

Technical Data

Measurement Possibilities

Rate deviation, amplitude and beat error of mechanical watches. Diagram of the beat noises.

Beat Number

Automatic selection of all common beat numbers.
Manual selection of any beat number between 3'600 to 43'200 b/h.

Measuring Modes

- Standard mode for watches with the Swiss escapement.
- Special1 Mode for watches with coaxial escapement.
- Special2 Mode for watches with AP escapement.
- Special4 Mode with specific amplitude filter for the measurement of watches with the Swiss escapement.

Gain Control

Automatic. Manual control facility for watches with stray or unusual beat noises.

Adjustment Possibilities

- **Continuous Diagram Recording**
Selectable integration time: 2, 4, 6, 8, 10, 20, 30, 40, 60, 120, 180 and 240 s.
Adjustable zoom: 1, 2, 4, 8, 16 x.
- **Trace Display Mode**
Selectable measuring time: from 4 s to 99:59:58h.
Adjustable zoom: 2, 4, 8 x.
- **Vario Display Mode**
Measuring time: adjustable from 4 s to 99:59:58h.
- **Sequence Display Mode**
Stabilisation time: adjustable from 2 s to 2 min.
Measuring time: adjustable from 4 s to 10 min.
Measuring cycle: adjustable from 1 to 6 test positions.
- **Scope Display Mode**
Selectable time deviations: 20, 200, 400 ms.
- **Screensaver / Illuminating**
May be switched on or off.
Switch on time: 1 to 99 min.

Measuring Ability

Rate accuracy: numerical display in s/d.
Resolution: 0.1 s/d or 0.01 s/d.
Measuring range: ± 999 s/d.
Accuracy: ± 0.1 s/d.

Amplitude: numerical display in degrees.
Resolution: 1° or 0.1°. Measuring range 80° to 360°.
Accuracy: ± 0.4 °.
Lift angle adjustable from 10° to 90°. Resolution 0.1°.

Beat error: numerical display in milliseconds.
Resolution: 0.1 ms. Measurement range 9.9 ms.
Accuracy: ± 0.1 ms

Details Micromat C

Automatic microphone with built in measuring electronics.
By means of the inserted Joystick are manually up to 10, in the automatic Sequence mode up to 6 test positions selectable.

Acoustic check: audio out, Stereo Jack (3.5 mm).

Time base: Pre-aged and thermo-compensated high frequency quartz, OCXO.

Stability: $+ / - 0.004$ s /d between 10° and 50° C.

Aging for the first year: max. $+ / - 0.03$ s /d.

Plastic housing: anthracite coloured.

Front panel: aluminium, colourless anodised.

Dimensions: 115 x 125 x 215 mm (w x h x d).

Weight: 1.7 kg.

Mains connection: mains adapter for 230 V~ or 120 V~, 1.2 A.

Details X1 Terminal

Display terminal with 10.4" SVGA TFT colour Touchscreen, resolution 800x600. High power and low current consumption.

Built in flash memory, 1GB.

Languages: English, German, French.

Interface:

- 2 x USB
- 2 x UART (RS232)
- 1 x RJ-45 100Base for network
- Slot for Micro SD-memory card, 32MB - 4GB.

Terminal in aluminium, silver coloured.

Stand in aluminium, anthracite coloured.

Dimensions: 264 x 275 x 158 mm (w x h x d).

Weight: 2.5 Kg.

Mains connection: universal mains adapter for 90 to 264 V~, 1.2 A.

Accessories

Witschi thermo printer with universal Item JB01-MCP7810
mains adapter 90 V~ - 260 V~.

Thermo paper, roll. Item JB01-MM58-DPU20-N

Wireless mouse, Logitech VX Nano Item JB03-910-000255

Mouse with cable, Optical V100. Item JB03-931641-0914

Earphone, Sony MDR-E829V. Item CA06-MDR-E829

Memorystick USB 2.0, 2GB. Item JB15-OCZUSB2DC

Technical details subject to changes 11.25D41e - 03/2008

Chronoscope X1



The Most Recent Technology for Testing Mechanical Watches

The Chronoscope X1 is the top-of-the-line instrument to be used during manufacturing, by the repair service or in the watch-testing lab. It includes the X1 terminal with a 10.4" colour touch screen and the automatic Micromat C microphone with integrated Chronoscope measurement electronics. It provides 4 different display modes as well as a graphical representation of beat noises.

PDF files can be individually stored with each measurement program. They can contain e.g. mounting drawings, limit data, lubricating schedules, etc. and can be called back whenever necessary.

The large touch screen provides an extremely intuitive and straightforward operation.

General Description

The X1 terminal is used as the control and display unit. Its large screen provides three content-ordered menu bars with big, self-explanatory buttons around the main display. The 4 display modes show measurements in a way adapted to any individual requirements. The measurement results can be printed on an external printer without interrupting the ongoing measurement process. It is possible to create up to 99 different measurement programs. The automated microphone Micromat C can be operated directly from the terminal or with its own function keys.

Particular Features

— Display of PDF documents

PDF documents, e.g. mounting drawings, maintenance recommendations, reference data, etc. can be individually assigned to each of the 99 measurement programs. For opening the PDF document, it is enough to key in the program number (paperless office).

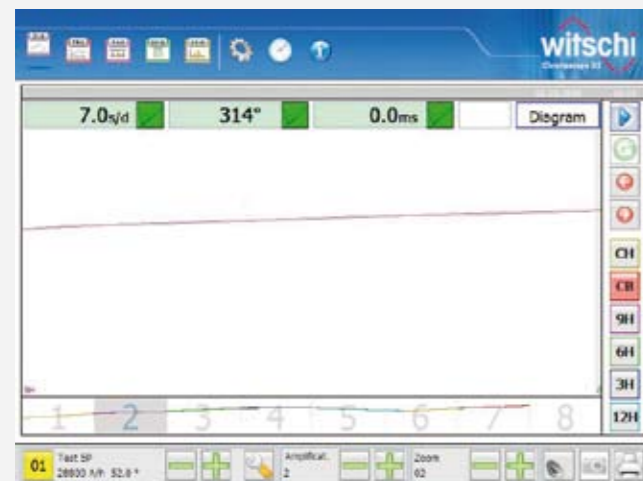
— Screen capture (camera function)

The current content of the screen is stored in JPG format into a plugged-in USB memory stick when the camera key is pressed.

— Picture presentation

Up to 99 pictures in JPG format can be stored for the start/stop screen saver. The slide show runs at a rate of a new picture every 10 seconds.

Continuous Diagram Recording

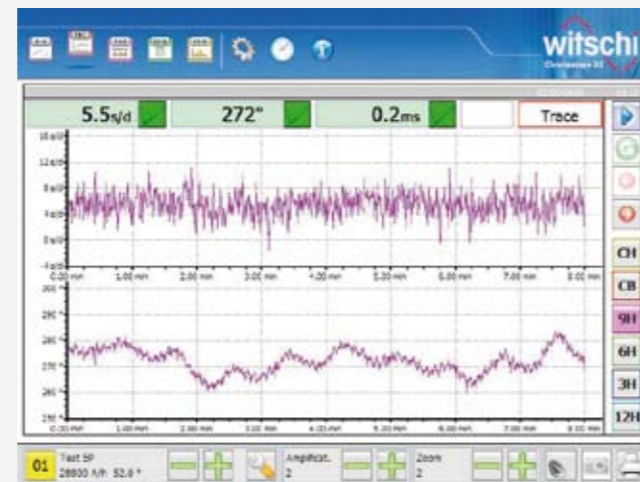


The rate deviation is continuously drawn on the screen. Measured values for rate deviation, amplitude and beat error are displayed numerically.

New

In addition to the diagram recorded in the main window, the last eight diagram pages are shown as small format strip.

Trace Display Mode



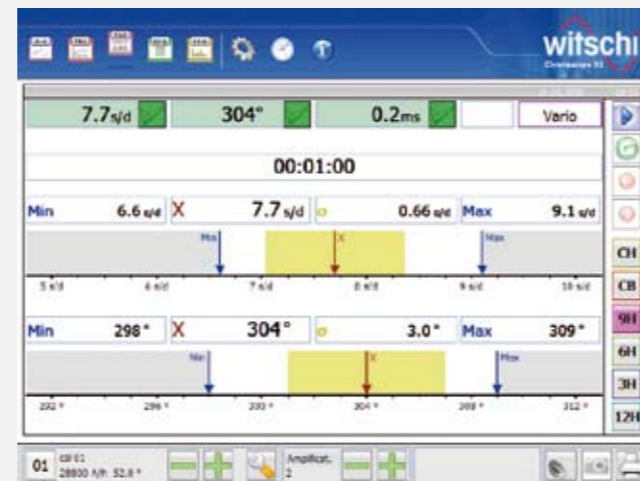
In this mode, the rate deviation and the amplitude are recorded in parallel in graphical format. The Trace mode provides long-term measurements up to 100 hours. This provides an extended time range (e.g. power reserve cycle) for measuring movements.

In addition to the graphics, the current test position of the watch as well as the running measured values for rate deviation, amplitude and beat error are also displayed.

Handy Feature

It is possible to switch between the Trace and Vario modes while the measurement process is running.

Vario Display Mode



The Vario mode measures the rate and amplitude stability over a longer time range. Each numerical measurement is represented by an arrow on the linear scale.

The following values are constantly updated as long as the measurement process is running:

- smallest measured value
- largest measured value
- average measured value and standard deviation
- elapsed measuring time.

Sequence Display Mode



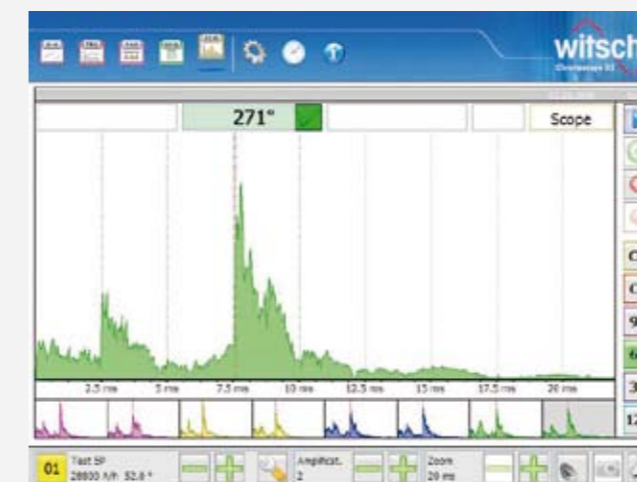
This neatly structured table clearly displays the measurement results in each position as well as the average and the largest difference between all positions and particular ones.

Programs can be created with up to 6 test position including stabilisation and measurement time. The sequence can also be initiated with the start key of the Micromat.

Handy Feature

The arrow keys can be used for toggling between the Trace, Vario, Sequence and Diagram Recording measurement modes during or after measurement.

Scope Display Mode



The Scope function graphically displays the acoustic beat noise of the watch. A detailed analysis of the beat noise, i.e. of the state of the escapement, can be carried out. Signal levels are represented as an envelope curve. The measured value of the amplitude is numerically displayed. The display is based on one of the following three time intervals: 20 ms, 200 ms and 400 ms.

New

The last eight beat noises are displayed in a small format and continuously updated when the measurement process is running.

Time and Date



This neatly structured display is ideal for setting up the date and time after a test.

In this mode, the time and date are displayed in analogue and digital form. A signal sound repeated every 15 seconds can be optionally switched on. A top-of-the-minute signal is generated whenever the last 5 seconds of the minute are reached.

If the instrument is connected to a network, the watch can be synchronised up to the second over the Internet by a time server (NTP).