

Application software – making measurements easier

Many a measurement is simpler and faster with the help of a computer. Rohde & Schwarz has developed a number of programs to support a wide variety of measurements. The software – obtainable with application notes – runs under Windows 3.1, Windows 95 and Windows NT 4.

MobiDemo is an application software that simplifies testing of components used in different mobile-radio systems, for example amplifiers and filters. Such components must be driven by signals with very small inherent error. The output signals from the components are then checked for distortion like poorer modulation quality or degradation of adjacent-channel power figures. The software can handle the W-CDMA, CDMA to IS95, Iridium and PHS standards. Just a few mouse clicks in MobiDemo activate the appropriate modulation mode in Vector Signal Generator SMIQ [1] and set frequency and level. The test signals are then applied to the DUT. The output signal of a component is measured by Spectrum Analyzer FSE [2], also programmed by MobiDemo (FIG 1). When measuring adjacent-channel power for W-CDMA in particular, proper setting of FSE is important because of the special signal characteristics and the, in most cases, stricter requirements. MobiDemo automatically optimizes settings and displays results numerically and as a trace. MobiDemo can also be run on FSE by adding Computer Function FSE-B15 and a second IEC/IEEE bus.

A further application note offers some convenient conversion programs. One of them is **Power Unit Calculator**, which converts power from W to dBm and vice versa and displays the corresponding voltages into 50 Ω in V and dB μ V. **VSWR Calculator** computes

VSWR in percent from the reflection coefficient as well as return loss in dB and reflected power in percent and vice versa. It also estimates the measurement error that may be caused by mismatch between generator and load. By entering the source reflection coefficient of the generator and the input reflection coefficient of a connected DUT, maximum and minimum error limits through mismatch are calculated and displayed in percent and dB.

You may find you have no network analyzer on hand when you need to measure the frequency response of a filter, amplifier, coupler or the like. The alternative to manual measurement using a signal generator and power meter or receiver is **FreRes** (FIG 2). It may not be as user-friendly and fast as a network analyzer, but it does support a variety of Rohde & Schwarz signal generators and indicator instruments, from power meter through test receiver to spectrum analyzer, whatever is available. Frequencies range from audio to microwave (depending on the signal generator), the dynamic range depends on the indicator and extends to beyond 100 dB (receiver or spectrum analyzer). And FreRes also offers convenience in the form of frequency-response compensation of instruments and connecting cables by calibration, graphical display of results, a linear and logarithmic frequency axis, automatic scaling of the trace diagram on the horizontal and vertical axis as well as different possibilities for data logging.

I/Q Modulation Generator AMIQ [3] is a programmable modulation source for a very wide range of applications. Software WinIQSIM works with it as a convenient user interface for computing a large variety of signals.

Software AMIQ-K2 (FIG 3) supports users for whom this is not enough and who want to compute their signals themselves. AMIQ-K2 allows you to transfer to AMIQ any waveforms

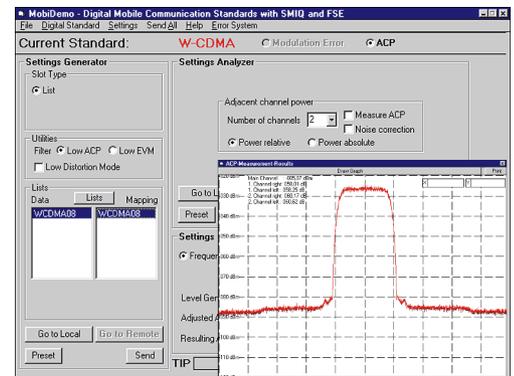


FIG 1 User interface of MobiDemo

available as a file. Very different file formats are accepted, including files generated by mathematical programs like MathCad or MatLab. Also supported are COFDM signals for terrestrial DAB and DVB, computed by Soft-

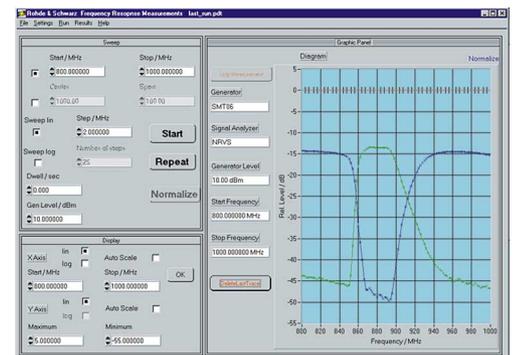


FIG 2 Frequency response of diplexer measured with FreRes

Application notes

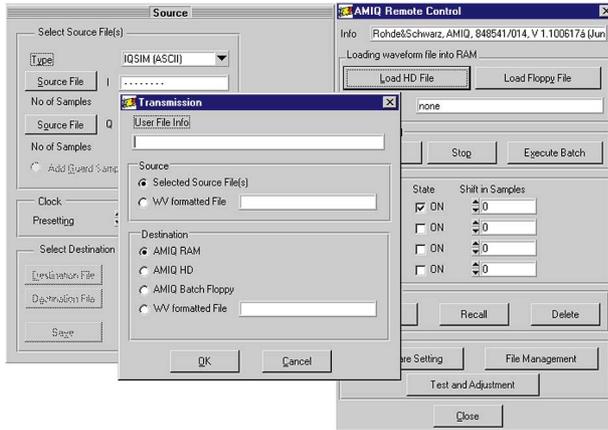


FIG 3
Waveforms of any type can be transferred to I/Q Modulation Generator AMIQ with AMIQ-K2

REFERENCES

- [1] Klier, J.: Signal Generator SMIQ – High-quality digital modulation up to 3.3 GHz. News from Rohde & Schwarz (1997) No. 154, pp 4–6
- [2] Wolf, J.: Spectrum Analyzer FSE with Option FSE-B7 – Vector signal analysis, indispensable in digital mobile radio. News from Rohde & Schwarz (1996) No. 150, pp 19–21
- [3] Kerchen, W.; Tiepermann, K.-D.: I/Q Modulation Generator AMIQ – Convenient generation of complex I/Q signals. News from Rohde & Schwarz (1998) No. 159, pp 10–12

ware DAB-K1. Transfer to AMIQ is possible via its IEC/IEEE or RS-232-C interface. The major functions of AMIQ like output voltage, clock rate or file management can be controlled by means of AMIQ-K2.

Albert Winter

Application notes are obtainable from all Rohde & Schwarz representatives by quoting the following numbers:

MobiDemo, Program for Generation and Analysis of Communication Signals

Application Note 1MA11_0E

Reader service card 160/09

Conversion **Calculators** for Power Units and VSWR/Reflection

Application Note 1MA12_0E

Reader service card 160/10

Program for Frequency-Response Measurements **FreRes**

Application Note 1MA09_0E

Reader service card 160/11

AMIQ-K2, Program for Transfer of I/Q Data of Different Formats to AMIQ

Application Note 1MA10_0E

Reader service card 160/12