WiNRADiO®

AVENTAS INC

Embedded Computing, Timing and Telemetry Products

WR-G315e Professional VHF/UHF Scanning Receiver

The WiNRADiO WR-G315e is a software-defined high-performance VHF/UHF receiver (9 kHz to 1800 MHz, extendable to 8599 MHz using an optional ***Antenna Multiplexer and Frequency Extender***) with a USB interface, an external version of the ***WR-G315i*** receiver.

This receiver is intended for government, military, security, surveillance, broadcast monitoring, industrial and demanding consumer applications.

The receiver offers an unparalleled flexibility given its SDR architecture, respectable dynamic range, and high sensitivity. Many useful features complement the receiver, making it capable of filling not only the role of a monitoring receiver but also that of a measuring receiver, such as the calibrated S-meter showing the received signal levels in dBm, µV or S-units, down to the -140 dBm noise floor, several spectrum analyzers, and many other features not usually found on receivers of this price.

The hardware and software package consists of the receiver card, Windows-based software, a start-up antenna and a user's manual.

The receiver connects to an IBM-compatible PC via the USB port. Several receivers can be controlled by a single PC to form a multi-channel HF receiver system.

The receiver has its own on-board DSP, and does not rely on the PC sound card for the signal input; the digitization is done in the receiver itself, using a high-performance analog-to-digital converter. As the DSP performs the final stage IF filtering and all demodulation, this receiver is entirely software-defined, which means that additional demodulation or decoding modes can be easily added by a mere software change. (For example, an optional ***DRM decoder/demodulator*** is also available.)

Software

The WR-G315e software contains numerous advanced features such as three types of scanning, five types of squelch, many tuning options, virtually unlimited memories and a rich on-line help facility.

There are numerous demodulation modes, continuously variable IF bandwidth 1 Hz to 15 kHz (in 1 Hz increments), a 20 kHz wide real-time spectrum analyzer with 16 Hz resolution, noise blanker and notch filter. There is also an integrated recorder, making it possible to instantly record and playback the received signal.

Apart from audio recording and playback, the receiver can also record an entire 20 kHz wide IF spectrum, making it possible to thoroughly analyze the received signal, and "re-receive" the same signal again and again with different IF filter bandwidths, notch filter, noise blanking or demodulator settings, to arrive at the best possible reception of weak or interference-prone transmissions.

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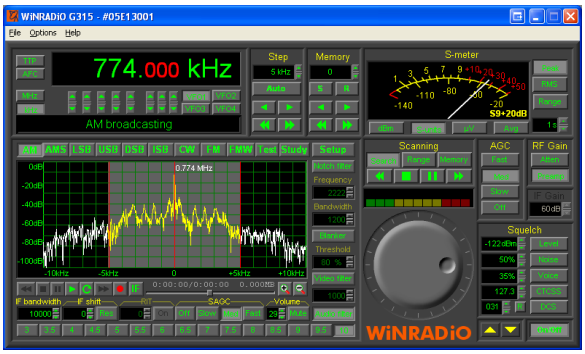

Receiver type	DSP-based SDR with DDS-based dual-conversion superheterodyne front end
Frequency range	9 kHz - 1800 MHz (3500 or 8599 MHz with optional ***AMFE*** unit) *(except cellular radiotelephone frequencies where required by law)*
Tuning resolution	1 Hz
Mode	AM, AMS, LSB, USB, DSB, ISB, CW, FM (wide-FM with optional WFM demodulator)
Image Rejection	1.8-150 MHz: 60 dB typ. 150-1800 MHz: 50 dB typ.
IP3	0 dBm @ 20kHz
Spurious-free dynamic range	90 dB
MDS	-135 dBm
Phase noise	-148 dBc/Hz @ 100 kHz
Internal spurious	Typically less than equivalent antenna input of -105 dBm
RSSI accuracy	2 dB
RSSI sensitivity	-137 dBm
Bandwidth	50 - 15000 Hz (adjustable in 1 Hz steps)
Scanning speed	50 channels/s
Sensitivity (AM/SSB/CW 10dB S/N) (FM 12dB SINAD)	Mode / 0.15-500 MHz / 500-1800 MHz AM, AMS (30% modulation): -108dBm (0.89µV) / -104dBm (1.4µV) AM, AMS (80% modulation): -116dBm (0.35µV) / -112dBm (0.56µV) LSB, USB, ISB, DSB: -119dBm (0.25µV) / -115dBm (0.40µV) CW: -126dBm (0.11µV) / -122dBm (0.18µV) FM: -113dBm (0.50µV) / -109dBm (0.80µV)
Intermediate frequencies	IF1: 109.65 MHz IF2: 16 kHz
Roofing filter	2 x 4-pole 20 kHz crystal filter
Tuning accuracy	1 ppm (25°C ±2°C)
Frequency stability	0.5 ppm (0 to 60° C)
Antenna input	50 ohm (SMA connector)
Output	Digitized IF & audio signal over USB interface
Interface	USB (1.0 and 2.0 compatible)
Dimensions	Length: 166 mm (6.5") *(excluding mounting bracket)* Height: 97 mm (3.80") *(excluding edge connector)* Thickness: 41 mm (1.6") *(incl. components on either side)*
Weight	430 g (15.1 oz)

In addition to the real-time narrow-band spectrum analyzer, there is also a wide-band ***spectrum analyzer*** which contains additional professional instrumentation facilities: the ability to display minimum and maximum spectrum sweeps, search for peaks, average spectra, save and print spectra, marker mode, etc.

Another useful feature, previously unavailable with receivers of this price class, is a ***test and measurement*** facility, performing measurements on the received signal including frequency accuracy, amplitude modulation depth, frequency deviation, THD (total harmonic distortion) and SINAD. An audio spectrum analyzer is also included, making it possible.

The unique ***research and education*** function makes it possible to explore interactive block diagrams of the software-defined demodulator, for each demodulation mode, and observe demodulation taking place on real-time signals using two spectrum analyzers and a vector voltmeter.

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