



# AR6000

9kHz - 6GHz

Super Wide-band Multi-mode Receiver

Photo of receiver with rack option HRE5001





In recent years, frequency bands above 3 GHz are populated with new signal standards such as MLS, STL and FPU. These new signals in the so-called C-band and S-band offer services such as ISM, WiMAX, etc..., which cannot be received with conventional wideband receivers. Not only the frequency coverage, but also high sensitivity and high reception accuracy are required for optimum performance. All over the world, frequency bands over 2.5 GHz are used for new digital cellular services such as LTE-Advanced, TD-SCDMA, and WCDMA/HSPA.

This is where AOR's new AR6000 receiver replies to such new needs by offering world's first wide-band communication receiver with frequency coverage up to 6000MHz, based on revolutionary broadband reception and digital signal processing technology introduced with the AR-ALPHA, AR2300 and AR5001D receivers.

On all frequencies, AR6000 provides excellent reception characteristics and can be used for signal analysis and signal strength measurement. Typical commercial applications are wide-area radio monitoring, interference detection and investigation, field-strength measurements, frequency analysis, radio propagation research, close range detection of illegal eavesdropping devices such as wiretap bugs and hidden wireless cameras.

## ■ Main features

**Super wide-band:** AOR is the world's first commercial receiver manufacturer to introduce a receiver with continuous coverage from 9kHz to 6GHz, in 1Hz step increments (2Hz over 3.15GHz). Unlike spectrum analyzers, it offers outstanding sensitivity, selectivity and reception stability. Thanks to its small size (30 x 22 x 10 cm), light weight (5 kg) and 13.5V power requirements, it can be easily carried around and used outdoors. AR6000 represents a ground breaking new concept to your signal measuring needs.

**Ultra low noise down converter:** The 3.15 GHz to 6 GHz portion is realized by cleverly designed, internal down conversion circuitry, offering ultra-low noise figures comparable to high-end microwave-only receivers.

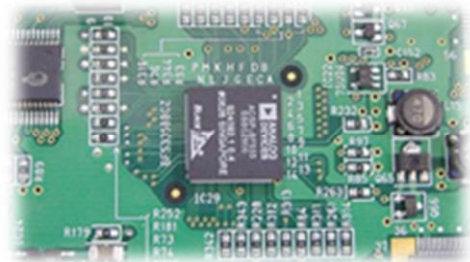
**Distributed constant circuit:** To ensure low noise performance and minimal performance deterioration over time and environmental variations, AR6000 is based on distributed constant circuitry, carefully designed by CAD/CAM and is therefore much superior to conventional lumped element circuit based receivers.

**SDR architecture:** Signals are processed digitally from the 3<sup>rd</sup> IF stage for better performance compared to typical analog receivers which require a detection circuit with a separate filter. The firmware of the high speed DSP is upgradable with great possibilities of customization to meet future diverse needs.

**Direct conversion:** For LF, MF and HF (9kHz~25MHz), signals from the antenna are converted directly to digital baseband format through a single frequency conversion. This method based on LSI circuitry provides high selectivity and greatly reduces image effects.

**Zero IF system:** While AR6000 applies direct conversion for frequencies below 25MHz, for higher frequencies the Zero IF system is used. Incoming radio signals are processed using synchronous detection driven by a local oscillator whose frequency is identical to, or very close to the carrier frequency of the intended signals. This method reduces image effects and allows output of a clean digital I/Q signal.

**Digital I/Q output:** After the A/D conversion, the analog IF signal becomes a quadrature demodulation zero-IF signal. This signal has two components known as I (In-phase) and Q (Quadrature). I/Q signals are expressed on a complex plane, even at the same angular frequency; the digital signal can be processed clockwise and counterclockwise. With the option board IQ5001, digital I/Q can be output through USB 2.0 for demodulation by PC.



**Highly accuracy reference frequency:** When connected to the AR6000 communications receiver, the GP5001 GPS receiver improves the frequency stability from +/- 0.1ppm to +/- 0.01 ppm; by using the GPS pulse signal (one pulse per second) for an accurate time base of the local oscillator circuit. +/- 0.01ppm frequency stability of the 10MHz internal master oscillator is achieved when synchronized to a GPS signal.

**Outstanding signal level correlation:** The signal input level from the antenna is tightly correlated to the analog 15MHz wide, 45.05MHz IF output and readings of the signal meter. Variations less than +/- 1.5dB throughout all bands! Ideal for signal spectrum analysis, precise signal level measuring and demodulation, system calibration etc...

**Up to 240 hours of audio recording:** Demodulated audio can be easily recorded as a PC compatible wav file with the built-in SD media recorder. Approximately 8 hours of recording per 1 GB. Max. SD size: 32GB (approx. 240 hours). Squelch recording function to avoid blanks.

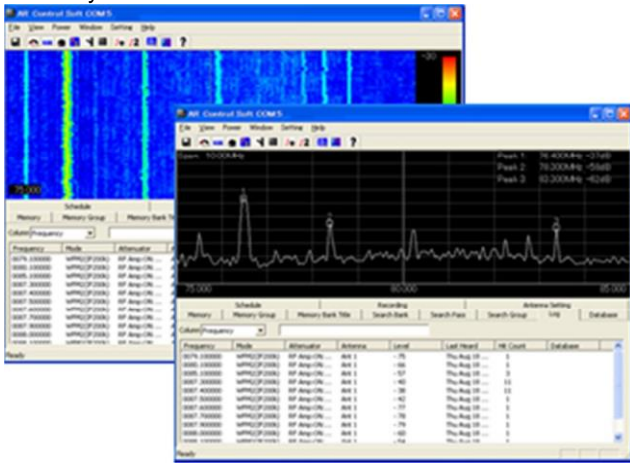
**Numerous powerful features:** High-speed scan & search, two-band & offset reception, High-speed FFT spectrum display on built-in LCD screen with selectable bandwidth 400kHz to 10MHz, CTCSS, DCS, DTMF, AFC, voice inversion, auto-notch, noise blanker, noise reducer, analog video out, etc...

■ **Software**



**Standard control software:** (Free to download from our website)

Our control software provides powerful features such as spectrum display (selectable bandwidth 400kHz to 10MHz), waterfall display, memory management, memory & bank scan, search, event scheduler, activity logging, audio recording, etc... it even allows to simultaneously control several receivers with one PC.



**I/Q software:** (only supplied with IQ5001 hardware option)

This software developed by MICROTELECOM allows, in addition to receiver control, the possibility to store (on a hard disk) and playback a full 0.9MHz ( $\pm$  450 kHz) bandwidth with no loss of quality!

AR6000 is the world's first receiver of its class to offer an optional digital I/Q output (USB 2.0 compatible isochronous transfer). The information held in the I/Q signal is almost identical to a 1 MHz bandwidth ( $\pm$  500 kHz) of analog I.F. 30 bit each for I and Q, high-speed output with sampling rate of 1.125 Msample/sec (two complement fixed point data).



■ **Optional accessories**

**I/Q output board – IQ5001:** Enables output of a 0.9MHz wide digital I/Q baseband signal, to be captured, stored and played-back on a PC with the supplied AR-IQ2 software. Frequency coverage 100kHz – 6GHz. Factory installed board.



**GPS receiver – GP5001:** Improves the frequency stability of AR6000 from  $\pm$  0.1ppm to  $\pm$  0.01 ppm, by using the GPS pulse signal for an accurate time base of the local oscillator circuit.



**APCO P-25 decoder board:** Enables decoding of APCO P-25 digital voice communication (non-encrypted, conventional mode). Factory installed board.



**Ethernet controller - ARL2300:** Allows remote control, 10MHz spectrum display, remote listening and audio recording of your AR6000 receiver, through the local network and Internet. Selectable audio bit rate.



**Rack mount kit - HRE5001:** EIA standard 19 inch rack mount kit for your AR6000 receiver. Front panel fitted with external speaker and handles.