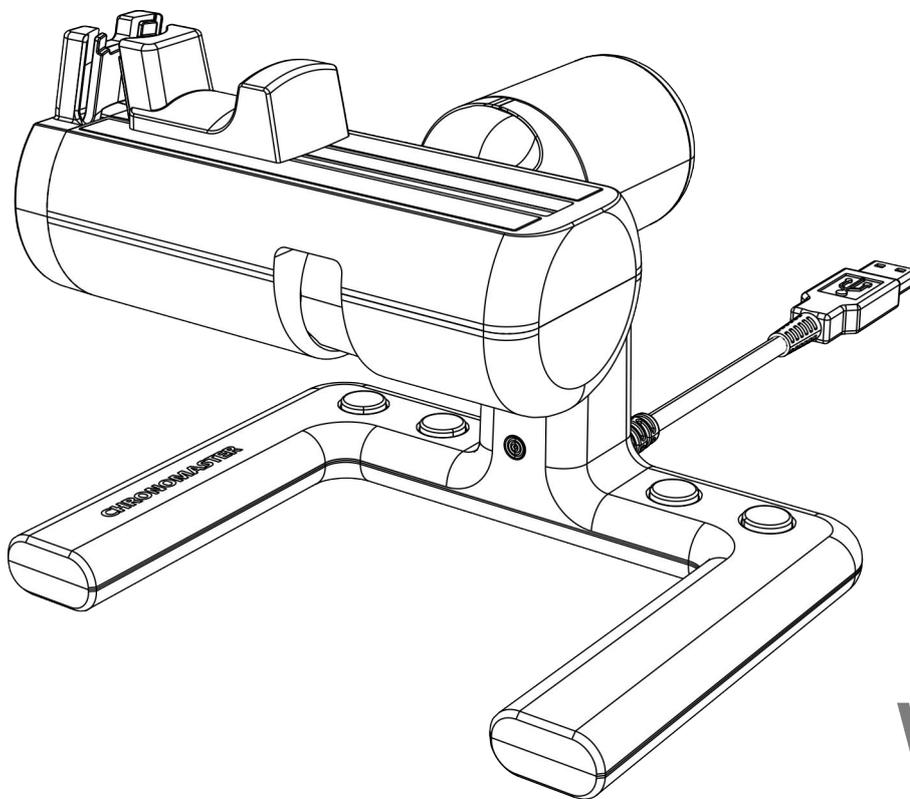


Operating instructions

Precision measuring device
ChronoMaster



witschi

Read the instructions prior to performing any task!

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Translation of the original operating instructions

Wits-39771-CH, 2, en_GB

About this document

This document enables the safe and efficient handling of the ChronoMaster precision measuring device (hereafter referred to as the "device" or "ChronoMaster"). The document is part of the device and must be kept near the device where it can be accessed by personnel at all times.

Personnel must have carefully read through and understood this document before starting work. The basic prerequisite for safe work is compliance with all the safety, warning and procedural instructions specified in this document.

In addition, the local health and safety regulations and general safety rules for the area in which the ChronoMaster is used apply.

Illustrations in this document are for a basic understanding and may deviate from the actual design.

Copyright

The content of this document is protected by copyright. It may be used within the context of using the ChronoMaster. No other use is permitted without the written approval of Witschi Electronic AG.

Customer Service

Your point of sale can provide you with technical information.

You can find your nearest point of sale on our website at <http://www.witschi.com/de/firma/vertretungen>

We are also always interested in hearing from you about your experiences in using the device and any information that could help us improve our products.

Customer Service information

Address	Witschi Electronic Ltd. Bahnhofstrasse 26 3294 Büren a.A. Switzerland
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1 Product description

1.1 Overview

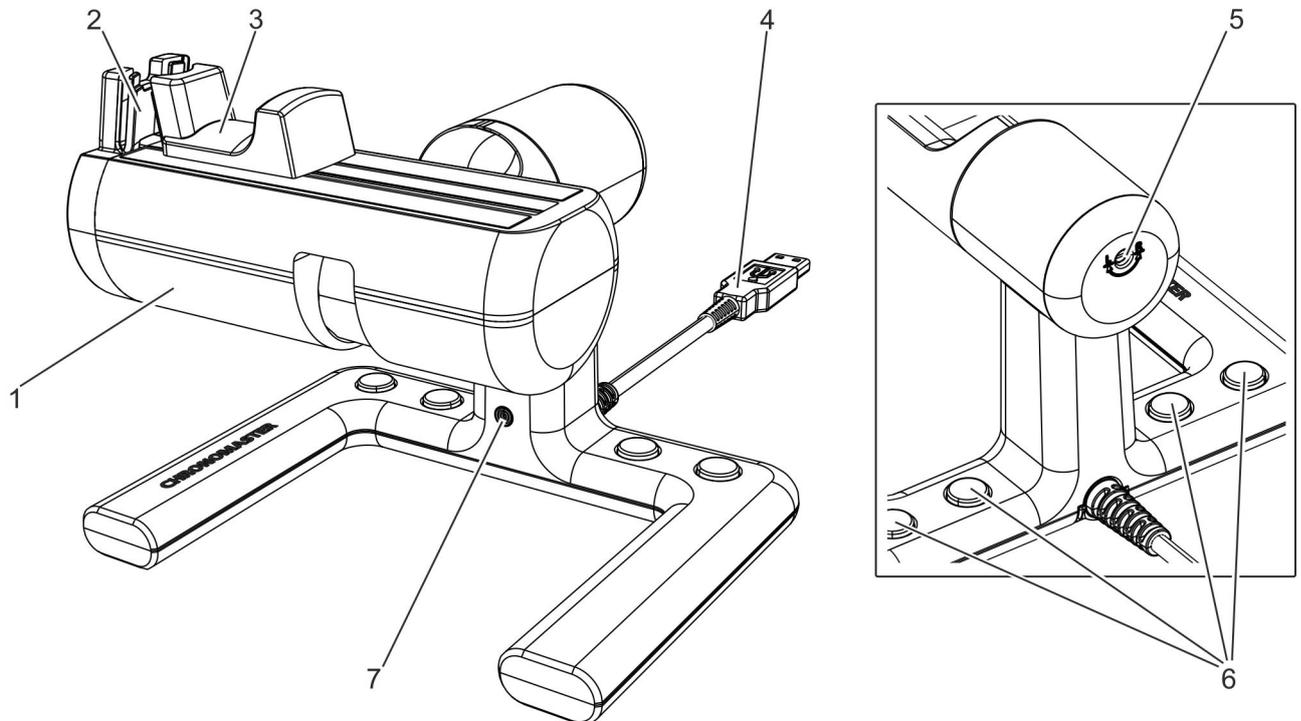


Fig. 1: ChronoMaster

No.	Description
1	Pivoting microphone for measuring the watch noise
2	Signal sensor for recording and transmitting the watch noise <ul style="list-style-type: none"> • ↪ Chapter 4.2 "Positioning the watch and starting a measurement automatically" on page 21
3	Clamping jaw made of neoprene for clamping the watch or the clockwork <ul style="list-style-type: none"> • ↪ Chapter 4.2 "Positioning the watch and starting a measurement automatically" on page 21
4	USB cable for connecting the ChronoMaster to the PC or tablet computer <ul style="list-style-type: none"> • ↪ Chapter 3.4 "Connecting the ChronoMaster" on page 20
5	Switching screw for setting the ChronoMaster for right-handers or left-handers

No.	Description
6	Control keys for frequently used functions: selecting the previous program or the next program, restart and start/stop <ul style="list-style-type: none">• ↪ Chapter 4.3 "Controlling the measurement using control keys" on page 25
7	LED for visual indication of the watch signal <ul style="list-style-type: none">• ↪ Chapter 4.2 "Positioning the watch and starting a measurement automatically" on page 21

Measuring options

The ChronoMaster is a precision measuring device for measuring the rate deviation, the amplitude and the beat error of mechanical watches. The compact microphone has integrated measurement electronics.

All common beat numbers can be determined automatically. The manual adjustment for any beat numbers in a range between 3'600 and 72'000 A/H is possible as an alternative.

Watches can be tested in the 6 main testing positions, in 4 vertical intermediate positions and in 2 special positions. The position is identified automatically.

Using different measuring modes, watches can be tested with the following escapements:

- Swiss anchor escapement
- Cylinder escapement
- Duplex escapement
- Chronometer escapement
- Co-Axial escapement
- AP escapement



Information on the measuring options

Further information on the measuring options is to be found under ↪ "Measuring modes" on page 8 and in the corresponding software manual.

Versions

Two ChronoMaster software versions are available:

- ChronoMaster
- ChronoMaster PRO

The “*Witschi Token Installer*” software can be used to install a token on the device to extend the device to the PRO version.



Ordering the token

The token is created exactly for the device to be extended. The token contains the item number and the serial number of the device.

For further information, see the software manual.

Using what is called a demo token, you can test the PRO version for a certain time. The demo token has a timestamp and can only be installed once on the device. If new functions are provided by the manufacturer, a new demo token can be created, which can be installed again once.

Controlling the measurements

A USB cable is used to connect the ChronoMaster to the PC or tablet computer. The measurements are controlled using the corresponding “*Chronoscope Service*” display software.

In the “*Chronoscope Service*” display software, you can choose between the “*Diagram*” and “*Vario*” display modes for both versions. In addition, the “*Trace*”, “*Sequence*”, “*Polar*”, “*Scope 1*” and “*Scope 2*” display modes are included for the ChronoMaster PRO version.



Information on controlling the measurements

Further information on controlling the measurements is to be found under ⚙ “Display modes” on page 9, in ⚙ Chapter 4 “Performing a measurement” on page 21 and in the corresponding software manual.

1.2 Scope of delivery

The scope of delivery consists of the ChronoMaster and a USB flash drive with the following contents:

- “Chronoscope Service” display software
- Software manual in German, French, English, Spanish and Italian as PDF file



Information on the display software

Further information on the display software is to be found in ↗ Chapter 1.3 “Software” on page 8 and ↗ Chapter 3.3 “Installing the software” on page 18 and in the corresponding software manual.

The scope of delivery also includes:

- This document
- Calibration certificate
- Warranty information
- Dust cover

1.3 Software

The measurements are controlled using the “Chronoscope Service” display software. It is provided on the supplied USB flash drive.



Information on the display software

Information on installation and operation of the display software is to be found in ↗ Chapter 3.3 “Installing the software” on page 18 and in the corresponding software manual.

1.4 Modes

Measuring modes

The ChronoMaster provides various measuring modes that can be set in accordance with the escapement type of the watch to be tested.

Measuring mode	Information
Standard	Standard measuring mode for watches with Swiss anchor escapement.
Rate	Measuring mode for the rate measurement only of watches with cylinder, duplex or chronometer escapement, in addition to watches with unusual beat noise.
Special 1	Measuring mode for watches with Co-Axial escapement.
Special 2	Measuring mode for watches with AP escapement.
Special 3, 5, 7, 8 and 9	not active (reserved)



Determining the escapement type

You can find out the escapement type of the watch that is to be tested by consulting the watch manufacturer.



Information in the software manual

Further information on the measuring modes is to be found in the corresponding software manual.

Display modes

The "Chronoscope Service" display software provides two different display modes for the ChronoMaster and ChronoMaster PRO versions:

- Continuous diagram recording
- Vario

The following display modes are also available for the ChronoMaster PRO version:

- Trace
- Sequence
- Polar
- Scope 1, Scope 2



Information in the software manual

Further information on the display modes is to be found in the corresponding software manual.

1.5 Technical data

Configuration

Device	Type no.
ChronoMaster	13.3210

Time base

- TCXO quartz, high-frequency quartz time base

Stability	± 0.08 s/d
Ageing, 1st year	± 0.03 s/d

Measuring capacity

Function	Measuring range	Resolution	Precision	Notes
Rate deviation	± 999 s/d	1.0 s/d, 0.1 s/d or 0.01 s/d can be selected	± 0.1 s/d	Numerical display in s/d
Amplitude	70° to 360°	1° or 0.1° can be selected	$\pm 0.4^\circ$	Numerical display in degrees Lift angle adjustable from 10° to 90°, resolution 0.1°
Beat error	9.9 ms	0.1 ms	± 0.1 ms	Numerical display in milliseconds

Communication interfaces

Designation	Purpose
USB	Connect device for the following functions to PC or tablet computer: <ul style="list-style-type: none"> • Power supply • Data transmission • Controlling measurements

Dimensions and weight

Data	Value	Unit
Width	130	mm
Height	110	mm
Depth	110	mm
Weight	180	g

Recommended requirements for the PC or tablet computer

Processor	Quadcore processor i5 or i7
Operating system	Windows 7, Windows 8.1 or Windows 10
Working memory (RAM)	at least 4 GB
USB interface	2.0, type A
Display	Minimum resolution: 1366 x 768 pixels

Operating conditions

Data	Value	Unit
Temperature range	10 – 50	°C
Relative humidity, maximum	10 – 80	%, non-condensing

2 Safety

This section provides an overview of all the important safety aspects that ensure personal protection and safe and trouble-free operation of the ChronoMaster. There are additional, task-specific warnings in the sections on the individual life cycle phases.

2.1 Symbols in this document

Safety indications and warnings

Safety information and warnings are identified by symbols in this document. The safety information and warnings are introduced by signal words that indicate the extent of the hazard.



NOTICE!

This combination of symbol and signal word indicates a potentially hazardous situation that can entail material damage if not avoided.



ENVIRONMENT!

This combination of symbol and signal word indicates possible hazards to the environment.

Tips and recommendations



This symbol draws your attention to useful tips and recommendations and to information that helps ensure efficient and trouble-free operation.

Additional labels

The following labels are used in this document to draw attention to instructions, results, lists, references and other elements:

Label	Explanation
 1., 2., 3. ...	Step-by-step instructions
	Results of actions
	References to sections of this document and other applicable documents
	Lists without a fixed order

2.2 Risk of material damage

Damage to the USB cable or to the electronics



NOTICE!

Damage to the USB cable or to the electronics

Damage to the USB cable or to the electronics of the ChronoMaster could damage the ChronoMaster itself.

- Only allow Customer Service to perform work on the ChronoMaster's electronics (☞ "Customer Service" on page 3).
- In the event of damage to the USB cable or the plug, pull the USB plug and arrange for a repair by Customer Service (☞ "Customer Service" on page 3).
- Keep moisture away from live parts. That can result in a short-circuit.
- Do not kink or jam USB cables, damage them on sharp edges or bring them into contact with heat sources.
- Check the USB cable and plug for damage every time before using the device.

Material damage due to opening the housing



NOTICE!

Material damage due to opening the housing!

Opening the housing poses a risk of damaging components inside the ChronoMaster or of damaging the housing itself.

- Never open the housing yourself.
- In the event of malfunctions or problems that cannot be solved using the operating instructions, contact Customer Service (☞ "Customer Service" on page 3).

2.3 Intended use

The ChronoMaster precision measuring device is intended solely for measuring mechanical watches to determine the rate deviation, amplitude and beat errors (repère).

With the aid of the clamping jaws, the ChronoMaster is capable of testing mechanical wrist watches of all sizes.

Its intended use includes compliance with all the information in this document.

Misuse

Any use beyond or other than the intended use shall be considered misuse.



NOTICE!

Material damage due to misuse!

Misuse of the ChronoMaster can result in material damage.

- Never immerse the device in water or other liquids. Always keep the device away from rain and wet conditions.
- Never clamp any objects other than watches on the device.

2.4 Owner's responsibilities

Owner's obligations

The device is intended for commercial use. The owner of the device is subject to the statutory obligations of occupational health and safety.

In addition to the safety indications and warnings in this document, you must comply with the safety, occupational health and safety and environmental protection requirements that apply to the device's area of application.

The following applies in particular:

- Throughout the entire period that the device is in operation, the owner shall check that the operating instructions compiled by the owner comply with the current versions of regulations and must adapt the instructions as necessary.
- The owner shall ensure that all persons who handle the device have read and understood this document. In addition, the owner shall train personnel at regular intervals.
- The owner shall ensure that the service intervals described in this document are complied with.
- The owner shall ensure that the service intervals for the components are complied with.

2.5 Personnel qualifications

This document stipulates the following qualifications for the operator:

Operator

The operator of the device has all the necessary knowledge and training to handle watches. In addition, the operator has been instructed by the owner about the tasks entrusted to him or her and about possible hazards in the event of improper behaviour. The operator may only perform tasks that go beyond normal operation where this is provided for in the operating instructions and the owner has specifically entrusted the operator with such tasks.

3 Commissioning the ChronoMaster

3.1 Unpacking the ChronoMaster

Delivery

The ChronoMaster is delivered by a local logistics company. All the components included in the scope of delivery are delivered together in a single package.

Transport inspection

Upon receipt of the delivery, check it immediately to ensure that it is complete and undamaged.

If there is any visible external transport damage, proceed as follows:

1. Do not accept the delivery.
2. Make a note of the scope of damage on the carrier's delivery note.
3. Lodge a complaint.



Claims for damages can only be made within the applicable claim periods.

Lodge a complaint for any damage as soon as it is identified. Claims for damages can only be made within the applicable claim periods.

Unpacking the ChronoMaster

1. Take the ChronoMaster out of its packaging.
2. Store the original packaging for any later transport or storage (see Chapter 5 "Transportation and storage of the ChronoMaster" on page 27).

3.2 Requirements for the location

Distortion of measurement results



NOTICE!

Distortion of measurement results due to unsuitable location!

There is a risk of the distortion of measurement results if the following requirements for the location are not complied with.

- Do not position the device and the test object in the vicinity of heaters or open windows.
- Do not expose the device and the test object to direct sunlight.
- Operate the device on a level, horizontal surface.
- Set up the device in a low-noise environment.
- Do not set up the device in the direct proximity of electromagnetic radiation (e.g. as caused by mobile telephones).

Short-circuit or damage to the electronics



NOTICE!

Risk of material damage due to unsuitable location!

There is a risk of a short-circuit or of damage to the device electronics if the following requirements for the location are not complied with.

- Install the USB cable so that it cannot be damaged by external influences.
- Never operate the device in an environment with a high level of humidity.

3.3 Installing the software

The “Chronoscope Service” display software is to be found on the USB flash drive provided (☞ Chapter 1.2 “Scope of delivery” on page 8).



Notes on installation

- The “Chronoscope Service” display software must be installed on the PC or tablet computer before the ChronoMaster is connected.
- To install the “Chronoscope Service” display software, administrator rights are required for the PC or tablet computer.
- Further information on the software is to be found in the corresponding software manual.

Personnel: • Operator

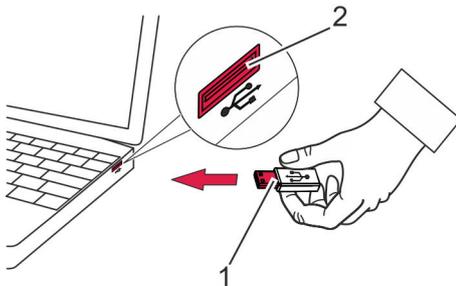


Fig. 2: Connecting the USB flash drive

1. ➤ Connect the USB flash drive to the USB port of the PC or tablet computer.
2. ➤ Open the directory of the USB flash drive on the PC or tablet computer.
3. ➤ Run the cs_setup.exe installation file.



Fig. 3: Selecting the storage location

4. ➤ Select the installation directory for the software on the PC or tablet computer (Fig. 3).



Fig. 4: Installing the software

5. → Start the installation (Fig. 4).



Software updates

Information on possible software updates is provided on the manufacturer's website.

3.4 Connecting the ChronoMaster

Personnel: • Operator

Requirement:

- The “Chronoscope Service” display software is installed on the PC or tablet computer.
1. ➤ Start the “Chronoscope Service” display software on the PC or tablet computer.
 2. ➤ Plug the USB plug of the USB cable (Fig. 6/1) into the USB port of the PC or tablet computer (Fig. 6/2).



Fig. 5: Starting “Chronoscope Service”

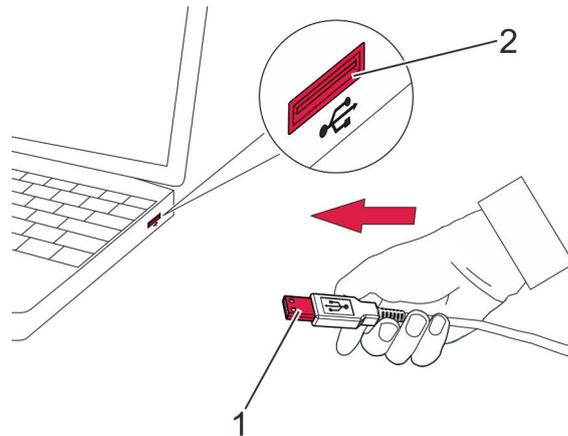


Fig. 6: Connecting the ChronoMaster

- ⇒
- The ChronoMaster is connected to the PC or tablet computer.
 - The ChronoMaster is identified by the display software and executed there (Fig. 7).

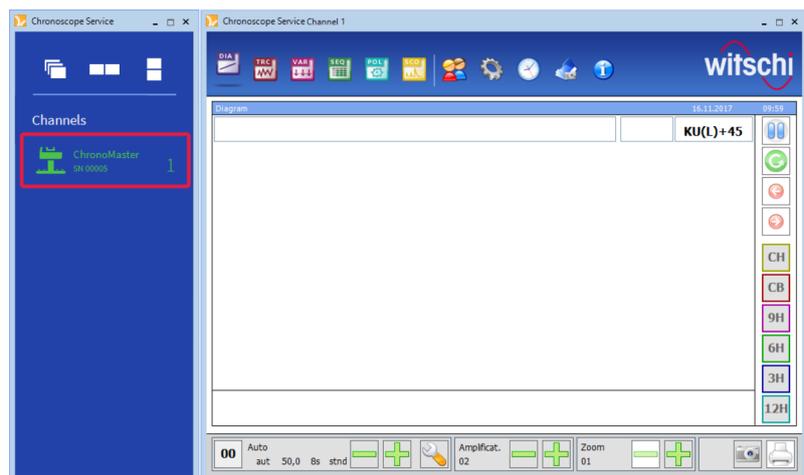


Fig. 7: ChronoMaster identified by the display software

4 Performing a measurement

4.1 Configuring measurement settings

Overview

The measurement settings are configured using the “Chronoscope Service” display software.

The measurement settings are:

- Beat number
- Lift angle
- Measuring mode
- Integration time
- Display mode



Information in the software manual

Information on the measurement settings is to be found in the corresponding software manual.

Programs

Various programs are available with pre-defined measurement settings.

It is also possible for you to create your own programs with frequently used measurement settings.



Information in the software manual

Information on selecting and setting the programs is to be found in the corresponding software manual.

4.2 Positioning the watch and starting a measurement automatically

Distortion of measurement results



NOTICE!

Distortion of measurement results!

There is a risk of the distortion of measurement results if the watch or the clockwork is not clamped correctly.

- Make sure that the watch or the clockwork is clamped correctly.

Clamp the complete watch or clockwork with cup

Personnel: • Operator

Prerequisites:

- The ChronoMaster is connected to the PC or tablet computer.
- The "Chronoscope Service" display software has been started.

1. ➤ Pull the clamping jaw (Fig. 8/1) outwards and hold it.

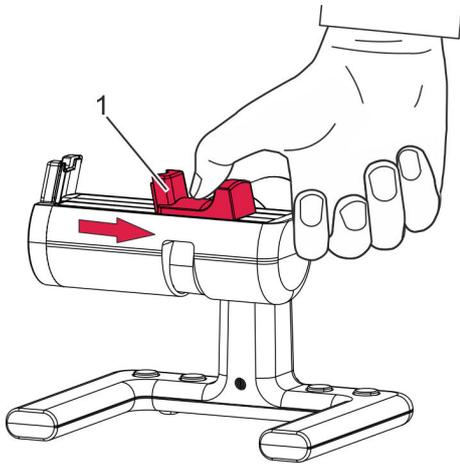


Fig. 8: Tightening the clamping jaws

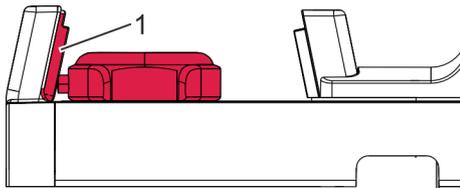


Fig. 9: Clamping the complete watch

2. ➤ Place the watch or cup on the clamping area so that the crown of the watch or cup is positioned against the signal sensor (Fig. 9/1, Fig. 10/1).

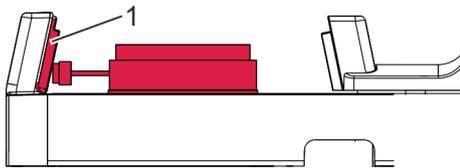


Fig. 10: Clamping the clockwork with cup

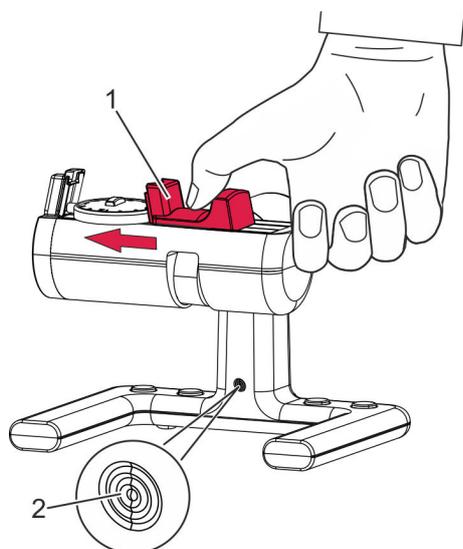


Fig. 11: Releasing the clamping jaw

3. Carefully guide the clamping jaw (Fig. 11/1) to the watch or the clockwork.

- ⇒ • The complete watch or the clockwork with cup is clamped.
- The LED on the ChronoMaster (Fig. 11/2) flashes at the same frequency as the watch beats.
- The measuring process starts automatically (Fig. 12).

Alternatively, the measurement can be started via the "Restart" button in the display software.

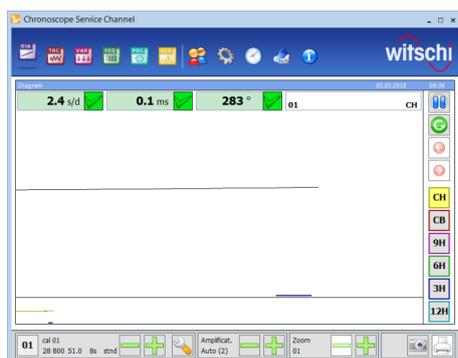


Fig. 12: The measuring process starts automatically



Information in the software manual

Information on the measuring process and on controlling the measurement is to be found in the corresponding software manual.

Clamping the clockwork without housing

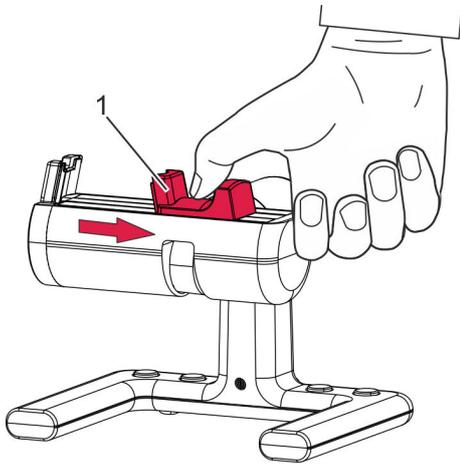


Fig. 13: Tightening the clamping jaws

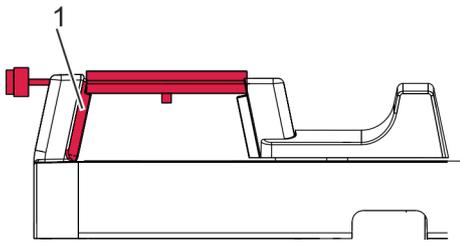


Fig. 14: Clockwork clamped without housing

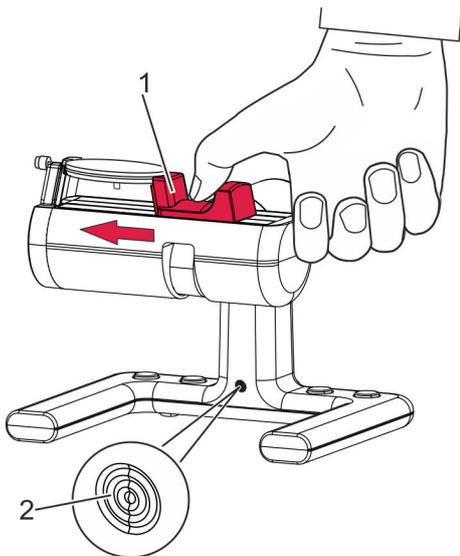


Fig. 15: Releasing the clamping jaw

Personnel: • Operator

Prerequisites:

- The ChronoMaster is connected to the PC or tablet computer.
- The "Chronoscope Service" display software has been started.

1. ➤ Pull the clamping jaw (Fig. 13/1) outwards and hold it.

2. ➤ Place the clockwork on the clamping area so that the plate is positioned above the signal sensor (Fig. 14/1).

3. ➤ Carefully guide the clamping jaw (Fig. 15/1) to the clockwork.

- ⇒ • The clockwork without housing is clamped.
- The LED on the ChronoMaster (Fig. 15/2) flashes at the same frequency as the watch beats.
- The measuring process starts automatically (Fig. 16).

Alternatively, the measurement can be started via the "Restart" button in the display software.

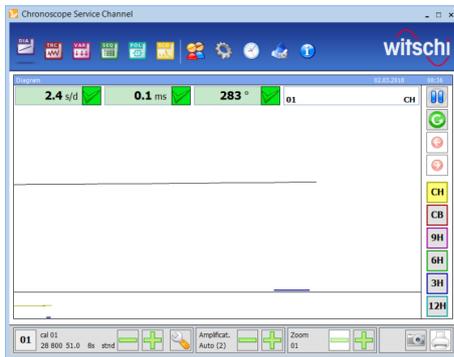


Fig. 16: The measuring process starts automatically



Information in the software manual

Information on the measuring process and on controlling the measurement is to be found in the corresponding software manual.

4.3 Controlling the measurement using control keys

To operate the software, the ChronoMaster has 4 control keys (Fig. 17).

The following functions are assigned to the control keys:

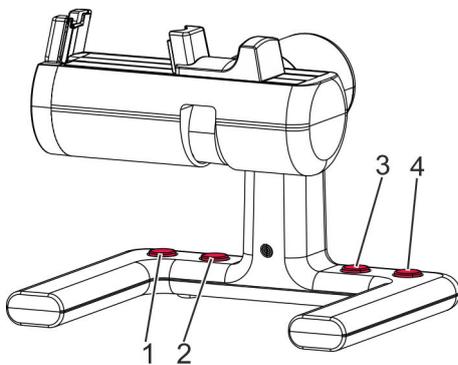


Fig. 17: Control keys

No.	Function
1	Program selection, select next lower program.
2	Program selection, select next higher program.
3	Restart current measurement.
4	Pause/continue current measurement.



Information in the software manual

Information on the individual functions is to be found in the corresponding software manual.

4.4 Monitoring and configuring the measurement

The measurements are monitored and configured using the “Chronoscope Service” display software.

This includes:

- Monitoring the measurement and the measurement results
- Setting the signal strength
- Pausing and resuming the measurement
- Printing the measurement results
- Creating screenshots
- Restarting a measurement



Information in the software manual

Information on monitoring and configuring the measurements is to be found in the corresponding software manual.

5 Transportation and storage of the ChronoMaster

5.1 Shutting down the ChronoMaster

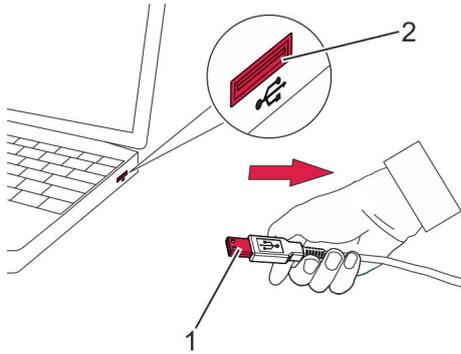


Fig. 18: Shutting down the ChronoMaster

Requirement:

- The measurement has been finished.
1. ➤ Pull the clamping jaw outwards and hold it.
 2. ➤ Remove the watch or clockwork from the microphone.
 3. ➤ Carefully release the clamping jaw.
 4. ➤ Disconnect the USB cable (Fig. 18/1) at the USB plug from the USB port of the PC or tablet computer (Fig. 18/2).

5.2 Transportation and storage of the ChronoMaster

Improper transport



NOTICE!

Risk of material damage due to improper transport!

In the event of improper transport, the device may fall or topple. This can cause significant material damage.

- Transport the device in its original packaging only.
- Always transport packages upright and never throw them.
- Only transport the device when it is shut down.
- Transport the device with two hands only.

Improper storage



NOTICE!

Risk of material damage due to improper storage!

Improper storage can cause significant material damage to the device.

- Store the device in its original packaging only.
- Do not store the device outdoors.
- Store the device in a dry and dust-free environment.
- Do not expose the device to any aggressive media.
- Protect the device from sunlight.
- Protect the device from mechanical vibrations.
- Store the device at a temperature between -20 °C and $+70\text{ °C}$.
- Store the device at a relative humidity of between 10 % and 80 % (non-condensing).

Requirement:

- The ChronoMaster is shut down (↪ [Chapter 5.1 “Shutting down the ChronoMaster” on page 27](#)).
1. ➤ Pack the device in its original packaging.
 2. ➤ Transport and/or store the device.

6 Maintenance and cleaning of the ChronoMaster

6.1 Safety during maintenance

Short-circuit or damage to the electronics



NOTICE!

Risk of material damage during maintenance!

A short-circuit or damage to the electronics of the device is possible during maintenance if the following instructions are not observed:

- Only allow Customer Service to perform work on the device's electronics.
- Before performing any work for maintenance or cleaning, disconnect the USB cable from the PC or tablet computer.
- Keep moisture away from live parts.

6.2 Maintenance schedule

Interval	Maintenance work	Personnel
Daily	Clean the ChronoMaster with a microfibre cloth.	Operator

Calibration instruction

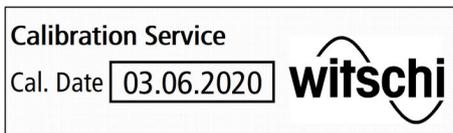


Fig. 19: Calibration label



Regular calibration of the device ensures that measurement results are reliable.

We recommend having the device calibrated and its functionality checked **once a year**.

7 Troubleshooting

7.1 Error messages in the display software



Information in the software manual

Information on errors messages in the display software is to be found in the corresponding software manual.

7.2 Damage to the ChronoMaster

Improper rectification of damage



NOTICE!

Damage due to improper rectification of material damage!

The improper rectification of material damage to the ChronoMaster can result in additional material damage.

- Stop operating the device in the event of material damage.
- Only allow Customer Service to repair the device.

If there is any visible external damage, proceed as follows:

1. ➤ Shut down the ChronoMaster (☞ [Chapter 5.1 "Shutting down the ChronoMaster" on page 27](#)).
2. ➤ Contact Customer Service (☞ ["Customer Service" on page 3](#)).

7.3 Troubleshooting

Fault description	Cause	Remedy
Implausible measurement result	The watch or clockwork is not positioned correctly.	Re-position the watch or clockwork (☞ Chapter 4.2 "Positioning the watch and starting a measurement automatically" on page 21).
Diagram with interference	Signal set too strongly/weakly.	Regulate the signal strength. Information on how to do this can be found in the corresponding software manual.

8 ChronoMaster disposal

If no return or disposal agreement has been made, take the device to a recycling facility.



ENVIRONMENT!

Incorrect disposal poses an environmental hazard!

The device contains electrical and electronic components. Incorrect disposal may result in hazards to the environment.

- Do not dispose of the device along with the household waste. Hand over the device to a municipal collection point or have it disposed of by a specialist.
- Only have authorised specialists dispose of the device.
- If in doubt about environmentally sound disposal, contact your local authority or a specialist waste disposal company.

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Appendix

A Declaration of conformity

EG-Konformitätserklärung
Déclaration de conformité CE
Declaration of conformity



DE FR EN

Wir **Witschi Electronic AG**
nous / We: **Bahnhofstrasse 26**
CH-3294 Büren a.A.
Schweiz / Suisse / Switzerland

erklären in alleiniger Verantwortung, dass das Produkt
déclarons sous notre seule responsabilité que le produit
declare under our sole responsibility that the product

Bezeichnung **ChronoMaster**
nom / name:

Typ-Nr.: **13.3210**

Fabrikations-Nr. **1 – 10'000**
no. de série / serial Nr.:

Funktion **Prüfgerät für mechanische Uhren mit int. Messelektronik**
fonction / function *appareil de test pour montres mécaniques avec électronique de mesure intégrée /*
test instrument for mechanical watches with integrated measuring electronic

Dok-Verwaltung **Witschi Electronic AG, Roman Siegfried, Bahnhofstr. 26, CH-3294 Büren a.A.**
doc. management

Zertifiziertes QMS **SQS, ISO 9001:2015, Scope 19 / Reg. Nr. 12228**
Quality mgt, systems

auf das sich diese Erklärung bezieht, mit den Bestimmungen der folgenden EG-Richtlinie(n) und Norm(en) oder normativen Dokument(en) übereinstimmt:

auquel se réfère cette déclaration, est conforme aux dispositions de la (des) directive(s) CE et à la (aux) norme(s) ou autre(s) document(s) normatif(s) suivants:

to which this declaration applies, is in conformity with the following EC-Directive(s) and standard(s) or other normative document(s):

Richtlinien / Lignes directrices / Guidelines

- 2014/30/EG Elektromagnetische Verträglichkeit / *compatibilité électromagnétique* / electromagnetic compatibility
2014/35/EU Niederspannungsrichtlinie / *Directive CE pour basse tension* / EC low voltage directive
2006/42/EG Maschinenrichtlinie / *Directive CE pour machines* / EX machinery directive
2011/65/EU RoHS-Richtlinien / *Directives RoHS* / RoHS Directive

Fachgrundnormen / Normes génériques / Generic Standards

- EN 61000-6-3: 2011 Elektromagnetische Verträglichkeit (EMV), Störaussendung für Wohn- Geschäfts und Gewerbebereiche sowie Kleinbetriebe / *Compatibilité électromagnétique (CEM), Norme sur l'émission pour les environnements résidentiels, commerciaux et de l'industrie légère* / Electromagnetic compatibility (EMC), Emission standard for residential, commercial and light-industrial environments
EN 61000-6-4: 2011 Elektromagnetische Verträglichkeit (EMV), Störaussendung für Industriebereiche / *Compatibilité électromagnétique (CEM), Norme sur l'émission pour les environnements industriels* / Electromagnetic compatibility (EMC), Emission standard for industrial environments
EN 61000-6-1: 2016 Elektromagnetische Verträglichkeit (EMV), Störfestigkeit für Wohn- Geschäfts und Gewerbebereiche sowie Kleinbetriebe / *Compatibilité électromagnétique (CEM), Immunité pour les environnements résidentiels, commerciaux et de l'industrie légère* / Electromagnetic compatibility (EMC), Immunity for residential, commercial and light-industrial environments
EN 61000-6-2:2016 Elektromagnetische Verträglichkeit (EMV), Störfestigkeit für Industriebereiche / *Compatibilité électromagnétique (CEM), Immunité pour les environnements industriels* / Electromagnetic compatibility (EMC), Immunity for industrial environments
EN ISO 12100-2010 Sicherheit von Maschinen / *Sécurité des Machines* / Safety of machinery

Büren a.A., den 27.2.18


Daniel Hug
Leiter Entwicklung


Roman Siegfried
Leiter Produktions-Management