



## Embedded Computing, Timing and Telemetry Products

### WR-G315i Receiver

#### Overview

The WinRADIO WR-G315i is a software-defined high-performance VHF/UHF receiver (9 kHz to 1800 MHz, extendable to 3500 MHz using an optional Antenna Multiplexer and Frequency Extender) on a PCI card.

**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,  $\mu$ V 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.

#### Hardware

The PCI card plugs into an available slot of an IBM-compatible PC. Several receivers (as many as there are free PCI slots available) can be controlled by a single PC - an ideal solution for high-performance multi-channel automatic monitoring systems.

There is a single SMA antenna connector and an output line audio jack which can be used to connect the receiver output directly to a sound card line-input or an amplified speaker.

The receiver has its own on-board DSP, and does not rely on the PC sound card for its performance. 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.)

**No cables or power supplies needed - no clutter on your desk. Every modern desktop computer can be converted into a powerful VHF/UHF monitoring station with minimum fuss.**

#### Software

The WR-G315i 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.

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 to observe the demodulated spectrum in real-time with a resolution of 5 Hz.

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.

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 <a href="#">AMFE</a> unit) <i>(except cellular radiotelephone frequencies where required by law)</i>		
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	1 - 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	600 ohm line audio
Form factor	2/3 length PCI card
Interface	PCI 2.2 compliant
Dimensions	Length: 195 mm (7.68") <i>(excluding mounting bracket)</i> Height: 99 mm (3.90") <i>(excluding edge connector)</i> Thickness: 19 mm (0.75") <i>(incl. components on either side)</i>
Weight	330 g (11.6 oz)

*Specifications are subject to change without notice due to continuous product development and improvement.*



#### What's included?

The standard WR-G315i package includes:

- WR-G315i receiver card
- Application software
- Comprehensive user's manual
- Start-up antenna
- Audio lead
- BNC-to-SMA adapter