

DTV Recorder Generator DVRG

Recording, processing and replaying MPEG2 transport streams

From the very beginning of digital television, Rohde & Schwarz has demonstrated its competence in terms of MPEG2 with MPEG2 Generator DVG and MPEG2 Measurement Decoder DVMD [1; 2]. This instrument duo with its unparalleled features is today found virtually wherever MPEG2 transport streams appear and have to be processed. Now a new member has been added to the family – the DVRG generator platform (FIG 1). This unit is quite unique, generating the entire spectrum of digital TV signals while occupying minimum space. In addition to recording and replaying MPEG2 transport streams, DVRG can optionally process uncompressed SDI video streams of 270 Mbit/s. Additional software packages open up a wide range of applications.

Newcomer with many special features

DVRG offers outstanding characteristics right in its basic version. Featuring compact design of only two height units, DVRG offers up to 36 Gbytes of storage

capacity for recording and replaying MPEG2 transport streams.

The supplied transport-stream library contains predefined signals for many applications and test cases. This library, familiar from DVG and much appreciated

FIG 1 Only two units in height yet easy to operate via the front panel: DTV Recorder Generator DVRG

Photo 43.401/3



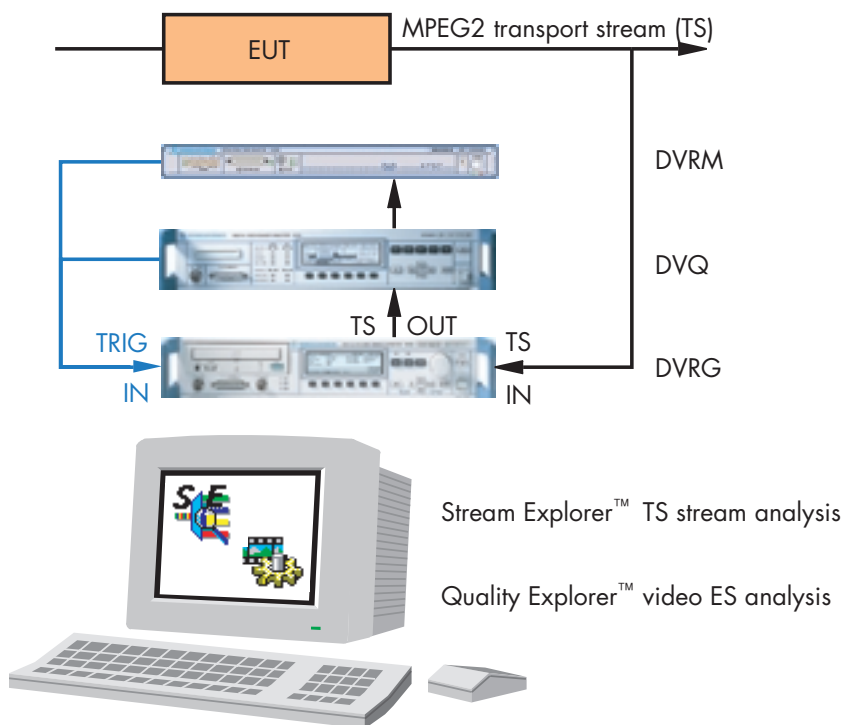


FIG 2 Compact test station for error analysis

by users, is continuously expanded by Rohde&Schwarz to match new requirements and developments in the TV industry. An integrated CD-ROM drive makes it easy to download signals. And an optional CD burner is available for archiving recorded streams.

A trigger input simplifies the selective recording of video streams. Transport streams can be recorded before, after or right at the time of an event, so that even rare errors or events can be reliably documented and analyzed (FIG 2).

Beside these characteristics, DVRG is also compatible with the widely used MPEG2 Generator DVG from Rohde&Schwarz. This makes for good economics, because all signals generated for DVG can be transferred to DVRG unmodified. Conversely, sequences generated by DVRG can be downloaded to DVG and replayed there.

Another strong point of DVRG shows in continuous operation. Free RAM capacity

is automatically used for signal output. This means that shorter image sequences can be output without requiring any hard disk capacity.

Robust operating system and comprehensive software packages

The Windows Embedded NT™ operating system is the powerful motor in DVRG. This robust version of the Windows NT™ 4.0 operating system known from the PC world also allows the unit to be powered off in ongoing operation. This does away with tedious shutdown, an aspect that will be appreciated by many users. The main advantage however is that reliable booting is ensured even after a power failure – an important feature especially in production.

Connecting a keyboard, mouse and monitor turns DVRG into a Windows NT™ workstation, for which exten-

sive software packages are available for generating, processing and analyzing transport streams in the unit (FIG 3). The Stream Combiner™ software [3] allows fast and simple modification and recombination of transport streams. This software too comes with a large library of elementary streams into which elements of recorded sequences can also be integrated. The coding of recorded transport streams can be analyzed and displayed in detail with the elementary stream analyzer of the Quality Analyzer software package [4].

Applications here, there and everywhere

Video server

Absolutely new in an MPEG2 generator is the optional ITU 601 interface. This enables recording and replaying of uncompressed video signals, turning DVRG into one of the most compact video servers on the market. DVRG is thus an ideal signal source for testing encoders and decoders.

Development

With its versatile capabilities, DVRG is an ideal tool in the development of digital TV equipment of every kind, for example encoders, multiplexers, modulators, receivers, set-top boxes. In the simplest case, one of the many predefined test signals available in DVRG can be used. If transport streams with specific contents are needed, these can be obtained either by recording other sources or by freely configuring the recorded elementary streams of optional Stream Combiner™ software DVG-B1 [3]. For special-purpose tests, defined error states can also be produced in this way.

Production

Test signals already generated at the development stage can be re-used in the production of the equipment in question. Compatibility with DVG – the MPEG2 generator most widely used –

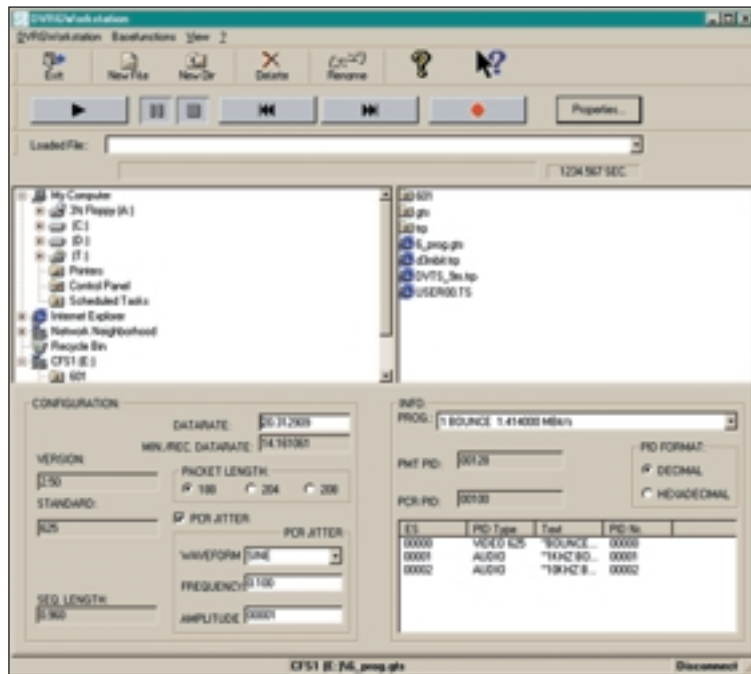


FIG 3 Windows™ user interface for operating DVRG as workstation

subsequently analyzed offline with other tools such as MPEG2 Measurement Decoder DVMD or Digital Video Quality Analyzer DVQ [4].

Monitoring

DVRG is suitable also in monitoring applications. Triggered recording allows in-depth analysis of error states that occur only rarely. The trigger signal is supplied by MPEG2 Realtime Monitor DVRM [5] or by DVQ for example (FIG 2). DVRG can be set to start recording some time before the trigger event so that the cause of an error state can easily be traced. In a workstation configuration, the Stream Explorer and Quality Explorer software options can be installed on these units to produce a complete, compact test station.

Compact, powerful and extremely flexible – these properties make DVRG a highly versatile MPEG2 test device.

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makes it possible to replay signals on both units.

In addition to the low-wear operation of DVRG, which makes it ideal for continuous service, its sturdy design also makes it an interesting proposition for a production environment. A stan-

dard 19-inch enclosure and Ethernet interface (100BaseT) simplify integration of DVRG into test systems.

If an EUT outputs MPEG2 transport streams or SDI video streams, these can be recorded by DVRG for test or quality-assurance purposes and

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Condensed data of DVRG

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|---------------------------|--|
| Signal inputs and outputs | DVB TS ASI (active loop-through input) DVB TS SPI/LVDS ISDI (ITU 601/SMPTE 259E) to ISO/IEC 1-13818 |
| Transport stream | ATSC: 188/208 bytes (selectable) |
| Packet lengths | DVB: 188/204 bytes (selectable) |
| Sequence length | endless or limited by hard disk size |
| Signal set | transport-stream library with approx. 80 sequences |
| Data memory | 18 Gbytes or 2 x 18 Gbytes |
| Operating system | Microsoft Windows Embedded NT™ |
| Remote-control interfaces | Ethernet 100BaseT, RS-232-C |

Reader service card 167/02