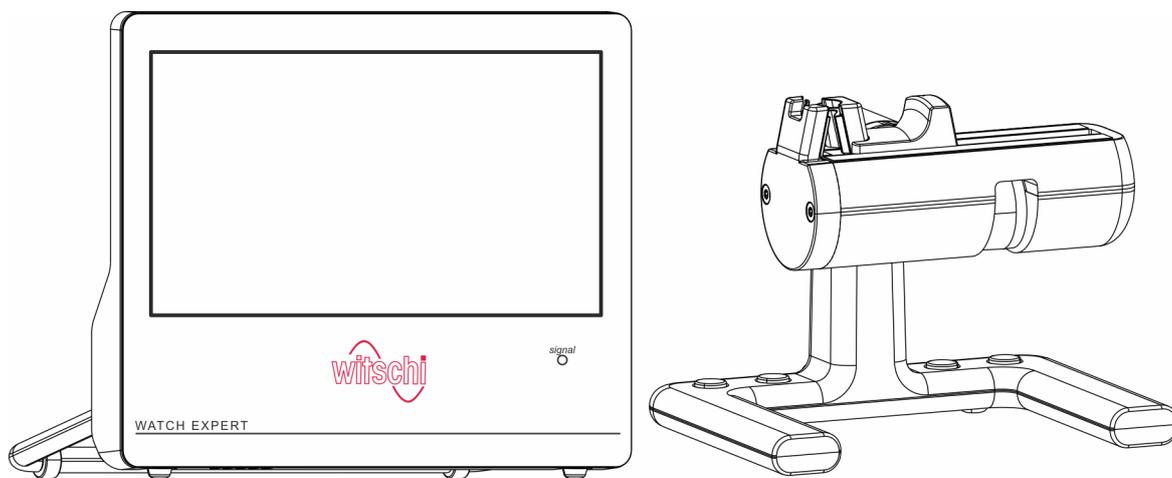


# Operating instructions

**Precision measuring device  
Watch Expert**



Read the instructions prior to performing any task!

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Translation of the original operating instructions

Wits-35286-CH, 1, 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

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

## Customer service

Your point of sale can provide you with technical information.

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

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

## Customer service information

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## Product description

Watch Expert

# 1 Product description

## 1.1 Watch Expert

### Overview

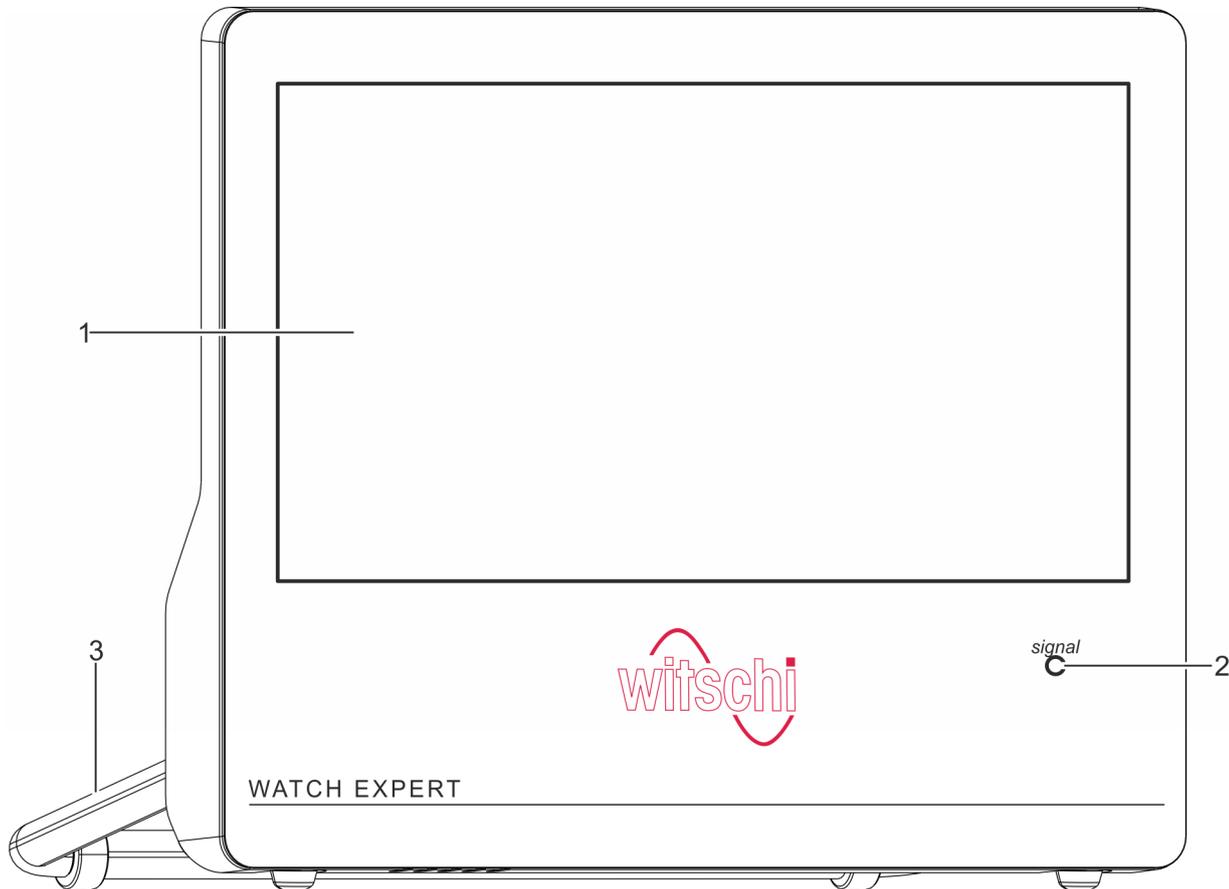


Fig. 1: Watch Expert

No.	Designation	Function
1	Touchscreen	<ul style="list-style-type: none"> <li>■ Displays for the numerical test results</li> <li>■ Displays for the graphical test results</li> <li>■ Displays for test progress</li> <li>■ Navigating through the menus</li> <li>■ Changing parameters</li> </ul>
2	[Signal] LED display	Displays whether the sensor is correctly positioned on the watch: <ul style="list-style-type: none"> <li>■ LED flashes to the rhythm of the escapement noises.</li> </ul>
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 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 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 11 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.

## Product description

Watch Expert

### Connections and interfaces

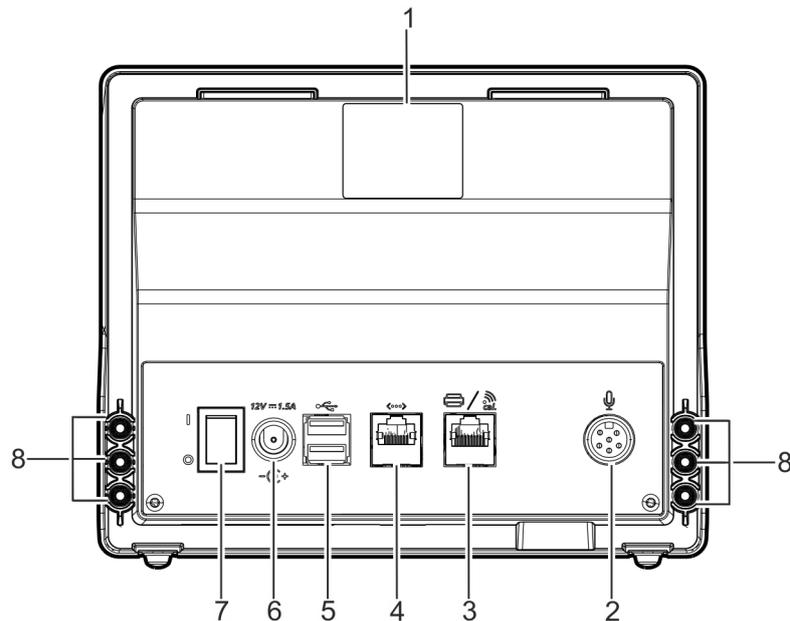
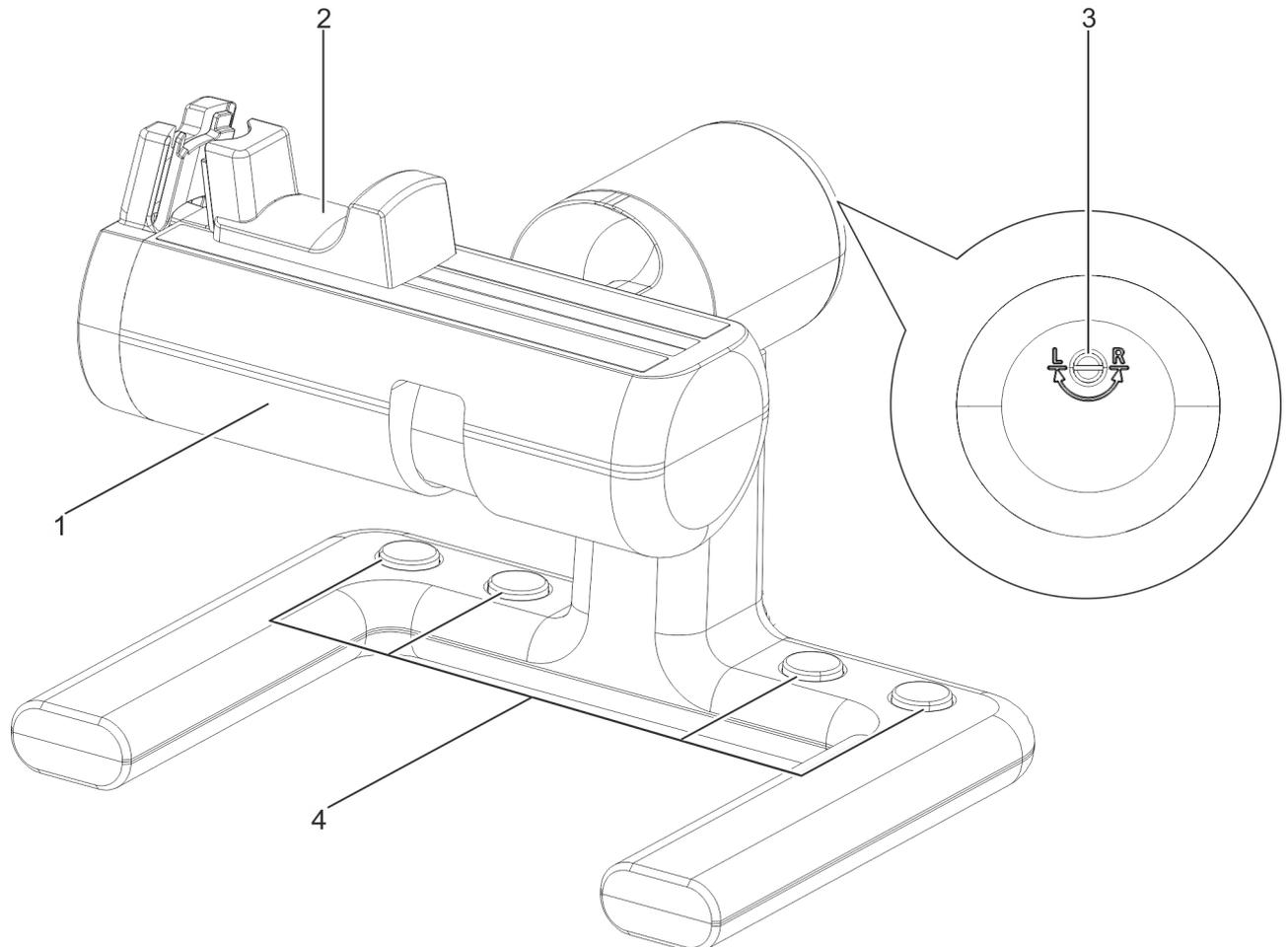


Fig. 2: Rear

No	Designation	Function
1	Rating plate	Identifying the device ↗ <a href="#">page 21</a>
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 11 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.

## Product description

User interface

### 1.3 User interface

#### Quick guide to the user interface

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

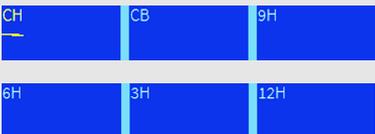
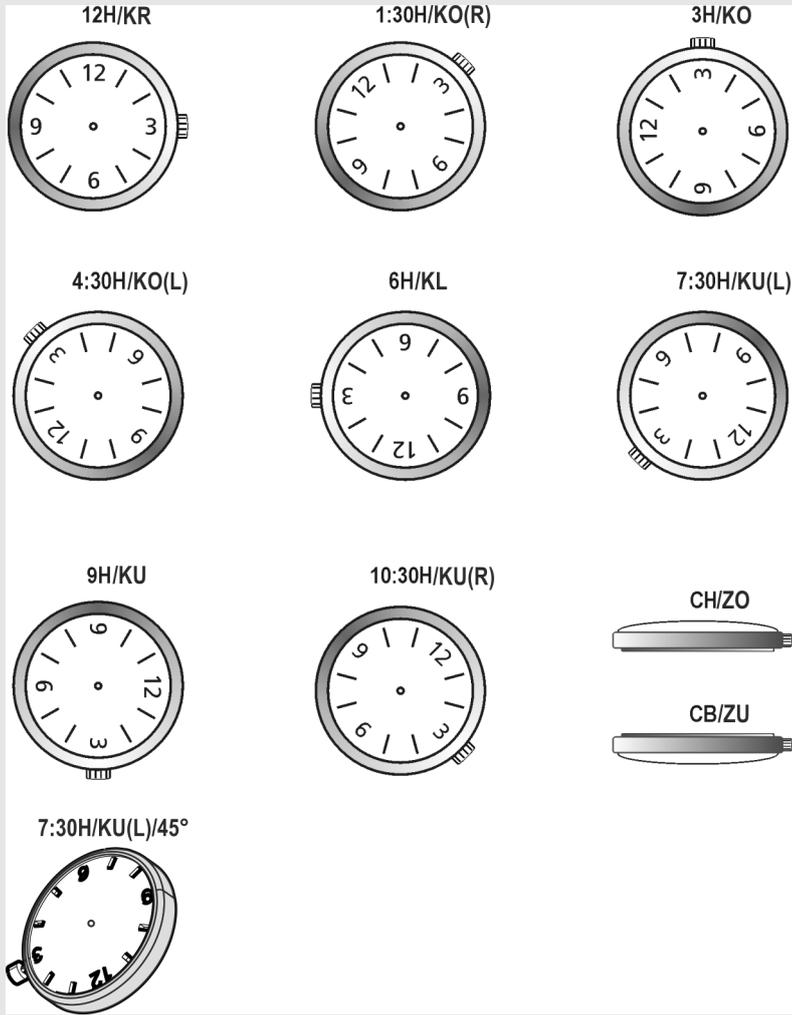
Symbol	Function
	Starting/pausing the measuring procedure.
	
	Deleting the current measured values and restarting the measuring procedure.
	Automatic recognition/manual control of the signal strength.
	
	Switching the integrated speaker on/off.
	
	Generating screenshots of the current view, where a USB 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
Mode <b>Automatic</b>	Provides 3 different options for setting the beat number: <ul style="list-style-type: none"> <li>■ <b>Automatic:</b> The beat number is recognised automatically.</li> <li>■ <b>Manual:</b> The beat number (value between 3,600 b/h and 86,400 b/h) can be entered manually.</li> <li>■ <b>Frequency:</b> The beat number is calculated automatically to obtain a rate deviation of 0 s/d.</li> </ul>
Beat number <b>28'800</b>	Provides the option of entering the beat time (value between 3,600 b/h and 86,400 b/h) manually.
Lift angle <b>52°</b>	Provides the option of manually selecting/entering the lift angle (value between 10° and 90°).
Test mode <b>Standard</b>	Provides 4 different option for setting the test mode: <ul style="list-style-type: none"> <li>■ <b>Standard:</b> Mode for watches with Swiss anchor escapement. To determine the amplitude of the watch, the lift angle must be specified.</li> <li>■ <b>Rate:</b> Mode for rate measurement of watches with cylinder, duplex or chronometer escapement, in addition to watches with unusual beat noise.</li> <li>■ <b>Special 1 (co-axial):</b> Mode for watches with co-axial escapement.</li> <li>■ <b>Special 2 (AP):</b> Mode for watches with AP escapement.</li> </ul>

Display element	Function
<b>4.7 s/d</b>	Shows the rate deviation in s/d.
<b>265°</b>	Shows the amplitude in °.
<b>0.2 ms</b>	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.

## Product description

User interface

Display element	Function
	Shows the currently-set test position of the watch. The flashing bars indicate that measured results are being received.
	<p>Position window for the 6 main test positions. Shows, in diagram display mode, which test position is currently being measured.</p> <p>The following 11 test positions (designation of the main test position as per NIHS 95-10/ISO 3158) are possible:</p>
	



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

## Product description

Modes

### Overview of display modes

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

Appearance	Function
<p><b>Diagram</b></p> 	<ul style="list-style-type: none"> <li>Shows the rate deviation, the beat error and the amplitude.</li> <li>During the measuring procedure, the measured values are displayed as a diagram.</li> <li>It is possible to configure the diagram view.</li> <li>The 6 position windows show the diagram as it relates to the respective measuring position.</li> <li>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.</li> </ul>
<p><b>VARIO</b></p> 	<p>Visualises the rate stability and amplitude over a longer period.</p> <p>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.</p>

## 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 16
4	Dust cover	Protects the Watch Expert against build-up of dust	☞ page 17
5	Stand	For supporting the Watch Expert with 6 different inclination angles.	☞ page 18

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

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

## Product description

Scope of delivery and accessories > Scope of delivery

### 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.

<b>Input values</b>	<ul style="list-style-type: none"> <li>■ 100 – 240 V AC (depending on the local mains voltage)</li> <li>■ 50 – 60 Hz</li> <li>■ 18 VA</li> </ul>
<b>Output values</b>	<ul style="list-style-type: none"> <li>■ 12 V DC</li> <li>■ 1.5 A</li> </ul>

**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.

## Product description

Scope of delivery and accessories > Optional accessories

### 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 measurement	none		
Minimum warm-up period for adjustment	10 min		No warm-up period from standby onwards

## Product description

Technical data

### 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	
<b>Measurement of mechanical watches</b>				
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

Data	Value	Unit
Power consumption in operation	8	W



*Before connecting the device, make sure that the local mains voltage matches the specified voltage on the power supply unit.*

**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-condensing

**Watch Expert rating plate**

**Watch Expert**

Typ 11.2710

Nr. 20

Year 2016

**SWISS MADE**


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

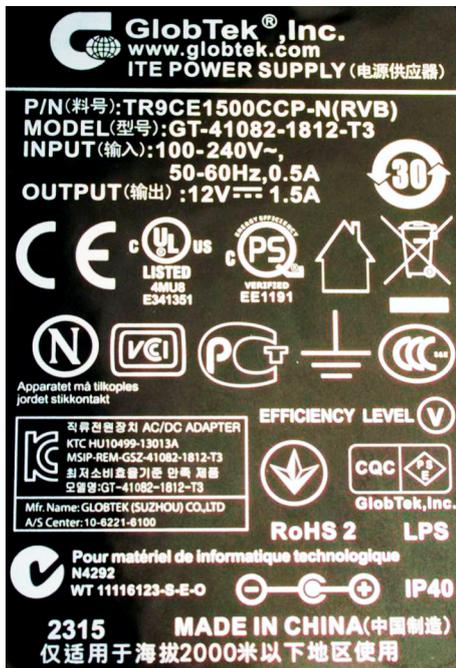
- Manufacturer
- Type
- Serial number
- Year of manufacture

Fig. 8: Watch Expert rating plate

## Product description

Technical data

### Power supply unit rating plate



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

- Manufacturer
- Type
- Specification

Fig. 9: Power supply unit rating plate

## 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.

**DANGER!**

This combination of symbol and signal word indicates an imminently hazardous situation that will entail death or serious injury if not avoided.

**WARNING!**

This combination of symbol and signal word indicates a potentially hazardous situation that can entail death or serious injury if not avoided.

**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.

## Safety

Intended use

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

Calibration Service		
Cal. Date	XX.XX.XXXX	Tech.
Next cal.	XX.XX.XXXX	NB

The calibration instruction on the rear side 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.

## Safety

Labels on the device > Risk of material damage

### 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 troubleshooting 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 65).
- 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 65*).
- 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 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.

## 4.2 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

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.

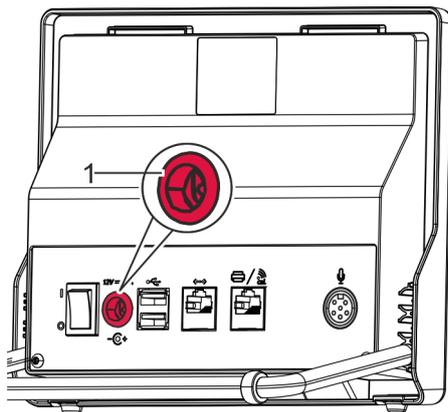


Fig. 10: Mains connection

## Commissioning the Watch Expert

Connecting the printer

### 4.3 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

➔ 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.

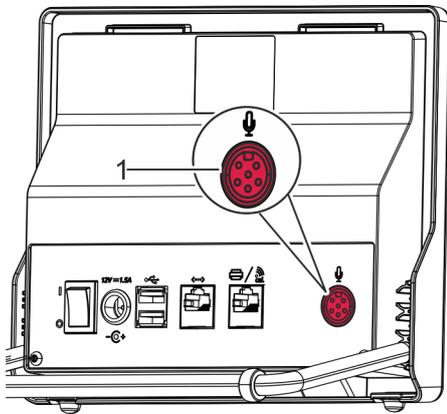


Fig. 11: Microphone socket

### 4.4 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 33).

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.

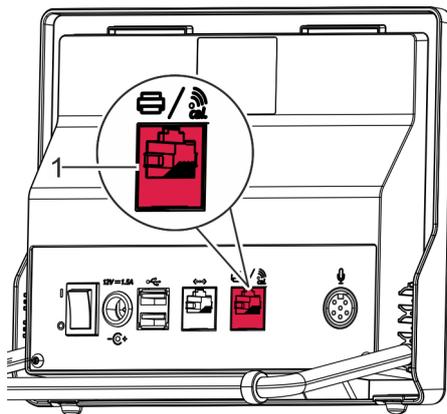


Fig. 12: Printer port



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).

## 4.5 Switching the Watch Expert on/off

### Switching on the Watch Expert

Personnel: ■ Operator

Requirement:

- The Watch Expert has been commissioned correctly (↪ page 30).

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

⇒ The welcome screen is displayed.

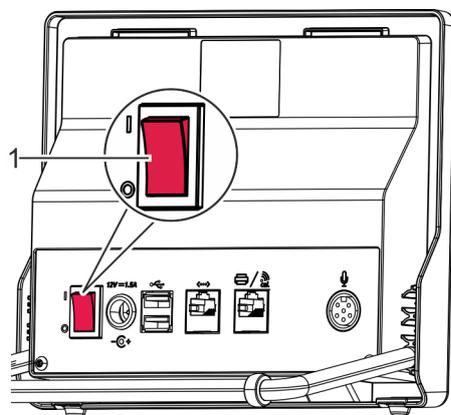


Fig. 13: Switching on the Watch Expert



If the wrong language is set, set the language (↪ page 60).

## Commissioning the Watch Expert

Switching the Watch Expert on/off

### Switching off the Watch Expert

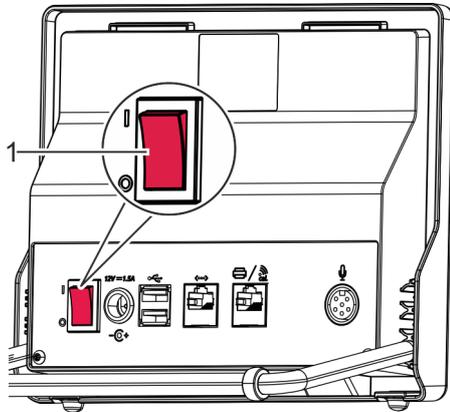


Fig. 14: Switching off the Watch Expert

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 65).*

## 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 <a href="http://www.witschi.com/assets/files/sheets/Scope_Schlagzahlen_def_2-3.pdf">http://www.witschi.com/assets/files/sheets/Scope_Schlagzahlen_def_2-3.pdf</a> .
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.

## Setting measuring parameters

Setting the beat number



***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](http://www.witschi.com/assets/files/sheets/Scope_Schlagzahlen_def_2-3.pdf)*

### Selecting a beat number manually

If you wish to measure the watch with a beat number other than that determined by the Watch Expert, it is possible to select the beat number 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.

Beat number  
28'800

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

123

1. Press the „123“ touch button.

⇒ A keypad appears.

## Setting measuring parameters

Setting the lift angle

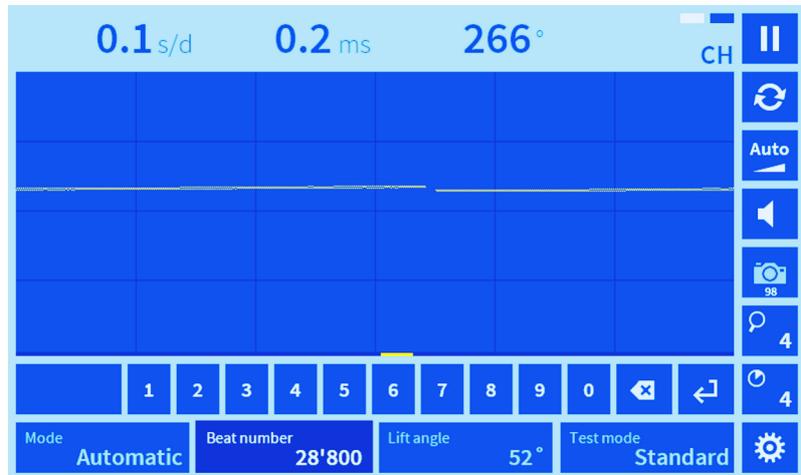


Fig. 16: Entering a beat number manually

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:*

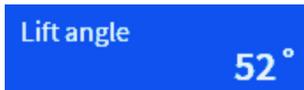
*[www.witschi.com/de/service/downloads/technische-infos.html](http://www.witschi.com/de/service/downloads/technische-infos.html)*



### 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.

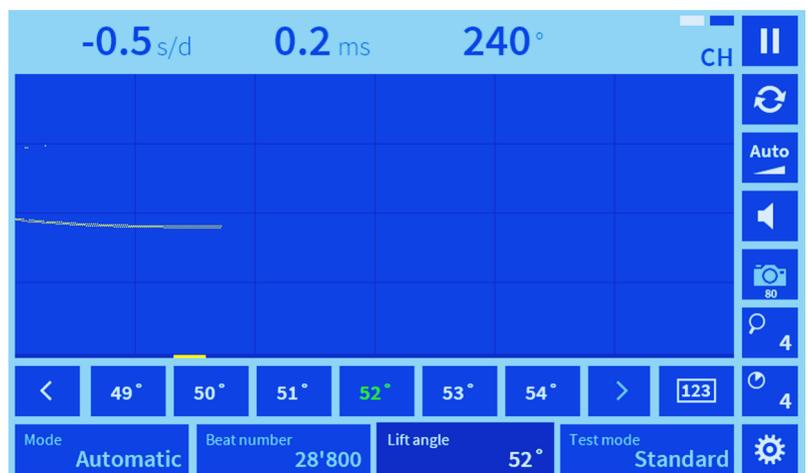


Fig. 17: Selecting a lift angle manually

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.

## Setting measuring parameters

Setting the lift angle

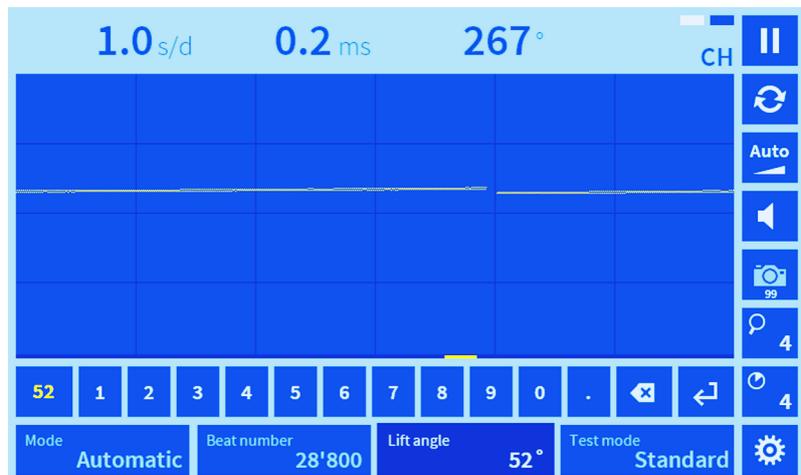


Fig. 18: Entering a lift angle manually

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.

Test mode  
Standard

1. ➔ Press the „Test mode“ touch button.

⇒ A submenu with four options appears (🔗 page 13).



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.

## Setting measuring parameters

Setting the integration time

### 5.4 Setting the integration time

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

Requirement: The diagram display mode is selected.



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: 4 A, 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.

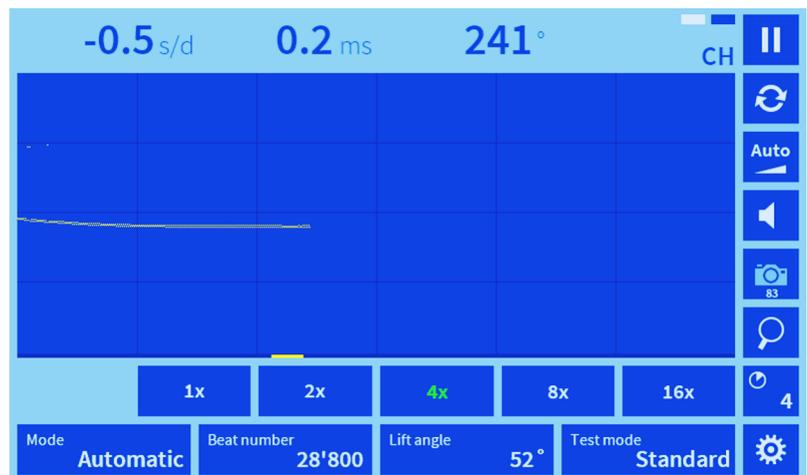


Fig. 21: Changing the size of the diagram

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 14).
- 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 14).

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.

## Performing a measurement

Positioning the watch and starting a measurement automatically

# 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 33).



#### **Positioning the watch correctly**

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

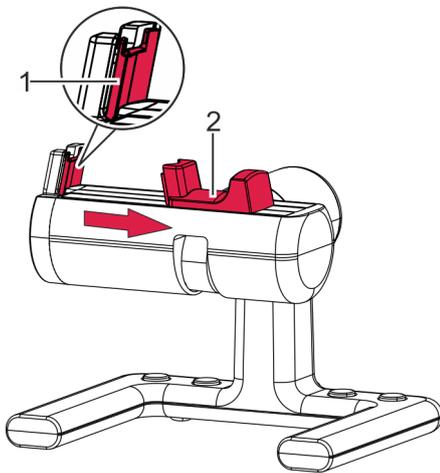


Fig. 22: Microphone clamping jaw

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

### Clamping the entire watch/clockwork

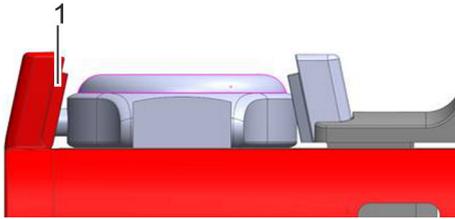


Fig. 23: Entire watch clamped

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 release the clamping jaw.
  - ⇒ The LED light flashes to the rhythm of the watch beats. The measuring procedure is started.

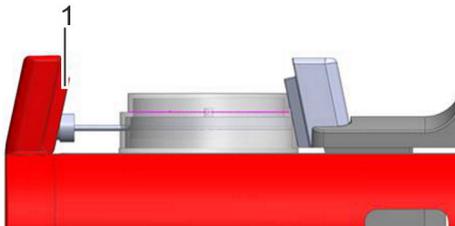


Fig. 24: Clockwork clamped in cup

### Clamping clockwork (without a housing)

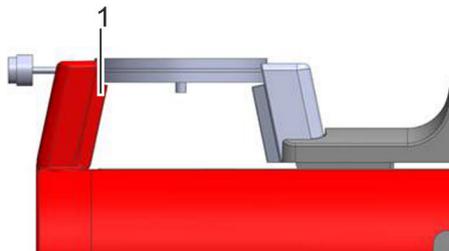


Fig. 25: Crown of clockwork positioned above the signal sensor

3. → Place the clockwork onto the clamping area so that the crown is positioned above the signal sensor (Fig. 22/1). Carefully release the clamping jaw.
  - ⇒ The LED light flashes to the rhythm of the watch beats. The measuring procedure is started.

## Performing a measurement

Monitoring the measured results

### 6.2 Monitoring the measured results

#### Diagram display mode

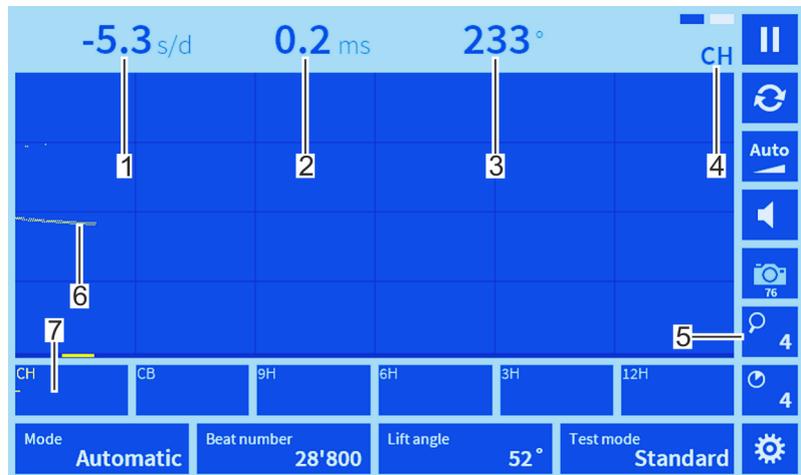


Fig. 26: Diagram display mode

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 50).

### 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.

## Performing a measurement

Setting the signal strength

### 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 about 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 about 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 44), 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 50).*

#### Resuming the measuring procedure



**2.** Press the „Play/Pause“ touch button.

⇒ The measuring procedure is resumed from the same point.

## Performing a measurement

Generating screenshots

### 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 59).*

### 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.

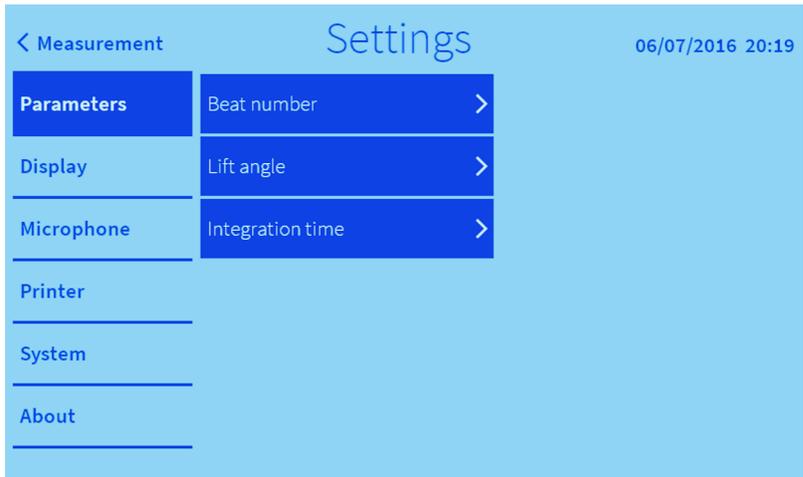


Fig. 28: Settings menu

### Exiting the settings menu

- ➔ Press the „Measurement“ (Fig. 29/1) touch button.
- ⇒ The settings are saved. The main display is shown.

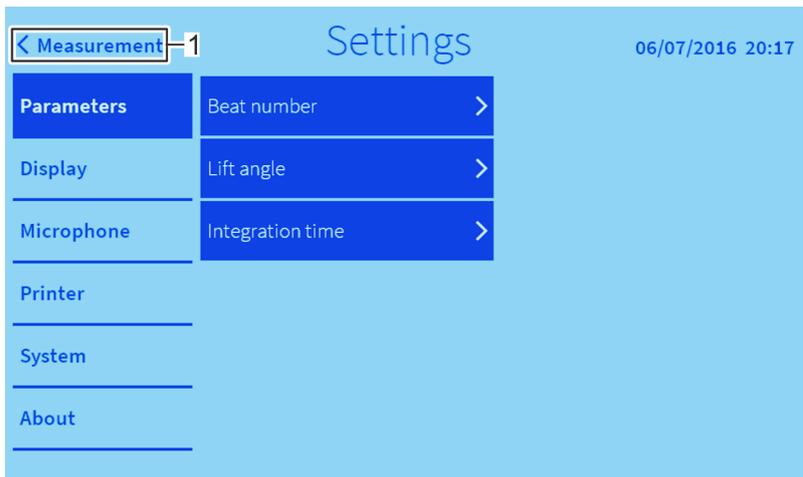


Fig. 29: Exiting settings



### **Saving settings**

*Settings are saved automatically and remain active after a restart.*

## Configuring the user interface

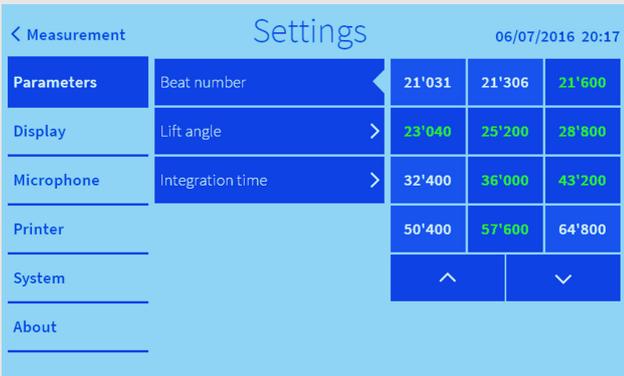
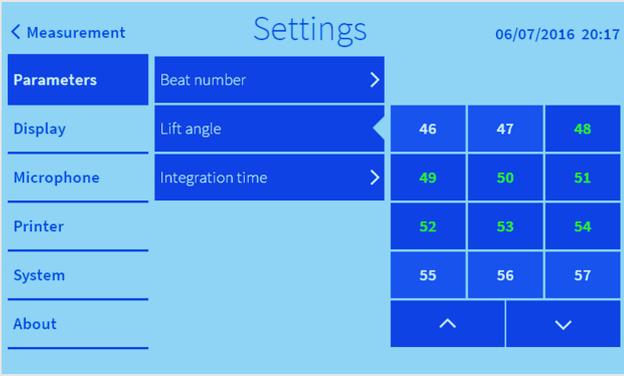
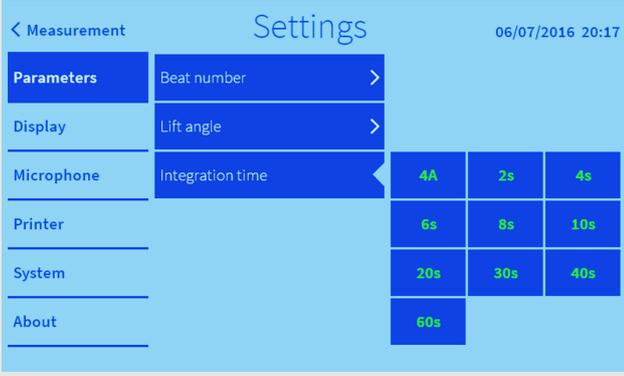
Configuring touch buttons

### 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
<p>Beat number</p> 	<p>Beat numbers between 3,600 b/h and 86,400 b/h can be added to the touch button selection list.</p>
<p>Lift angle</p> 	<p>Lifting angles between 10° and 90° can be added to the touch button selection list.</p>
<p>Integration time</p> 	<p>The following integration times can be added to the touch button selection list:</p> <ul style="list-style-type: none"> <li>■ 4 A</li> <li>■ 2 s</li> <li>■ 4 s</li> <li>■ 6 s</li> <li>■ 8 s</li> <li>■ 10 s</li> <li>■ 20 s</li> <li>■ 30 s</li> <li>■ 40 s</li> <li>■ 60 s</li> </ul>



### 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

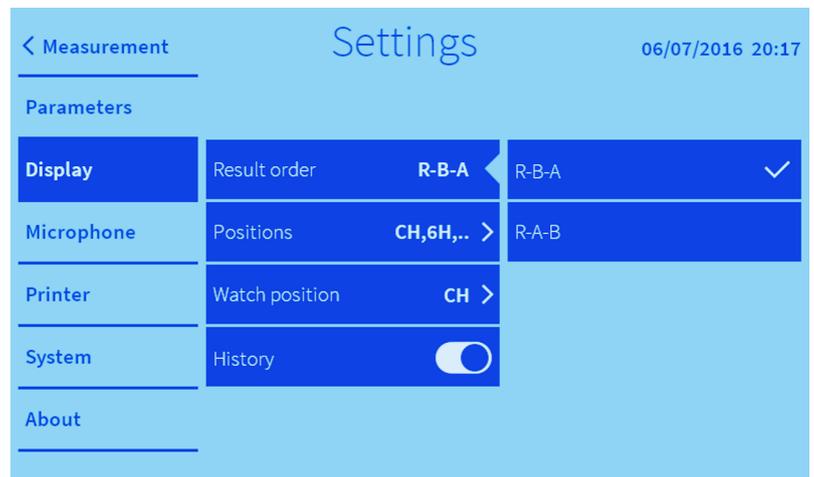


Fig. 30: Setting the display sequence of the current measured values

Two orders are available:

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

## Configuring the user interface

Configuring the main display

### Positions

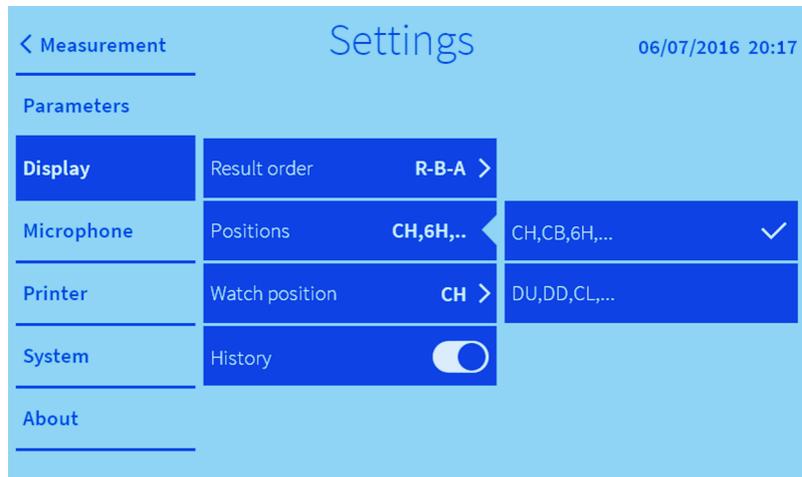


Fig. 31: Setting test position designation types

There are two test position designation types available

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

### Watch position

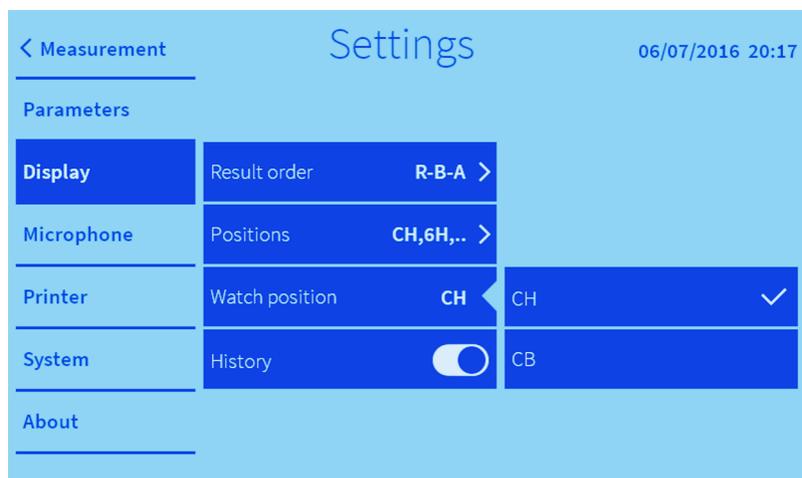


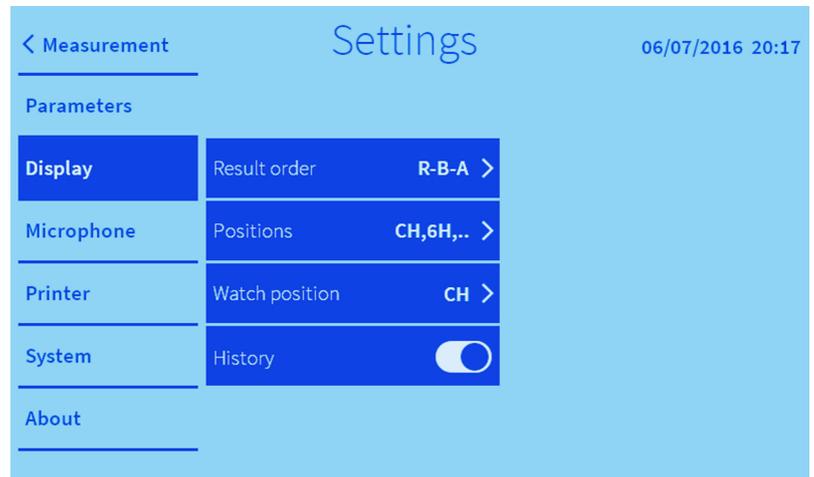
Fig. 32: Setting the watch position

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 determine the correct positioning of the watch.

## Position window



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

The history of the measured test positions can be displayed/hidden in the main display. If the history is hidden, the test position does not appear on the printout.

## 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.

## Configuring the user interface

Configuring microphone buttons

### Use as navigation buttons

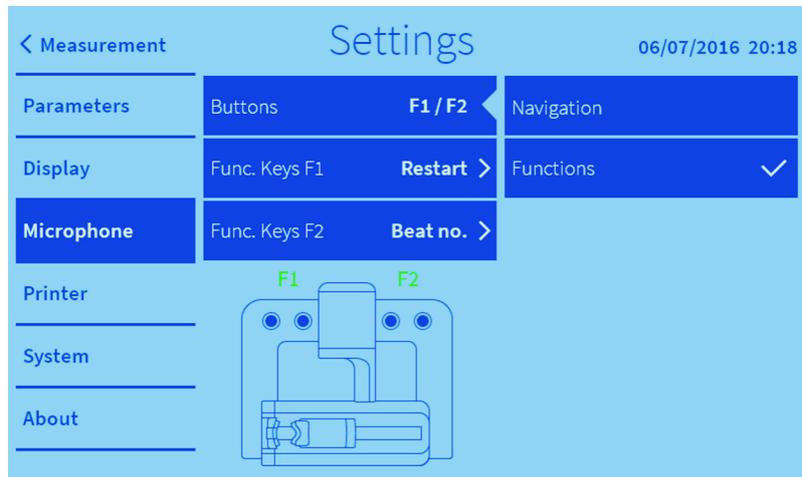


Fig. 34: Setting up navigation buttons

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

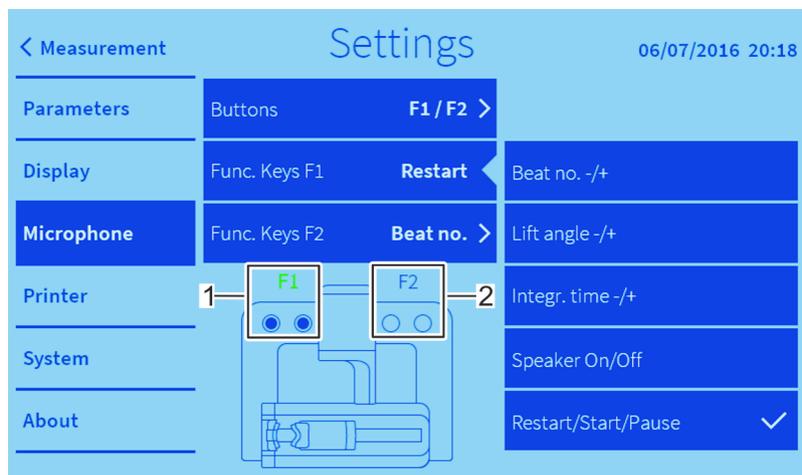


Fig. 35: Assigning functions

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

## 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

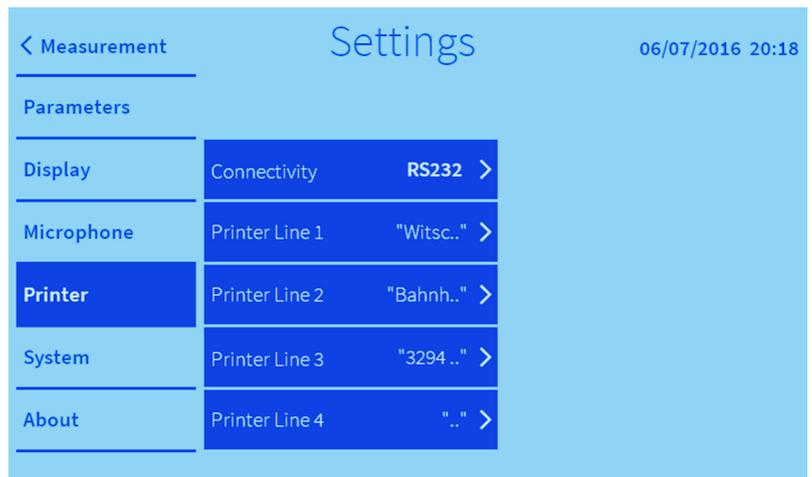


Fig. 36: Printer settings

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.

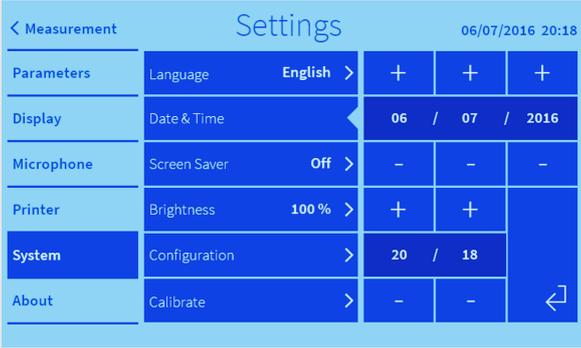
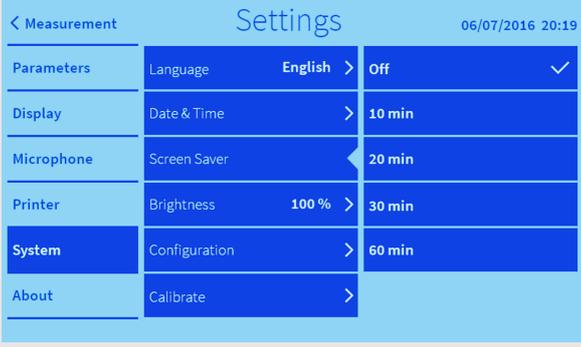
## Configuring the user interface

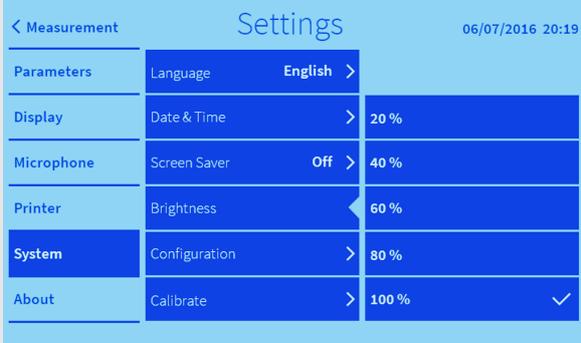
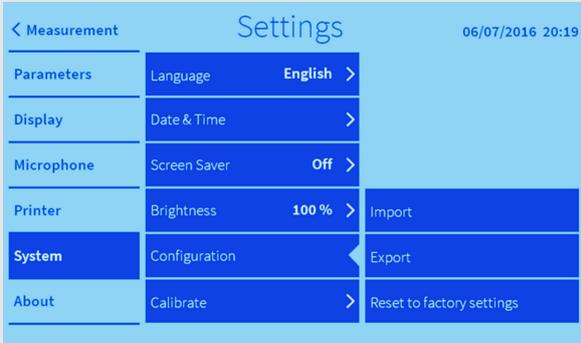
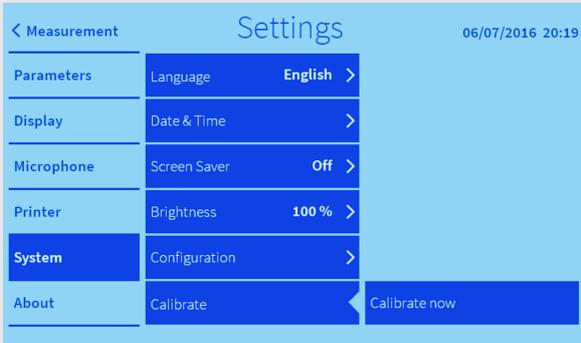
Configuring system settings

### 7.5 Configuring system settings

#### General system settings

The following settings can be adjusted using the „System“ tab:

Appearance	Additional information
<p>Language</p> 	<p>The following languages are available:</p> <ul style="list-style-type: none"> <li>■ German</li> <li>■ English</li> <li>■ Spanish</li> <li>■ French</li> <li>■ Italian</li> <li>■ Russian</li> <li>■ Chinese (simplified)</li> <li>■ Chinese (traditional)</li> </ul>
<p>Date &amp; Time</p> 	<p>The date format is as follows: DD.MM.YYYY</p> <p>The time format is as follows: HH:MM</p>
<p>Screen Saver</p> 	<p>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.</p> <p>To deactivate the screen saver, press the “Off” touch button.</p>

Appearance	Additional information
<p><b>Brightness</b></p>  <p>The screenshot shows the 'Settings' application with the 'Printer' category selected. The 'Brightness' slider is currently set to 60%.</p>	<p>It is possible to adjust the brightness of the display</p>
<p><b>Configuration</b></p>  <p>The screenshot shows the 'Settings' application with the 'System' category selected. The 'Configuration' option is highlighted, showing sub-options: 'Import', 'Export', and 'Reset to factory settings'.</p>	<p>Using a USB stick, settings can be imported/exported. The settings can be reset to factory settings.</p>
<p><b>Calibrate</b></p>  <p>The screenshot shows the 'Settings' application with the 'About' category selected. The 'Calibrate' option is highlighted, showing a 'Calibrate now' button.</p>	<p>Recalibration of the Watch Expert. Calibration can only be performed by Customer Service.</p>

## Configuring the user interface

Displaying device information

### 7.6 Displaying device information

**Device information display**

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

**System information**



Fig. 37: Displaying system information

System information	Additional information
Serial number	Shows the serial number of the Watch Expert.
Firmware Rel.	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 troubleshooting 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	<ul style="list-style-type: none"> <li>■ Clean the device with a microfibre cloth.</li> <li>■ Clean the microphone with a microfibre cloth.</li> </ul>	Operator
Calibration as per the calibration instructions on the device	Have the Watch Expert recalibrated. To do so, contact your point of sale (☎ <i>page 3</i> ).	Customer service

## 9 Troubleshooting

### 9.1 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.	<ul style="list-style-type: none"> <li>■ Watch positioned incorrectly.</li> <li>■ Watch not wound.</li> <li>■ Microphone cable not connected.</li> </ul>	<ul style="list-style-type: none"> <li>■ Position the watch or clockwork with its crown against the signal sensor.</li> <li>■ Wind the watch.</li> <li>■ Connect the microphone cable.</li> </ul>
„Out of range“	Measured values are not transferred to the Watch Expert.	<ul style="list-style-type: none"> <li>■ Beat number is not set correctly.</li> </ul>	<ul style="list-style-type: none"> <li>■ Set the beat number in accordance with the watch specifications.</li> <li>■ Set mode to „Automatic“.</li> </ul>

### 9.2 Troubleshooting

Description of malfunction	Cause	Remedy
Implausible test result	The watch is not positioned correctly.	Reposition the watch ( ↶ page 44 ).
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 48 ).

## 10 Shutting down and disposing of the Watch Expert

### Shutdown

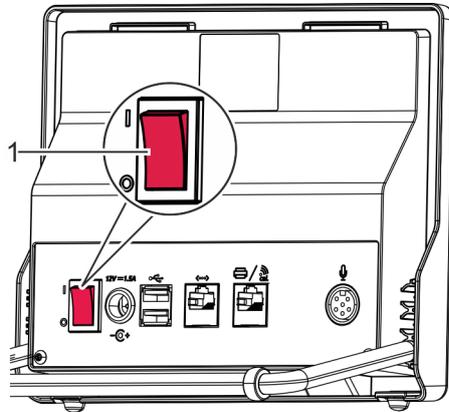


Fig. 38: Pressing the switch

1. → Set the switch (Fig. 38/1) to the [O] position.

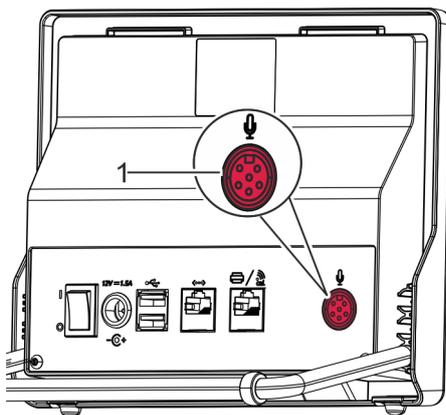


Fig. 39: Removing the microphone cable

2. → Remove the microphone cable from the microphone socket (Fig. 39/1).

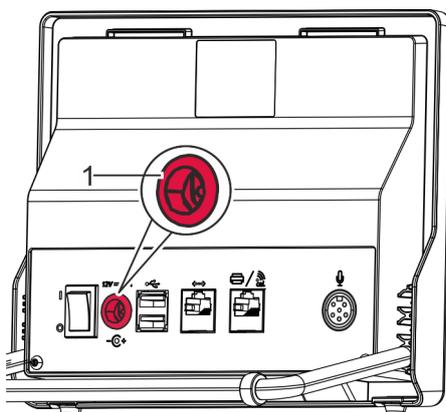


Fig. 40: Removing the power supply unit cable

3. → Pull the power supply unit cable from the mains connection (Fig. 40/1).
4. → Disconnect the power supply unit plug from the local mains network.
  - ⇒ The Watch Expert is shut down.

## Shutting down and disposing of the Watch Expert

### 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.

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## Appendix

**A Declaration of conformity**

**EG-Konformitätserklärung**  
*Déclaration de conformité CE*  
Declaration of conformity



DE FR EN

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

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

**Bezeichnung** **Watch Expert (G4) / Pilotmikrofon**  
*nom / name:*

**Typ-Nr.:** **11.27 / 13.13**

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

**Funktion** **Prüfgerät für mechanische Uhren mit Signalaufnehmer**  
*fonction / function* *appareil de test pour montres mécaniques avec capteur acoustique /*  
test instrument for mechanical watches with acoustic transducer

**Baujahr** **2016**  
*an / year:*

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

**Zertifiziertes QMS** **SQS, ISO 9001:2008, Scope 19 / Reg. Nr. 12228**  
*Systèmes de QMS*  
Quality mgt, systems

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

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

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

**Richtlinien/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  Elektromagnetische Verträglichkeit (EMV), Störaussendung für Wohn- Geschäfts- und Gewerbebereiche sowie Kleinbetriebe  
+A1:2011  
EN 61000-6-4:2007  Elektromagnetische Verträglichkeit (EMV), Störaussendung für Industriebereiche  
+A1:2011  
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** **Witschi Electronic AG**  
*La / Nosotros:* **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** **Watch Expert (G4) / Pilotmicrophone**  
*nome / denominación:*

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

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

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

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

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

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

**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 documenti 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  Electromagnetic compatibility (EMC), Emission standard for residential, commercial and light-industrial environments
- + A1:2011
- EN 61000-6-4: 2007  Electromagnetic compatibility (EMC), Emission standard for industrial environments
- +A1:2011
- 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







The logo for Witschi features the word "witschi" in a bold, lowercase, grey sans-serif font. A red curved line arches over the letters "i" and "t", and another red curved line arches under the letters "s" and "c".

**witschi**