# Batronix **Magnova®** Oscilloscope
Unique, precise, fast and silent

**w w w . b a t r o n i x . c o m / M a g n o v a**

# Unique Concept

## Give the Magnova 5 minutes and you will love the unique concept.

We broke new ground in the development of the Magnova. It is not just another oscilloscope, everything has been redesigned from scratch.

With the Flex-Encoder® concept, the four rotary encoders adapt to the currently used function, allowing a wide range of parameters to be conveniently set in all areas. The current parameters and other functions are always shown next to the rotary encoders on the display.

As well as setting the signal position and scaling, the rotary encoders can be used to control the zoom factor and position in the zoom view, for example, and to set the offset, scale, centre and span in the FFT display. For the generator, these are the amplitude, offset, frequency and other parameters of the generated signal. Whatever you want to do, the four rotary encoders provide the perfect setting options.

## Stepless tilt - always the ideal viewing angle

Whether you are sitting close to the Magnova, a little further away, it is placed on a shelf or you are standing in front of it: The tilt is infinitely variably adjustable from 80° to 170°, always giving you the perfect view of the display. You can also mount the Magnova on a VESA monitor arm and let it hover above your desk.

## Side ports - simply more convenient

On many desks, the circuit to be measured is placed directly in front of the oscilloscope and the probe leads running in between can be inconvenient. Thanks to the special design of the Magnova, the ports are at the side providing better cable management.

## Silent operation - enjoy the silence

The passive cooling concept ensures that you no longer have to be disturbed by fan noise. With the Magnova, the largest heat sources (processor, FPGA, RAM) are thermally connected directly to the metal case. This means that most of the heat is dissipated directly outside the case. Therefore a fan is unnecessary in normal operation and the Magnova can run silently.

# Damn Good Software

## Intuitive, feature-packed, responsive, and future-proof - that's the Magnova software.

Extensive measurement functions with trend charts, powerful history, signal analysis, search and mask test functions, X/Y mode, reference- and maths channels with freely definable formulas, simultaneous signal decoders, FFT spectra with waterfall display and markers, vertical and horizontal zoom function, Bode plots, display with persistence, adjustable colour grading and much more.

The Magnova software comes with a comprehensive set of feature set already included in the price of the instrument.



We see the Magnova as an evolving oscilloscope platform. You buy the hardware once and receive software updates for years to come, continually extending its functionality. For example, a window docking system, PC software, additional protocol decoders and a frequency counter are already in development and will be available via software updates in the coming months.

# Unbeatable Performance

## Compare it to other oscilloscopes. We bet you won't find a complete match.

- up to over 12 million waveforms per second in history mode
  up to over 300,000 waveforms per second in normal mode
- less than 70 ns trigger rearm time / dead time between waveforms
- up to 3.8 million waveforms in history memory and for averages
- up to 300,000 mask tests per second
- 4 FFT spectra with up to 8 million data points each
- 4 math channels with freely definable formulas
- 4 simultaneous protocol decoders
- 8 simultaneous measurement functions (up to 4 with trend charts)
- digital trigger with freely adjustable hysteresis
- optional 16-channel logic analyser up to 1600 MSa/s
- optional function generator with full 20 Vpp amplitude range
  (90 MHz, 400 MSa/s, arbitrary waveforms, modulations, and more)

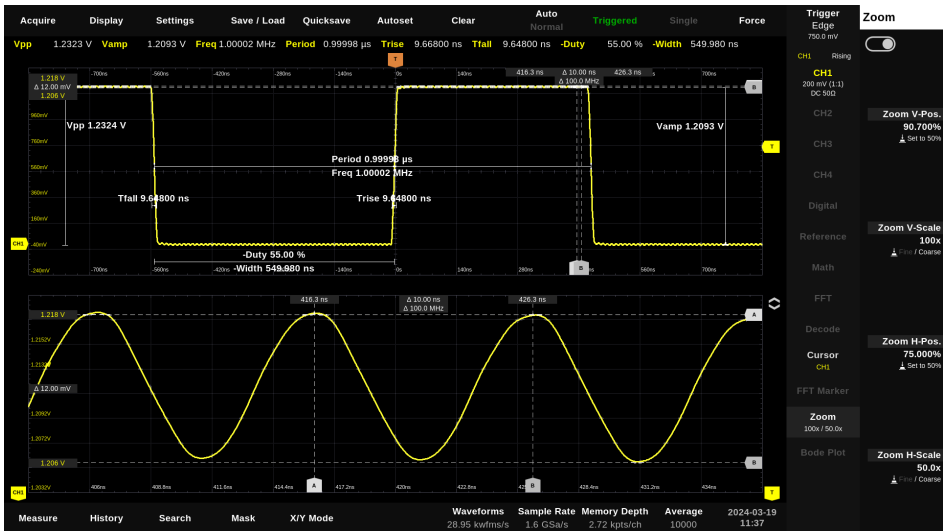And all this in silence - no fan required in normal operation.
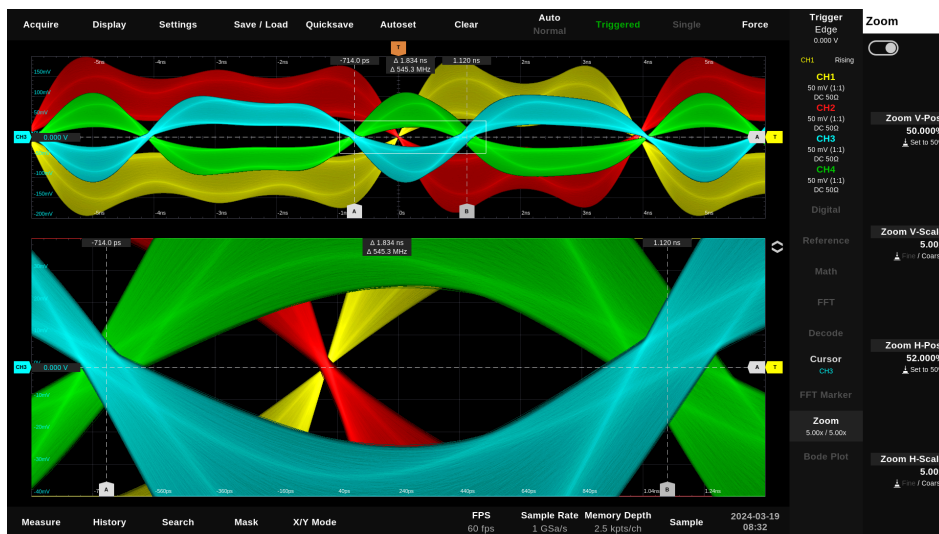
# 12-bit ADC With 16-bit Architecture

## See the finest details in zoom and FFT by combining high-quality 12-bit ADCs with a 16-bit system architecture.

With powerful filters, HiRes, and averaging functions in the 16-bit system architecture, we get even more out of the 12-bit data from the ADCs.



The screenshot shows a 100x vertical zoom on the only 12 mVpp large sinusoidal 100 MHz noise interference on a square wave signal (1 MHz). Thanks to the 16-bit system architecture and the powerful zoom function, the signal and the noise, which is a hundred times smaller, can be measured and displayed in detail.

# Brilliant Display

## The crystal-clear 15.6" Full HD touchscreen display will always deliver the best view of the signals.

The large screen diagonal and crisp resolution of 1920 x 1080 pixels will impress you. Whether you're viewing multiple channels simultaneously, analysing complex signals, or simply wanting to see everything at a glance, this display leaves nothing to be desired.

In addition, we have applied full liquid bonding to the display, where the touch module and the glass front are fully bonded with a liquid. This makes the image crystal clear and reduces reflections.

The Full HD resolution is also a great advantage for external displays. Large external screens or projectors can also be used for meetings, training and presentations.

# Awesome Digital Triggering

## Experience new possibilities with Magnova's fully digital triggering!

Most current oscilloscopes use a separate analogue trigger path, where the signal is separated from the measurement path, processed separately, and then digitised in a trigger circuit.

With the Magnova, triggering is fully digital, directly on the measurement data. This allows triggering on the smallest signal details with adjustable hysteresis, ensuring absolute reliability and the highest precision. This level of performance is usually only found in the high-end models of selected manufacturers.



The screenshot shows triggering on a signal detail as small as 220 µV (!). In the zoom view (centre), you can see the signal detail with a resolution of 50 µV/div, and the measurement trend charts (below) show the time progression of the Vpp voltage and the rise time of this signal detail.

The perfect full digital triggering allows reducing the noise here to be reduced to about one microvolt via averaging. And if that's not enough - the averaging number set here of 1000 can be increased to over 3.8 million waveforms on the Magnova.

# Powerful FFT

## Analyse noise, find the cause, check signal quality and more.

The FFT is one of the most important analysis tools of an oscilloscope. With up to up to 4 simultaneously running FFT channels, each with up to 8 million data points and many functions, the Magnova places a strong emphasis on a particularly powerful FFT.

Averaging, Min and Max Hold, Peak Tables, Waterfall Display, various window functions, FFT cursors, and functions, FFT cursors and even spectrum analyser-style markers. There is hardly a wish that will remain unfulfilled. If you come up with one, we will be happy to include it in an update.



For the screenshot, a BicoLog antenna without amplifier was connected directly to the input of the Magnova. At the top you can see the signal in the time domain, at the bottom the amplitudes in the frequency range LF to 800 MHz with spectrum, average and max hold display and in the centre the time progression of the spectrum in a waterfall display. Some peaks and marker values are shown in tabular form on the left.

# Optional Add-Ons

## The Magnova can be expanded at any time with up to 16 digital channels and a function generator.

The optional function generator module offers 14 bit resolution and a sampling rate of up to 400 MSa/s for any signal waveform from 1 µHz to 90 MHz. It is a full-featured generator with an amplitude range of up to 20 Vpp (up to 10 Vpp with 50 ohm termination).

In addition to various standard and test signals of any form, the generator also supports AM/FM and other modulations as well as sweep and burst signals, noise addition, and many other features.

The function generator module can be purchased and installed on the backside of the Magnova at any time, even after purchase.

On top of that, up to two logic analyzer modules can be connected for a total of 16 digital channels. The sampling rate is up to 1600 MSa/s and the threshold voltage is adjustable from -8 V to +8 V. The modules are automatically recognised on connection and no software licences or similar are required.
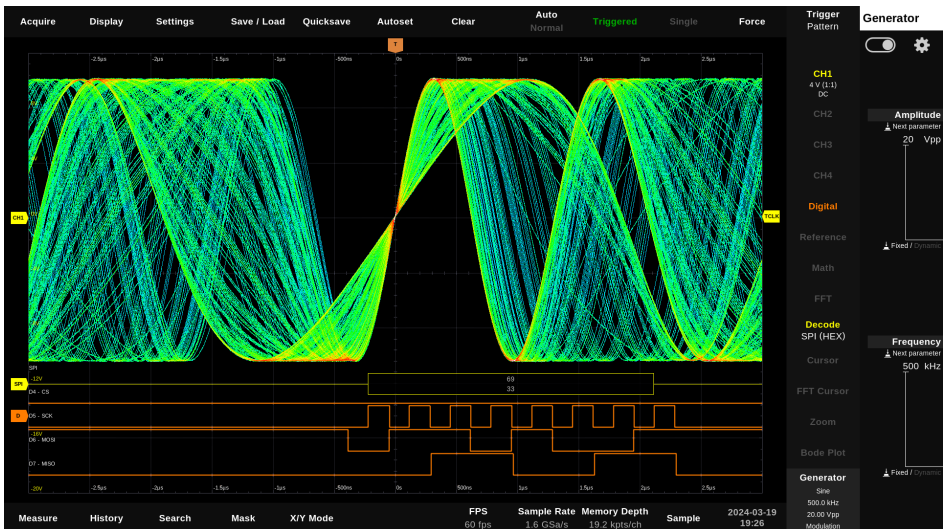
# Quality You Can Rely On

## You get a full 5-year warranty and our commitment to support you.

The design and manufacture of the Magnova takes place at our HQ in Preetz, a small town in Germany north of Hamburg. The case is manufactured by a renowned metalworking company near Stuttgart, while the PCB assembly is done in Magdeburg.

Only high-quality components are used to produce the Magnova. These include ELMA rotary encoders, rotary knobs with metal collets from Switzerland and micro switches from Denmark. The probes supplied with the Magnova are from Testec, based in Dreieich near Frankfurt am Main.

- We use high-quality ELMA-E33 encoders with a life expectancy of 1 million revolutions and knobs with metal collets.
- High-quality MEC micro switches are used instead of silicone keypads.
- There are no tantalum or electrolytic capacitors installed on the Magnova mainboard and frontend, as well as in the generator and logic analyser modules.
- We use high-quality displays with LOCA "Full Liquid Bonding". Although this is more expensive, it's worth every penny.

We've been producing programmers for over 20 years, but we acknowledge to be newcomers in measurement technology. The Magnova has been designed with a focus on an exceptionally long lifespan, and we stand by it with a 5-year warranty.

# Specifications

- 15.6" Full HD touchscreen (1920 x 1080 pixels)
- 4 analog channels, optionally expandable by 16 digital channels
- 12-bit A/D converter with 16-bit system architecture
- 4 x 1 GSa/s sampling rate (2 x 1.6 GSa/s interleaved)
- 100, 200, and 350 MHz bandwidth models available
- 320 Mpts memory depth

Software:
- Serial decoders (I2C, SPI, UART, CAN, CAN-FD, LIN, more to come)
- Extensive measurement functions with trend charts
- 4-channel FFT spectrum analysis with up to 8 million data points each
- Spectrum waterfall display, FFT peaks, cursor, and markers
- 4 math channels with user-defined formulas
- Mask testing for up to 300,000 tests per second
- History function stores up to 3.8 million waveforms
- Bode plot (included with the generator option)
- Comprehensive digital triggers with adjustable hysteresis

Connectivity:
- 3 USB 3.0 host ports
- 1 USB 3.0 device port
- DisplayPort monitor output with Full HD resolution (1920 x 1080 pixels)
- LAN network port
- 10 MHz Ref-In, Aux-Out (trigger / mask test / 10 MHz Ref-Out)
- VESA compliant (75 x 75 mm, M4)
- Kensington compliant (3 x 7 mm)

Accessories Included:
- 4 Testec probes with extensive accessories;
  for models with 100 and 200 MHz bandwidth: TT-HX 312 (350 MHz)
  for the model with 350 MHz bandwidth: TT-HF 612RA (500 MHz)
- Power cable

Optional Add-Ons:
- 16-channel logic analyser (up to 1600 MSa/s)
- Full-featured arbitrary function generator
  (90 MHz, 400 MSa/s, 20 Vpp)

# www.batronix.com/Magnova