Video testers: new model plus modules for HDMI and analog A/V interfaces

The new R&S®VTC video test center has been optimized for R&D requirements and complements the R&S®VTE and R&S®VTS testers. Together with the new test modules for analyzing HDMI and analog A/V interfaces, the product family now covers a spectrum of applications that is unrivaled among its competitors.

Family of video testers now complete

The R&S®VTE and R&S®VTS video testers and the test module for the MHL™ interface were introduced in the previous issue (NEWS 206, pages 32 to 37). A third member of the family – the R&S®VTC video test center (Fig. 1) – and additional modules for these three instruments round off the product family, which now covers all applications in the consumer electronics value chain.

R&S®VTC video test center – optimized for use in R&D and test labs

The R&S®VTC video test center is a fully modular platform with a diverse range of functions for testing video and audio interfaces. Like the R&S®VTE and the R&S®VTS, the R&S®VTC can perform standard interface protocol tests and also analyze media content in realtime during application tests on consumer electronics equipment. The R&S®VTC is incredibly versatile. It can be modified to meet the needs of specific testing environments and upgraded to accommodate new standards.

The new high-end model takes up four height units in a 19" rack. It is larger than the R&S®VTE and has room for up to eight modules. Its powerful features are targeted primarily at R&D labs, where a wide range of tests need to be performed on devices with different interfaces.

The R&S®VTC with its capacitive 11-inch touchscreen is just as intuitive and convenient to use as the R&S®VTE video tester. It can be remotely controlled by sending SCPI commands to the instrument over the VXI-11 remote control interface. And test setups can be easily automated using the R&S®AVBrun test sequencer that was also presented in NEWS 206.

Fig. 1   The R&S®VTC video test center is larger than the R&S®VTE video tester. It has room for up to eight modules and an 11" touchscreen for even more convenient operation.

Fig. 2   The R&S®VT-B2360/2361 HDMI RX options support testing of HDMI sources.

Fig. 4   The R&S®VT-B2370 analog AV RX audio/video test module can be used to measure analog composite and component signals as well as two-channel audio signals
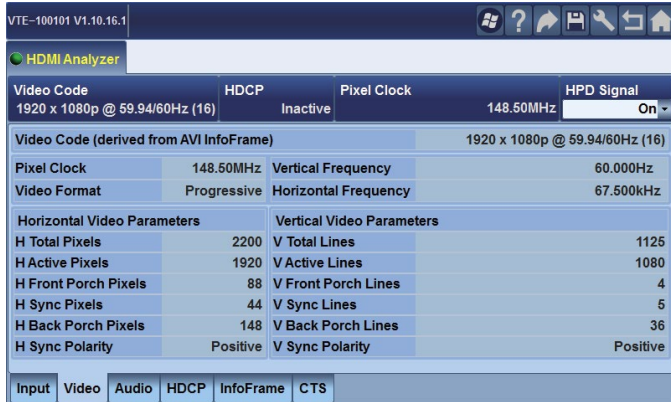

Fig. 3   The new analysis options offer many capabilities, including comprehensive protocol analysis for HDMI signals.
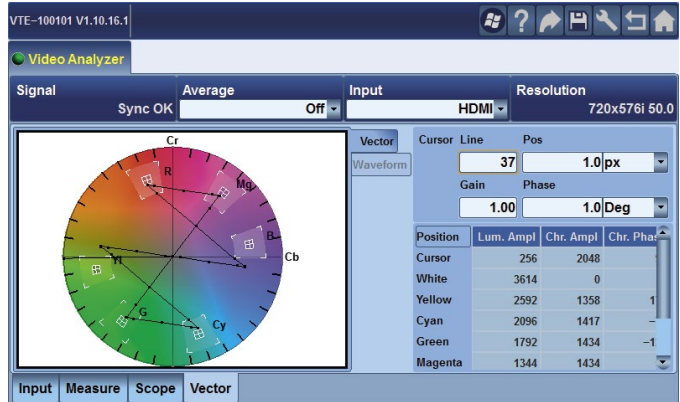

Fig. 5   The vectorscope can be used to investigate color difference signals in analog and digital video signals.

HDMI test modules – including support for 4k resolution

The new trend in consumer electronics in the next years will be ultra definition (UD), which offers four times the resolution of conventional Full HD. The current version 1.4 of the HDMI standard already supports UD. Work is now underway on an extension of the interface standard with an extended feature set.

For comprehensive testing of the HDMI interface, Rohde&Schwarz now offers the new R&S®VT-B2360 HDMI RX 225 and R&S®VT-B2361 HDMI 300 interface modules (Fig. 2) that allow in-depth testing at the protocol and content level on HDMI sources such as set-top boxes, Blu-ray™ players and tablet computers. The modules support resolutions up to Full HD or 4k. Audio and video content can be played back in realtime on the base unit or output externally via the AUXILIARY HDMI OUT output. Extensive analysis functions are provided (Fig. 3):

❙ Output of video timing parameters such as pixel clock and resolution in line with CEA-861
❙ Display of content from audio clock regeneration (N/CTS) and from audio sample packets
❙ Display of the high-bandwidth digital content protection (HDCP) status and the keys used
❙ Display of the auxiliary video information (AVI) InfoFrame, audio InfoFrame, source product description (SPD) and MPEG InfoFrame
❙ Optional: source test in line with HDMI compliance test specification 1.4

The HDMI Ethernet and audio return channel (HEAC) can also be tested. An Ethernet interface on the modules allows an external signal to be supplied or additional analysis equipment to be connected. Rounding out the range of functions is an optical S/PDIF input for digital audio signals. This input can also forward the signals to the software option for audio analysis.

Analog audio/video test module

The new R&S®VT-B2370 analog AV RX analyzer module (Fig. 4) comes with one composite input and two analog audio test interfaces. The NTSC and PAL composite formats are currently supported. As an option, three inputs for analyzing SD and HD component signals and VGA (RGBHV) can be activated. YCbCr or RGB signals in the different resolutions can be applied to the component inputs.

In conjunction with this analog audio/video test module and additional software options, the video testers can analyze analog video signals in the time domain and provide a vectorscope display for measuring the color components (Fig. 5). In the future, automated measurements of common signal parameters will also be supported.

Audio analysis option

In addition to the video content analysis functions described above, it is now also possible to assess the quality of the audio content transmitted via analog or digital interfaces. The

new R&S®VT-K2150 audio analysis option measures the level, frequency response, interchannel phase, signal-to-noise ratio, total harmonic distortion and crosstalk (Fig. 6).

On digital interfaces such as MHL™ and HDMI, simultaneous audio measurements are performed on up to eight channels. Analog interface testing is supported on two channels. The various parameters are simply selected using the tabs on the user interface. A wide range of common weighting filters is also provided.

Summary

The R&S®VTC video test center for development-related applications, the R&S®VTE video tester for automated applications in test setups and the R&S®VTS compact video tester for manufacturing applications – Rohde&Schwarz now offers A/V T&M instruments covering the entire value chain in the consumer electronics sector. With test modules for HDMI, MHL™ and analog A/V interfaces and comprehensive analysis capabilities, these instruments support a spectrum of
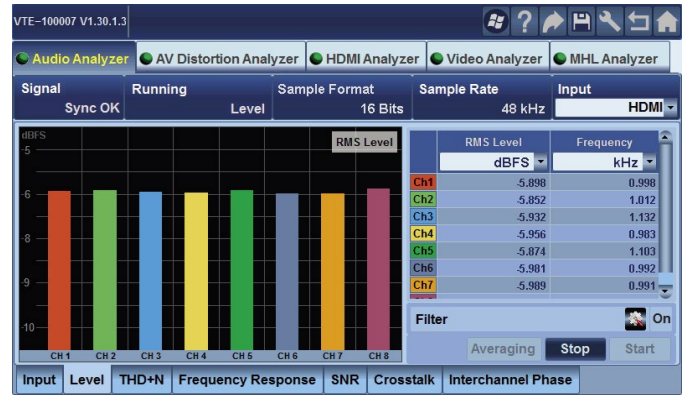

Fig. 6   The R&S®VT-K2150 audio analysis option supports essential audio measurements on the available interfaces.

applications that is unrivaled among the competition. Thanks to the product family's modular design, it is also ready for future interface standards.

Harald Gsödl

Unrivaled application spectrum for consumer electronics

Comprehensive testing of devices such as set-top boxes, smartphones and Blu-ray™ players includes assessing the quality and correctness of audio and video content. During development, for example, a device's long-term stability, immunity to interference and video and audio quality must be tested. All of these tests have to be performed over the DUT's A/V interfaces.

The video testers from Rohde&Schwarz cover virtually all of the tests that have to be performed on A/V components in the consumer sector. Fig. 7 shows an example of a setup for testing a set-top box in the lab. First, the receive quality is tested. The

signal generator outputs a broadcast signal that has noise, fading and other types of interference superimposed on it. Using the Rohde&Schwarz video testers, it is now possible to automatically and reproducibly determine the picture errors (picture failure points (PFP)) that occur.

Next, the A/V outputs on the set-top box (i.e. analog composite or component signals as well as HDMI signals) can be tested for compliance with the relevant standards. Finally, the audio and video quality is tested.

Fig. 7   Test scenario with the R&S®VTC video test center: testing the HDMI and analog audio/video outputs of a set-top box.