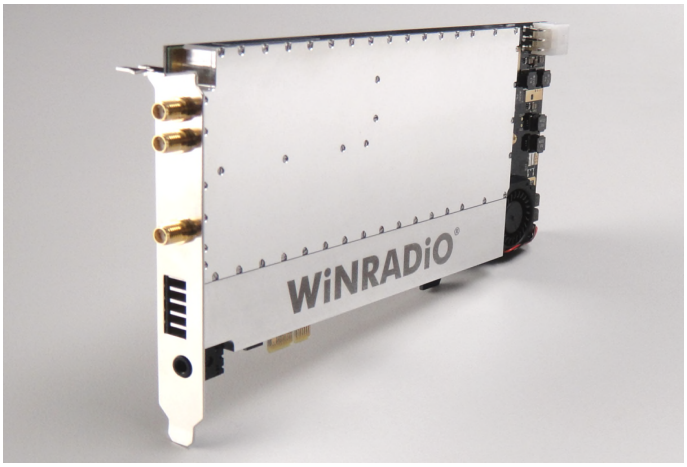
WR-G35DDCi *Excalibur Pro WB*

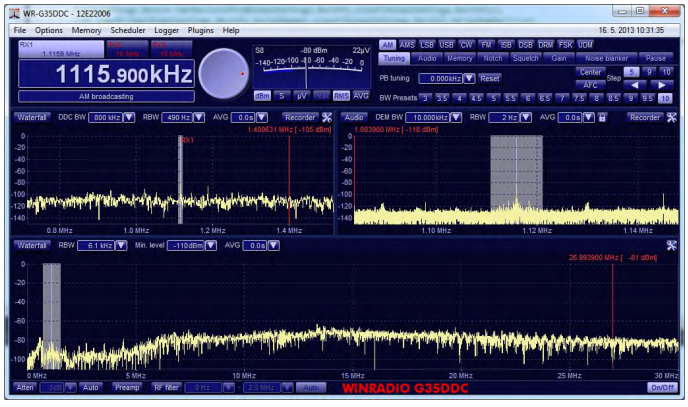
Professional Software-Defined Wideband Shortwave Receiver

- 9 kHz to 45 MHz continuous frequency range
- Direct sampling with digital down-conversion
- 16-bit 100 MSPS A/D converter
- 45 MHz-wide, real-time spectrum analyzer
- 32 MHz recording and processing bandwidth
- Ready for phase-coherent system configurations
- Continuously adjustable filter bandwidth down to 1 Hz
- Three parallel demodulator channels
- Waterfall display functions and audio spectrum analyzer
- Audio and wideband IF recording
- Very high IP3 (+31 dBm)
- Excellent sensitivity (0.20 µV SSB, 0.10 µV CW)
- Excellent dynamic range (107 dB)
- Excellent frequency stability (0.5 ppm)
- Selectable low-noise preamplifier
- Switchable input filters (bypass, manual or auto)
- Test and measurement functions

Preliminary information



The WiNRADiO WR-G35DDCi *Excalibur Pro WB* is a high performance, direct-sampling, software-defined wideband shortwave receiver with a frequency range from 9 kHz to 45 MHz. It includes a real-time 45 MHz-wide spectrum analyzer and 32 MHz-wide instantaneous bandwidth available for recording, demodulation and further digital processing.



The receiver's superior performance results from its innovative, direct-sampling, digital down-conversion architecture along with the use of leading-edge components and design concepts. These all result in a very high IP3, wide dynamic range, high sensitivity, and accurate tuning. These key features create a receiver in a class of its own, with wide application potential, with many operational and instrumentation features not usually found on receivers of any price category.

The entire 32 MHz DDC (digitally down-converted) bandwidth is available for recording and demodulation. Multiple demodulators allow the simultaneous reception and decoding of radio signals within the entire HF band.

The receiver's robust front-end is equipped with an ultra-high-linearity amplifier which results in exceptional strong-signal performance while at the same time offering excellent sensitivity.

The WR-G35DDCi *Excalibur Pro WB* also features external reference clock inputs and outputs, as well as a FPGA interface, allowing for phase-coherent system configurations such as in high performance interferometer direction finding applications.

This is the first time a receiver of such advanced specification and unique combination of features is being offered to the general marketplace.

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

The WR-G35DDCi receiver represents an excellent multi-purpose mobile and stationary solution for advanced HF band monitoring and surveillance.

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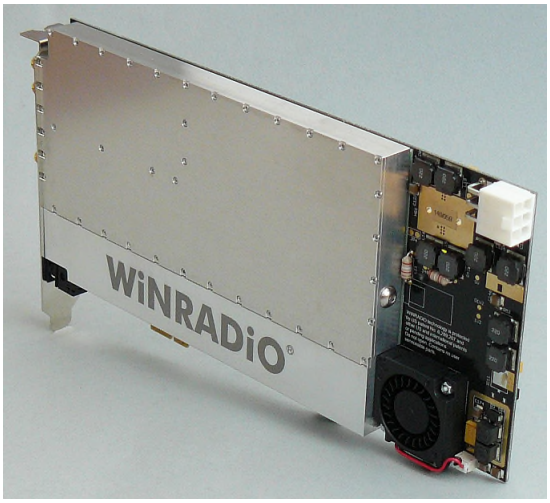
Hardware

The WiNRADiO G35DDCi *Excalibur Pro WB* receiver breaks new ground with its state-of-the-art components, such as a high-performance 16-bit 100 MSPS analog-to-digital converter.



The receiver is very well shielded against interference, making it possible to operate in a noisy computer environment. The receiver card has very modest power requirements of less than 10 watts, allowing it to be powered from the PC's internal power supply. There is also provision for an external power supply feed in cases where several of these receiver cards are to be installed in a multi-channel configuration.

Software

The WR-G35DDCi control software provides a highly functional and logical user interface. There are several spectrum analyzer configurations available, including the 45 MHz full span with 1.5 kHz resolution. The scaleable spectrum display can be viewed in either the standard or waterfall mode.

The digital down-converter provides 33 selectable output bandwidths ranging from 20 kHz to 32 MHz. The receiver's selectivity can be adjusted with 1 Hz resolution.

Recording and playback are also provided at the output of the digital down-converter, whereby a 32 MHz wide spectrum chunk, representing the entire HF band, can be recorded for later demodulation and post-processing.

The receiver is entirely software-defined, which means that additional demodulations or decoding modes can be easily added by a mere software change.

In spite of the receiver's ground-breaking architecture, the user interface still remains simple and intuitive to use, with a rich on-line help facility. The control software contains all the features generally expected in modern receivers such as noise blanking, memories, scheduler, squelch (level, voice or noise activated), numerous tuning options, and a wide choice of demodulation modes, including user-defined and optional DRM modes.

Specifications

Receiver type	Direct-sampling, digitally down-converting software-defined receiver	
Frequency range	9 kHz to 45 MHz	
Tuning resolution	1 Hz	
Mode	AM, AMS, LSB, USB, ISB, DSB, CW, FMN, FSK UDM (user-defined mode), DRM mode optional	
Image rejection	95 dB typ.	
IP3	+31 dBm (preamp off), +21 dBm (preamp on)	
Attenuator	0 – 21 dB, adjustable in 3 dB steps	
SFDR	107 dB (preamp off), 103 dB (preamp on)	
Noise figure	14 dB (preamp off), 10 dB (preamp on)	
MDS	-130 dBm @ 10 MHz, 500 Hz BW (preamp off) -134 dBm @ 10 MHz, 500 Hz BW (preamp on)	
Phase noise	-145 dBc/Hz @ 10 kHz	
RSSI accuracy	2 dB typ.	
RSSI sensitivity	-140 dBm	
DDC bandwidth (processing and recording)	20 kHz - 32 MHz (selectable in 33 steps)	
Selectivity (demodulation bandwidth)	1 Hz – 64 kHz (continuously variable in 1 Hz steps)	
Spectrum analyzers	Input spectrum/waterfall, 30 or 45 MHz wide, 1.5 kHz resolution bandwidth	
	DDC spectrum/waterfall, max 32 MHz wide, up to 1 Hz resolution bandwidth	
	Channel spectrum, max 64 kHz wide, 1 Hz resolution bandwidth	
	Demodulated audio, 24 kHz wide, 1 Hz resolution bandwidth	
ADC	16 bit, 100 MSPS	
Sensitivity (@ 10 MHz, preamp on, input filter bypass)	**AM**	-106 dBm (1.10 µV) @ 10 dB S+N/N, 30% modulation, 6 kHz BW
	SSB	-121 dBm (0.20 µV) @ 10 dB S+S/N, 2.1 kHz BW
	CW	-127 dBm (0.10 µV) @ 10 dB S+S/N, 500 Hz BW
	FM	-117 dBm (0.31 µV) @ 12 dB SINAD, 3 kHz deviation, 12 kHz BW, Audio filter 300 – 3000 Hz, De-emphasis -6 dB/oct
Tuning accuracy	0.5 ppm @ 25 °C	
Tuning stability	0.5 ppm (0 to 50 °C)	
Input filters (operation mode: bypass, manual or automatic)	4 x high-pass filters 4 x low-pass filters Various band-pass filters by combining HPF and LPF	
Antenna input	50 Ω (SMA connector)	
Interface	PCI Express	
Power supply	10 W max.	
Operating temp.	0 °C to 50 °C	

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

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