The M520 Series
new USB oscilloscopes made by ETC

The M520 Oscilloscope Series belongs to the **E**TC **M**easuring **L**ab **3** (EML3) line and offers a wide range of devices. It provides a customer with a possibility to select a device perfectly fitting his or her needs offering the best performance/cost ratio.

All devices of the M520 Oscilloscope Series offer extremely simple and intuitive installation and operation, can adapt to any screen resolution (from 800 x 600 pixels upwards). They are powered directly from the USB interface.

Specifically speaking, the M520 Oscilloscope Series comprises of six USB oscilloscopes. They all have identical housing with dimensions of 106 x 163 x 35 mm (excl. connectors and feet); however, each of them has different characteristics and price. All of the M520 Oscilloscope Series devices have two vertical channels with 8-bit resolution and offer deflection factor from 10mV/div to 5V/div in 1-2-5 steps. They are fully compatible with both USB 2.0 and USB 1.1. The devices are extremely portable, because they are powered directly from the USB interface, thus do not need any kind of external power supply.

These instruments offer many features, which are rare in this price category. Here are a few for illustration:

- Dual level triggering system with digital pulse length filter and event counter on each level. This allows displaying of very complicated events (i.e. displaying of the selected row of a video signal)
- Virtual storage with size of 63000 samples. This feature allows to delay data acquisition from trigger event by maximum of 63000 samples.
- Simple and complex triggering modes. Simple triggering mode is very easy to use; while using the complex mode, the customer can utilize the triggering possibilities to the fullest extent.

Standard triggering features, such as data acquisition before trigger, triggering from channel A, channel B and external trigger or setting the trigger threshold of both channels within the whole vertical range of display are also supported.

The vertical deflection system is, of course, equipped with all standard features, such as AC/DC switch, GND switch or probe input ratio selector (1:1, 1:10, 1:100). The measuring channel inputs withstand the voltage of +-200 V with no respect to the selected deflection factor.

A very useful feature of the vertical deflection system is Digital Shielding. When turned on, removes the asynchronous noise from the measured waveform without any influence to the frequency response.

Using the random sampling method is the horizontal deflection system capable of reaching the equivalent sampling frequency of up to 20GS/s[1]. It also provides zoom functionality with factors from 10:1 to 1:16[2]. The fastest timebase setting is 200ps/div [(1] with zoom factor set to 10:1 or 2ns/div[3] with zoom ratio 1:1.

The standard oscilloscope software, which provides access to all functionalities of the device is accessible on the website of the ETC and is free of charge. When a customer keeps the software up-to-date, his hardware will be also in the up-to-date state, because big parts of the hardware are directly configured via software.

The customer, who has a need to control any of the M520 Series devices via own software, can use the M520DK API (available at the end of 2004). It works with following operating systems: Windows 98 SE, Windows ME, Windows 2000, and Windows XP.

1– Depending on the device model
2– 10:1 to 1:8 for models with 4K of storage per channel
3– Depending on the device model

The availability and comparison of devices of the M520 Oscilloscope Series is displayed in the following table:

TYPE	Frequency response of vertical amplifiers	Max. real time sampling frequency	Max equivalent sampling frequency	Size of storage for each channel	Introductory price in EUR	Production
M521	**60 MHz**	**50MS/s**	**5GS/s**	**4K**	**427**	**Available**
M522	**60 MHz**	**50MS/s**	**5GS/s**	**8K**	**487**	**Available**
M523	**120 MHz**	**100MS/s**	**10GS/s**	**4K**	**547**	**Available**
M524	**120 MHz**	**100MS/s**	**10GS/s**	**8K**	**607**	**Available**
M525	150 MHz	200MS/s	20GS/s	4K	697	3Q-05
M526	**150 MHz**	**200MS/s**	**20GS/s**	**8K**	**757**	**Available**

For detailed information please see The description and Performance characteristics.