



Vaisala Sigmet Digital IF Receiver and Signal Processor RVP8™



Features

The RVP8™ provides comprehensive digital receiver and signal processing functions on an open systems PC platform

- Dual IF signal inputs, plus Burst input
- 72 MHz, 14-bit IF sampling
- Programmable transmit waveforms
- Programmable IF bandpass filters
- DFT and GMAP™ processing
- Phase coded 2nd trip echo filtering
- Public API's/FREE software upgrades

PCI technology, Linux and public API's – an open system approach

The RVP8™ changes everything. Through the years, signal processing has been performed on dedicated hardware or proprietary DSP chips. However, the technology in the personal computing industry now makes it possible to package the signal processor as a conventional PC. Vaisala's RVP8™ Digital Receiver and Signal Processor takes full advantage of this open systems approach and even includes public API's so that sophisticated users can program their own custom signal processing applications in a standard development environment. Plus, FREE software and documentation upgrades are easily obtained at www.Vaisala.com.

Extensible system lifetime and expansion

Over the decades the signal processor development has been motivated by faster hardware and/or end-of-life of proprietary hardware. Unfortunately, each transition required substantial hardware and software redesign, re-tooling and re-implementation. The RVP8™ changes all of this. Since standard PC hardware is used and processor speeds double every 18 months, the next generation hardware is simply the next faster PC chip.

Performance – our fastest processor ever

In spite of using standard PC hardware, the RVP8™ is the fastest processor we have ever produced-currently 10 times the speed of a maximum performance three-board RVP7™ system. This gives the RVP8™ more than enough power for complex algorithms such as dual-polarization, phase coded 2nd trip echo filtering, pulse compression, DFT/FFT and the new DFT-based Gaussian Model Adaptive Processing algorithm (GMAP™).

27 years of quality products and support

You can integrate the RVP8™ into your own software or you may choose to purchase IRIS software for UNIX workstations. For a radar upgrade or a new installation, when you specify the RVP8™, you can be assured that you have specified the best there is.

Options

- Dual polarization
- HydroClass™
- Ultra-wide dynamic range
- Pulse compression
- Time Series recording/playback

Technical data

RVP8™ IF Digitizer Module (installed in receiver cabinet) and IF Processing

IF INPUTS

Dual IF signal channels for dual pol or ultra-wide dynamic range applications: 50 Ohm, +6.5 dBm Transmit burst channel for AFC and digital phase locking: 50 Ohm, +6.5 dBm

IF RANGES

Selectable: 12-34 MHz, 38-70 MHz

DYNAMIC RANGE

85-100 dB depending on matched filter (e.g., 96 dB for 0.5 MHz matched filter). Optional 20 dB ultra wide dynamic range extension using 2nd input channel

A/D CONVERSION

14 Bits at 72 MHz with jitter <2.5 picosec

AFC OUTPUT

Control Voltage -10V to +10V, nominal ±14 MHz span or 25-bit digital control

IFD LINK

Standard CAT 5-E gigabit connection

IF BAND PASS FILTERS

Digital FIR with selectable impulse response and pass band Built-in filter design software with graphical display

IMPULSE RESPONSE

Up to 80 microseconds (for optional pulse compression)

RANGE RESOLUTION

Arbitrary bin spacing to within ±1m, minimum of 15 m

MAXIMUM RANGE

8192* resolution, e.g., 1024 km @ 125-m resolution

NUMBER OF RANGE BINS

Up to 3096 spaced within an 8192-bit range mask

PHASE STABILITY

Klystron: Better than 0.1 degrees
Magnetron: Better than 0.5 degrees (for 1.0 microsecond pulse)

RVP8™ IF and Signal Processing Unit

PROCESSING MODES

Pulse Pair DFT/FFT, GMAP™ Random Phase 2nd trip filtering/recovery. Optional: ZDR, RHOHV and KDP in pulse pair mode

AZIMUTH (PULSE) AVERAGING

2 to 1024

CORRECTIONS

Range normalization (normally $1/R^2$), gaseous attenuation

VELOCITY DE-ALIASING

By dual PRF technique in ratios of 2:3, 3:4, or 4:5 for 2X, 3X or 4X de-aliasing

RANGE DE-ALIASING

By random phase technique for magnetron
Klystron can have optimized phase coding controlled by RVP8/Tx™

CLUTTER FILTERS

Fixed or automatic adaptive width GMAP™ filtering to > 60 dB clutter cancellation

OUTPUTS

dBZ: 8 or 16 bits; V: 8 or 16 bits; W: 8 or 16 bits; I & Q: 16 bits; FFT: 16 bits. Real-time display. Optional Polarization parameters 8 or 16 bits

PERFORMANCE OPTIONS

Dual SMP Pentium processors easily upgradeable as faster processors become available. Gigabit networking for multiple processor expansion

HOST INTERFACE

10/100/1000T Ethernet

CONFIGURATION INTERFACE

Using optional keyboard, mouse, monitor or via network workstation

Physical and Environment

PACKAGING

IF Digitizer Module: 30 x 109 x 236 mm mounted in receiver cabinet
RVP8™ Main Chassis: 4U rackmount chassis with >40 GB Disk, DVD+RW. Other PC configurations available

INPUT POWER

100-240 VAC; 47-63 Hz

POWER CONSUMPTION

IF Digitizer: 24 Watts; RVP8™: 70 Watts

ENVIRONMENTAL

0 °C to 50 °C operating, 0 to 95% (non condensing) R.H.

RELIABILITY

Digitizer, RVP8™ : >40,000 Hours MTBF
(estimated from RVP7™ field data)



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