Vaisala Sigmet Digital Receiver and Signal Processor RVP900™

Experience and Innovation

The people who brought you the “Gold Standard” in Weather Radar Signal Processing now bring you the RVP900™. The highly successful RVP8™ with over 400 units delivered, has been improved.

It’s All in One Box

The RVP900™ consolidates all of the RVP8™ hardware and functions into a single package. The IF Digital Receiver (IFDR) provides I/Q samples directly to a PC Linux server over a CAT5 E Ethernet link. No longer are users limited to computer servers with multiple PCI slots. This reduces the cost and increases the server options available for use with the RVP900™.

Also, by eliminating four components, the RVP900™ improves reliability of the system and reducing the cost of spares and maintenance. It does all this in approximately the same mechanical footprint of the RVP8™ IFD. In addition, the RVP900™ has substantially improved capabilities for dynamic range, sensitivity, and sampling rate.

Performance – Our Fastest Processor Ever

The RVP900™ can perform 38.4 billion multiply-accumulate cycles per second and the flexibility in choosing computer servers allows us to select the fastest processors and motherboards on the market. The overall computational power is 5X faster than the RVP8™.

This allows the use of multiple, advanced processing algorithms simultaneously which improves your data.

28 Years of Quality Products and Support

You can integrate the RVP900™ into your own software or you may choose to purchase the IRIS software for Linux workstations. For a radar upgrade or a new installation, when you specify the RVP900™, you can be assured that you have specified the new industry standard.

Benefits

- The RVP900™ provides comprehensive digital IF and signal processing functions on an open Linux PC platform
- 100 MHz, 16-bit IF sampling improving sensitivity and dynamic range in 5 independent channels
- 38.4 Billion multiply accumulates cycles per second which is a x5 increase over the RVP8™
- Ethernet interface allowing the RVP900™ to be PC independent. The next generation hardware is the next faster PC chip.
- Independent and parallel FIR filtering allowing dual pulse width and dual frequency strategies on each receive channel
- Dual Polarization, Wide Dynamic Range, and Pulse Compression ready.
## Technical Data

### IF Digital Receiver

**FIVE IF INPUTS**

- **IF Range**: 5-120 MHz
- **Saturation Level**: +8.0 dBm @ 50Ω
- **Dynamic Range (dependant on matched filter)**: 90 to >105 dB
- **Optional single and dual polarization**
  - **wide dynamic range**: >120 dB
  - **A/D Resolution**: 16 bits
  - **Sampling Rate**: 50 - 100 MHz
  - **Master Clock jitter**: <1.0 picosec
  - **Multiply/accumulate cycles per second**
    - (5X greater than RVP8/IFD): 38.4 billion Hz
  - **Pulse Repetition Frequency**: 50 Hz to 20 KHz
  - **Impulse Response**: 3024 FIR taps
    - (Up to 80 microseconds)
- **Minimum Range Resolution**: 15 meters
  - (accuracy of ±1.5 m)
- **Maximum Range**: 1024 km
- **Maximum number of range bins**: 4200

**PHASE STABILITY**

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

**IF WAVEFORM GENERATOR**

- **Two 16-bit TxDAC outputs**: 5-65 MHz
  - >65 dB SNR
  - +13dBm @ 50Ω
- **TxDDS output**: 5-105 MHz
  - >65 dB SNR
  - +13dBm @ 50Ω

**MISCELLANEOUS I/O**

- **RS-422**: 20 Differential Line Pairs
- **TTL/CMOS Lines**: 20 open-ended lines
- **Analog input**: 6 differential pairs ±10V

### Signal Processor

**Processing Modes**

- PPP, FFT/DFT, Random Phase 2nd trip filtering/recovery

**Data Outputs (8 and 16 bit)**

- Zh, Zv, Zhv, V, W, SQI, ZDR, LDR, RHOHV, PHIDP, and KDP

**Optional Data Outputs**

- HCLASS, I/Q

**Dual Polarization**

- Alternating, Simultaneous, H-Only, V-Only

**High Sensitivity Rhv STAR mode Processing**

- >3dB improvement in detectability

**Azimuth Averaging**

- 2 to 1024 Pulses

**Dual PRF Velocity De-aliasing**

- 2:3, 3:4, or 4:5 for 2X, 3X, or 4X de-aliasing

**Clutter Filters**

- IIR, Fixed and Adaptive Width
  - GMAP >55 dB rejection

### Physical and Environmental

**INPUT POWER**

- **Digital Receiver**: 85-264 VAC 50/60 Hz or 12-36 VDC
- **Signal Processor**: 100 - 240V, 50 - 60Hz

**ENVIRONMENTAL**

- **Digital Receiver**: (non-condensing) R.H.
  - 40 °C - 50 °C operating, 0 - 95%
- **Signal Processor**: (non-condensing) R.H.
  - 10 °C - 35 °C operating, 8 - 90%

**RELIABILITY**

- **Digital Receiver**: >50,000 Hours MTBF (at 25 °C), < 1 hour MTTR