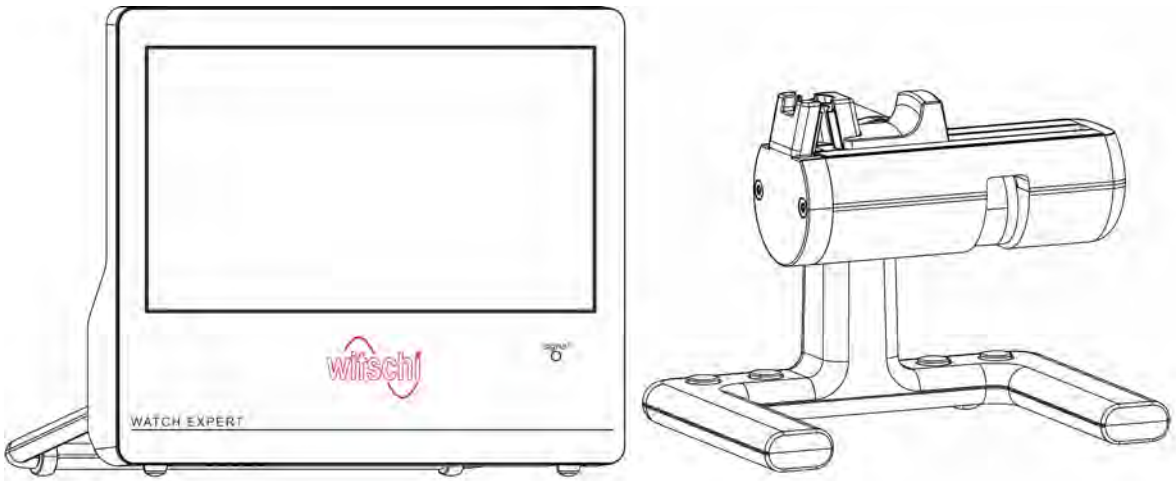
Operating instructions

Precision measuring device
Watch Expert



witschi

Read the instructions prior to performing any task!

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Translation of the original operating instructions
Wits-35286-CH, 3, en_GB

About this manual

This manual enables safe and efficient handling of the precision measuring device (hereafter referred to as the “device” or “Watch Expert”). The manual 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 manual before starting work. The basic prerequisite for safe work is compliance with all the safety, warning and procedural instructions specified in this manual.

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

Illustrations in this manual 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 of 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 Watch Expert

Overview

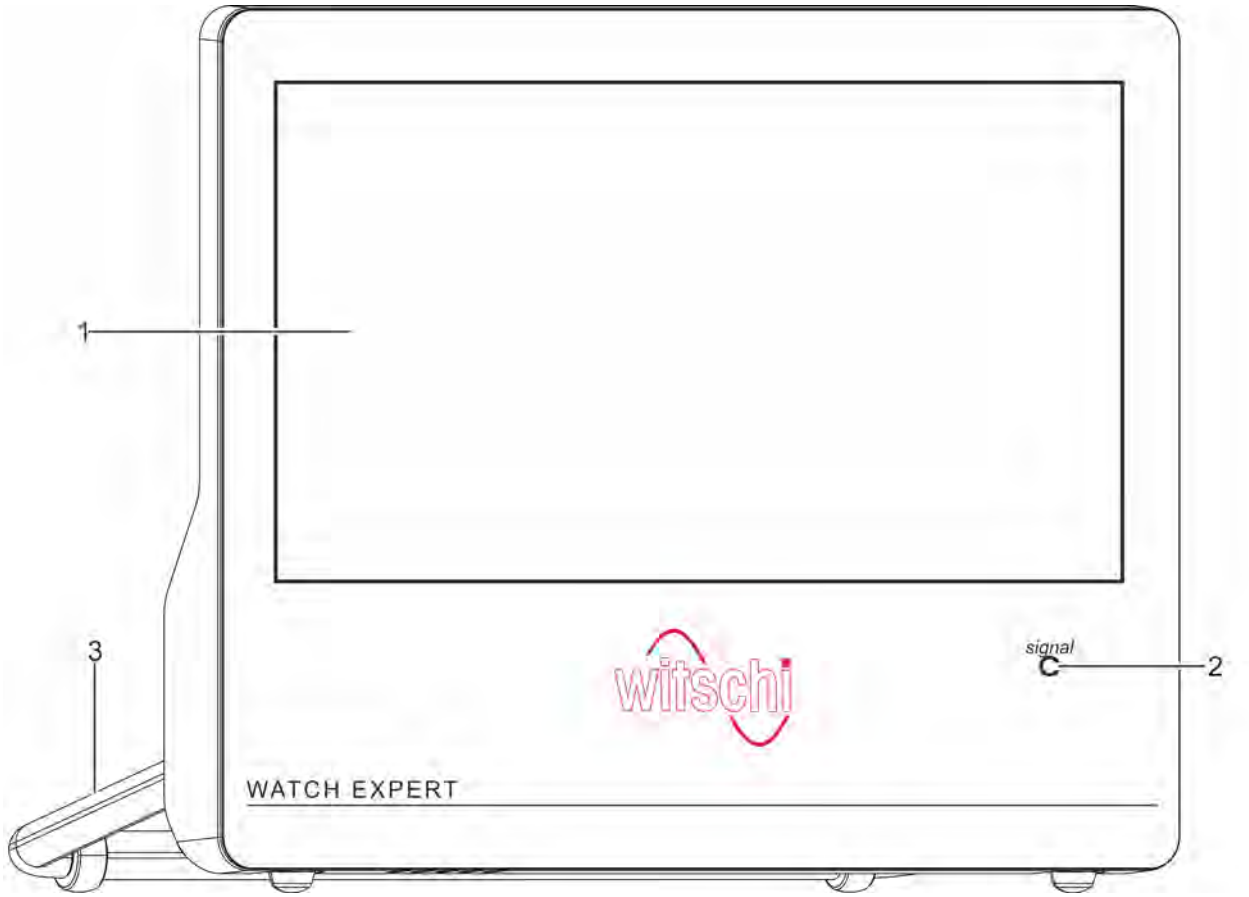


Fig. 1: Watch Expert

No.	Designation	Function
1	Touchscreen	■ Displays for the numerical test results ■ Displays for the graphical test results ■ Displays for test progress ■ Navigating through the menus ■ Changing parameters
2	*[Signal]* LED display	■ LED flashes to the rhythm of the escapement noises.
3	Stand	Adjustable stand for the Watch Expert (can be set to 6 inclination angles)

Description

The Watch Expert is a precision measuring device for determining the accuracy of mechanical watches.

The choice of parameters can be adjusted to suit the given requirements.

The Watch Expert automatically calculates measured values for rate deviation, amplitude and beat errors, and displays them numerically.

With the aid of 4 different test modes, mechanical watches with the following escapement types can be measured:

- Anchor escapement
- Duplex escapement
- Cylinder escapement
- Chronometer escapement
- Co-axial escapement
- AP escapement

in addition to watches with unusual beat noise.

The typical beat numbers of all common watches are recognised automatically by the Watch Expert. Alternatively, the beat number can be entered manually.

In addition to the *"Diagram display mode"*, which shows the measurement in the form of a diagram, the Watch Expert also features the *"VARIO display mode"*, which shows rate accuracy and amplitude measurements and displays the smallest, largest and resulting mean values, in each case.

With the aid of the pivoting microphone, a watch can be measured in 12 different test position.

The switching screw on the rear side of the microphone ensures a stable handling position for left and right-handed users.

Bluetooth functionality allows the device to be connected to a suitable printer so the measured results can be printed out. Bluetooth functionality is possible using an optional dongle. Otherwise the connection is via the serial interface.

Connections and interfaces

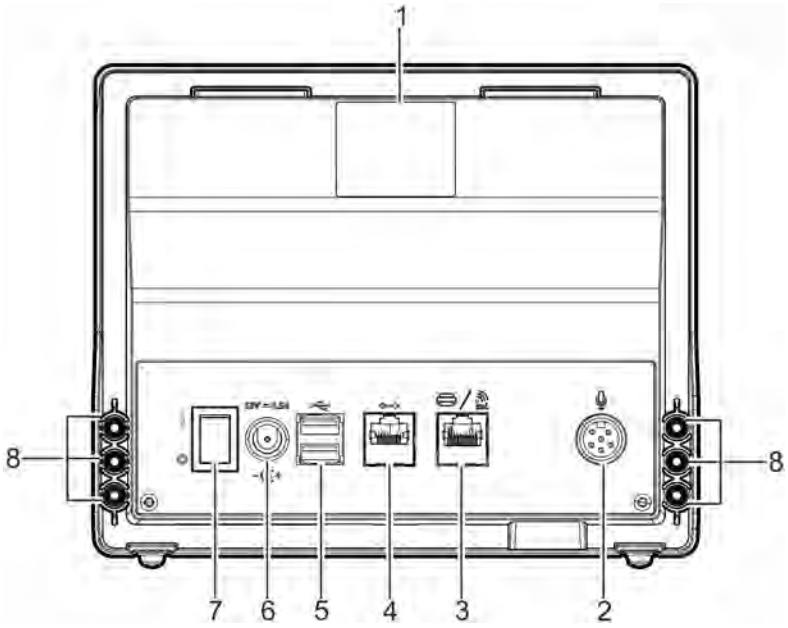


Fig. 2: Rear

No.	Designation	Function
1	Rating plate	Identifying the device *page 20*
2	Microphone socket	Connection socket for the microphone
3	Printer port (RS232)/connection for calibration	■ Connection for the thermal printer
4	Ethernet interface	Connection for future applications
5	2x USB connections	Connections for USB sticks
6	Power supply	Connection socket for the power supply unit
7	*[I/O]* switch	Switches the Watch Expert on/off
8	Openings for the stand	Openings for inserting the stand, in 6 different positions

1.2 Microphone

Microphone

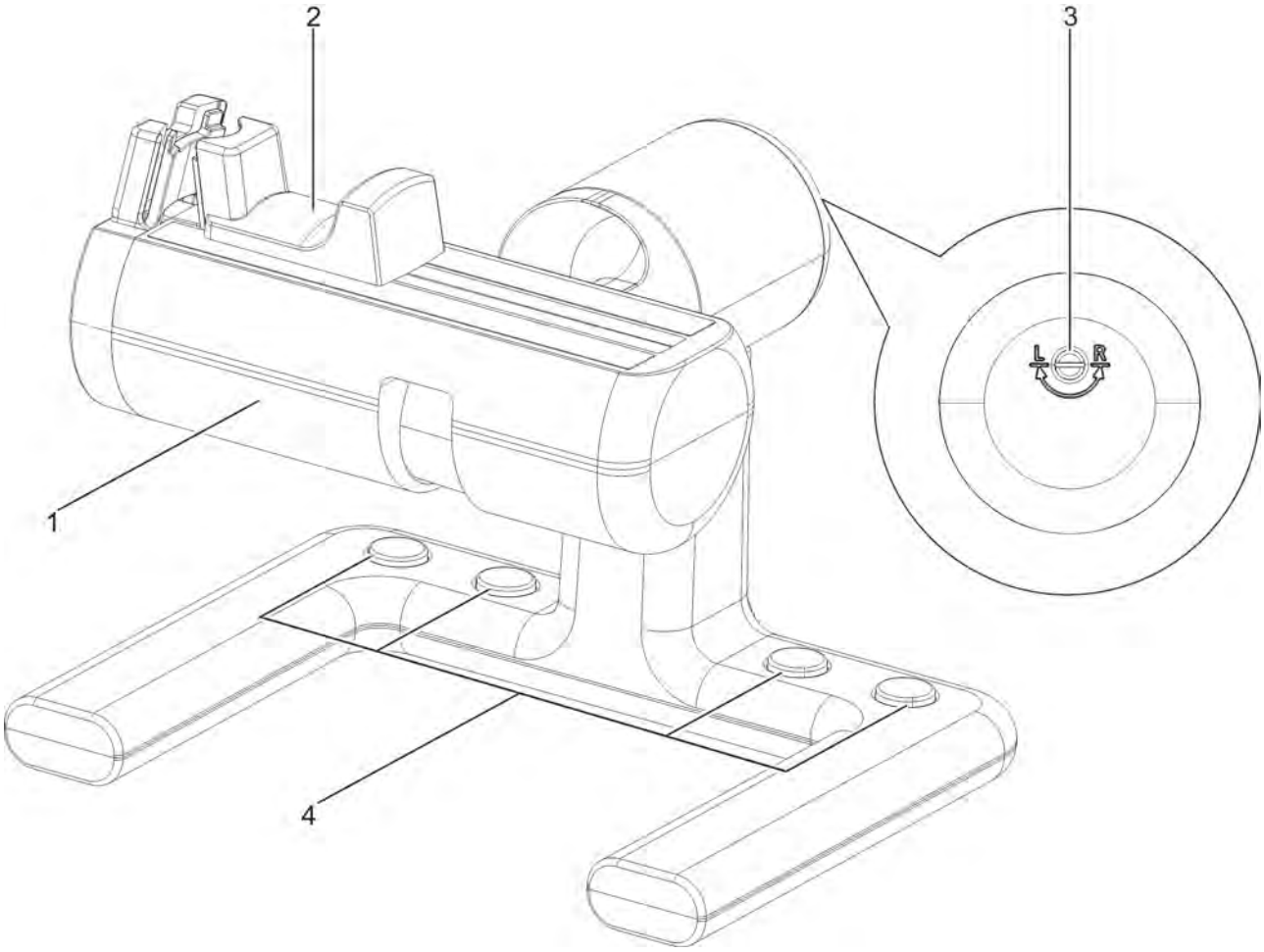


Fig. 3: Microphone

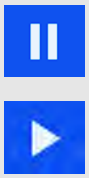
1 Pivoting microphone
2 Clamping jaws
3 Switching screw for left/right-handed user adjustment
4 Programmable keys

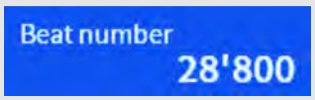
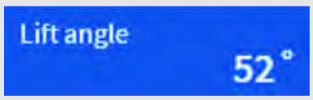
The pivoting microphone (Fig. 3/1) provides 12 different test positions for measuring mechanical watches. The neoprene clamping jaw (Fig. 3/2) can be adjusted in accordance with the size of the watch. To ensure a stable hand resting position, the microphone can be adjusted for left/right-hand users with the aid of the switching screw (Fig. 3/3). The freely programmable keys (Fig. 3/4) are used to navigate through the menu. Alternatively, the keys can be assigned an individual function.

1.3 User interface

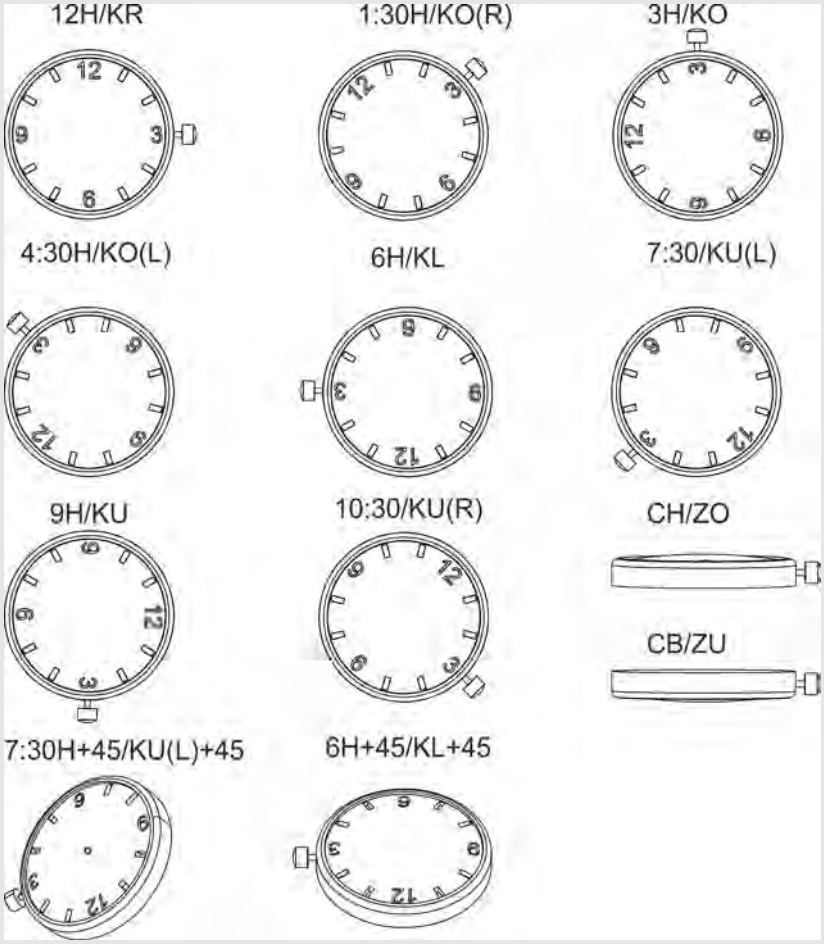
Quick guide to the user interface

The symbols and touch buttons on the software user interface have the following functions:

Symbol	Function
	Starting/pausing the measuring procedure.
	Deleting the current measured values and restarting the measuring procedure.
	Automatic recognition/manual control of the signal strength.
	Switching the integrated speaker on/off.
	Generating screenshots of the current view, where a USB stick is connected.
	Sending the measuring results to a connected printer and printing them out.
	1x, 2x, 4x, 8x and 16x enlargement of the diagram.
	Adjustment of the integration time.
	Opening the settings menu.
	Opening the keypad for manual parameter entry.

Touch button	Function
	Provides 3 different options for setting the beat number: ■ **Automatic**: The beat number is recognised automatically. ■ **Manual**: The beat number (value between 3,600 b/h and 86,400 b/h) can be entered manually. ■ **Frequency:** The beat number is calculated automatically to obtain a rate deviation of 0 s/d.
	Provides the option of entering the beat time (value between 3,600 b/h and 86,400 b/h) manually.
	Provides the option of manually selecting/entering the lift angle (value between 10° and 90°).
	Provides 4 different option for setting the test mode: ■ **Standard:** Mode for watches with Swiss anchor escapement. To determine the amplitude of the watch, the lift angle must be specified. ■ **Rate:** Mode for rate measurement of watches with cylinder, duplex or chronometer escapement, in addition to watches with unusual beat noise. ■ **Special 1 (co-axial):**: Mode for watches with co-axial escapement. ■ **Special 2 (AP):** Mode for watches with AP escapement.

Display element	Function
	Shows the rate deviation in s/d.
	Shows the amplitude in °.
	Shows the beat error (repère) in ms. If the zero-crossing is reached during calibration (fine-tuning) the Δ symbol appears in addition to the beat error, e.g. Δ 0.9 ms.
	Shows the currently-set test position of the watch. The flashing bars indicate that measured results are being received.

Display element	Function
	Position window for the 6 main test positions. Shows, in diagram display mode, which test position is currently being measured. The following 12 test positions (designation of the main test position as per NIHS 95-10/ISO 3158) are possible: 

Selected parameters

The selected parameters are shown in green in the main display and in the settings menu.

1.4 Modes

Overview of test modes

The Watch Expert provides 4 test modes that can be set in accordance with the escapement type of the watch to be tested.

Test mode	Additional information
Standard	Mode for watches with Swiss anchor escapement. To determine the amplitude of the watch, the lift angle must be set.
Rate	Mode for rate measurement of watches with cylinder, duplex or chronometer escapement, in addition to watches with unusual beat noise.
Special 1 (co-axial)	Mode for watches with co-axial escapement.
Special 2 (AP)	Mode for watches with AP escapement.

Determining the escapement type

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

Overview of display modes

The Watch Expert provides two different display modes in which various parameters are measured and displayed.

Appearance	Function
Diagram 	■ Shows the rate deviation, the beat error and the amplitude. ■ During the measuring procedure, the measured values are displayed as a diagram. ■ It is possible to configure the diagram view. ■ The 6 position windows show the diagram as it relates to the respective measuring position. ■ If the measuring procedure has stopped, the measured values and the diagram can be shown in the large display by tapping the small position windows.
VARIO 	Visualises the rate stability and amplitude over a longer period. During the measuring procedure, the current measured values, including the mean, are shown over the entire measuring period, in addition to the minimum and maximum rate and amplitude values.

1.5 Scope of delivery and accessories

1.5.1 Scope of delivery

Fig. 4: Scope of delivery

No.	Designation	Function	For details, see:
1	Watch Expert		
2	Pilot microphone	For signal transmission to the Watch Expert	*page 9*
3	Power supply unit (12 V DC, 1.5 A)	Connection to electricity supply	*page 15*
4	Dust cover	Protects the Watch Expert against build-up of dust	*page 16*
5	Stand	For supporting the Watch Expert with 6 different inclination angles.	*page 17*

Not shown in Fig. 4 but included in the scope of delivery:

- 1x manual
- 1x calibration certificate
- 1x warranty information

Power supply unit

Fig. 5: Power supply unit

The power supply unit (Fig. 5) is used to connect the Watch Expert to the power supply.

Input values	■ 100 – 240 V AC (independent of the local mains voltage) ■ 50 – 60 Hz ■ 18 VA
Output values	■ 12 V DC ■ 1.5 A

Dust cover

Fig. 6: Dust cover

The dust cover (Fig. 6) protects the Watch Expert against build-up of dust when it is not being used.

Stand

Fig. 7: Stand

Using the stand (Fig. 7), the Watch Expert can be positioned at 6 different angles.

Ordering contact

To order accessories or spare parts, contact your point of sale (page 3).

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

1.5.2 Optional accessories

Printing

Item	Item number
Thermal printer	JB01-SLK-TE25-S
Thermal paper, roll for 740RS232	JB01-MM60-740RS
Bluetooth kit	95.1510
Bluetooth dongle	JB15-BT900-US
Bluetooth module	JB01-BT Module SLK-TE25

Sensor

Item	Item number
Optoelectronic sensor for pendulum timepieces	13.1620
Stand for optoelectronic sensor	13.16.201

GPS receiver

Item	Item number
Witschi GPS receiver	19.91PK1 (230 V~) 19.91PK2 (120 V~)

1.6 Technical data

Configuration

Device	Type no.	Notes
Watch Expert measuring device	11.2710	
Pilot microphone signal sensor	13.1310	
Portable power supply	JA01-GT-41082-1812	Portable power supply, 100 – 240 V AC, 12 V DC, 18 W

Power supply

Parameters	Nominal value	Range	Note
Nominal voltage	230 V AC	100– 240 V	
Mains frequency	50 / 60 Hz	45 – 65 Hz	
Power consumption in operation	8 W		
Standby with screen saver	4 W		
Minimum warm-up period for measure-ment	none		
Minimum warm-up period for adjustment	10 min		No warm-up period from standby onwards

Measuring parameters

Function	Measuring range	Resolution	Accuracy	Notes
Time base in temperature range 10 – 50 ° C			±0.08 s/d	TCXO
Time base, 1st year			±0.03 s/d	
Measurement of mechanical watches				
Accuracy	±999 s/d	0.1	±0.1 s/d	
Beat error (repère)	9.9 ms	0.1 ms	±0.1 ms	
Amplitude	70° - 360°	1°	±0.4°	If the lift angle is incorrect, the amplitude value may exceed 360°.

Communication interfaces

Designation	Purpose	Protocol	Data rate	Notes
USB	Parameterisation, Print Screen Print via Bluetooth			
Ethernet				for future applications
Printer / calibration	Calibration	PPS	1 pps ±90 ns	Witschi CTB /GPS receiver
Printer	Sewoo printer MARTEL printer	MARTEL	19200/8/none/1	Item no. JB01-SLK-TE25-S Item no. JB01-740RS232

Dimensions and weight

Data	Value	Unit
Weight (including pilot microphone and mains adapter)	1.7	kg
Width	197	mm
Height	164	mm
Depth	130	mm

Mains supply connection values

Data	Value	Unit
Mains voltage	100 – 240	V AC
Mains frequency	50 – 60	Hz
Power consumption in operation	8	W

Power supply unit output values

Data	Value	Unit
Voltage	12	V DC
Current consumption, maximum	1.5	A
Power consumption, maximum	18	W

Operating conditions

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

Watch Expert rating plate

Fig. 8: Watch Expert rating plate

The Watch Expert's rating plate is located on the rear side of the device and contains the following information:

- Manufacturer
- Device designation
- Type
- Serial number
- Year of manufacture

Power supply unit rating plate

Fig. 9: Power supply unit rating plate

The power supply unit's rating plate contains the following information:

- Manufacturer
- Type
- Specification

2 Safety

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

2.1 Symbols in this manual

Safety indications and warnings

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

CAUTION!
This combination of symbol and signal word indicates a potentially hazardous situation that can entail minor injury if not avoided.

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.

Warnings in instructions

Warnings may relate to specific, individual instructions. Warnings of this kind are embedded in the instruction so that they do not distract the reader's attention while performing the action in question. The signal words described above are used.

Example:

1. Loosen screw.
2. 

   CAUTION!
   Risk of pinching on the cover!

   Close the cover carefully.
3. Tighten screw.

Tips and recommendations

This symbol draws 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 manual 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 manual and other applicable documents
■	Lists without a fixed order
[Pushbutton]	Control elements (e.g. buttons, switches), display elements (e.g. signal lamps)
“Touch button”	Screen elements (e.g. names of windows, touch buttons)

2.2 Intended use

The Watch Expert precision measuring device is intended solely for measuring mechanical watches with the aid of a microphone to determine rate deviation, amplitude and beat errors (repère).

With the aid of the clamping jaws on the microphone, the Watch Expert is capable of testing mechanical wrist watches of all sizes.

The intended use includes compliance with all the information in this manual.

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

NOTICE!

Danger in the event of misuse!

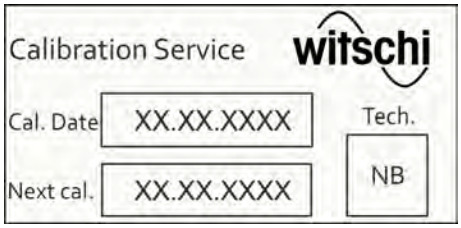
Misuse of the Watch Expert can lead to material damage.

- Never clamp any objects other than watches against the microphone.
- Only operate the device on a stable and horizontal surface.
- Never set up or operate the Watch Expert in an explosive atmosphere.
- Do not expose the device to direct sunlight or extreme temperatures.
- Set up the device in a low-noise environment in order to avoid distortion of the measured values.

2.3 Labels on the device

The following labels can be found on the device.

Calibration instruction



The calibration instruction on the underside of the device shows when the device needs to be recalibrated. To ensure reliable measuring results, we recommend observing the proposed date for the next calibration.

Electrical and electronic components

Electrical and electronic components in the device contain toxic substances. The device must therefore be handed over to a municipal collection point for disposal or be disposed of by a specialist.

2.3.1 Labels on the power supply unit

The following labels can be found on the power supply unit.

Electrical and electronic components

The power supply unit must not be disposed of as household waste, it must be handed over to a municipal collection point or be disposed of by a specialist.

2.3.2 Risk of material damage

Short-circuit

NOTICE!

Material damage due to short-circuit!

Damage to the insulation on the power supply unit cable or the power supply unit can result in a short-circuit and damage to the Watch Expert.

- Only allow customer service to perform work on the Watch Expert's electronics.
- If the power supply unit cable or power supply unit are damaged, disconnect the power supply unit plug and have the unit repaired.
- Route the power supply unit cable so that it cannot be damaged by external influences.
- Before any cleaning, maintenance or trouble-shooting work, disconnect the power supply unit plug.
- When disconnecting the power supply unit, only pull on the plug itself, never pull on the cable.
- Always keep access to the power socket clear.
- Keep moisture away from live parts. Moisture can result in short-circuits.
- Never immerse the device in water.

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.

- Never open the device housing yourself.
- In the event of malfunctions or problems that cannot be solved with the help of this manual, contact the manufacturer.

Opening the housing results in a loss of warranty.

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 manual, 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:

- The owner must learn about the applicable occupational health and safety requirements and perform a risk assessment to identify additional hazards resulting from the specific working conditions at the device's site of operation. The owner shall use this information to create operating instructions for the device.
- Throughout the entire period that the device is in operation, the owner shall check that the operating instructions created 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 manual. In addition, the owner shall train personnel at regular intervals and inform them of potential risks.
- The owner shall ensure that the service intervals described in this manual are complied with.
- The owner shall ensure that the service intervals for the components are complied with.

2.5 Personnel qualifications

This manual stipulates the following qualifications for the operator:

Customer service
Certain work may only be performed by Customer Service. Customer Service has 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 manual and the owner has specifically entrusted the operator with such tasks.

3 Storing the Watch Expert

3.1 Delivery and storage

Improper transport

CAUTION!

Risk of injury and material damage due to improper transport!

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

- Always transport packages upright and never throw them.
- Only remove packaging immediately before first use.
- Only transport the device when it is shut down (*page 69*).
- Always use both hands when transporting the device.

3.2 Delivery

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

3.3 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:

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

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

3.4 Storage

Store the device and packages under the following conditions:

- Watch Expert is shut down (*page 69*).
- Do not store outdoors.
- Store in a dry and dust-free condition.
- Do not expose to any aggressive media.
- Protect against sunlight.
- Avoid mechanical shocks.
- Do not place anything on top of the device packaging.
- Storage temperature: -20 °C – +70 °C
- Relative humidity: 10 % – 80 %, no condensation.

4 Commissioning the Watch Expert

4.1 Setting the inclination of the device

The inclination of the display unit can be adjusted to the requirements and lighting conditions of the workplace.

Different inclinations can be set by inserting the adjustment stand on the reverse side into the intended openings at different heights. The stand can be rotated 180° to allow the display unit to be set up with 6 possible inclinations.

4.2 Requirements for location

Distortion of results

NOTICE!

An unsuitable location may distort test results!

To achieve precise test results, the following requirements must be fulfilled:

- Do not position the Watch Expert and test object in the vicinity of radiators or open windows.
- Do not place the Watch Expert and test object in direct sunlight.
- Operate the Watch Expert on a level, horizontal surface.
- Set up the Watch Expert in a low-noise environment.

4.3 Connecting the power supply unit

Use of a suitable power supply unit

NOTICE!

Risk of material damage if an unsuitable power supply unit is used!

Using an unsuitable or damaged power supply unit can result in a short-circuit. This can damage the device.

– Only use the power supply unit provided.
– Route the power supply unit cable so that it cannot be damaged by external influences.

Personnel: ■ Operator

Checking the mains voltage

1. Make sure that the local mains voltage is appropriate for the power supply unit.

Input values	■ 100 – 240 V AC ■ 50 – 60 Hz ■ 18 VA

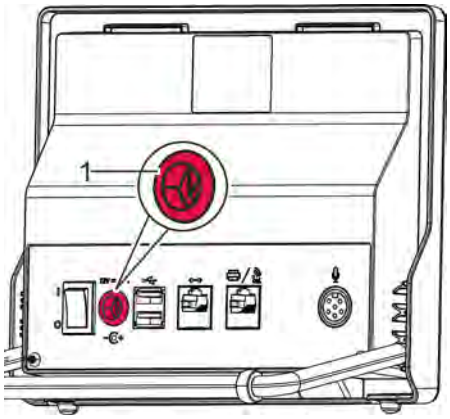


Fig. 10: Mains connection

2. Insert the power supply unit adapter into the mains connection (Fig. 10/1).
3. Connect the power supply unit to the local mains supply.

⇨ The power supply is now connected.

4.4 Connecting the microphone

Use of a suitable microphone

NOTICE!

Risk of material damage if an unsuitable microphone is used!

Using an unsuitable or damaged microphone can result in a short-circuit. This can damage the device.

– Only use the supplied microphone.
– Place the microphone on an even surface.

Personnel: ■ Operator

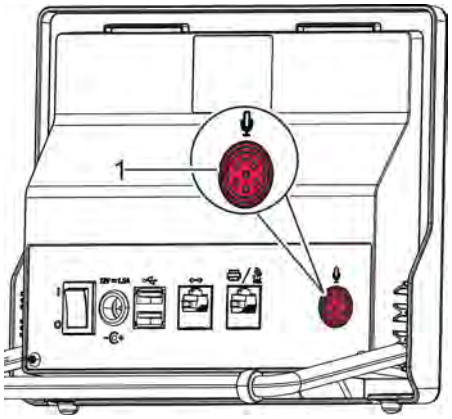


Fig. 11: Microphone socket

→ Insert the microphone cable into the microphone socket (Fig. 11/1).

Observe the correct alignment of the microphone cable

When connecting the microphone cable, observe the notch on the socket and align the cable accordingly. Connect the cable carefully and do not use force!

⇨ The microphone is connected to the Watch Expert.

4.5 Connecting the printer

Thermal printer

The thermal printer is used to print out test results. The thermal printer is connected to the Watch Expert via the printer port (*page 34*).

The test results can be printed out in the following ways:

■ Connect the Witschi thermal printer directly to the Watch Expert and begin using it.

Only perform the following steps if you wish to use a thermal printer.

Personnel: ■ Operator

Materials: ■ Printer cable

1. Connect the printer cable to the thermal printer.
2. Insert the printer cable into the printer port (Fig. 12/1).
   ⇨ The thermal printer is now connected.

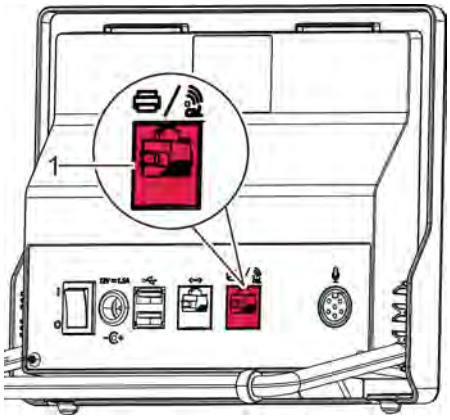


Fig. 12: Printer port

Consult the manufacturer's documentation before using the thermal printer.

Another possibility is to connect the Watch Expert to the printer via a Bluetooth connection using a Bluetooth kit (Type no. 95.1510).

4.6 Switching the Watch Expert on/off

Switching on the Watch Expert

Personnel: ■ Operator

Requirement:

■ The Watch Expert has been commissioned correctly (↳ *page 31*).

Switch on the Watch Expert by setting the *[I/O]* switch (Fig. 13/1) to *[I]*.

⇨ The welcome screen is displayed.

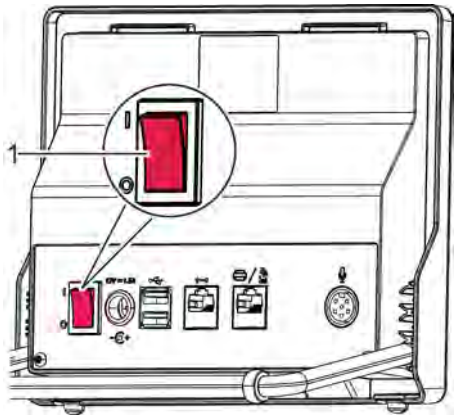


Fig. 13: Switching on the Watch Expert

If the wrong language is set, set the language (↳ page 62).

Switching off the Watch Expert

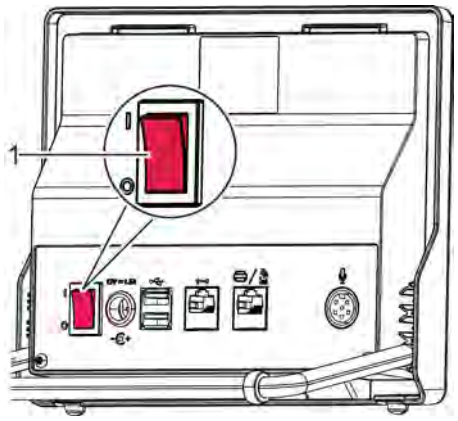


Fig. 14: Switching off the Watch Expert

Personnel: ■ Operator

1. Switch off the Watch Expert by setting the *[I/O]* switch (Fig. 14/1) to *[O]*.
2. Cover the Watch Expert with the dust cover.

If you are not planning to use the Watch Expert for a longer period, shut it down (page 69).

5 Setting measuring parameters

5.1 Setting the beat number

***"Mode"* touch button**

In the main display, using the *"Mode"* touch button, it is possible to determine whether the beat number is to be recognised automatically or entered manually. In *"Frequency"* mode, the beat number of a watch is determined for a rate deviation of 0 s/d.

→ Press the *"Mode"* touch button.

⇨ A submenu with 3 options is opened.

The following modes are available:

Modus (Mode)	Function
Automatic	The most common beat numbers are pre-programmed into the Watch Expert (between 12,000 b/h and 72,000 b/h), allowing for the beat number to be recognised automatically as soon as the watch is placed against the microphone.
Manually	If the *"Manual"* mode is selected for the beat number, the beat numbers in the range from 3,600 b/h to 86,400 b/h can be selected or entered manually. Information on the beat number to be entered for the test watch can be obtained from the watch manufacturer or downloaded from *http://www.witschi.com/assets/files/sheets/Scope Schlagzahlen def 2-3.pdf*.
Frequency	The Watch Expert determines the beat number to obtain a rate deviation of 0 s/d. Using this function, reference values for measurements and, with that, a reference clock, can be created. The determined beat number can be entered as a manual value for further measurements.

Selecting a beat number in accordance with the watch manufacturer's specifications

To find out the beat number to be entered for the test watch, contact the watch manufacturer. Otherwise, a manufacturer list with parameter data can be downloaded from http://www.witschi.com/assets/files/sheets/Scope Schlagzahlen def 2-3.pdf.

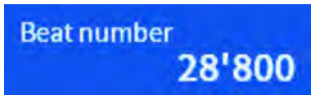
Selecting a beat number manually

As an alternative to automatic recognition, the beat number can also be selected manually from the touch button selection list.

Requirement:

- The *“Manual”* mode is set.

> ***Adding a beat number to the selection list***
> *Under “Settings > Parameters > Beat number”, it is possible to set the beat numbers that are shown in the main display under the “Beat number” touch button. Beat numbers between 3,600 b/h and 86,400 b/h) can be selected.*



1. Press the *“Beat number”* touch button.
   ⇨ A selection list of the available beat numbers is shown.

Fig. 15: Selecting a beat number manually

2. Select the desired beat number from the list in accordance with the watch manufacturer’s specifications.
   ⇨ The selected beat number is highlighted green. The selection window is closed.

Entering a beat number manually

1. Press the *“123”* touch button.
   ⇨ A keypad appears.

Fig. 16: Entering a beat number manually

2. Enter the desired beat number in accordance with the watch manufacturer's specifications.
3. Confirm by pressing the *"Enter"* touch button.
   ⇨ Measurements will then be carried out using the set beat number.

5.2 Setting the lift angle

Setting the lift angle

The *"Lift angle"* touch button provides a list of options for setting the lift angle for escapement. The amplitude is calculated with the aid of the lift angle and can be set in accordance with the watch caliber.

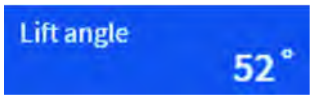
Selecting the lift angle in accordance with the clockwork manufacturer's specifications

Incorrect setting of the lift angle leads to an incorrect amplitude value. To find out which lift angle should be entered for the watch that is to be tested, contact the clockwork manufacturer. Otherwise, a manufacturer list with parameter data can be downloaded from the Witschi website at: www.witschi.com/de/service/downloads/technische-infos.html.

Adding a lift angle to the selection list

Under "Settings > Parameters > Lift angle", it is possible to set the lift angles that are shown in the main display under the "Lift angle" touch button. Lifting angles between 10° and 90° can be selected.

Selecting a lift angle manually



1. Press the *"Lift angle"* touch button.
   ⇨ A list of the selected lift angles is shown, along with the keypad symbol.

Fig. 17: Selecting a lift angle manually

2. Select the desired lift angle in accordance with the watch manufacturer's specifications.
   ⇨ The selected lift angle is highlighted green.

Entering a lift angle manually

1. Press the *"123"* touch button.
   ⇨ A keypad appears.
2. Enter the desired lift angle in accordance with the watch manufacturer's specifications.

Entering values with decimal places

It is also possible to enter lift angle values with decimal places.

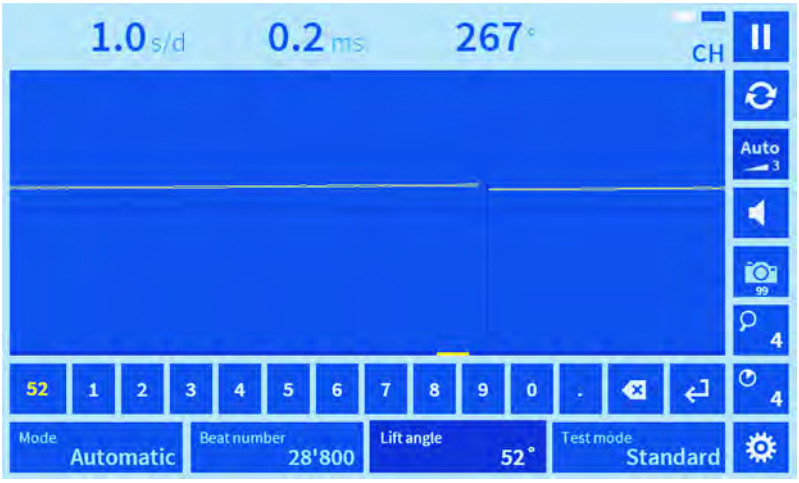


Fig. 18: Entering a lift angle manually

3. Confirm by pressing the *"Enter"* touch button.

⇨ Measurements will then be carried out using the set lift angle.

5.3 Setting test mode

The *"Test mode"* touch button provides a list of options for setting the type of escapement that is to be measured.

1. Press the *"Test mode"* touch button.
   ⇨ A submenu with four options appears (⇳ *page 12*).

Fig. 19: Selecting test mode

2. Select a test mode in accordance with the watch manufacturer's specifications.
   ⇨ The selected program is highlighted green.

Selecting a test mode in accordance with the clockwork manufacturer's specifications

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

5.4 Setting the integration time

The mean values of the measured results are calculated with the aid of the integration time.

The integration time applies both to the Diagram view and the Vario view.

> *Under "Settings > Parameters > Integration time", it is possible to set the integration times that are shown in the main display under the "Integration time" touch button. The following integration times can be selected: 4A, 2 s, 4 s, 6 s, 8 s, 10 s, 20 s, 30 s, 40 s, 60 s.*

1. Press the *"Integration time"* touch button.

⇨ A selection list with the available integration times is shown.

Fig. 20: Selecting an integration time

2. Select the desired integration time.

⇨ The selected integration time is highlighted green. Measured results are calculated and displayed for every four half-vibrations.

> ***Optimised representation of rate and amplitude values***
>
> *To display smaller oscillations in rate and amplitude values in greater detail, we recommend selecting shorter integration times.*

5.5 Zooming in and out of the diagram

In order to better recognise irregularities in the diagram, the zoom function can be used to increase the size of the diagram by up to 16 times. The larger the zoom factor (between 1x and 16x), the greater the distance between the lines of the diagram.

Requirement: The diagram display mode is selected.

1. Press the *"Zoom in"* touch button.

⇨ A selection list is shown.

Fig. 21: Changing the size of the diagram

2. Select the desired zoom factor.

⇨ The selected zoom factor is highlighted green.

5.6 Changing the display mode

The Watch Expert provides two different display modes. Both show the most current measured rate deviation, amplitude and beat error (repère). The display modes differ in the following ways:

- In the diagram display mode, the rate deviation and beat error (repère) are measured and shown in the form of a diagram (↳ *page 13*).
- In the VARIO display mode, rate stability and amplitude are measured over a longer time period. At the same time, the smallest, largest and resulting mean values are shown (↳ *page 13*).

To switch between diagram and VARIO display modes, proceed as follows:

Touch the main display.

⇨ The display mode is changed. The desired display is shown.

6 Performing a measurement

6.1 Positioning the watch and starting a measurement automatically

Positioning the watch in the clamping area

Personnel: ■ Operator

Requirement:

■ The Watch Expert is switch on (*page 34*).

> ***Positioning the watch correctly***
> *If the watch is not positioned correctly, the test results may be distorted.*

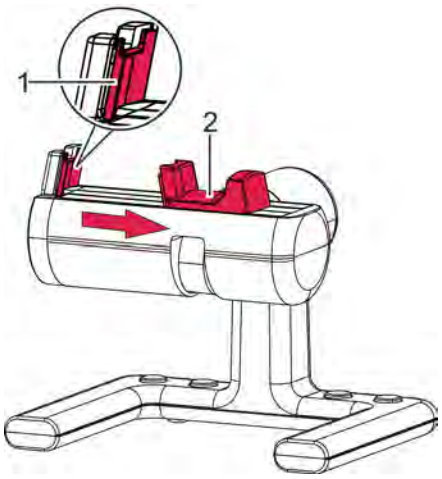


Fig. 22: Microphone clamping jaw

1. Pull the clamping jaw (Fig. 22/2) outwards.

Clamping the entire watch/clock-work

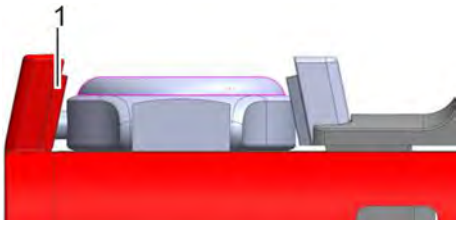


Fig. 23: Entire watch clamped

2. Place the watch onto the clamping area so that the crown of the watch is positioned against the signal sensor (Fig. 22/1). Carefully close the clamping jaw.

⇨ The LED light flashes to the rhythm of the watch beats. The measuring procedure is started.

> *Alternatively, the measurement can be started via the button.*

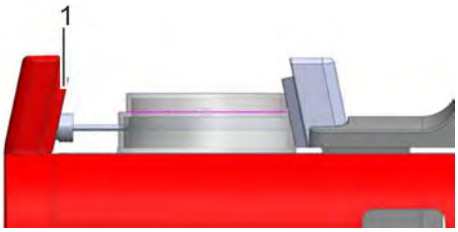


Fig. 24: Clockwork clamped in cup

Clamping clockwork (without a housing)

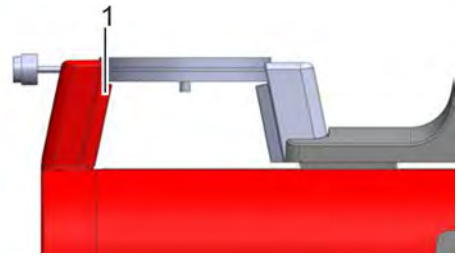


Fig. 25: Crown of clockwork positioned above the signal sensor

3. Place the clockwork onto the clamping area so that the plate is positioned above the signal sensor (Fig. 22/1). Carefully close the clamping jaw.

⇨ The LED light flashes to the rhythm of the watch beats. The measuring procedure is started.

Alternatively, the measurement can be started via the button.

6.2 Monitoring the measured results

Diagram display mode

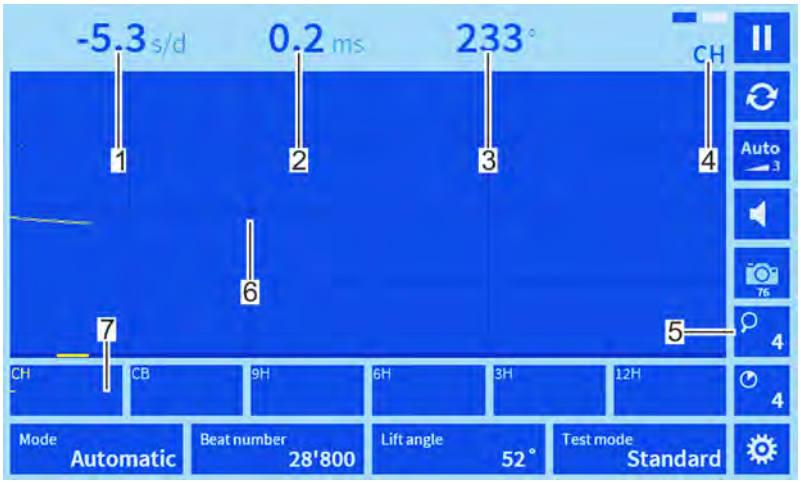


Fig. 26: Diagram display mode

In the diagram display mode, the rate deviation and the beat error (repère) are shown in diagram form (Fig. 26/6).

Rate (Fig. 26/1), beat error (repère) (Fig. 26/2) and amplitude (Fig. 26/3) are illustrated numerically.

The flashing rectangles (Fig. 26/4) show that a measured value is being received. The letters below indicate the test position of the microphone.

In order to better recognise irregularities, the diagram can be enlarged using the zoom function (Fig. 26/5).

The 6 position windows (Fig. 26/7) show the diagram in the respective measuring position. If the measuring procedure is stopped, the measured values and the diagram can be shown in the large display by tapping the small position windows.

Printing measured results/generating screenshots

For the purposes of evaluating the measured values, the current view can be printed or a screenshot can be generated (page 51).

VARIO display mode

Fig. 27: VARIO display mode

In the VARIO display mode, the rate (Fig. 27/1), beat error (repère) (Fig. 27/2) and amplitude (Fig. 27/3) are illustrated numerically.

The flashing rectangles (Fig. 27/4) show that a signal is being received. The elapsed measuring time is displayed underneath (Fig. 27/4).

During the measuring procedure, the smallest, largest and resulting mean measured values are shown for rate stability (Fig. 27/5) and amplitude (Fig. 27/6).

Evaluation of rate quality and amplitude

- *The difference between the smallest and largest rate value (Fig. 27/5) is an indicator for the rate quality of the watch. The smaller the difference, the better the rate stability.*
- *The mean value is an indicator of the comparison quality (control) of the clockwork.*

6.3 Setting the signal strength

Using the *"Signal amplifier"* touch button, the signal strength of the microphone can be set.

If the signal strength is set to *"Auto"*, the Watch Expert automatically recognises and controls the signal for most watches.

If the signal is too weak or too strong, an "unclean" diagram appears in the diagram display mode. In such cases, it is possible to control the signal sensitivity manually.

Automatic recognition of the signal strength

In order to recognise the signal strength automatically, proceed as follows:

1. Press the *"Signal amplifier"* touch button.
   ⇨ A signal controller appears in the main display.
2. Press the *"Auto"* touch button on the signal controller.
   ⇨ The signal strength is recognised automatically.
3. Press the *"Signal amplifier"* touch button.
   ⇨ The signal strength is saved. The signal controller is hidden automatically after approx. 3 seconds.

Setting the signal strength manually

In order to set the signal strength manually, proceed as follows:

1. Press the *"Signal amplifier"* touch button.
   ⇨ A signal controller appears in the main display.

Amplifying the signal

2. To amplify the signal, push the control switch upwards.

> ***Unclean diagram (signal too weak)***
> *If the first signal in the signal package is too weak, proper signal recognition can be made possible by amplifying the signal. However, this increases the sensitivity of the microphone to unwanted background noise.*

Decreasing the signal

3. To decrease the signal strength, push the control switch downwards.

> ***Unclean diagram (signal too strong)***
> *Unclean diagrams can result from unwanted background noise. By reducing the strength of the signal, background noise can be eliminated.*

4. Press the *"Signal amplifier"* touch button.
   ⇨ The signal strength is saved. The signal controller is hidden. The signal controller is hidden automatically after approx. 3 seconds.

6.4 Switching the speaker on/off

The speaker can be switched on and off by pressing the speaker symbol. With the loudspeaker activated, watch irregularities can be heard.

Speaker switched on

1. Press the *"Speaker"* touch button.
   ⇨ The speaker is switched on. The symbol is shown as follows:

Speaker switched off

2. Press the *"Speaker"* touch button.
   ⇨ The speaker is switched off.

6.5 Pausing and resuming the measuring procedure

As soon as the watch is positioned and clamped with the clamping jaw (*page 45*), the measuring procedure starts automatically. Using the pause function, the measuring procedure for the analysis of the determined values can be paused.

Avoidance of background noise
The measuring procedure can be paused to prevent the microphone recording background noise when the test position is changed.

Pausing the measuring procedure

1. Press the *"Play/Pause"* touch button.
   ⇨ The measuring procedure is paused.

Printing measured results
*If the measuring procedure is paused, the current view can be printed (*page 51*).*

Resuming the measuring procedure

2. Press the *"Play/Pause"* touch button.
   ⇨ The measuring procedure is resumed from the same point.

6.6 Printing measured results

For the purposes of printing measured results or generating screenshots, a thermal printer can be connected to the Watch Expert via Bluetooth or a printer cable.

Requirement:

- A printer is connected to the Watch Expert.

Printing measured results

1. Press the *"Play/Pause"* touch button.
   ⇨ The measuring procedure is paused.

2. Press the *"Print"* touch button.
   ⇨ The current display is sent to the printer. The display is printed.

Printing during the measuring procedure

If the "Print" touch button is pressed during the measuring procedure, the currently displayed numerical values for rate, amplitude and beat error are printed.

Editing the header of the printout

Under "Settings > Printer > Printer Line (1-4)" individual lines of header text can be added to the printouts, with 20 characters per line (page 61).

6.7 Generating screenshots

Screenshots of measured results

Using the screenshot function, images of the current view can be generated.

Requirement:

- A USB stick is connected to the Watch Expert

→ Press the *"Print"* touch button.

⇨ A screenshot of the current view is saved to the USB stick.

Accessing screenshots

The generated screenshots are saved to the USB stick in PNG format. To access the screenshots, remove the USB stick from the Watch Expert and connect it to a computer.

6.8 Restarting a measuring procedure

Using the restart function, the determined measured values can be deleted and the measuring procedure can be restarted.

→ Press the *"Restart"* touch button.

⇨ The measuring procedure is restarted. The previously determined measured values are deleted.

7 Configuring the user interface

In the settings menu, you can configure the main display, touch buttons, microphone buttons and printer.

Opening the settings menu

→ Press the *"Settings"* touch button.

⇨ The settings menu is shown.

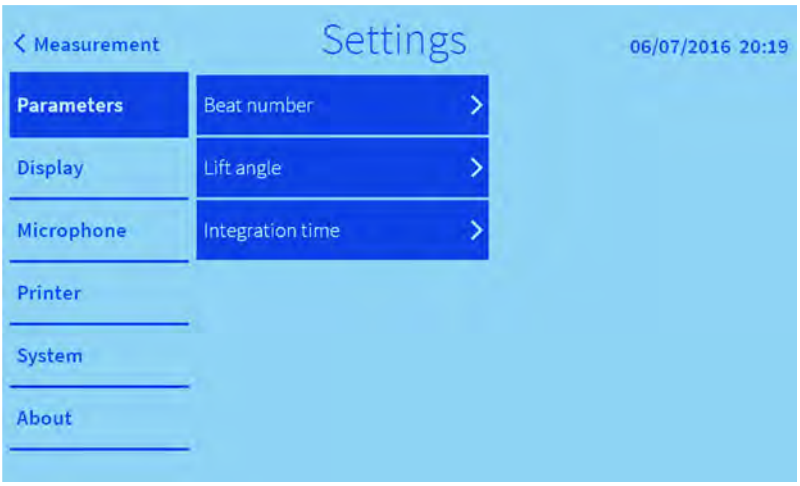


Fig. 28: Settings menu

Exiting the settings menu

→ Press the *"Measurement"* (Fig. 29/1) touch button.

⇨ The settings are saved. The main display is shown.

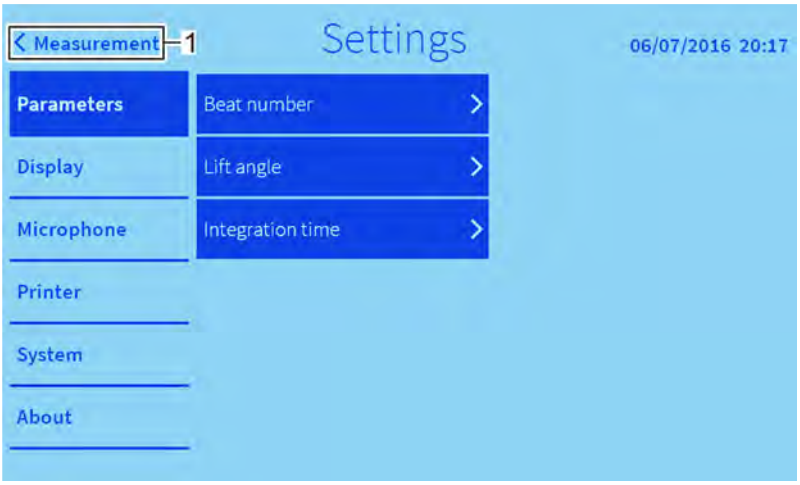


Fig. 29: Exiting the settings menu

Saving settings

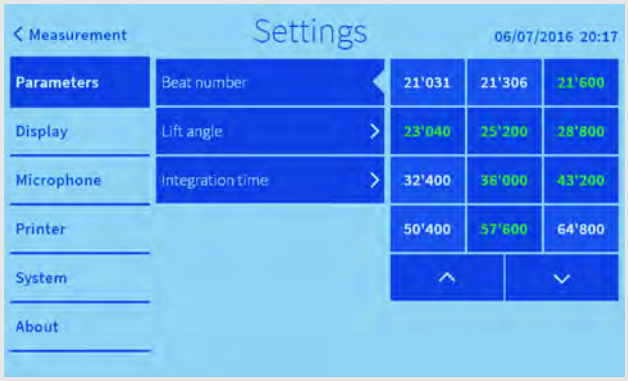
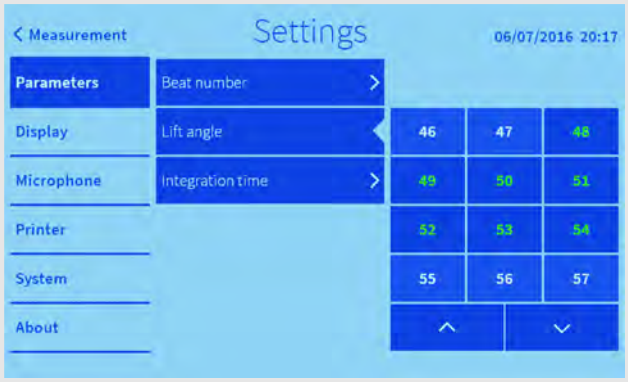
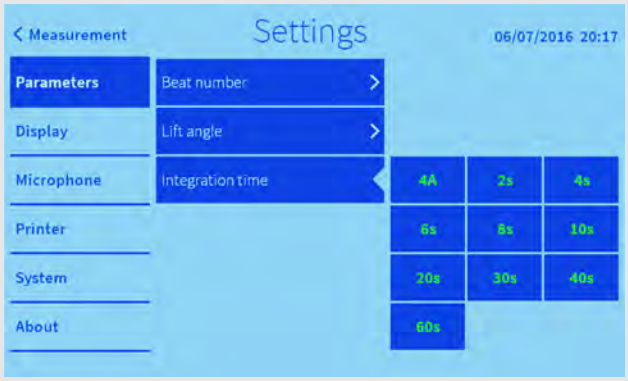
Settings are saved automatically and remain active after a restart.

7.1 Configuring touch buttons

Adding parameters to the selection list

Using the *"Parameters"* tab, it is possible to set which parameters are to be displayed in the selection lists of the touch buttons in the main display.

The following touch buttons can be configured:

Appearance	Additional information
Beat number 	Beat numbers between 3,600 b/h and 86,400 b/h can be added to the touch button selection list.
Lift angle 	Lifting angles between 10° and 90° can be added to the touch button selection list.
Integration time 	The following integration times can be added to the touch button selection list: ■ 4 A ■ 2 s ■ 4 s ■ 6 s ■ 8 s ■ 10 s ■ 20 s ■ 30 s ■ 40 s ■ 60 s

Highlighting parameters
The selected parameters are highlighted green and displayed in the touch button selection lists in the main display.

7.2 Configuring the main display

Customising the appearance of the main display

The main display can be configured using the *"Screen"* tab.

The following settings can be adjusted:

Result order

Fig. 30: Setting the display sequence of the current measured values

Two orders are available:

- Rate deviation/beat error (repère)/amplitude
- Rate deviation/amplitude/beat error (repère)

Positions

Fig. 31: Setting test position designation types

There are two test position designation types available

- CH/CB/9H/6H/3H/12H
- ZO/ZU/KU/KL/KO/KR

Watch position

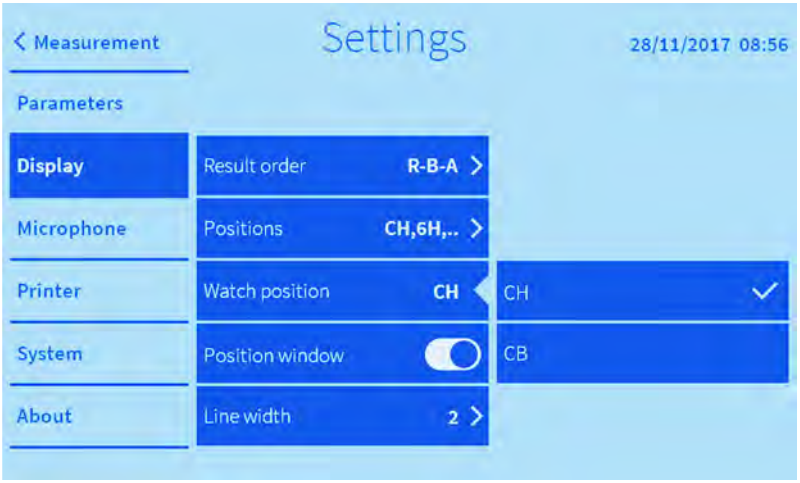


Fig. 32: Setting the watch position

There are two watch positions available:

- CH (Dial side up)
- CB (Dial side down)

This function defines the position in which the watch has been clamped so as to determined the correct positioning of the watch.

Position windows

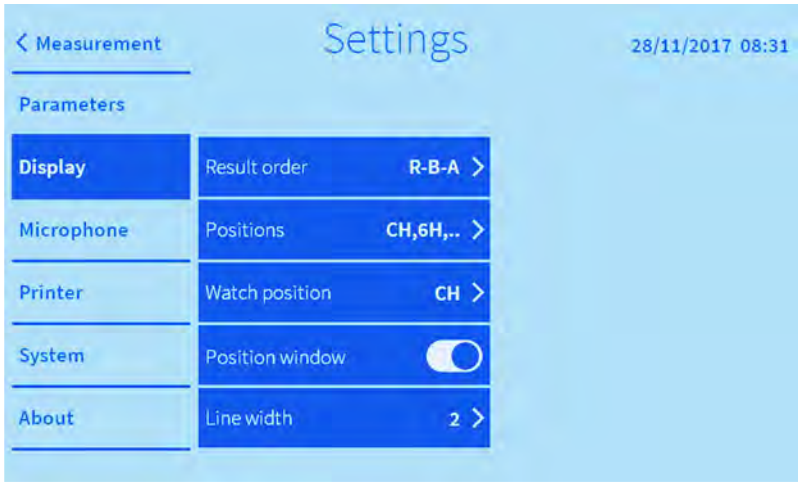


Fig. 33: Hiding/displaying the position windows of the measured test positions in the main display (only in the diagram display mode)

The position windows of the measured test positions can be displayed/hidden in the main display. If the position windows are hidden, the test positions do not appear on the printout.

Line width

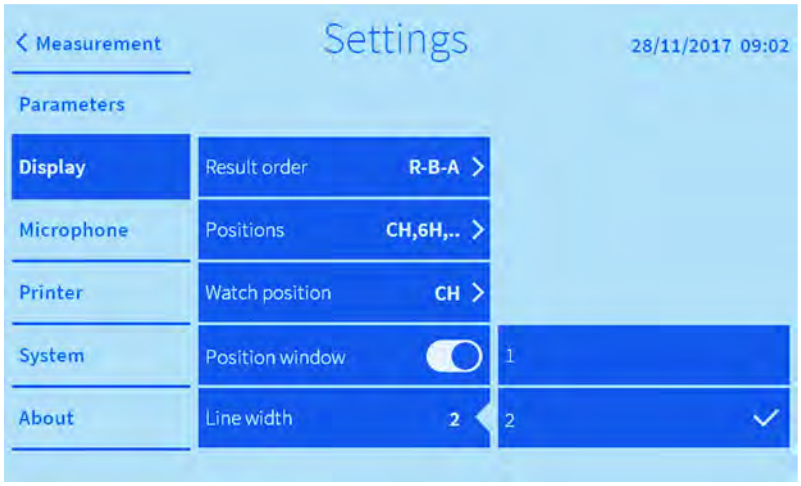


Fig. 34: Determination of line thickness (only in Diagram display mode)

The diagram line is shown with different thicknesses.

7.3 Configuring microphone buttons

Configuring microphone buttons

The following settings are available using the *“Microphone”* tab:

- Use the microphone buttons as navigation buttons in the display mode.
- Assign a function to both left microphone buttons.
- Assign a function to both right microphone buttons.
- Switch off the microphone buttons.

Use as navigation buttons

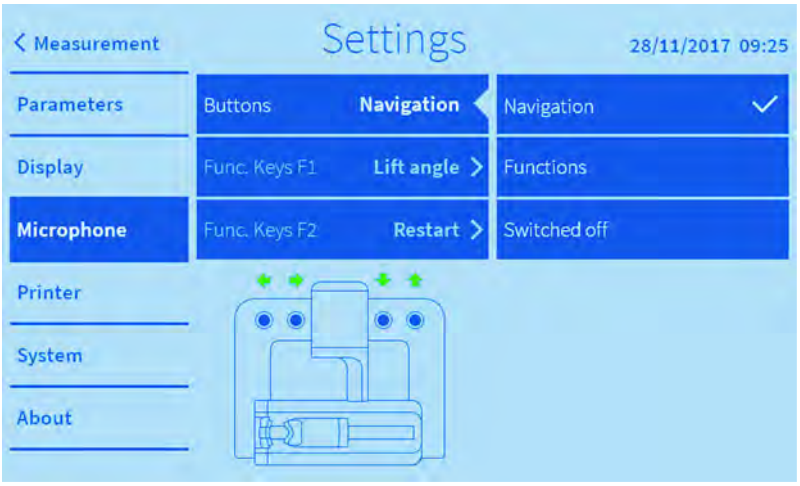


Fig. 35: Setting up navigation buttons

The two microphone buttons on the left can be used in the display mode as arrow buttons (down/left and up/right). The two microphone buttons on the right can be used to change parameters and modes, depending on the touch button in question.

Assigning functions to microphone buttons

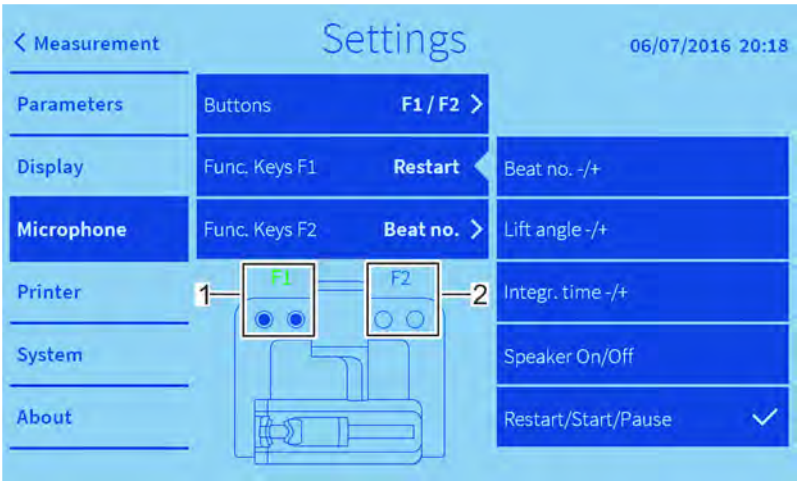


Fig. 36: Assigning functions

The two microphone buttons on the left (1) and two microphone buttons on the right (2) can be assigned fixed functions which can be used to control the touch buttons.

The following functions can be assigned to the microphone buttons:

- Beat no. -/+
- Lift angle -/+
- Integr. time -/+
- Speaker On/Off
- Restart/Start/Pause

Switching off the microphone buttons

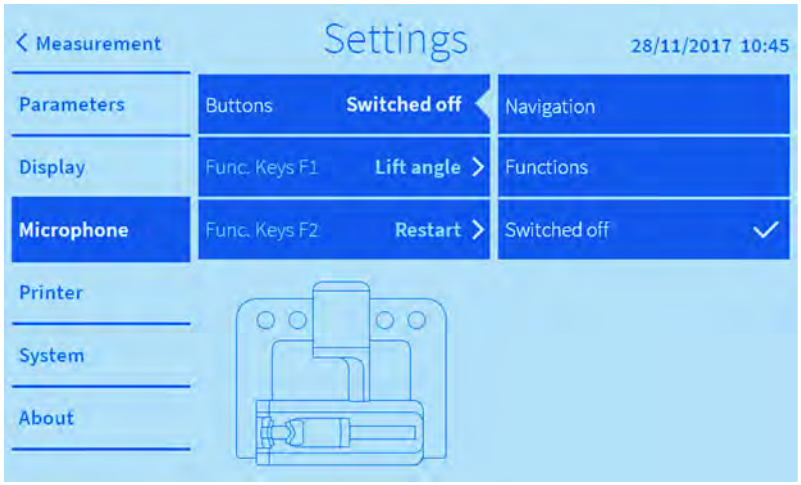


Fig. 37: Switching off the microphone buttons

If the microphone is held by hand during adjustment, then the microphone buttons can be switched off. This prevents unintentional changes to the measurement parameters.

7.4 Configuring a printer

Editing headers for print logs

The printer that is to be used can be selected using the *“Printer”* tab. The printout with the measured results can be assigned a header of up to 4 individual lines of text.

Adjusting printer settings

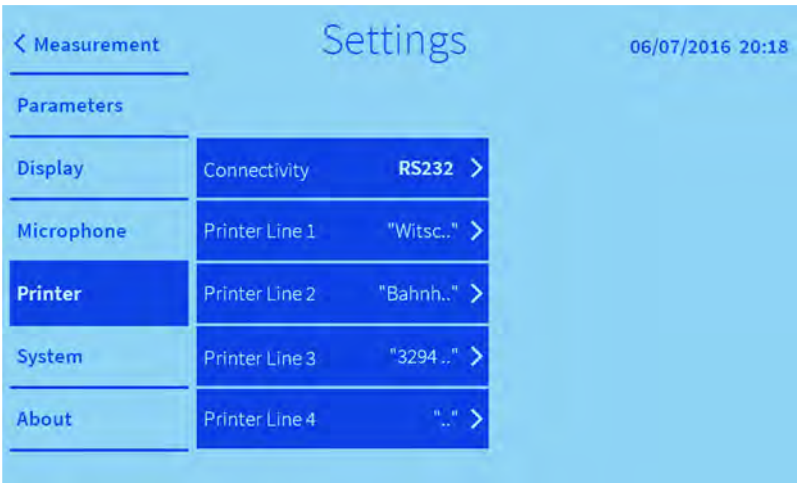


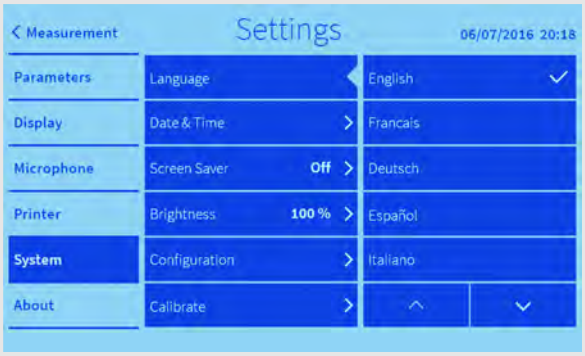
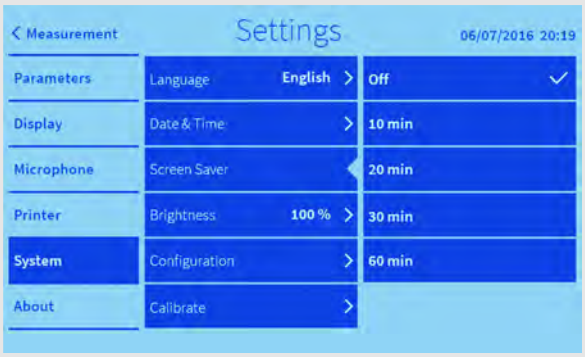
Fig. 38: Printer settings

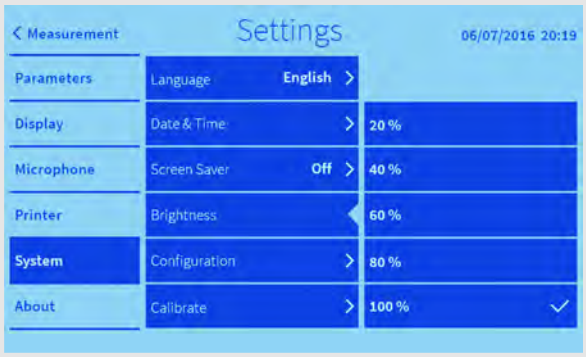
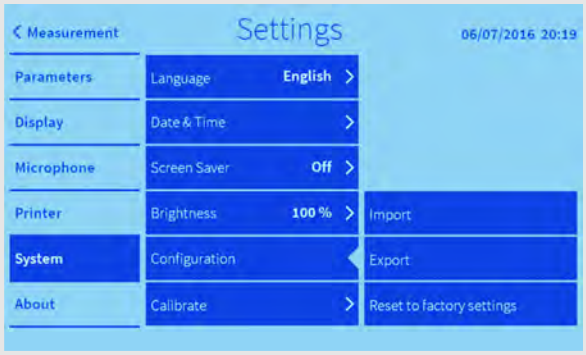
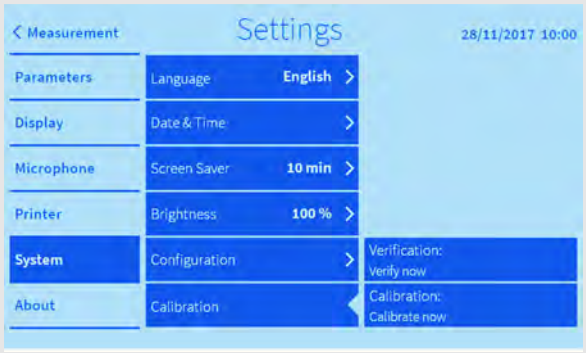
The following settings can be adjusted:

Function	Additional information
Displaying the connected printer.	A printer that is connected to the Watch Expert via the printer port (RS232) is displayed. If a Bluetooth connection is selected, then all Witschi Bluetooth printers within range are listed.
Enter the first line of the printout header.	You can enter up to 20 characters.
Enter the second line of the printout header.	You can enter up to 20 characters.
Enter the third line of the printout header.	You can enter up to 20 characters.
Enter the fourth line of the printout header.	You can enter up to 20 characters.

7.5 Configuring system settings

General system settings The following settings can be adjusted using the *"System"* tab:

Appearance	Additional information
Language 	The following languages are available: ■ German ■ English ■ Spanish ■ French ■ Italian ■ Russian ■ Chinese (simplified) ■ Chinese (traditional)
Date & Time 	The date format is as follows: DD.MM.YYYY The time format is as follows: HH:MM
Screen Saver 	The device can be set to automatically activate the screen saver after 10, 20, 30 or 60 minutes. The screen saver reduces the screen's illumination. To deactivate the screen saver, press the "Off" touch button.

Appearance	Additional information
Brightness 	It is possible to adjust the brightness of the display
Configuration 	Using a USB stick, settings can be imported/exported. The settings can be reset to factory settings.
Calibrate 	Recalibration and testing the Watch Expert. Calibration and testing can only be performed by Customer Service.

7.6 Displaying device information

Device information display

System information

The following information can be called up using the *“Info”* tab:

Fig. 39: Displaying system information

System information	Additional information
Serial number	Shows the serial number of the Watch Expert and the pilot microphone.
Firmware release	Shows the current firmware software version: Release display (GUI) // Measuring module // Microphone
Calibration	Shows the most recent date of calibration

Saving usage data

A wide range of usage data is saved to the Watch Expert (e.g. operating hours, number of printouts etc.). This data is used only for the improvement of our products and is used solely by the Witschi company for internal purposes. No measured results or user data are saved to the device.

8 Servicing the Watch Expert

8.1 Safety during maintenance

Short-circuit

NOTICE!

Material damage due to short-circuit!

Damage to the insulation on the power supply unit cable or the power supply unit can result in a short-circuit and damage to the Watch Expert.

- Only allow customer service to perform work on the Watch Expert's electronics.
- If the power supply unit cable or power supply unit are damaged, disconnect the power supply unit plug and have the unit repaired.
- Route the power supply unit cable so that it cannot be damaged by external influences.
- Before any cleaning, maintenance or trouble-shooting work, disconnect the power supply unit plug.
- When disconnecting the power supply unit, only pull on the plug itself, never pull on the cable.
- Always keep access to the power socket clear.
- Keep moisture away from live parts. Moisture can result in short-circuits.
- Never immerse the device in water.

8.2 Maintenance schedule

Interval	Maintenance work	Personnel
Daily	■ Clean the device with a microfibre cloth. ■ Clean the microphone with a microfibre cloth.	Operator
Calibration as per the calibration instructions on the device	Have the Watch Expert recalibrated. To do so, contact your point of sale (↪ *page 3*).	Customer service

9 Performing firmware update

9.1 Registering Watch Expert

Registering the Watch Expert

To access Witschi Service and the most up-to-date firmware release, register your Watch Expert at the following address:

http://www.witschi.com "Support" "Create account"

After successful registration, the most up-to-date firmware can be accessed under "Firmware" "Product overview".

9.2 Updating firmware

The pilot microphone is connected to the Watch Expert.

1. The file "Update_WE4.zip" is downloaded from the Witschi Support page onto an empty USB stick.
2. Unpack "Update_WE4.zip".
3. Run the file "Update_xxx.exe".
   ⇨ The files and directories are created on the USB stick.
4. Switch off the Watch Expert.
5. Insert the USB stick into the USB port on the reverse side of the Watch Expert.
6. Switch on the Watch Expert.
   ⇨ The boot-up is started. Once the boot-up is complete, the "Update Window" appears
7. To start the update, press the "Update" button. The process lasts approx. 3 minutes.

NOTICE!

Potential damage and loss of data!

Switching off or disconnecting the power supply can cause irreparable damage to the Watch Expert or result in loss of data.

- Never switch off the Watch Expert during an update.
- Never remove the Watch Expert from the power supply during an update.

⇨ The update is started.

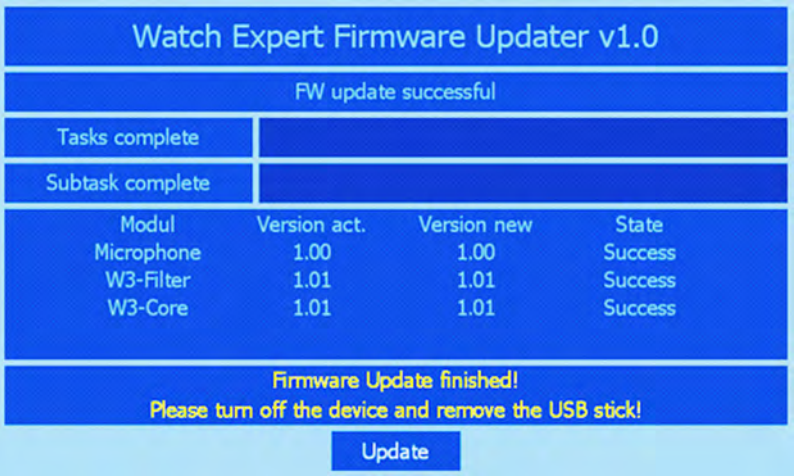


Fig. 40: Firmware update

8. If the update has been completed successfully, the message *"Firmware Update finished!"* appears.

9. Switch off the Watch Expert.

10. Remove the USB stick.

⇨ The update is complete. The most up-to-date firmware is installed.

Checking the firmware

The new firmware versions can be checked under Parameters"Info".

Retention of inventory data

The user parameters and calibration data are not deleted as part of a firmware update.

10 Troubleshooting

10.1 Error messages on the touchscreen

Error messages appear when there is a malfunction in the device. The following table provides information about possible causes of an error message and information about possible remedies.

Display/reaction	Description of error	Cause	Remedy
"No signal"	Measured values are not transferred to the Watch Expert.	■ Watch positioned incorrectly. ■ Watch not wound. ■ Microphone cable not connected.	■ Position the watch or clockwork with its crown against the signal sensor. ■ Wind the watch. ■ Connect the microphone cable.
"Out of range"	Measured values are not transferred to the Watch Expert.	■ Beat number is not set correctly.	■ Set the beat number in accordance with the watch specifications. ■ Set mode to *"Automatic"*.

10.2 Troubleshooting

Description of malfunction	Cause	Remedy
Implausible test result	The watch is not positioned correctly.	Reposition the watch (↬ *page 45*).
Test results are not being printed.	Printer out of paper.	Insert a new roll of paper. See the manufacturer's documentation.
Unclean diagram	Signal is too strong/weak.	Adjust the signal strength using the *"Signal amplifier"* touch button (↬ *page 49*).

11 Shutting down and disposing of the Watch Expert

Shutdown

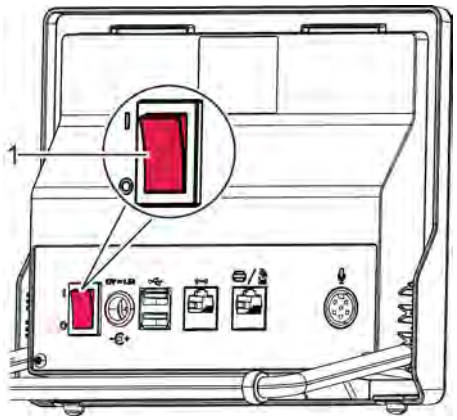


Fig. 41: Pressing the switch

1. Set the switch (Fig. 41/1) to the *[O]* position.

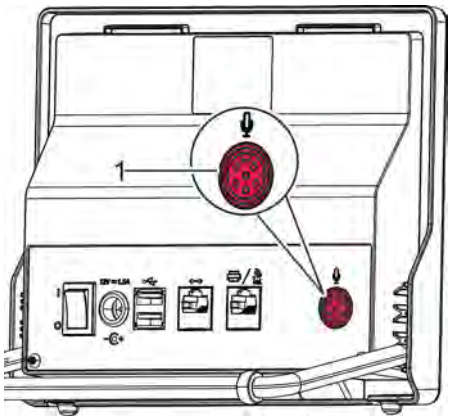


Fig. 42: Removing the microphone cable

2. Remove the microphone cable from the microphone socket (Fig. 42/1).

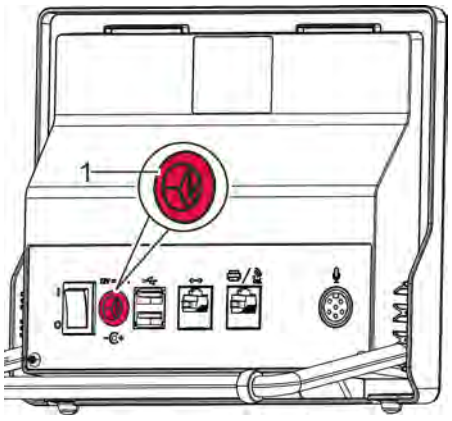


Fig. 43: Removing the power supply unit cable

3. Pull the power supply unit cable from the mains connection (Fig. 43/1).
4. Disconnect the power supply unit plug from the local mains network.

   ⇨ The Watch Expert is shut down.

Disposal

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

ENVIRONMENT!

Incorrect disposal poses an environmental hazard!

Incorrect disposal may result in hazards to the environment.

- 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.

Electrical and electronic components

The device must not be disposed of as household waste, it must be handed over to a municipal collection point or be disposed of by a specialist.

12 Index

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Appendix

A Declaration of conformity

EG-Konformitätserklärung
Déclaration de conformité CE
Declaration of conformity

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:	**Watch Expert (G4) / Pilotmikrofon**
Typ-Nr.:	**11.27 / 13.13**
Fabrikations-Nr. *no. de série* / serial Nr.:	**1 – 10'000**
Funktion *fonction* / function	**Prüfgerät für mechanische Uhren mit Signalaufnehmer** *appareil de test pour montres mécaniques avec capteur acoustique* / test instrument for mechanical watches with acoustic transducer
Baujahr *an* / year:	**2016**
Dok-Verwaltung doc. management	Witschi Electronic AG, Roman Siegfried, Bahnhofstr. 26, CH-3294 Büren a.A.
Zertifiziertes QMS Systèmes de QMS Quality mgt, systems	SQS, ISO 9001:2008, Scope 19 / Reg. Nr. 12228

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/Guidelines

2014/30/EU	☒	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* / EC machinery directive
2011/65/EU	☒	RoHS-Richtlinien / *Directives RoHS* / RoHS Directive

Fachgrundnormen

EN 61000-6-3:2007 +A1:2011	☒	Elektromagnetische Verträglichkeit (EMV), Störaussendung für Wohn- Geschäfts- und Gewerbebereiche sowie Kleinbetriebe
EN 61000-6-4:2007 +A1:2011	☐	Elektromagnetische Verträglichkeit (EMV), Störaussendung für Industriebereiche
EN 61000-6-1:2007	☐	Elektromagnetische Verträglichkeit (EMV), Störfestigkeit für Wohn- Geschäfts- und Gewerbebereiche sowie Kleinbetriebe
EN 61000-6-2:2005	☒	Elektromagnetische Verträglichkeit (EMV), Störfestigkeit für Industriebereiche
EN ISO 12100-2010	☐	Sicherheit von Maschinen

Büren a.A., den 7.7.2016

Daniel Hug
Leiter Entwicklung

Roman Siegfried
Leiter Produktions-Management

Declaration of conformity
Dichiarazione di conformità CE
Declaración de conformidad

EN | IT | ES

We / *La* / Nosotros:
Witschi Electronic AG
Bahnhofstrasse 26
CH-3294 Büren a.A.
Switzerland / Svizzera / Suiza

declare under our sole responsibility that the product
dichiara sotto la sua esclusiva responsabilità che il prodotto
declaramos por responsabilidad propia, que el producto

Name / *nome* / denominación: **Watch Expert (G4) / Pilotmicrophone**

Typ-Nr. / *N. tipo* / N° de tipo: **11.27 / 13.13**

Serial-Nr. / *N. di serie* / N° de fabricación **1 – 10'000**

Function / *funzione* / función: **Test instrument for mechanical watches with acoustic transducer**

Year / *Anno di costruzione* / Año de fabricación: **2016**

doc. management / *Gestione doc.*/ Administración de documentos: Witschi Electronic AG, Roman Siegfried, Bahnhofstr. 26, CH-3294 Büren a.A.

Quality mgt, systems / *QMS certificate* / Sistema de gestión de calidad: SQS, ISO 9001:2008, Scope 19 / Reg. Nr. 12228

to which this declaration applies, is in conformity with the following EC-Directive(s) and standard(s) or other normative document(s):
a cui si riferisce la presente dichiarazione è conforme ai requisiti previsti dalle direttive CE ed alle norme o ai do-cumenti normativi elencati qui di seguito:
al cual hace referencia esta declaración, satisface las disposiciones de la(s) siguiente(s) directiva(s) UE y norma(s) o documento(s) normativo(s):

Guidelines

2014/30/EU	☒	electromagnetic compatibility
2014/35/EU	☐	EC low voltage directive
2006/42/EG	☐	EC machinery directive
2011/65/EU	☒	RoHS Directive

Generic Standards

EN 61000-6-3: 2007 + A1:2011	☒	Electromagnetic compatibility (EMC), Emission standard for residential, commercial and light-industrial environments
EN 61000-6-4: 2007 +A1:2011	☐	Electromagnetic compatibility (EMC), Emission standard for industrial environments
EN 61000-6-1: 2007	☐	Electromagnetic compatibility (EMC), Immunity for residential, commercial and light-industrial environments
EN 61000-6-2: 2005	☒	Electromagnetic compatibility (EMC), Immunity for industrial environments
EN ISO 12100-2010	☐	Safety of machinery

Büren a.A., den 7.7.2016

Daniel Hug
CTO

Roman Siegfried
COO