

# Scoping out new scopes

Steve Bush reviews two summer oscilloscope offerings, as the equipment adds touch screens, becomes more versatile and portable

Tektronix and Yokogawa have announced the introduction of new oscilloscopes, both offering multi-function operation through unusual input configurations.

Tektronix's is a bench instrument with up to eight 2GHz analogue channels, each of which can be replaced with eight digital channels using a new probe assembly. Supplied with an enormous screen, it also includes test functions such as signal generation.

Yokogawa's is portable, offering both oscilloscope and data recorder functions, with input characteristics – including high-voltage isolation – set by two plug-in modules.

## The Tektronix 5 Series MSO

Called '5 Series mixed signal oscilloscope' (MSO), Tektronix's offering, features a front panel connector dubbed 'FlexChannel' which enables each input to be configured as either one analogue channel or, by connecting the new TLP058 logic probe, eight digital channels. Any combination of analogue and digital probes is supported.

By default, the physical input is a TekVPI+ connector (pictured below), which is compatible with TekVPI analogue probes.

"Until now, oscilloscopes have been defined with fixed configurations: the user had to decide up front how many analogue channels and whether they want zero or a fixed number of digital channels. Some scopes offer the option of adding digital channels post-purchase, but even then, it's a fixed quantity of



Tektronix's 5 Series mixed signal oscilloscope

digital channels that can't be changed as needs evolve," says Tektronix. "In many instruments, analogue and digital channels are sampled at different rates triggered using separate hardware, and stored in different-sized records, making precise comparisons impossible," said the firm.

At the heart of the new instrument is a new ASIC which combines traditional ADC, demultiplexer, trigger and digital acquisition components in a single device. Among other things it cuts front-end noise by 4.5dB compared with earlier mid-range Tektronix MSO offerings, and increases integration between analogue and digital channels.

ADC front-end resolution is 12-bit, although there is a DSP-based 16-bit mode for lower frequency signals.

Along with oscilloscope mode, the instrument can also be a logic analyser, arbitrary waveform generator, function generator, protocol analyser, DVM and trigger frequency counter. Some of these are pay-for options, although DVM and trigger frequency counter come free after product registration.

The huge screen is 1,920x1,080 spread across 15.6 inches with capacitive touch and "a user interface actually designed for touch", according to the firm. It has pinch, zoom and swipe, and also works with a mouse.

Configuration menus are accessed by double tapping relevant items on the display, and are transparent and movable

in case they are obscuring something of interest.

Two operating systems are available, with identical user interfaces: Windows (via a solid-state drive that holds the licence and operating system) or the built-in proprietary operating system.

"Many customers prefer a simple, secure, dedicated scope without Windows. Others prefer running other applications on the scope, using extended monitors, for example," says Tektronix. "The solid-state drive can be removed at any point in the future, extending the life of the scope as a dedicated instrument, if Windows goes out of support, for example."

If eight traces and 2GHz are too much, there are four- and six-channel versions, and variants at 350MHz, 500MHz and 1GHz.

## The Yokogawa ScopeCorder

Yokogawa's portable device, the DL350 ScopeCorder, combines general-purpose oscilloscope features with a high-performance data recorder.

"Unlike alternative portable measuring solutions such as oscilloscopes and combined oscilloscope/multimeters, it adds high levels of precision and accuracy to field measurements, isolated inputs for measurements at high voltage levels, and long-memory capabilities that allow recording for many hours or days," says Yokogawa.

Plug-in modularity allows it to be configured to suit user applications including precision voltage

measurement, current probes, temperature sensors, strain gauges, accelerometers and serial buses.

There are two slots that the user can populate with any of 18 different types input module – for example, four isolated 16-bit 1Msamples/voltage inputs can run alongside 16 temperatures or two separate CAN or LIN buses. Changing a single module would enable 100Msamples measurement with two isolated 12-bit inputs and 1kV of isolation.

Other options are AC measurements using an RMS module in real time and a mathematics channel for signal processing and analysis after recording is finished. As a data recorder, up to 5Gpoints of data per slot can be recorded directly to an SD card, for up to 50 days of continuous recording, according to Yokogawa. For high-speed capture, up to 100Mpoint/channel of internal memory is available.

A high-resolution, high-speed sampling module provides individually isolated 12-bit, 100Msamples inputs, that can measure and record transient waveforms (superimposed on inverter outputs, for example) and the edges of control signals that Yokogawa claims cannot be measured by traditional handheld recorders or oscilloscopes.

A recorder mode set-up wizard is there to guide novice operators. The display is 8.4 inches with high-resolution resistive touch, chosen

over capacitive touch because it operates in environments with high electrical noise, such as near motors and inverters, and can be used with gloved hands.

Yokogawa's ScopeCorder boasts up to 18 different plug-in modules

