R&S®FSL-K93 WiMAX Application Firmware

Spectrum and modulation measurements on stationary and mobile WiMAX signals

◆ Expands the R&S®FSL spectrum analyzer by adding the capability to perform spectrum and modulation measurements on signals in line with the IEEE 802.16-2004 and IEEE 802.16e-2005 standards

◆ Supports OFDM and OFDMA

◆ Excellent price/performance ratio at a demodulation bandwidth of 20 MHz

◆ Ideal solution for production and service applications

◆ Highly flexible measuring instrument for verification purposes in development

◆ All functions can be remote-controlled via IEC/IEEE bus or LAN

◆ LXI Class C compliant

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At a glance

The R&S®FSL-K93 WiMAX application firmware supports the IEEE 802.16-2004 and IEEE 802.16e-2005 standards for mobile WiMAX signals including WiBro. R&S®FSL-K93 is an expansion of the R&S®FSL-K92 WiMAX application firmware option for the R&S®FSL spectrum analyzer.

The R&S®FSL-K93 WiMAX application firmware offers an excellent price/performance ratio. It is ideally suited for R & D and service applications as well as for production purposes.

All functions can be completely remote-controlled via IEC/IEEE bus or LAN. The remote control commands as well as the functional and control concept are largely identical to those of the R&S®FSQ signal analyzer (with the R&S®FSQ-K93 option). This makes it easier for users who are already familiar with the R&S®FSQ to operate the instrument and thus reduces the time for product launch.

Features

The main parameters and results are numerically listed in a table, allowing the user to view all important results at first glance:

◆ EVM results (averaged)
  – EVM (all carriers)
  – EVM (data carriers only)
  – EVM (pilot carriers only)
◆ I/Q constellation
  – I/Q offset
  – Gain imbalance
  – Quadrature offset
◆ Power measurement
  – In time and frequency domain
  – Crest factor
  – Radio signal strength indicator (RSSI) measurement
◆ Carrier frequency error and symbol clock error
◆ Carrier to interference and noise ratio (CINR) measurement
◆ BER of pilot sequences

Moreover, the following results are graphically displayed:

◆ EVM – error vector display
  – EVM versus symbols
  – EVM versus carriers
◆ Frequency error and phase error during preamble
◆ Spectrum flatness and group delay
◆ Adjacent carrier power difference
◆ Constellation diagram (color-coded according to modulation)
◆ Bit stream (color-coded according to modulation)
◆ Overview of all bursts
◆ Spectrum mask with limit lines and pass/fail indication
◆ Adjacent channel power (absolute and relative) with noise correction (up to five adjacent channels can be defined)
◆ CCDF and crest factor

In addition, the R&S®FSL can import and export the I/Q data, thus offering further analysis capabilities. The R&S®FSL is one of the first spectrum analyzers that has been certified as LXI Class C compliant.


The result summary displays the most important parameters for characterizing WiMAX signals detected within the period of recording.

In the Frame Configuration menu, the UL and DL map as well as the individual zones of the OFDMA signal can be defined by means of a table. The settings are graphically displayed simultaneously in the Burst map or Zone map.
Additionally, automatic detection of the zones and demodulation is possible. The user can define which modulation mode or which part of the signal should be analyzed. Furthermore, the settings can be loaded from an R&S®SMU200A signal generator connected via LAN.
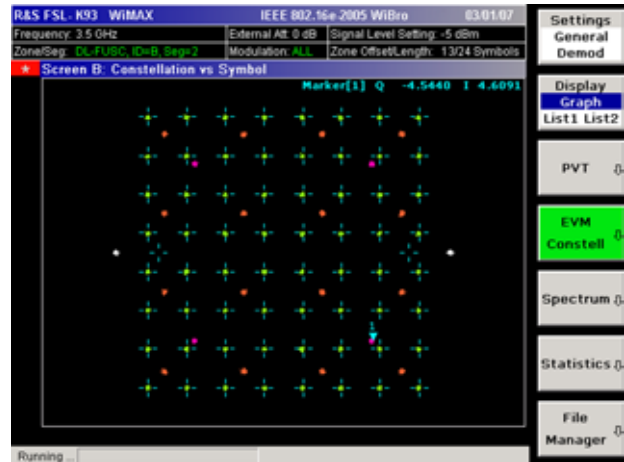
The constellation diagram of WiMAX signals is color-coded according to the modulation. Either the entire zone or individual modulation modes are displayed. The R&S®FSL can display the constellation diagram either for all carriers or for selected carriers.
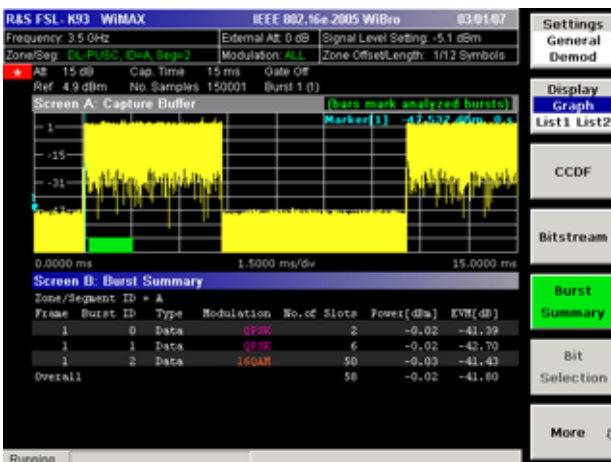
The green highlighted subranges of the WiMAX signal in the time domain are demodulated. The burst summary provides information about the bursts of the analyzed zone, for example modulation mode and EVM.

The R&S®FSL can be used for measuring both the adjacent channel power and the spectrum mask in line with the IEEE, ETSI, and WiBro standards. Using predefined limit lines, the analyzer determines, at the press of a button, whether the spectrum conforms to specified requirements. The screenshot shows the WiBro spectrum mask with pass/fail evaluation.

Ordering information

Designation	Type	Order No.
WiMAX Application Firmware	R&S®FSL-K93	1302.0736.02
Spectrum Analyzer, 9 kHz to 3 GHz	R&S®FSL3	1300.2502.03
Spectrum Analyzer, 9 kHz to 3 GHz, with tracking generator	R&S®FSL3	1300.2502.13
Spectrum Analyzer, 9 kHz to 6 GHz	R&S®FSL6	1300.2502.06
Spectrum Analyzer, 9 kHz to 6 GHz, with tracking generator	R&S®FSL6	1300.2502.16

Certified Quality System
ISO 9001
DQS REG. NO 1954 QM

Certified Environmental System
ISO 14001
DQS REG. NO 1954 UM

More information at
www.rohde-schwarz.com
(search term: FSL)

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