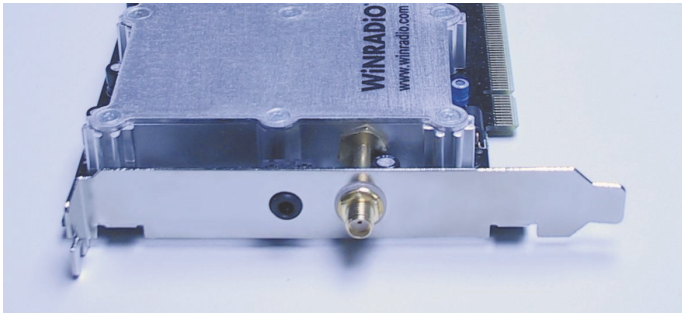


Hardware

The PCI card plugs into an available slot of an IBM-compatible PC. 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.

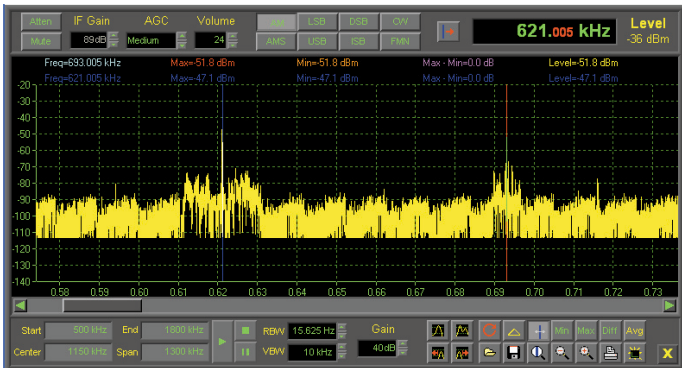


The receiver has its own on-board DSP, and does not rely on the PC sound card for its performance. As the DSP performs the final stage IF filtering and all demodulation, this receiver is entirely software-defined, which means that additional demodulation or decoding modes can easily be added by a mere software change.

Software

The WR-G313i software contains numerous advanced features, many tuning and scanning options, virtually unlimited memories and a rich on-line help facility.

There are numerous modulation modes, variable IF bandwidth 1 Hz to 15 kHz, two spectrum analyzers with 16 Hz resolution, graphically controlled IF shift and notch filter, and noise blanker. The built-in recorder can record and play back demodulated audio as well as the IF signal, which means that it is possible to "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 a weak or interference-prone signal.



The signal test facility can perform various measurements on the received signal including frequency accuracy, amplitude modulation depth, frequency deviation, THD (total harmonic distortion) and SINAD.

There is also a unique research and education function making 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.

G313i Options

Frequency Extension Option (G313/180)

The G313/180 option extends the frequency coverage from the standard 9kHz-30MHz to 9kHz-180MHz. This makes it possible to use this receiver for narrow-band communications in the low VHF range. The receiver's variable IF bandwidth makes this receiver particularly suitable for surveillance and monitoring of civilian and military aircraft and marine communications.

External Reference Oscillator Option (G313/XR)

The G313/XR option adds an external SMA connector to the receiver board, which can be used to connect an external reference oscillator for the highest possible frequency accuracy. This external oscillator can be any frequency from 8 to 20 MHz (the user specifies this frequency via software).

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Reference Oscillator Output Option (G313/RO)

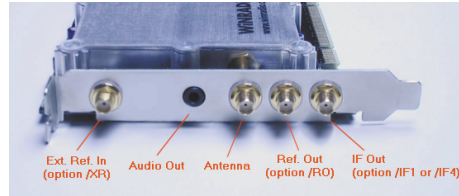
The G313/RO option adds an external SMA connector to the receiver board, which can be used to output the internal reference frequency. This is useful for situations when the receiver's own internal oscillator is to be used as a reference for other equipment, or, if an external reference is used, to provide this external reference to other receivers in a daisy-chain arrangement. If the receiver relies on its internal reference oscillator, this option will provide 16.384 MHz reference output. If an external oscillator is used, then the external oscillator frequency will be provided at this output.

Intermediate Frequency Output Option 45 MHz (G313/IF4)

The G313/IF4 option adds an external SMA connector to the receiver board, which provides a wide-band IF output of the entire 9kHz-30MHz input band, up-converted to 45 MHz (i.e. 9 kHz corresponds to 45.009 MHz, 30 MHz corresponds to 75 MHz). This makes it possible for the receiver to be used as a front-end tuner for HF monitoring systems requiring the capability of digitizing the entire HF band instantaneously; or a front-end for a spectrum analyzer, taking advantage of the receiver's excellent sensitivity and low noise-floor level.

Intermediate Frequency Output Option 10.7 MHz (G313/IF1)

Similar to the previous option, the G313/IF1 option provides a wide-band IF output. The difference is that this option involves an additional down-converter which converts the 45 MHz IF down to 10.7 MHz.



To order a receiver with an option from above, add the option code(s) to the receiver model number. For example, for a 180MHz receiver with external reference oscillator, the model number will be G313/180/XR. Options can be mixed together (except the IF options where only one can be selected, i.e. IF1 and IF4 cannot be selected at the same time).

Specifications

Receiver type	DSP-based SDR with DDS-based dual-conversion superheterodyne front end		
Frequency range	9 kHz - 30 MHz (optionally 9 kHz - 180 MHz)		
Tuning resolution	1 Hz		
Mode	AM, AMS, LSB, USB, DSB, ISB, CW, FM		
Image Rejection	1.8-7.3 MHz:	80 dB	
	7.3-30 MHz:	70 dB	
Spurious-free dynamic range	95 dB		
MDS	-137 dBm		
Phase noise	-148 dBc/Hz @ 100 kHz		
Internal spurious	Less than equivalent antenna input of -115 dBm		
RSSI accuracy	2 dB		
RSSI sensitivity	-137 dBm		
Bandwidth	1 - 15000 Hz (adjustable in 1 Hz steps)		
Scanning speed	400 steps/s (at 1 kHz steps)		

Sensitivity	Mode	0.15-0.5 MHz	0.5-1.5 MHz	1.5-30 MHz
(AM/SSB/CW 10dB S/N)	AM, AMS (30% modulation)	-103dBm (1.6µV)	-106dBm (1.1µV)	-108dBm (0.9µV)
(FM 12dB SINAD)	AM, AMS (80% modulation)	-111dBm (0.63µV)	-115dBm (0.4µV)	-116dBm (0.35µV)
	LSB, USB, ISB, DSB	-115dBm (0.40µV)	-118dBm (0.28µV)	-119dBm (0.25µV)
	CW	-122dBm (0.18µV)	-125dBm (0.13µV)	-130dBm (0.07µV)
	FM	-110dBm (0.7µV)	-113dBm (0.5µV)	-117dBm (0.32µV)

Note: Below 150 kHz, the sensitivity gradually drops. Typical figures (CW) are: 100 kHz: -113 dBm 50 kHz: -102 dBm 25 kHz: -98 dBm 10 kHz: -90 dBm

Intermediate frequencies	IF1: 45 MHz IF2: 16 kHz (variable 12-22 kHz)
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") (excluding mounting bracket) Height: 99 mm (3.90") (excluding edge connector) Thickness: 19 mm (0.75") (incl. components on either side)
Weight	330 g (11.6 oz)
System Requirements	IBM PC compatible (CPU 500MHz or higher, PCI slot) Sound Blaster 16 (or compatible sound card) Windows 98/ME/NT/2000/XP

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

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