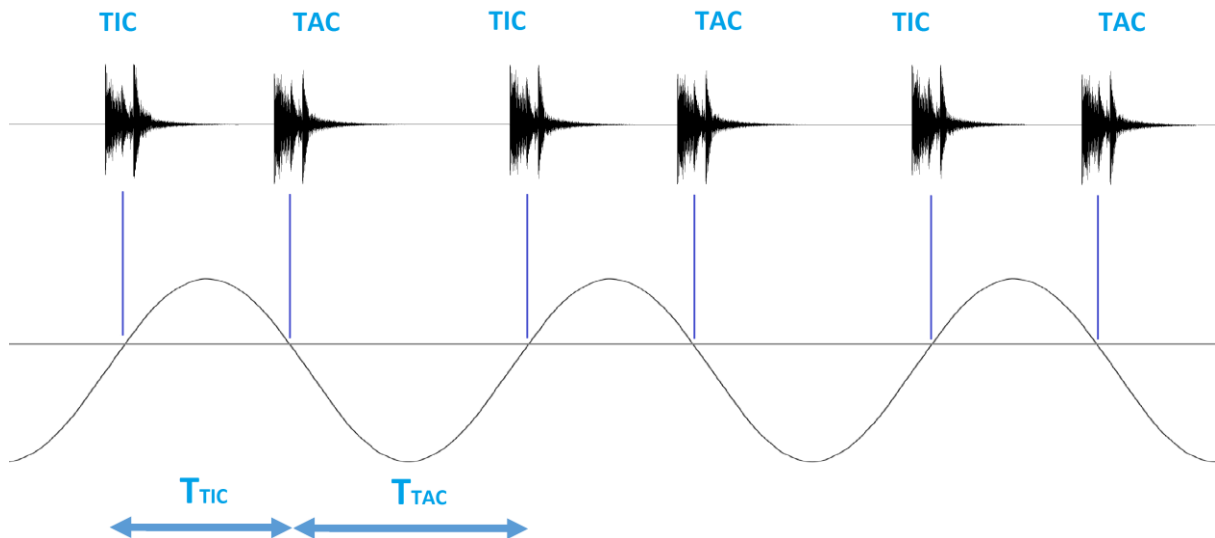


Period duration is calculated as follows: $T_P = (T_{TIC} + T_{TAC}) / 2$

The number of beats per hour is called the Beat Number (BR).

2.2. Beat error

If the balance oscillates asymmetrically around the zero position, the period duration of consecutive beats T_{TAC} and T_{TIC} is unequal. The beat error is calculated from the difference between the half-wave durations and given in milliseconds.



Beat error is calculated as follows: $T_P = (T_{TAC} - T_{TIC}) / 2$

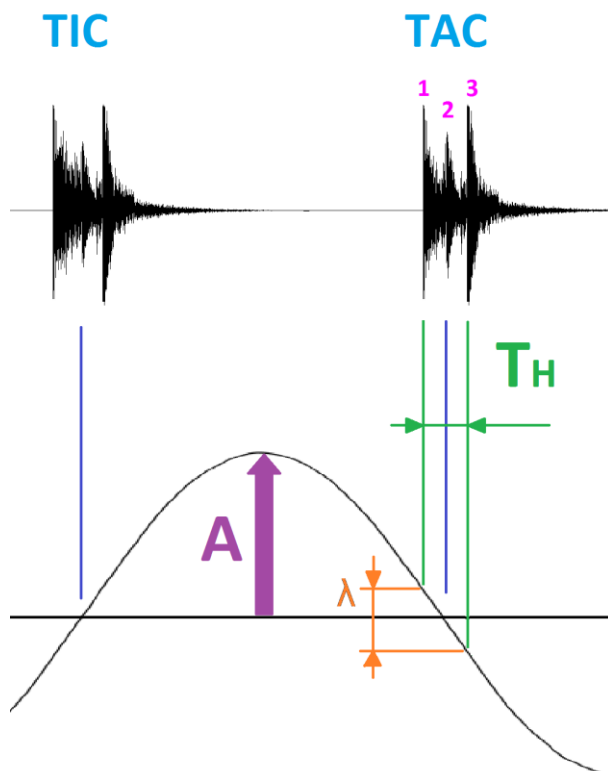
2.3. Amplitude

The amplitude is the maximum amplitude of the balance and is given as an angle to the equilibrium position. The amplitude values of the wristwatches are around $260^\circ - 310^\circ$.

To determine the amplitude, the impact sound must be examined more closely. A beating noise of the Swiss lever escapement consists of three impulses:

1. Impuls: The lever of the roller hits the fork of the anchor.
2. Impuls: A tooth of the escape wheel hits the impulse surface of a pallet and the anchor fork touches the lever stone.
3. Impuls: The strongest noise. A tooth of the escape wheel falls on the resting surface of the pallet and the anchor rod strikes a limit pin.

Based on the known lift angle λ (mostly $50^\circ - 52^\circ$) and the measured lifting time of the balance T_H (time interval between the first (1) and the third (3) impulse), the amplitude A is determined.



3. Measurement with the Timegrapher

There are two ways to measure mechanical clocks using the time scale. There are:

- Acoustic measurement
- Measurement with the light barrier

During acoustic measurement the sound of the clock is detected. In the light barrier measurement the light path of the pendulum is interrupted. The source of the measurement (acoustic or optical) is to be set in the settings of the device.

3.1. Acoustic Measurement

Measurement with the built-in piezo microphone

The acoustic measurement can be realized with the built-in piezo microphone. To decouple acoustic noise, the piezo disk is mounted on a 5 mm thick foam. For maximum decoupling the device can be placed on an additional foam. Because of the high sensitivity of the microphone (despite digital filtering), ambient noise should be avoided. The signal gain can be adjusted with the rotary knob placed in the front wall of the device. For very quiet watches it is recommended to remove the back cover of the watch for the duration of the measurement. The use of the battery voltage can also help to avoid the noise from the voltage network.

To measure a wristwatch or a small watch, place it on the microphone on the top of the device. In order to optimally transfer the vibrations to the piezo crystal, the watch case should lie directly on the microphone. This method is only allowed for watches up to 200 g! Although the covering metal disk of the piezo element of the microphone is made of a soft metal, the watch should be placed with care to avoid scratches.

Please note: Piezo discs are very sensitive. When measuring with the built-in microphone you should even avoid the use of the display during the measurement, as this can generate noise too.

Measurement with the external acoustic crocodile microphone

The external crocodile microphone belongs to the optional accessories and can be ordered separately.

For acoustic measurement, an external piezo microphone from the optional accessories can be used. This is to be connected to the 3.5 mm microphone jack. When plugging in the microphone plug, the built-in microphone is automatically deactivated. The crocodile microphone is to be clamped to the watch case. It is particularly suitable for measuring mechanisms of large clocks. For acoustic measurements of clocks with percussion the percussion should be switched off to avoid noise. Microphones connected to the external power supply are not allowed to be used.

The crocodile microphone gives a lot of flexibility and is very useful when measuring a clock in different positions. It is characterized by very good decoupling from the ambient noise.



[External crocodile microphone](#)

Adjustment of microphone sensitivity

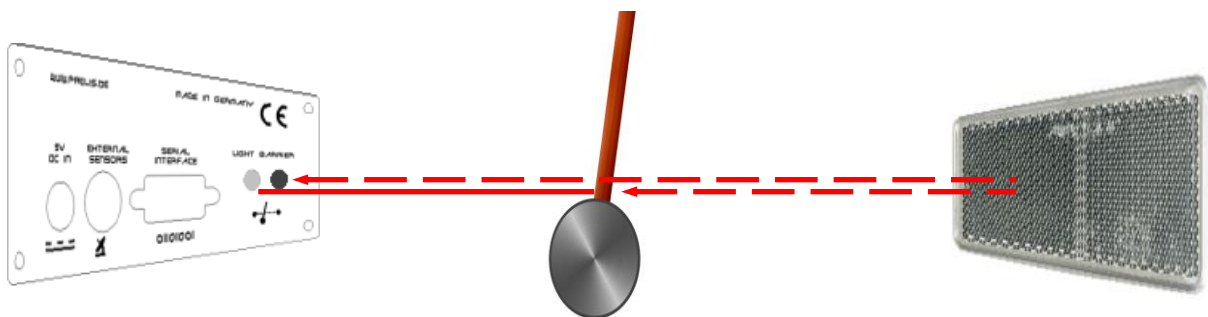
The "Sensitivity" rotary knob allows you to adjust the sensitivity of the piezo microphone. It should be noted that neither minimum nor maximum microphone sensitivity leads to optimum signal processing. The best result is usually achieved approximately in the middle position of the rotation. The sensitivity should be set until every single measuring pulse is clearly recognizable in the "Time axis" display mode. Noisy noise (such as fan noise in the PC) should be avoided. This noise is not visible in the time scale display, but reduces the sensitivity of the amplifier electronics significantly.

3.2. Optical Light Barrier measurement

Optical measurement is based on the principle of the light barrier. If the clock pendulum or the minute hand interrupts or reflects the light beam of the transmitter diode, the receiver diode of the time scale receives a pulse. Please note that the frequency of the infrared light emitted by the diode is outside the visible range. Avoid strong extraneous light during the measurement.

Light barrier measurement of the pendulum (internal light barrier)

Pendulum clocks can be measured with the optical light barrier. In order to measure the clock with the built-in light barrier, the Timegrapher is to be placed with the outgoing infrared LEDs and the supplied reflector toward the swinging pendulum, so that the pendulum interrupts the invisible light beam (see picture below). If the invisible infrared beam of the light barrier is interrupted, the Timegrapher registers an impulse. The reflector should be aligned as possible directly opposite to the diodes, parallel to the rear wall of the housing. Do not stick the reflector directly to the watch case. With a reflective pendulum you can even work without the reflector.



Light barrier measurement of the pendulum (external light barrier)

When using the external light barrier place it so that the oscillating pendulum passes through the light barrier between the two beveled ends of the fiber optic columns.

Optical measurement of the minute hand (external Licht Barrier Sensor)

The external light barrier also allows the measurement directly at the minute hand. To do this, place the light barrier so that the pointer passes through the light barrier during the hourly cycle.



The external light barrier is an optional accessory and can be ordered necessary.

3.3. Using the headphone jack

The Timegrapher has a headphone jack for listening to the clockwork. The volume is adjusted using the microphone sensitivity knob. Before plugging in the microphone plug, the volume / sensitivity must be set to minimum. Place the watch on the piezo microphone and slowly increase the volume. Keep the headphones as far away as possible from the piezo microphone.

CAUTION: Setting the volume too high may cause hearing damage!

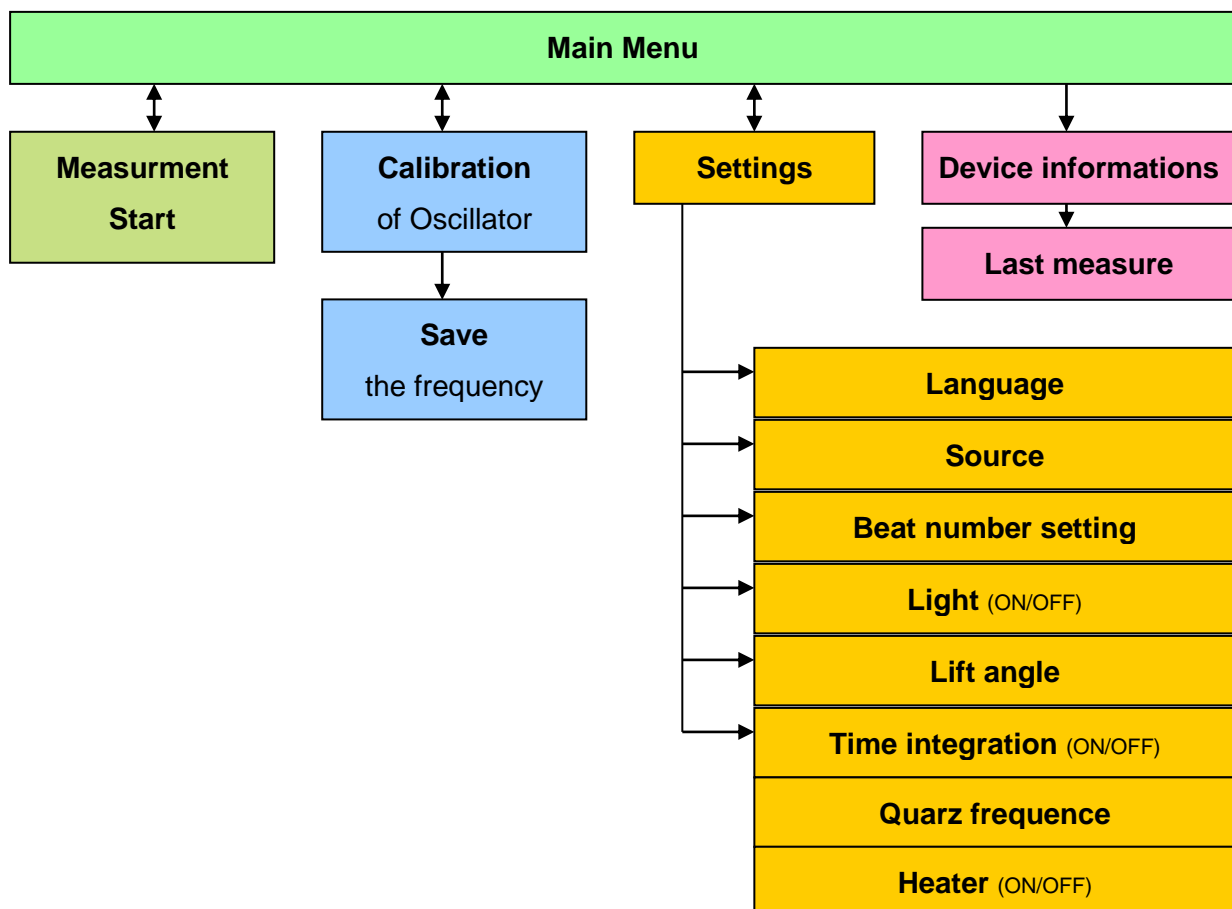
3.4. Measurement with external sensors

External sensors, such as radio receivers or active microphones, can be connected to the built-in 4-pin Mini-DIN socket. Only devices from the original accessories may be used. Please read the user manual enclosed with the optional active microphone.



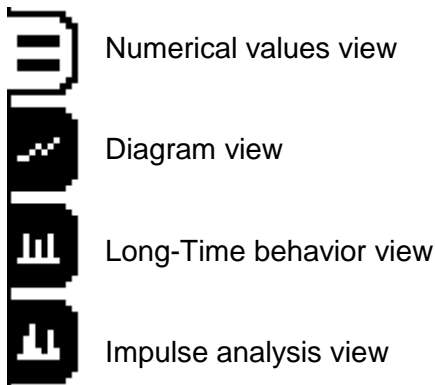
3.5. Menu structure

The following is an overview of the menu assembly:



3.6. Starting the measurement and the buttons

When starting a measurement from the main menu, you are automatically guided to the measurement with numerical values view. After a periodic signal has been detected, the actual measurement begins. If an error occurs during the measurement or if no periodical signal has been detected (yet), the red lamp will light up. During the measurement it is possible to switch between the display modes arbitrarily. The buttons serve:



Further buttons are:

Restart the measurement.

This deletes all measured values and restarts measurement.



Amplitude measurement: automatic / manual

You can choose between automatic or manual determination of the lifting time



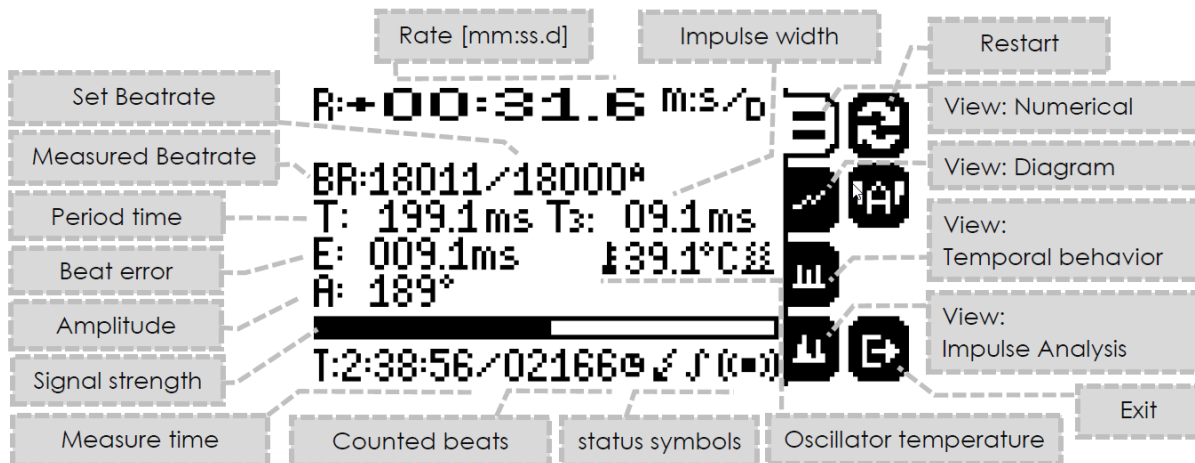
of the balance T_H (see Theoretical Basics), which is necessary for the calculation of the amplitude. With manual amplitude measurement, you can limit the lifting time of the balance by moving the brackets in the Impulse Analysis view.

Exit

Exits the measurement and returns to the main menu.



3.7. Measurement – Numerical Values



Numerical values

- R: Rate [mm:ss.f /24h]
- BR: Measured Beat Number [/h] / Reference Beat Number [/h]
- T_P: Half period time of oscillation [ms]
- T₃: Lifting time of the balance
- E: Beat error [ms]
- A: Amplitude
- ⚡ Temperature of the oscillator
- T: Timing progress / beats used for calculation

Icons

During the measurement in the lower right corner are displayed symbols (so-called icons), which give some information about different states. They are:

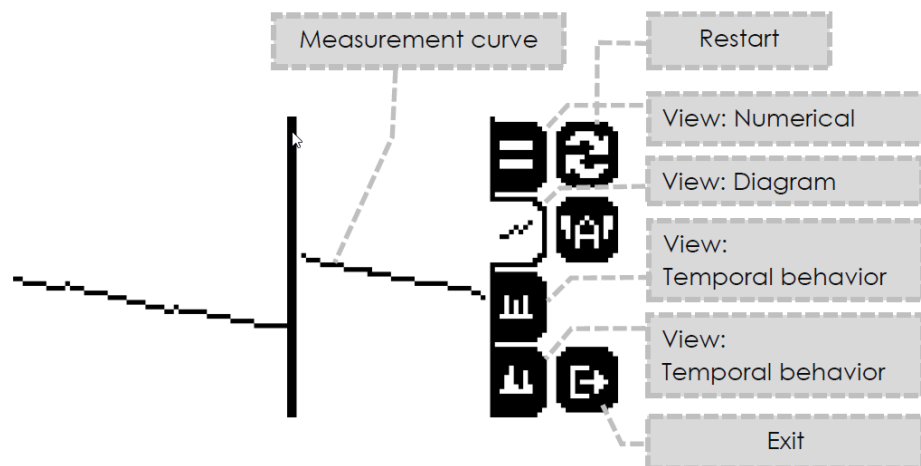
- (□) Measure source: Acoustic measurement
- ⚡ Measure source: internal optic light barrier
- EXT Measure source: external sensor
- ⌘ Signal processing
- ⌚ Long-term measurement
- ⚡ Interfering signal
- ∫ Measurement with time integration
- ⚡ A pulse failed or Signal missing

Horizontal bar of signal amplification

The horizontal bar shows the strength of the incoming signal. In the optimal case, the signal strength should oscillate around the middle position. This can be adjusted with the sensitivity dial. For the measurement of the amplitude the adjustment of the signal amplification is decisive.

3.8. Measurement – Diagram view

When measuring in diagram view, the determined values are converted into a graphic curve and shown on the display. The time between two successive clock beats (period duration) is measured and compared with the setpoint value. If the measured time is exactly equal to the set point, the new point on the graph will be placed next to the previous one - creating a horizontal line. If, on the other hand, the new beat comes too early, the new point, corresponding to the time difference from the setpoint, is shown slightly higher than the previous one. Accordingly, a beat that arrives too late is set lower. The line of dots on the display will therefore go up or down.

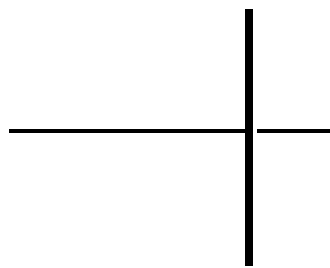


The diagram shows not only the rate deviation but also other temporal irregularities in the clockwork, e.g. Waste error (Repère), defective escapement wheel teeth etc.

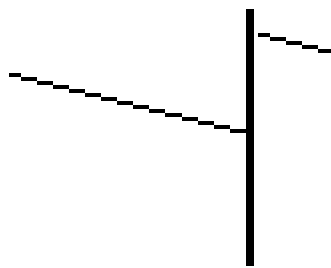
Examples of clock behavior in The Diagram View

When measuring with a graphical view, the values are displayed on the right side of the display. These are the same values, as in the measurement with the time axis.

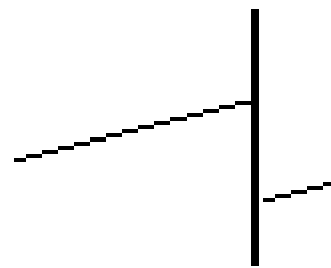
The following part shows some examples of errors. These are the idealized representations and should be used only for guidance. In reality usually several errors occur simultaneously.



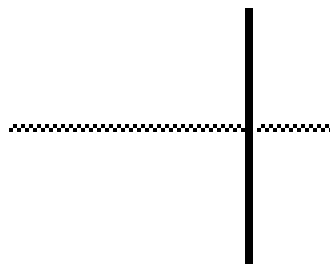
Ideal clock



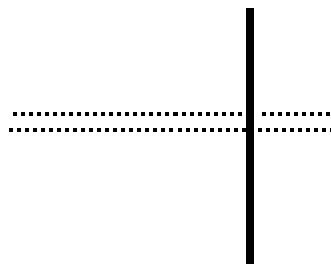
Delay



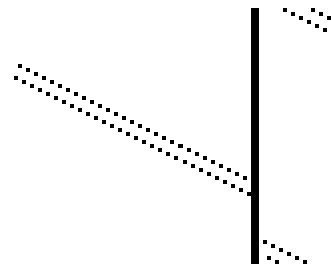
Clock is too fast



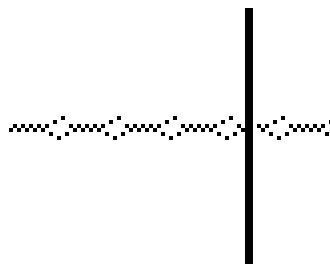
Light beat error



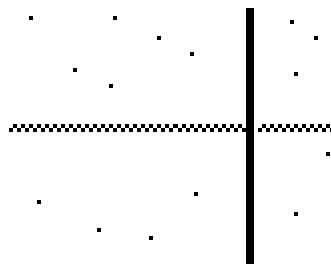
Larger beat error



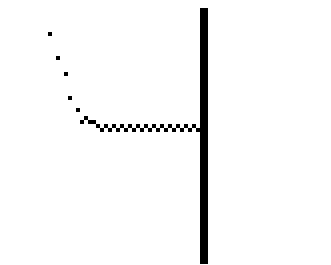
Beat error with delay



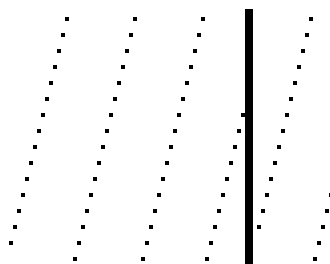
Periodic error



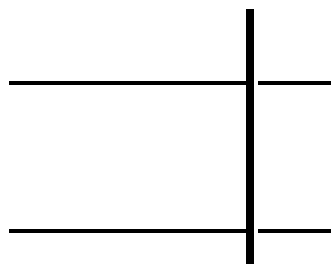
Noise



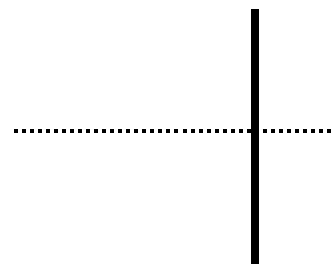
Swing-into of a clock



Wrong beat number selected



Selected beat number too small



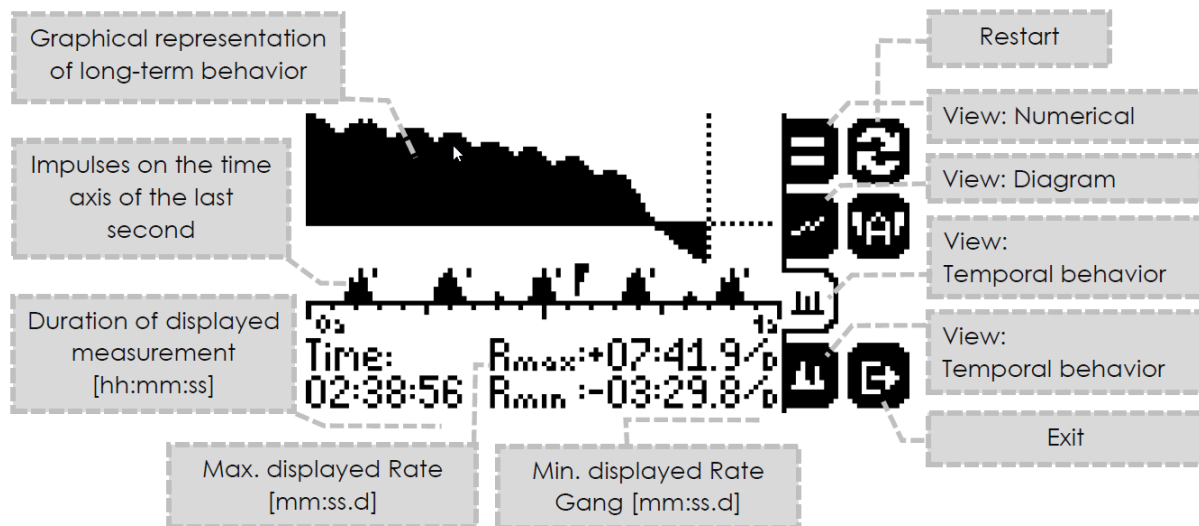
Selected beat number too big (2x)

3.9. Measurement – Time axis view

Impulse view

In this mode the pulses are plotted on the one second time axis in the middle part of the display (see picture). The smallest division of the axis corresponds to 50 ms, one pixel corresponds to 10 ms.

If a signal is accepted for evaluation, it will be indicated with a dash.



Clock Rate graph in the long-term monitoring

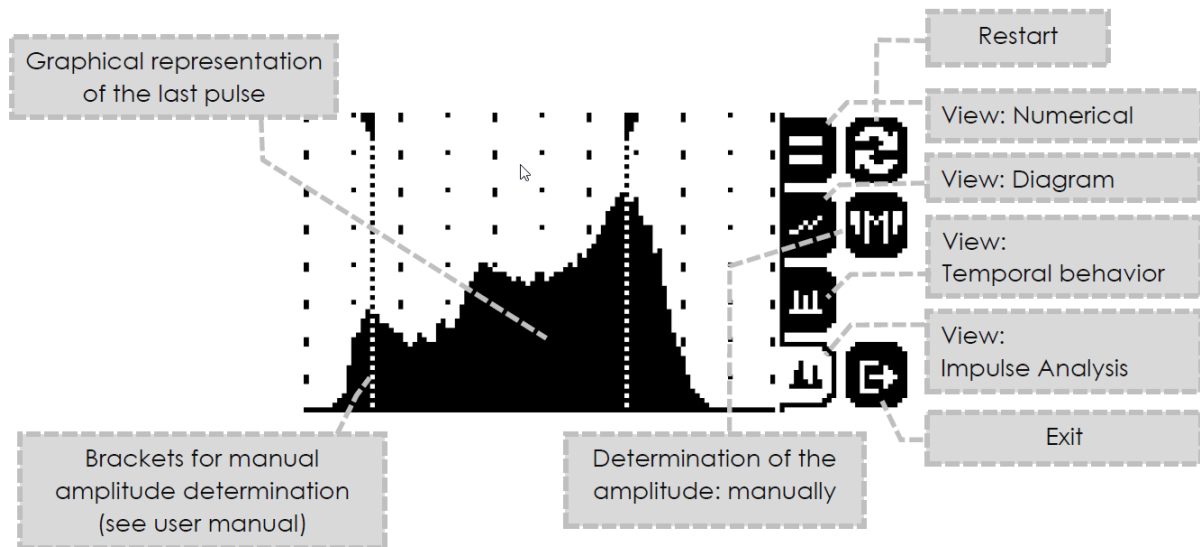
The graph of the long-term rate monitoring helps you to observe how the rate of the clock behaves for a long time. Graphing will restart if any of the following occurs:

- Measurement is restarted
- A different Beat Number is detected during the measurement with automatic beat number recognition
- There is a strong disorder during the measurement
- The measurement is ended

The graph above the horizontal dotted zero line represents a positive rate, below the line a negative rate. The graph shows the total duration of the measurement.



3.10. Measurement – Impulse view

The Impulse View allows to study the beat closely. The width of the graphic represents a time range of 100 ms. A beat is not displayed until it has been detected in long-term mode.



Manual adjustment of the lifting time of the balance



The buttons  and  can be used to switch between the manual and the automatic detection of the lifting time of the balance. This value is decisive for the calculation of the Amplitude. The lifting time of the balance is measured between the first and third pulse of a beat and is shown in brackets (see picture). To manually limit the range, move the brackets to the first and third peak. A manually set value of the lifting time is maintained until one of the cases occurs:

- Switching to automatic mode
- The measurement is restarted
- The measurement is ended



3.11. Optical Clock Arm measurement

To start optical pointer measurement, first go to the settings and set the clock arm measurement in the beat number setting.

The pointer measurement measures the time periods in which the minute hand traverses the light barrier during the hourly cycle. The time of each measured period is listed on the screen. From the sum of the results, the average gear is calculated and displayed.

```
R:+05:11.9 | 1: 59:48.5
              | 2: 59:46.6
              | 3: 59:46.1
              | 4: 59:46.2
              | 5: 59:46.5
              | 6: 59:46.6
              | 7: 59:47.0
              | 8: 59:48.0
T:7:58:16.0 8?✓
```

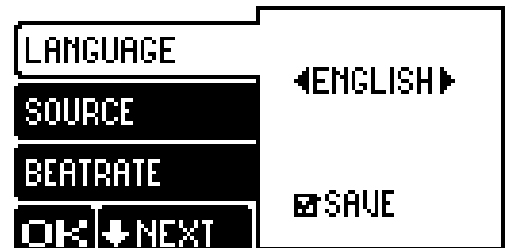
In this way a measurement of up to 8 hours is possible

4. Settings

You can access the settings directly from the main menu. The settings are arranged in a kind of card system. On the left half of the picture, there are 3 possible settings. Press "NEXT" to get to the next 3 setting cards. The currently setting card is displayed on the right half of the screen. There you can change the actual options by hitting the arrows or boxes. If the checkbox "SAVE" is set, the settings will be saved in the device on exit. To exit the settings press "OK".

4.1. Selection of the menu language

Here you can switch between the menu languages stored in the device. The following languages are offered: English, German, Spanish, French, Italian and Polish.



4.2. Selection of the measuring source

Several sources can be used for the measurement. The following options are available as measurement sources in the settings:



Acoustic measurement

Measurement with the built-in piezo microphone or the external microphone connected to the microphone jack.

Optical measurement

Measurement with the light barrier installed on the rear wall of the device.

Measurement with external sensor

Measurement with external sensor connected to the four-pin mini DIN socket on the rear wall of the device.

4.3. Setting the Beat Number

You can choose between the following modes in the beat setting menu:

- Automatic (The Beat Number is determined automatically)
- Preselection (The Beat Number is selected manually from the table)
- Manual selection (The Beat Number is set manually and can be freely selected and saved)
- Stored Beat Number
- Optical pointer measurement

Switching between modes is done by pressing the arrows next to the current mode. Below, the beat number can be changed (not in Auto mode).



Auto Mode

In Auto mode the nearest Beat Number is taken from the values stored in the unit. These are: 3600, 6000, 7200, 9000, 12000, 14400, 17280, 18000, 19800, 21600, 27000, 28800, and 36000. During measurement in Auto mode, an "A" symbol appears next to the target Rate.

Internal Table of Beat Numbers

The target Beat Number can be manually taken from the Beat Number Table stored in the device. Available Beat Numbers: 3600, 6000, 7200, 9000, 12000, 14400, 17280, 18000, 19800, 21600, 27000, 28800 and 36000.

Manual setting / Saving the Beat Number

Here the beat number can be adjusted completely freely. The value range may be between 1800 and 45000. If "SAVE" checkbox is set, the value set at this moment will be saved in the device on exit.

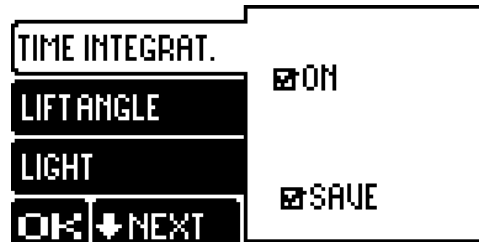
Saved Beat Numer

It will inherit the beat number previously stored during manual setting.

Press "NEXT" to go to the next settings.

4.4. Time integration

It is possible to choose between a measurement with time integration or instantaneous measurement. When time integration is switched on, the measurement result of the entire measurement duration is calculated and averaged. If the time integration is switched off, only the last seconds are evaluated for the measurement. This allows you to regulate the clock during the measurement.



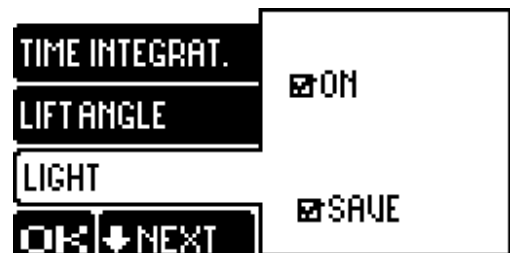
4.5. Setting the lifting angle

The lifting angle of the clock to be measured is set to 51° by default. However, this can be adjusted if necessary within certain limits.



4.6. Display illumination

The display illumination can be switched on or off, e.g. to save energy during battery operation.



Press "NEXT" to go to the next settings.

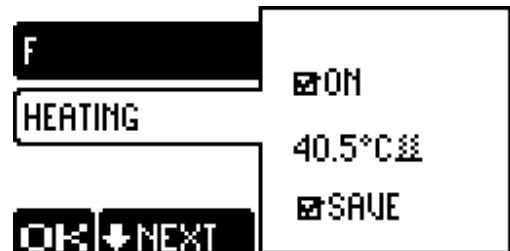
4.7. Oscillator frequency setting

The device allows manual adjustment of the oscillator frequency. If the calculated rate is observed as to low on a correctly running clock, the crystal frequency must be set higher (about 185Hz per 1s / day). Conversely, if the calculated rate is to high compared to the reality, the crystal frequency should be set lower.



4.8. Oscillator Oven

The frequency of the clock oscillator of the unit varies depending on the room temperature. If the measurements have place at room temperature, this is negligible. However, to ensure maximum measurement accuracy, a oscillator oven keeps the temperature of the oscillator and thus its oscillation frequency constant. The temperature of the oscillator can be followed on the display. The oscillator oven can be switched on on off. When the oven is switched on, the green LED lights up. The heating-up phase is additionally indicated by the flashing of the yellow LED. Oscillator oven is switched of in battery mode.



Press "NEXT" to go to the first settings.

5. Calibrating the quartz frequency

External DCF radio receiver is an optional accessory and can be ordered separately.

5.1. About the calibrating with DCF77 radio signal

The calibrating of the internal quartz results from comparison with the radio signal of the atomic clock in Mainflingen near Frankfurt Main (Germany). DCF77 is a time signal emitted on the long radio wave. DCF77 is emitted on the 77.5 kHz frequency as time information in coded form and has a broadcast range of about 2000 km in radius around Mainflingen. In DCF77 signal is the time of the next minute coded. The DCF77 signal is the definition of "right time" of Germany.

ATTENTION! The reception of the signal is depending on location and is not guaranteed outside of Germany! The receiver is not always included and must be possibly ordered separately. Neither the timegrapher nor the receiver should be connected to other devices with with S-Video port! Danger of a destruction!

Calibrating the quartz frequency can be selected directly from the main menu. To calibrate connect the radio receiver to the 4-pin Mini-Din socket with the provided cable. For a better receive in enclosed spaces, the receiver should be placed close to a window. The receiver is not allways added to the set.

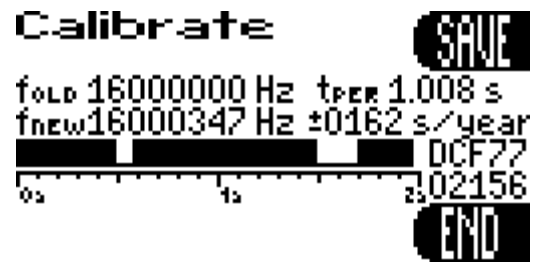


5.2. Calibrating the Timegrapher

To calibrate the crystal frequency, start the calibration directly from the main menu. After connecting the receiver, the calibration starts automatically.

The following values are displayed:

- Current quartz frequency
- Measured pulse duration of the DCF77 signal [s] (ideally: 1,000 s)
- Calculated quartz frequency
- Accuracy achieved [s / year]
- In the lower right corner, the number of pulses counted.



The accuracy of each second time signals is dependent of location and environmental factors. Therefore the calibration should last at least one hour. It is recommended to calibrate 12 hours. The determined frequency and the deviation during the calibration is always displayed on the screen. With the touch field “SAVE” the determined frequency can be stored. This field will not appear until fairly good accuracy.

The device is calibrated before shipping. If measurement takes place in room ambient temperature, a re-calibration is not necessary.

6. Output of information

6.1. Device information

In this menu you have an access to some information from the device. Available information are listed below:

- Version of the software
- Version of the hardware
- Frequency of the oscillator
- Supply voltage
- Temperature of the oscillator

Information about the temperature (on selected devices)

If the device has never been calibrated, appropriate information will be displayed.

6.2. Last measurement data

Here you have the opportunity to output data of the last measurement. These data will be deleted when disconnect of power supply.

7. PC-Software „Chronoport 2.0“

7.1. General functions

The „Chronoport 2.0“ software displays the measured data during the measurement on the computer, which can be saved and printed. The measured curve of the complete measurement is displayed graphically.

7.2. System requirements

Required operating system to start or to install the software: Microsoft Windows "Windows 98 SE" or higher.

If the system does not have the latest updates, it can happen that "Microsoft. NET Framework" is not included. This can be installed during the installation from the CD or downloaded and installed from the website of the software manufacturer Microsoft™.

7.3. Connect the Timegrapher

In order to use the software, a USB interface is required on the computer. The Timegrapher can be connected to the PC at any time. However, the Timegrapher will be detected by the Chronoport software in the main menu only.

7.4. Installation of the Software

To install the software, insert the time scale included CD into your drive. The application should start automatically open the screen below. Is it not the case, start it manually by double clicking the application autorun.exe from the root directory of the CD.

The software "Chronoport" can be downloaded on www.chronoskop.com



Is the "MS. NET Framework" in the system not included, it should be installed first. With the second button you can install the required components. Is the "MS. NET Framework" included, the button is not active.

To start the installation of the software "Chronoport 2.0", press the button "Install application".

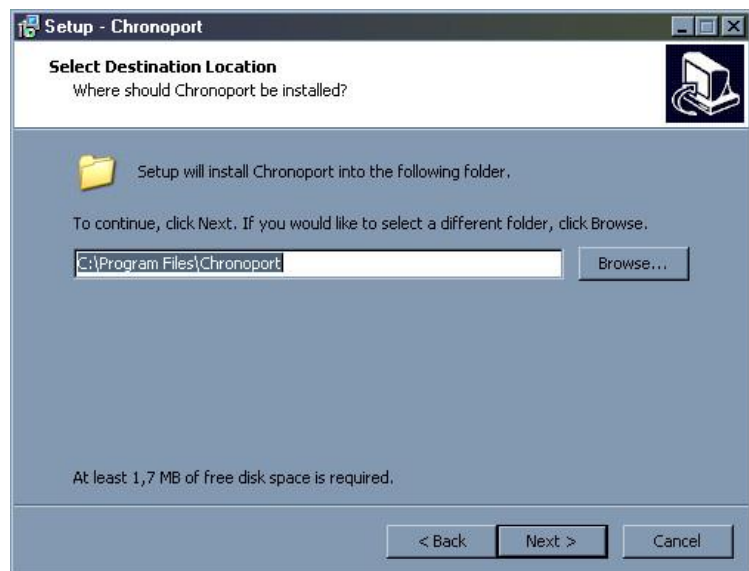
Next you are asked for the language in which you want the installation to run.



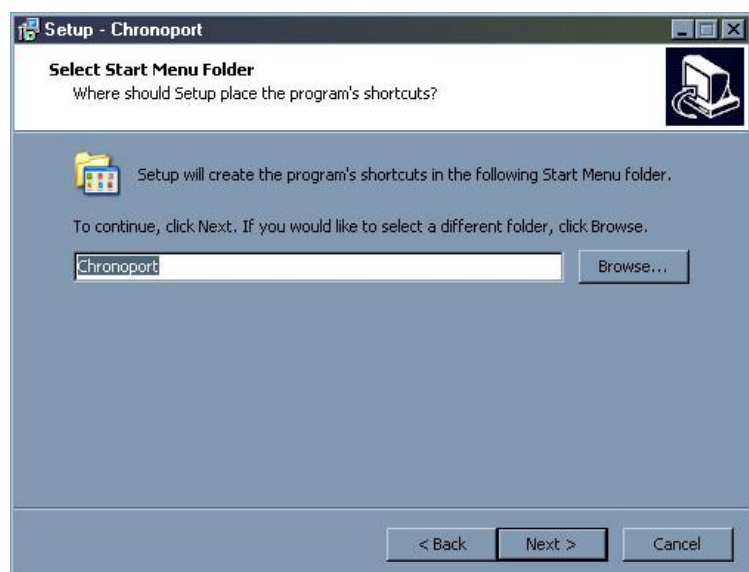
A welcome screen will guide you in the installation..



Choose a directory for the application to be installed in.



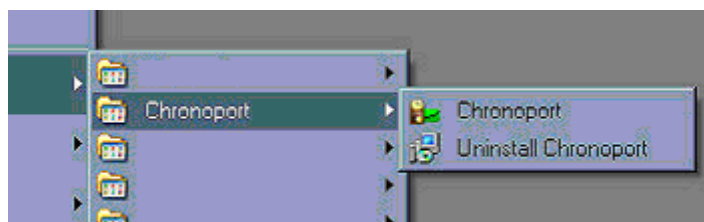
You can choose where in the Start menu shortcut should be created.



If all necessary information has been entered, choose "Next" to confirm the start of the installation..



After installation, you can find the shortcut to the program in your Start menu.

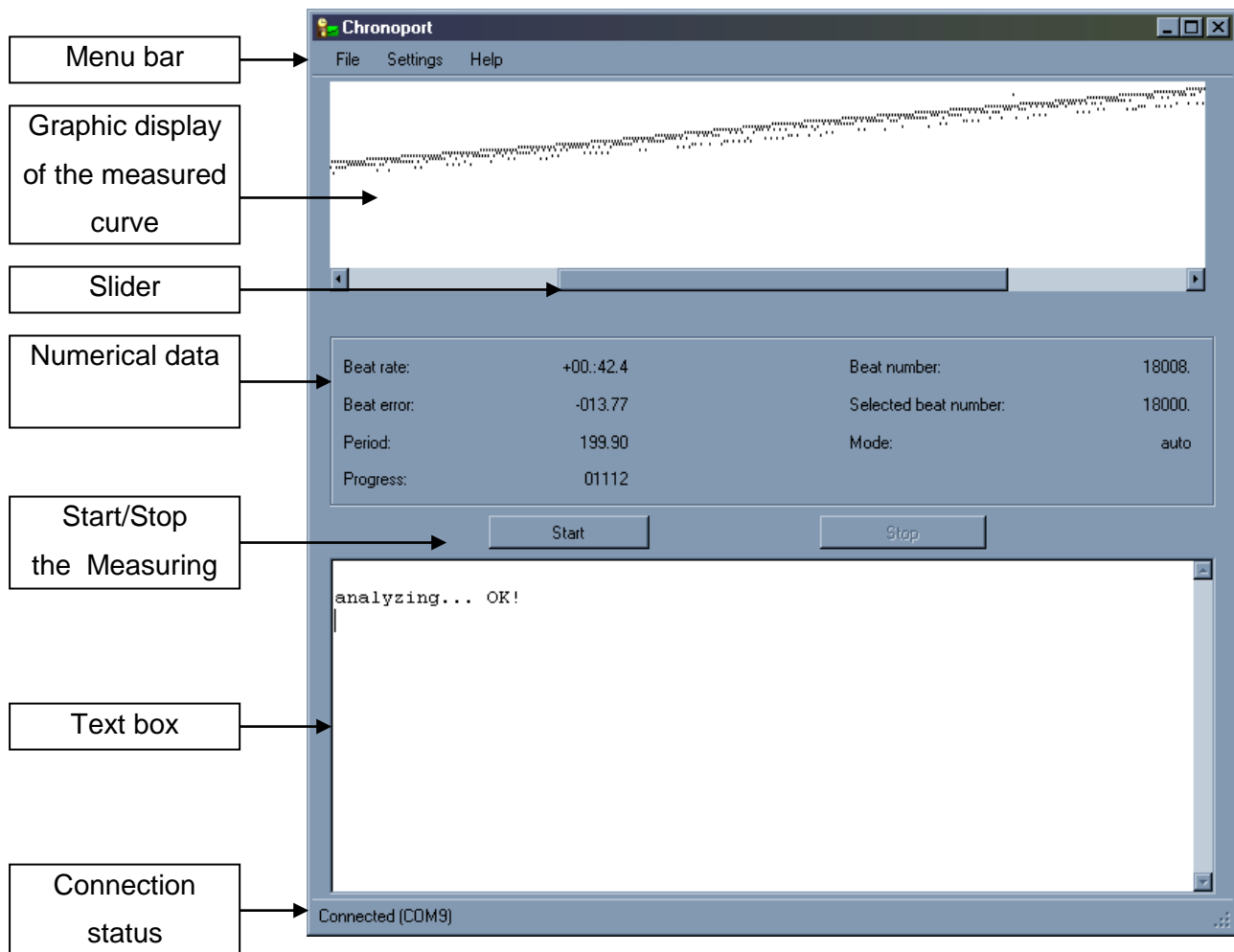


7.5. Direct Start of the application

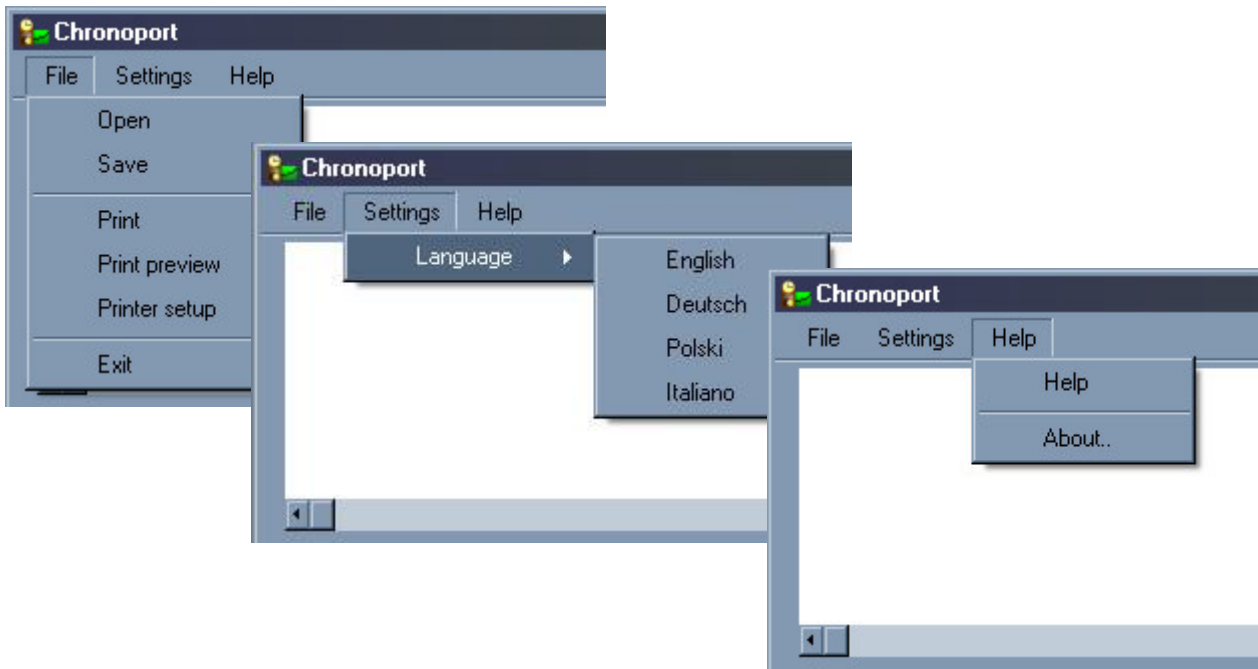
It is possible to start the application "Chronoport 2.0" without to install it. Therefor select in the window that appears automatically after inserting the CD, "Run from the CD".

7.6. Window structure

The main window of "Chronoport 2.0" includes three parts: a graphical display of the curve, results in numerical values and text box with messages.



7.7. Menu structure



File

- „Open” – Open a previously saved measure protocol.
- „Save” – Save the measurement data including measurement curve in a measure protocol.
- „Print” – Print the measurement protocol
- „Print preview” – Preview of the measurement protocol
- „Printer setup” – settings of the printer
- „Exit” – Close the program

Settings

- „Language“ – Setting of the language

Help

- „Help“ – Help and instructions for operation.
- „About..“ – Software version information

7.8. Measurement

Make sure that the time scale is connected to the PC. Turn on the timegrapher and let it in the main menu. After the device has been detected by the application, "connected" is indicated the bottom section of the window. The recognition of the port is fully automated. In the same moment on the device displays a message "PC Mode". From that moment the timegrapher will only be controlled from a PC. Therefore, any manual adjustments of the time scale, such as manual input of beat rate, time integration or quartz oven setting should be made before connection.

To start the measurement, press the Start button.

If automatic beat rate detection is set, in the first seconds of the measurement in the text box is displayed "analyzing" followed by dots that are added until the recognition of the beat rate.

If the beat rate is detected, the data listing starts and the graph is drawn.

To stop the measurement press on the "Stop " button. The device returns to main menu.

Does the graphics go beyond the width of the window, you can push it with the slider to the desired location.

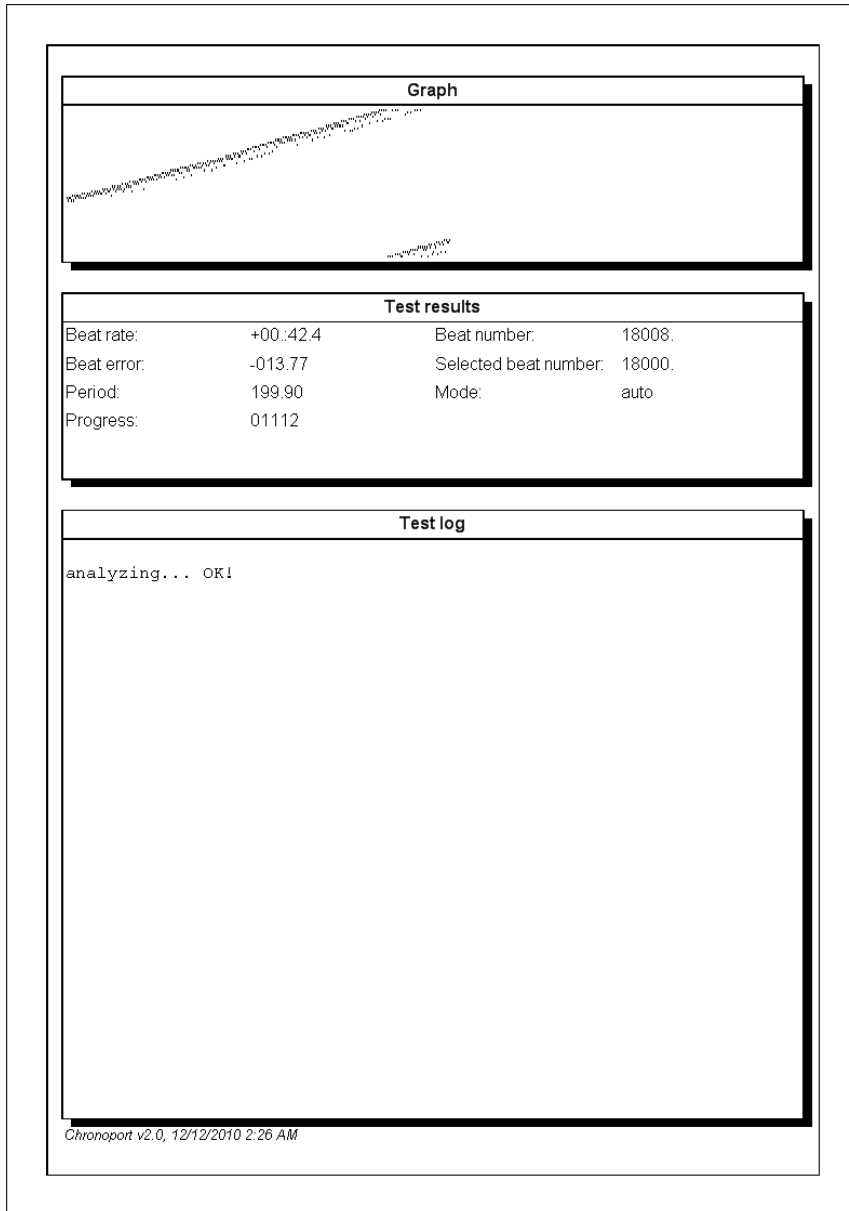
7.9. Save and open Measure protocols

All results, including the graphical curve of the measurement, can be stored in a file. The specific file ending for the "Chronoport 2.0" protocols is ".chp". On Save a file name is proposed, which consists of the current date and time, for example:

2011-05-01_23-59.chp

7.10. Printed Measurement Protocol

The print view of the measurement protocol is designed to fit on an A4 sheet. It includes three parts: a graphical display of the curve, results in numerical values and text box with messages.



7.1. Deinstallation

To uninstall the software from your computer, please use "Uninstall" from the Start menu. Alternatively, to uninstall you can choose "uninstall" from the application that starts when you insert the original CD. The uninstall option appears only if "Chronoport 2.0" installed on your computer.

www.CHRONOSKOP.com

Timegraphers made by PRELIS / LISIT Group [®]

