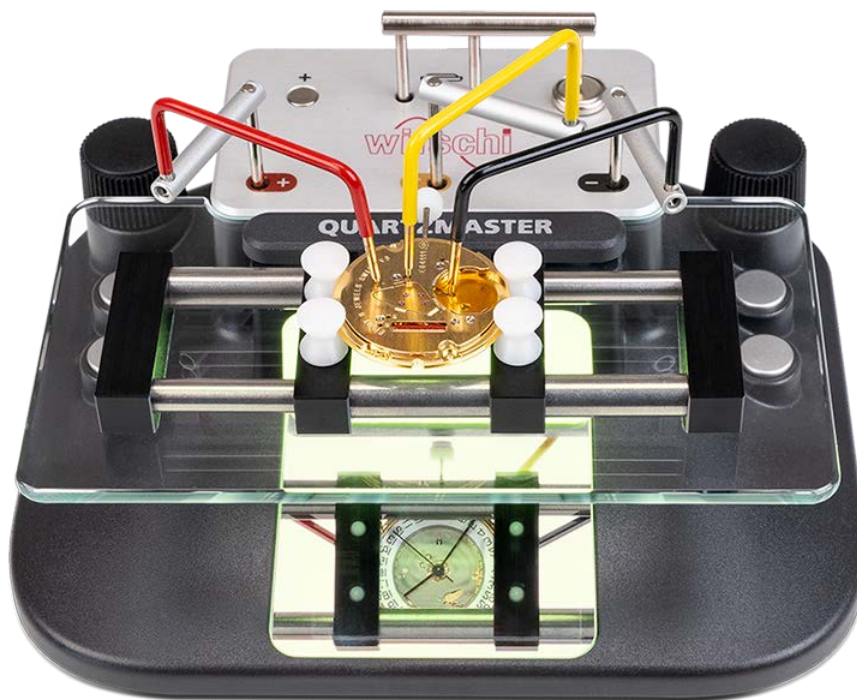


# QuartzMaster®

Operating instructions



Always read the document before commencing any work!

Original manual  
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## Congratulations

**You have made a good choice.**

By purchasing the Witschi QuartzMaster®, you have chosen a testing device that combines the highest technical demands with practical ease of operation.

You will be able to use your new device for many years to come if you handle and service it correctly. Enjoy using your new device.

## 1 PRIOR TO INITIAL USE



Please read all information in this manual carefully. It contains important instructions on the use, safety and maintenance of your device. Keep this document in a safe place and pass it on to any later users.

The device may be used only for its intended purpose as outlined in this manual.

**If the testing device or watches are damaged or persons are injured due to improper operation and use, the manufacturer, Witschi Electronic Ltd. in CH-3294 Büren a.A., Switzerland accepts no responsibility.**

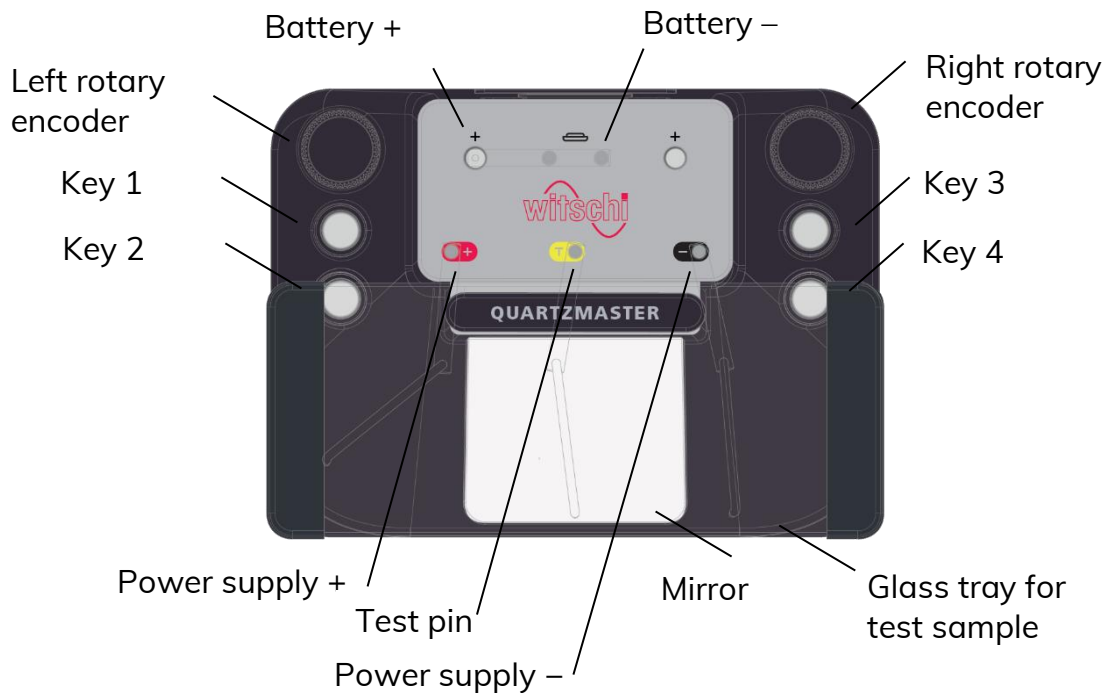
## 2 APPLICATION

The QuartzMaster® is an ideal testing device for fast and efficient use in repair service, sales and watchmaking laboratories.

Ultramodern technology with extensive measuring and testing options guarantee professional trouble-shooting for quartz watches. Thanks to largely automated measuring processes, the device offers an extraordinary level of operating convenience.

### 3 CONTROL ELEMENTS AND DISPLAYS

#### 3.1 Work surface



#### Control elements

Left and right rotary encoders: Allocation as per the measure program.

Keys 1 and 2 left, keys 3 and 4 right: Allocation can be set in the PC software.

#### Connections

Support for battery +: positive pole of battery. Available on the left and right side of the device for left-handed and right-handed people.

Connection for battery -: negative pole of battery

Connection for power supply +: positive power supply for watch / watch movement

Connection for power supply -: negative power supply for watch / watch movement

Connection T: contact for test pin (e.g. accelerated measurement)

#### Display

Illumination of dial side and status display through luminous surface.

White: waiting for user interaction. Illumination of dial side

Yellow: ongoing measurement by QuartzMaster®

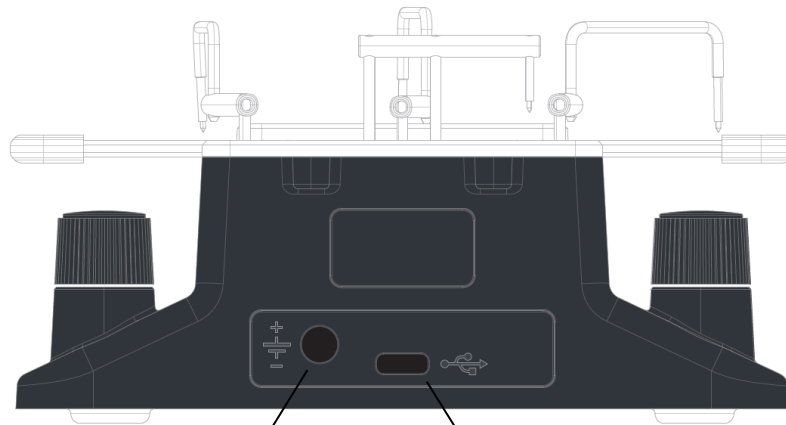
Red / green: completion of the measurement. Result according to selected tolerances

Grey: standby

Dark blue: no login on USB. Possible cause: Driver not installed

Flashing red: firmware update

## 3.2 Rear panel



Socket for connecting dummy battery (option) –

USB

USB: connection between QuartzMaster® and PC.  
Can additionally be used during calibration of the time base.

## 4 INITIAL OPERATION

### 4.1 Scope of delivery

The basic equipment consists of the following components:

- 1 QuartzMaster® testing device
- 1 cable USB standard A to USB type C
- 3 moving contact clips, red, black and yellow
- 1 work holder
- 1 cable set with test tips and crocodile clips in black and red
- 1 manual
- 1 Software Download info card for WiCoTRACE Lite

### 4.2 Set-up location



Stray electrical and magnetic fields from electrical devices can interfere with the recording of signals. Interference is particularly intense from computer terminals, fluorescent lamps, clocked power supply units and ultrasound cleaning systems. The device must therefore be set up at a sufficient distance from such sources of interference. In case of exposure to electromagnetic radiation, the device may no longer work properly.

## 5 CONTACTS

### 5.1 Battery test

Place the battery you want to test on the contact surface of the support “+” with the “+” side and contact the “-” side with the contact clip.

### 5.2 Watch movement

**Attention** The watch can be damaged if the power supply is provided in the wrong places or with the wrong polarity.

To measure the power consumption and minimum starting voltage, the battery must be removed from the watch.

For contact, the watch or watch movement is clamped into the module holder and placed on the glass tray of the device. The moving contact clips with the telescopic sensors are adjusted to the contact points of the watch and pressed down until they deflect approx. 1 mm. To adjust the height, you have to grip the clips at their back end.

Place the red “+” clip on a point that is usually connected to the “+” pole of the battery (battery housing). In most watches, the entire plate is connected to the “+” pole. Place the black “-” clip on a point that is usually connected to the “-” pole of the battery. In most watches, the contact spring is the most accessible for the “-” battery connection.

Alternatively, it is possible to use the dummy battery.

If you want to perform testing in accelerated mode, contact connection T with the yellow contact clip.

## 6 MAINTENANCE

The QuartzMaster® does not require any special maintenance.

Use a soft cloth only to clean the device and remove dirt. Never use aggressive cleaning agents or solvents.

In order that the accuracy of the measurements remains guaranteed, we recommend that you have the device calibrated and its function checked by our service centre every year.

For more information, please contact our customer service at our company’s head office or one of our representatives.

## 7 TECHNICAL DATA

### 7.1 Measuring functions

#### Module supply

Contact the watch with moving sensors, with the dummy battery or with the measuring cable and test tips.

Supply voltage:	0 V to 3.5 V, adjustable
Resolution:	0.05 V
Precision:	$\pm 1\% \pm 0.02$ V
Current limitation:	20 mA

#### Current measurement

Instantaneous measurement of IC current.

Integrating measurement of total current over a measurement period.

Measuring period:	1 s to 960 s, adjustable
Measuring range:	0 nA to 20 mA
Resolution:	1°nA
Precision:	$\pm 2\%$ of measured value $\pm 2$ nA

#### Resistance measurement

Measurement of the coil resistance.

Measurement of the current for a fixed output voltage.

Measuring range:	10 $\Omega$ to 1 M $\Omega$
Resolution:	1 $\Omega$
Precision:	$\pm 2\%$ of measured value $\pm 5$ $\Omega$
Test voltage:	100 mV to 50 $\Omega$ 200 mV above 50 $\Omega$

#### Motor pulse measurement

Measurement of the rate deviation and the characteristic of the motor pulses

Motor period:	1 s to 60 s
Stabilisation time:	0 s to 60 s
Measuring period:	1 s to 960 s

Rate deviation measuring range:	$\pm 300$ s/d
Rate deviation resolution:	0.01 s/d
Rate deviation precision:	0.1% of measured value $\pm 0.03$ s/d (in case of annual calibration)

Pulse width measuring range:	0 ms to 20 ms
Pulse width resolution:	10 $\mu$ s

Chopping-level measuring range: 0 to 100%  
Chopping-level resolution: 0.01%  
Chopping-level precision: 10%

### **Battery**

Measurement of battery voltage with load resistance 2 M $\Omega$  (no load), with 2 k $\Omega$  load (low drain) and with 100  $\Omega$  load (high drain).

Measuring range: 0 to 3.5 V, resolution 10 mV  
Precision: 0.5% of measured value  $\pm$ 10 mV  
Error display: Display in case of wrong polarity or when the measuring range is exceeded.

## **7.2 General data**

### **Time base**

Pre-aged, temperature-controlled high-frequency quartz time basis, OCXO.

Temperature stability:  $\leq \pm 0.00432$  s/d (0.05 ppm) for 0° to 60°  
Caging after one year:  $\leq \pm 0.03$  s/d (0.3 ppm)

**Usage temperature** 5° to 40°C





### **Dimensions and weight**

Width: 142 mm  
Height: 53 mm excluding contact clips. Approx. 91 mm with contact clips  
Depth: 104 mm excluding plug.  
Weight: 430 g device  
800 g with dummy battery and packaging

## **8 ACCESSORIES**

Dummy battery: Art. No. 26.10.510  
for standard diameters 6.8, 7.9, 9.5, 11.6 mm

## 9 CE/UKCA DECLARATION OF CONFORMITY

<b>CE/UKCA Declaration of conformity</b> Déclaration de conformité CE/UKCA Declaration of conformity CE/UKCA		 <div style="border: 1px solid black; padding: 2px; display: inline-block;">EN IT ES</div> 
<b>We</b> La / Nosotros:	<b>Witschi Electronic AG</b> Bahnhofstrasse 26 CH-3294 <u>Büren a.A.</u> Switzerland / Svizzera / Suiza	
<p><b>declare under our sole responsibility that the product</b>  <i>dichiaro sotto la sua esclusiva responsabilità che il prodotto</i>  <i>declaramos por responsabilidad propia, que el producto</i></p>		
<b>Name</b> nome / denominación:	<b>QuartzMaster</b>	
<b>Typ-Nr.</b> N. tipo / N° de tipo:	<b>26.1010</b>	
<b>Serial-Nr.</b> N. di serie / N° de fabricación	<b>1 – 10'000</b>	
<b>Function</b> funzione / función:	<b>Test instrument for electronic watches</b>	
<b>Year</b> Anno di costruzione / Año de fabricación:	<b>2021</b>	
<b>doc. management</b> Gestione doc./ Administración de documentos	Witschi Electronic AG, Roman Siegfried, Bahnhofstr. 26, CH-3294 Büren a.A.	
<b>Quality mgt. systems</b> QMS certificate / Sistema de gestión de calidad	SQS, ISO 9001:2015, Scope 19 / Reg. Nr. 12228	
<p><b>to which this declaration applies, is in conformity with the following EC-Directive(s) and standard(s) or other normative document(s):</b>  <i>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:</i>  <i>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):</i></p>		
<b>Guidelines</b>		
2014/30/EU	<input checked="" type="checkbox"/>	electromagnetic compatibility
2011/65/EU	<input checked="" type="checkbox"/>	RoHS Directive
<b>Generic Standards</b>		
EN 61000-6-3: 2007 +A1:2011+AC:2012	<input checked="" type="checkbox"/>	Electromagnetic compatibility (EMC), Emission standard for residential, commercial and light-industrial environments
EN 61000-6-2: 2019	<input checked="" type="checkbox"/>	Electromagnetic compatibility (EMC), Immunity for industrial environments
Büren a.A., den <u>20.11.2022</u>	 Daniel Hug CTO	 Roman Siegfried COO

**Notes:**

