ChronoMaster® Auto

Operating instructions

Read the instructions prior to performing any task!

witschi

LEADING SWISS PRODUCTS

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About this document

This document enables safe and efficient use of the ChronoMaster Auto® precision measuring device (hereafter referred to as the "device" or "ChronoMaster Auto®"). The document is an integral component 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 commencing work. The basic prerequisite for safe work is compliance with all the safety notices and warnings, and instructions, specified in this document.

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

Illustrations in this document are intended to aid basic understanding and may deviate from the actual design.

Copyright

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

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1 Product description

1.1 Overview

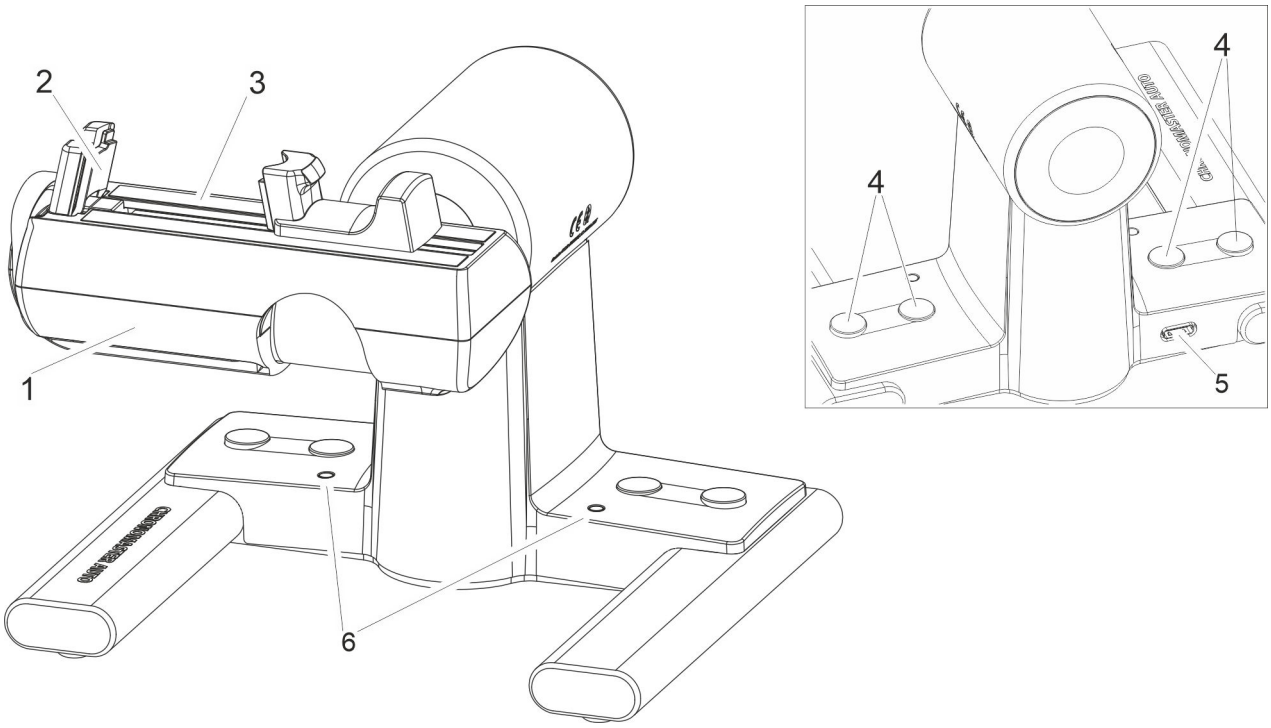

Fig. 1: ChronoMaster Auto

No.	Description
1	Pivoting microphone for measurement of the watch noises
2	Signal sensor for recording and transmission of the watch noises • *Chapter 4.2 'Positioning the watch and starting a measurement automatically' on page 27*
3	Clamping jaw made of neoprene for clamping the watch or the watch movement • *Chapter 4.2 'Positioning the watch and starting a measurement automatically' on page 27*
4	Control keys for frequently used functions: Change of position, restart and pause/start • *Chapter 4.3 'Controlling the measurement using control keys' on page 32* • The key layout on PC applications (Chronoscope Service/WiCoTRACE) and the terminal application may differ.
5	USB-C port for connection of the device to the PC, tablet computer or terminal.
6	LED/BLE-LED signal lamp for visual indication of the device status and watch signal • *Chapter 4.2 'Positioning the watch and starting a measurement automatically' on page 27* • *Chapter 1.7 'Signal LED' on page 12*

Measuring options

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

All standard beat numbers can be determined automatically. Manual adjustment for any beat numbers in a range from 3,600 to 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.

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

- Swiss lever escapement
- Co-axial escapement
- AP escapement

Rate measurement only for:

- Cylinder escapement
- Duplex escapement
- Chronometer escapement

> ***Information on the measuring options***
> *Further information on the measuring options can be found under* *'Measuring modes' on page 8* *and in the corresponding software manual.*

Controlling the measurements

A USB cable is used to connect the device to the PC, tablet computer or the terminal. The measurements are controlled using the corresponding *'Chronoscope Service'*, *'WiCoTRACE'* or *'terminal app'* display software. The term *'Chronoscope Service'* is used in the following to represent all control options.

1.2 Scope of delivery

The scope of delivery consists of the ChronoMaster Auto® and a USB flash drive with the following content:

- *'Chronoscope Service'* and *'WiCoTRACE 3 Lite'* display software
- Software manual in English, German, French, Spanish and Italian as PDF files

> ***Information on the display software***
> *Further information on the display software can be found in Chapter 1.3 'Software' on page 8 and Chapter 3.3 'Installing software' on page 20, and in the corresponding software manual.*

The scope of delivery also includes:

- This document
- Calibration certificate
- Warranty information
- USB A–C cable (1 m)

1.3 Software

The measurements are controlled using the *'Chronoscope Service'* display software. It can be found on the USB flash drive included with the device.

> ***Information on the display software***
> *Information on installation and operation of the display software can be found in Chapter 3.3 'Installing software' on page 20 and in the corresponding software manual.*

1.4 Modes

Measuring modes

The device provides different measuring modes that can be set in accordance with the type of escapement of the watch being tested.

Measuring mode	Information
Standard	Standard measuring mode for watches with a Swiss lever escapement.
Rate	Measuring mode only for a rate measurement of watches with a cylinder, duplex or chronometer escapement, as well as watches with unusual beat noises.
Co-axial (SPE1)	Measuring mode for watches with a co-axial escapement.
AP escapement (SPE2)	Measuring mode for watches with an AP escapement.
Fourdroyante (SPE6)	Measuring mode for a Foudroyant chronograph (flashing second)

Determining the escapement type

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

Information in the software manual

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

Display modes

The *'Chronoscope Service'* display software for ChronoMaster Auto® provides several display modes:

- Continuous diagram recording
- Vario
- Trace
- Sequence
- Polar
- Scope 1, Scope 2

Information in the software manual

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

1.5 Bluetooth connection

Bluetooth® is a registered trademark of Bluetooth SIG, Inc.

Range and signal strength display

The Bluetooth connection generally has a range totalling several metres. The range is affected by many different factors. To ensure that a measurement can be performed without disruptions, placing the ChronoMaster Auto® as close as possible to the receiver is recommended. The signal strength of the Bluetooth communication is displayed as an icon in the header of the measurement window, and in the channel overview.

Meaning of the signal strength display:

Symbol	Meaning
	Strong signal strength
	Sufficient signal strength
	Weak signal strength, insufficient

Faults affecting the Bluetooth connection

If more than one ChronoMaster Auto® is connected to the PC or tablet computer by Bluetooth, or faults or disruptions occur, using the external Bluetooth dongle "Laird" (item no. JB15-BT851) is recommended. It can be ordered from the firm Witschi Electronic Ltd. as an accessory.

1.6 Technical data

Configuration

Device	Type no.
ChronoMaster Auto®	13.3410

Time base

- TCXO quartz, high-frequency quartz time base

Stability	± 0.026 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	± 0.4°	Numerical display in degrees
				Lift angle can be set 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 the device to a PC, tablet computer or Witschi terminal for the following functions: • Power supply • Data transmission • Controlling measurements
Bluetooth	Connect the device to a PC, tablet computer or Witschi terminal using Bluetooth for the following functions: • Data transmission • Controlling measurements

Bluetooth

Data	Value	Unit
Technology	Bluetooth Low Energy 4.2	
Bluetooth module	CYBLE-222005-00	
Output	–18 to +3	dBm
Range, depending on placement	2 – 3	m
Module ID	FCC ID: WAP2005, IC ID: 7922A-2005	
Frequency	2.4	GHz

ChronoMaster Auto®

Data	Value	Unit
Power consumption in operation	Typically 250	mA

Dimensions and weight

Data	Value	Unit
Width	150	mm
Height	125	mm
Depth	160	mm
Weight	1.25	kg

Recommended requirements of PC or tablet computer

Processor	Quadcore processor i5 or i7
Operating system	Windows 10, build number 14393 or higher
Working memory (RAM)	Minimum 4 GB
USB interface	2.0, type A
Screen	Minimum resolution: 1366 × 768 pixels

Operating conditions

Data	Value	Unit
Temperature range	5 – 40	°C
Relative humidity, maximum	Max. 80	%, non-con-densing

1.7 Signal LED

The signal LED remains lit up in yellow for the full installation process. Once the initialisation process is complete, the signal LED goes out when there is no watch movement or watch on the microphone.

In other cases, the LED flashes at the same speed as the watch noises.

1.8 BLE-LED

The LED remains lit up in blue for the initialisation process. Once the initialisation process is complete and a USB connection to a PC or terminal can be set up, the blue LED goes out.

If a USB connection cannot be set up (power supply using USB power supply adapter), the blue LED flashes and the device can be paired using a Bluetooth connection.

If the ChronoMaster Auto® is paired with a device using Bluetooth, the LED remains lit up in blue.

Device status	LED display	Meaning
Device is performing a measurement	Flashes in yellow	Indicates the beat noises of the watch placed on the device
During initialisation	Blue and yellow LEDs both remain lit up	Initialisation is being performed

2 Safety

This section provides an overview of all important safety aspects that ensure personal protection, and safe and trouble-free operation of the device. There are additional, task-specific warnings in the sections on the individual lifecycle 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 Danger 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 can damage the device.

- Only allow Customer Service to perform work on the device's electronics (↯ *'Customer Service' on page 3*).
- In the event of damage to the USB cable or the plug, disconnect the USB plug and arrange for a repair by Customer Service (↯ *'Customer Service' on page 3*).
- Keep moisture away from live parts. It 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 causes a risk of damaging components inside the device or damaging the housing itself.

- Never open the housing of your own accord.
- In the event of malfunctions or problems that cannot be solved using the operation manual, contact Customer Service (↯ *'Customer Service' on page 3*).

2.3 Intended use

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

The device can test watches of any size due to the clamping jaw.

Intended use also 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 device can result in material damage.

- Never immerse the device in water or other liquids. Keep the device away from rain and wet conditions at all times.
- Never clamp any objects other than watches or watch movements 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:

Customer Service

Certain work may only be performed by Customer Service. Customer Service personnel have been trained extensively for all work performed on measuring devices.

Work that is the specified task of Customer Service personnel may not be performed by unauthorised personnel. Contact Customer Service when this work is due.

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 Starting up the device

3.1 Unpacking the device

Delivery

The device 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 device

1. Take the device out of its packaging.
2. Keep the original packaging for any later transport or storage (*Chapter 5 'Device transport and storage' on page 34*).

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 no 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 software

The *'Chronoscope Service'* and *'WiCoTRACE 3 Lite'* display software can be found on the USB flash drive included with the device (*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 device is connected.*
- *To install the 'Chronoscope Service' display software, administrator rights are required for the PC or tablet computer.*
- *Further information on the 'WiCoTRACE3 Lite' software can be found in the corresponding software manual.*

Personnel: • Operator

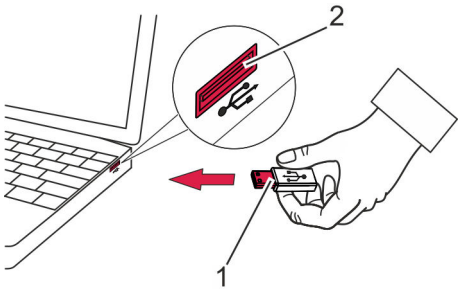

Fig. 2: Connecting the USB flash drive

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 installation file **cs_setup.exe** as the administrator.

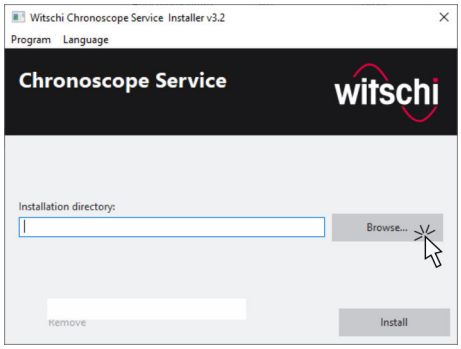

Fig. 3: Selecting the file location

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

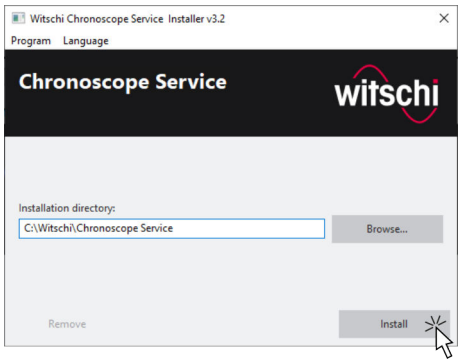

Fig. 4: Installing software

5. Start the installation (Fig. 4).
   ⇨ After successful installation, the software can be started.

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

3.4 Connecting the device

Fig. 5: Starting 'Chronoscope Service'

Personnel: • Operator

Prerequisite:

- The *'Chronoscope Service'* display software has been installed on the PC or tablet computer.

1. Start the *'Chronoscope Service'* display software on the PC or tablet computer.
2. Insert the USB plug on the USB cable (Fig. 6/1) into the USB port of the PC or tablet computer (Fig. 6/2).

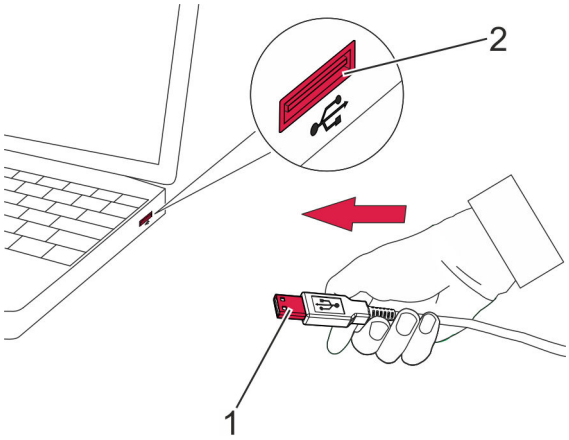

Fig. 6: Connecting the device to a PC or laptop

⇨
- The device has been connected to the PC or tablet computer.
- The device is identified by the display software and is listed there (Fig. 7).

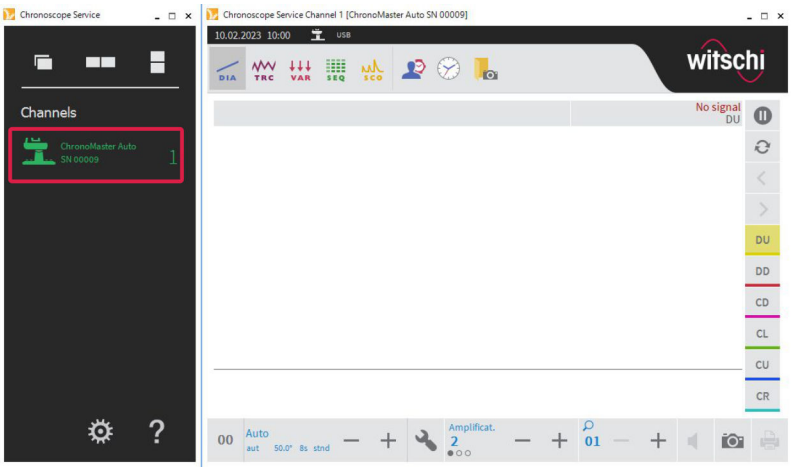

Fig. 7: Identification of the device by the display software

3.5 Assigning the device to a channel

There is the option of using the USB cable for communication between the device and a PC or tablet computer, or using Bluetooth for wireless communication.

> ***Choice between 'manual' and 'automatic'***
> *There is the option of choosing between 'automatic' and 'manual'.*
>
> *'Automatic' mode is recommended if only one device is connected to the PC or tablet computer by USB cable. In 'automatic' mode, only devices are identified that are connected to the PC or tablet computer by a USB connection. If several devices are connected, the assignment of the devices on channel 1 and 2 may change under certain circumstances.*
>
> *'Manual' mode is recommended if two channels are being used, or if at least one device will be connected to the PC or tablet computer using the Bluetooth interface.*

Configuring the device in *'automatic'* mode (by USB only)

Personnel:
- Operator

Prerequisites:
- The *'Chronoscope Service'* display software has been installed on the PC or tablet computer.
- The device has been connected to the PC or tablet computer by a USB cable.

1. Click the configuration symbol .
2. Click the *[Yes]* button in the *'Configuration'* dialogue window.

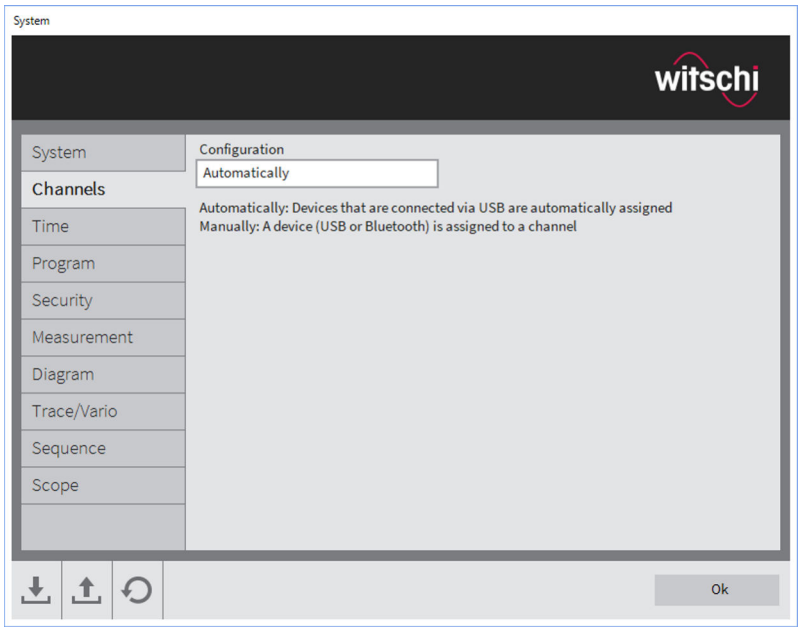

Fig. 8: Automatic channel assignment

3. Click on the *'Channels'* tab and select *'Automatic'*.
   ⇨ The software identifies the device connected by USB.

Configuring the device in *'manual'* mode

Personnel:
- Operator

Prerequisite:
- The *'Chronoscope Service'* display software has been installed on the PC or tablet computer.

1. Click the configuration symbol .
2. Click the *[Yes]* button in the *'Configuration'* dialogue window.

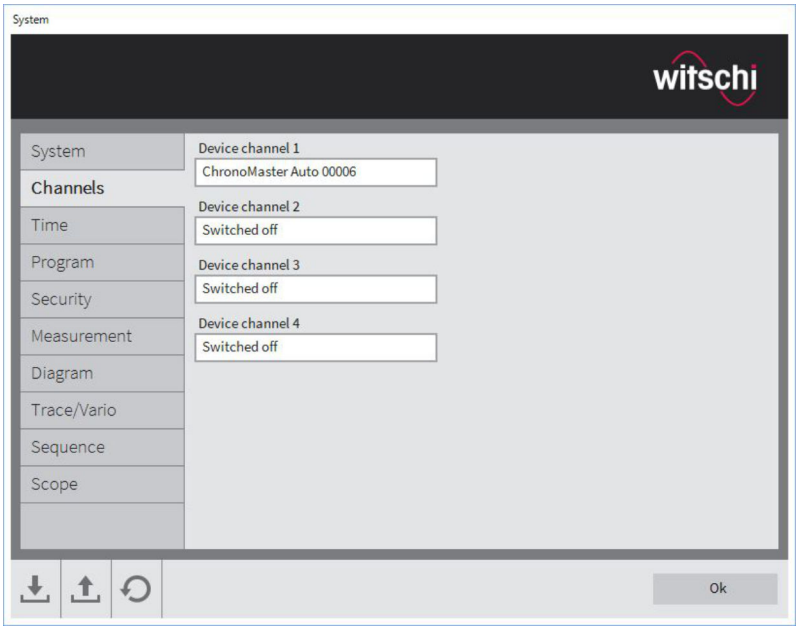

Fig. 9: Manual channel assignment

3. Click on the *'Channels'* tab and select *'Manual'*.
4. Choose a device from the list in the selection window for *'Device channel 1'* and *'Device channel 2'* respectively.
   ⇨ It is now possible to define which connection is used for communication between the device and the PC or tablet computer for devices with several connection options.
5. Choose *'Automatic'*, *'USB'* or *'Bluetooth'*.
   ⇨ USB:
   - The device chosen is only assigned to the channel when it is connected to the PC or tablet computer by a USB cable.

   Auto:
   - The device chosen is assigned either by using a USB or a Bluetooth connection. The USB connection is given priority in this case.

A device that is connected by means of Bluetooth will not automatically switch to a USB connection when the USB cable is plugged in. Only after the software restarts will the USB connection be active.

All channel assignments are saved, and are opened automatically the next time the device is switched on with the corresponding connection.

3.6 Initialisation

Place the device on a level surface and do not move it for the full duration of initialisation.

→ Switch on ChronoMaster Auto®.

⇨ Initialisation of the position sensor in the microphone head is carried out; both LEDs light up.

The two end positions of the tilt axis are determined first, followed by the horizontal position of the rotation axis.

⇨ Both LEDs go out; the signal LED visualises the beat noise.

⇨ The initialisation phase has been completed.

Change of position

There are different way to change the position of the microphone head:

- *Programmed test sequence on the terminal or PC*
- *Selection of preferred test position using buttons on the terminal or PC*
- *Function keys 1 und 2 on the ChronoMaster Auto®, as described in chapter ↯ Chapter 4.3 'Controlling the measurement using control keys' on page 32.*
- *Manual change of position directly at the microphone head (except for Sequence mode).*

  Divisions are perceptible every 45° along both the rotation axis and the tilting axis when the movement is carried out. This is also where the microphone head engages.

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

Corruption of measured 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.

Watch holder

The ChronoMaster Auto® is equipped with an elastic watch holder that has been integrated into the microphone head for large, heavy watches.

Securing the watch on the microphone

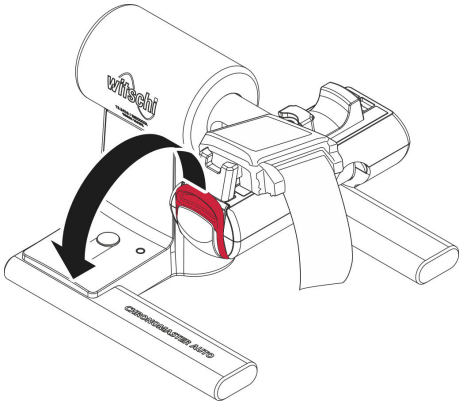

Fig. 10: Lifting the watch holder 1

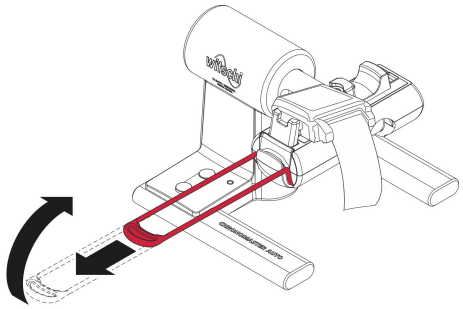

Fig. 11: Lifting the watch holder 2

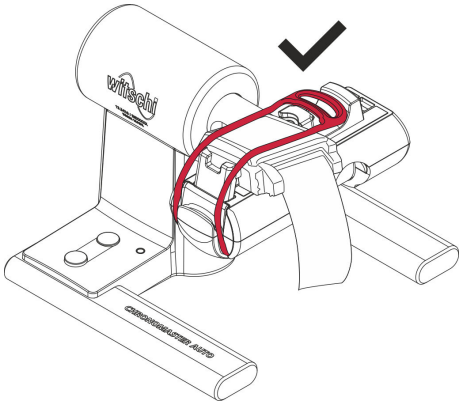

Fig. 12: Securing the watch holder

1. Place the watch on the microphone in the home position (DU).
2. Pull the watch holder outwards out of its rest position (Fig. 10), across the watch (Fig. 11), onto the slide and hook it in place (Fig. 12).

> **NOTICE!**
> **Material damage due to improperly secured watch!**
> – In order to ensure the watch is reliably protected, the elastic bands must remain in the correct guide slots.

⇨ The watch has been secured.

Removing the watch from the microphone

The watch is on the microphone in the home position (DU).

- Lift the watch holder out of the slide and guide it back to its starting position.

⇨ The watch can be removed.

Clamping the entire watch or watch movement with cup

Personnel: • Operator

Prerequisites:

- The device has been connected to the PC or tablet computer.
- The *'Chronoscope Service'* display software has been started.

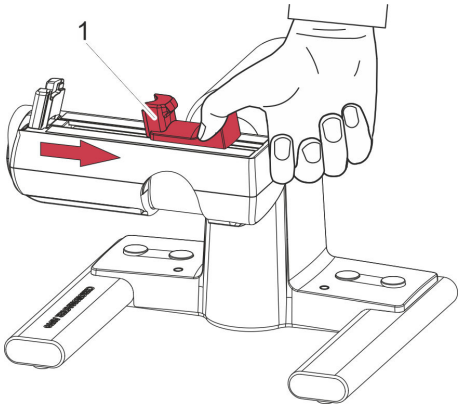

Fig. 13: Tightening the clamping jaws

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

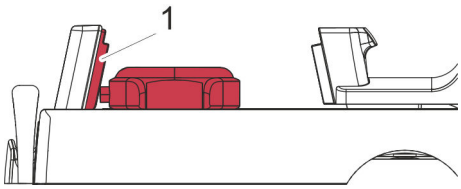

Fig. 14: Clamping the entire watch

2. Place the crown of the watch or cup on the clamping area so that it is positioned up against the signal sensor (Fig. 14/1, Fig. 15/1).

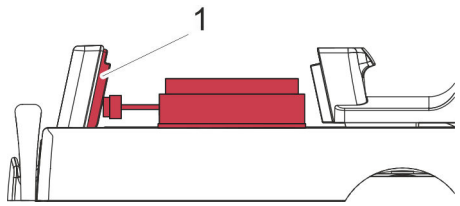

Fig. 15: Clamping the watch movement with cup

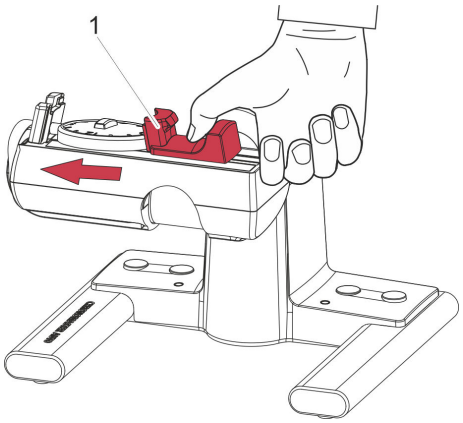

Fig. 16: Letting go of the clamping jaw

3. Carefully guide the clamping jaw (Fig. 16/1) to the watch or the watch movement.

⇨
- The complete watch or the watch movement with cup has been clamped.
- The LED on the device flashes at the same frequency as the watch beats.

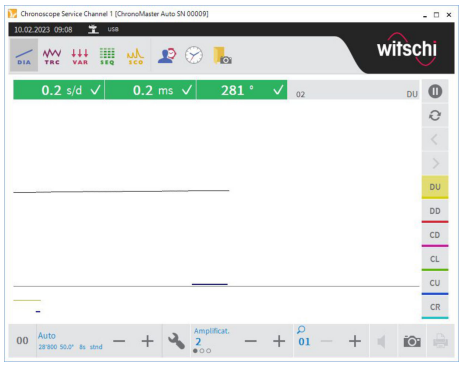

Fig. 17: Automatic start to the measuring procedure

- The measuring procedure starts automatically (Fig. 17).

Alternatively, the measurement can be started using the ‘Restart’ button in the display software.

Information in the software manual

Information on the measuring procedure and on controlling the measurement can be found in the corresponding software manual.

Clamping a watch movement without housing

Personnel: • Operator

Prerequisites:

- The device has been connected to the PC or tablet computer.
- The *'Chronoscope Service'* display software has been started.

1. Pull the clamping jaw (Fig. 18/1) outwards and hold it.

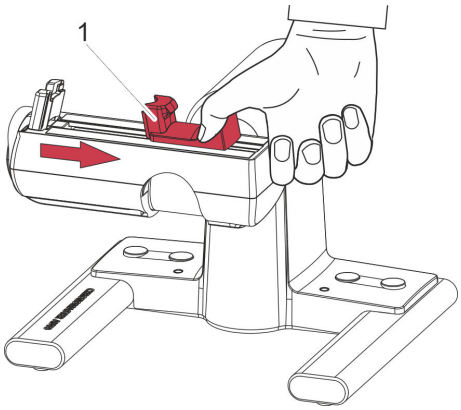

Fig. 18: Tightening the clamping jaws

2. Place the watch movement on the clamping area so that the watch plate is positioned above the signal sensor (Fig. 19/1).

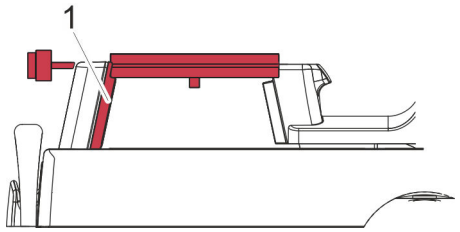

Fig. 19: Watch movement without housing clamped

3. Carefully guide the clamping jaw (Fig. 20/1) to the watch movement.

⇨ • The watch movement without housing has been clamped.
• The LED on the device flashes at the same frequency as the watch beats.

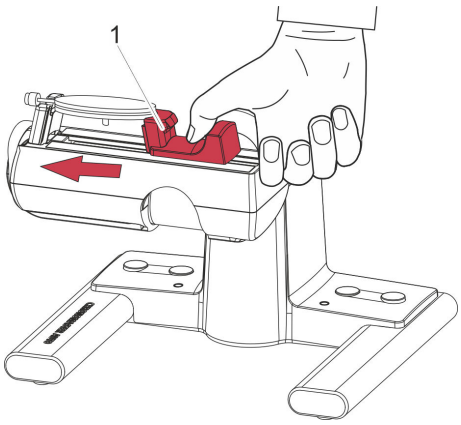

Fig. 20: Letting go of the clamping jaw

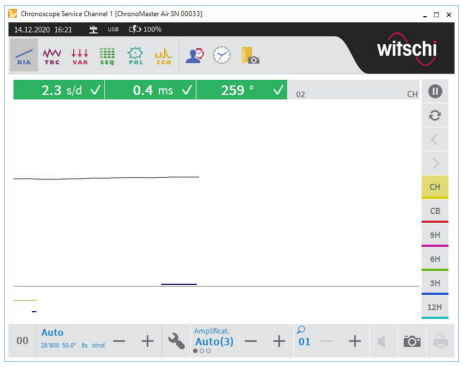

Fig. 21: Automatic start to the measuring procedure

- The measuring procedure starts automatically (Fig. 21).

Alternatively, the measurement can be started using the ‘**Restart**’ button in the display software.

Information in the software manual
Information on the measuring procedure and on controlling the measurement can be found in the corresponding software manual.

4.3 Controlling the measurement using control keys

The device features 4 control keys (Fig. 22) that are used to operate the software.

The following functions are assigned to the control keys:

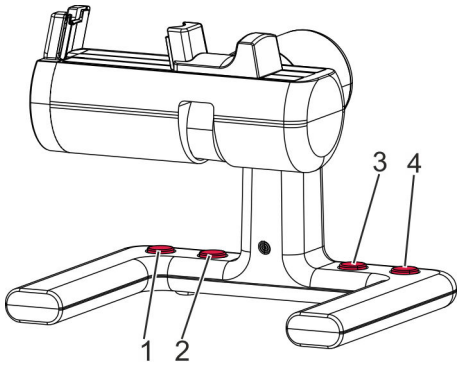

Fig. 22: Control keys

No.	Function
1	Change of position CH > CB > CH, every other position > CH
2	Change of position CH > 9H > 6H > 3H > 12H
3	Restart measurement
4	Pause/Start

Different key layout
The key layout on PC applications (Chronoscope Service/WiCoTRACE) and the terminal application may differ.

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 Device transport and storage

5.1 Device shutdown

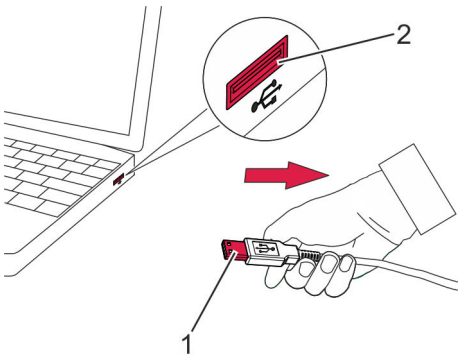

Fig. 23: Device shutdown

Prerequisite:

- The measurement has been completed.

1. Pull the clamping jaw outwards and hold it.
2. Remove the watch or watch movement from the microphone.
3. Carefully let go of the clamping jaw.
4. Remove the USB cable (Fig. 23/1) from the USB port of the PC or tablet computer (Fig. 23/2) by the USB plug.

If the plug of the ChronoMaster Auto® is removed or the supply of power to the device is disconnected, the blue LED lights up and the microphone head moves back to the home position. This guarantees that the microphone head moves to a defined 'standby position'.

5.2 Device transport and storage

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 °C.
- Store the device at a relative humidity of between 10 % and 80 % (non-condensing).

Prerequisite:

- The device has been shut down (*Chapter 5.1 'Device shutdown' on page 34*).

1. Pack the device in its original packaging.
2. Transport and/or store the device.

6 Device maintenance and cleaning

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 Replacing the watch holder

Although the material, and the geometry and layout, were chosen with utmost care, the watch holder may still tear. Allowance was made for this fact in the design phase, and it is easy for the user to replace the watch holder.

The watch was removed from the device.

1. Pull the slide slightly upwards, and undo the screw in the groove using a T9 Torx screwdriver.
2. Turn the microphone head in the direction of rotation by 180° (CD) and lift the bottom section.
3. Remove the defective parts of the watch holder.
4. Pull the new watch holder through the openings with the aid of the rubber guide, and position it on the retaining pin.

NOTICE!

Material damage due to incorrect position of the bearings!

The two bearings at the side function as guide pulleys, and must remain in position.

5. Cut off the rubber guides at the notch using a pair of scissors.
6. Position the bottom section on the microphone.
7. Rotate the microphone head by 180° (DU) and retighten the screw in the centre groove.

6.3 Maintenance schedule

Interval	Maintenance work	Personnel
Daily	Clean the device with a microfibre cloth.	Operator
Annually	Have the device calibrated.	Customer Service

Calibration instruction

Fig. 24: 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 device

Improper repair of damage

NOTICE!
Damage due to improper repair of material damage!
The improper repair of material damage to the device 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 device (↯ *Chapter 5.1 'Device shutdown' on page 34*).
2. Contact Customer Service (↯ *'Customer Service' on page 3*).

7.3 Troubleshooting in the event of malfunctions

Fault description	Cause	Remedy
Implausible measurement result	The watch or watch movement has not been positioned correctly.	Reposition the watch or watch movement (↯ *Chapter 4.2 'Positioning the watch and starting a measurement automatically' on page 27*).
Diagram with interference	Signal setting too strong/weak.	Adjust the signal strength. Information on how to do this can be found in the corresponding software manual.
The device is not listed in the selection list for channel assignment	The device is not connected to the PC or tablet computer correctly.	• Close the selection window for channel assignment, and open it again. • Ensure that the device is connected to the right PC, tablet computer or terminal.

Fault description	Cause	Remedy
Bluetooth connection disrupted	Unstable Bluetooth connection.	• Place the device closer to the PC, tablet computer or terminal. • Use the external Bluetooth dongle "Laird" (item no. JB15-BT851) for a more stable connection.

8 Disposal

8.1 Device 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 for ChronoMaster Auto

CE/UKCA-Konformitätserklärung
Déclaration de conformité CE/UKCA
Declaration of conformity CE/UKCA

DE | FR | EN

Wir
nous / We:

Witschi Electronic AG
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 *nom / name:*	**ChronoMaster Auto**
Typ-Nr.:	**13.3410**
Fabrikations-Nr. *no. de série / serial Nr.:*	**1 – 10'000**
Funktion *fonction / function*	**Motorisiertes Prüfgerät für mech. Uhren mit integrierter Messelektronik, inkl. BLE** *appareil de test motorisé pour montres méc. avec électronique de mesure intégrée et BLE/* Motorised test instrument for mech. watches with integrated measuring electronic and BLE radio
Dok-Verwaltung doc. management	Witschi Electronic AG, Roman Siegfried, Bahnhofstr. 26, CH-3294 Büren a.A.
Zertifiziertes QMS Quality mgt, systems	SQS, ISO 9001:2015, Scope 19 / Reg. Nr. 12228

auf das sich diese Erklärung bezieht, mit den Bestimmungen der folgenden EG-Richtlinie(n):
auquel se réfère cette déclaration, est conforme aux dispositions de la (des) directive(s) CE:
to which this declaration applies, is in conformity with the following EC-Directive(s):

Richtlinien / *Directives* / Directives

2014/53/EU	☒	Richtlinie über Funkanlagen / *Directive concernant les équipements radio / Radio Equipement Directive RED*
2011/65/EU	☒	RoHS-Richtlinien / *Directives RoHS* / RoHS Directive

Angewendete Normen / *Normes appliquées* / Applied Standards

EN 61000-6-3: 2021 IEC 61000-6-3:2020	☒	Elektromagnetische Verträglichkeit (EMV), Störaussendung für Wohn- Geschäfts und Gewerbereiche 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 61000-6-2:2019 IEC 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
ETSI EN 300 328: V2.2.2	☒	Breitband-Übertragungssysteme 2,4GHz systèmes de transmission à large bande / Wideband transmission systems 2,4GHz
ETSI EN 301 489-17 V3.2.4	☒	EMV-Norm für Funkgeräte und -dienste / *Norme CEM pour les équipements et services radio* / Electromagnetic compatibility (EMC), standard for radio equipment and services

Büren a.A., den 7.3.2023

Daniel Hug
CTO

Roman Siegfried
COO