TV Test Transmitter SFQ

Bit-error-rate measurement on set-top boxes

Bit error rate (BER) can be measured at different points on set-top boxes for digital television. A BER instrument must be able to accept and evaluate data in serial or parallel form or as the payload of an MPEG2 transport stream. This is no problem with TV Test Transmitter SFQ (FIG 1) and its BER measurement option: while the necessary signals are generated at the right places in the signal flow, BER is measured at the same time. Together with an optional noise generator and fading simulator, SFQ is also able to simulate the interference occurring in real-life transmissions in a reproducible way.

No need for special transmission testers

Reproducible measurement of BER under defined conditions is an informative and important measurement when you want to assess the quality of digital transmission methods and the components involved. TV Test Transmitter SFQ [*] features comprehensive BER capability: it evaluates data from receivers, set-top boxes or demodulator chips in serial form as data and clock, or in parallel form as a PRBS sequence, or as the payload of an MPEG2 transport stream. No extra digital transmission tester is necessary. Signal generation and evaluation can be fully remote-controlled.

Quasi errorfree

In digital television to DVB specifications, measurement of the quasi errorfree (QEF) point at a defined receive level has proven to be especially important. QEF means a BER of $2 \times 10^{-4}$ before the Reed-Solomon decoder. White Gaussian noise is added to the useful signal and BER is measured before the Reed-Solomon decoder at different noise levels (C/N settings). The deviation of the measured from the theoretical curve is then determined at the QEF point to obtain the equivalent noise degradation (END), which is an important receiver parameter.

What was previously only possible with a special configuration is now done by SFQ quite simply: BER measured direct in an MPEG2 transport stream. For this purpose SFQ provides a NULL PRBS PACKET signal before the FEC (forward error correction) in the coder in which a pseudo-random bit sequence (PRBS) is packeted as the payload in an MPEG2 transport stream.

Example: set-top box

The set-top box demodulates and decodes the RF signal generated by...
SFQ (FIG 2). The received MPEG2 transport stream is available at its common interface. An adapter card is available as a recommended extra for this standard interface so that the MPEG2 transport stream can be output, converted in level and the signal then applied to the parallel input (TS PARALLEL AUX) of SFQ. For BER measurement, SFQ eliminates the header from the MPEG2 transport stream and evaluates bit errors in the payload.

The BER measurement hardware is accommodated in the DVB-T module of SFQ. The BER measurement software option is independent of this module, however, and works with transport streams of any modulation format. The bit error rate currently being measured is shown in a line of the display (FIG 3). The user can thus vary the C/N ratio and see the measured bit error rate at the same time.

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REFERENCES


Reader service card 167/12