

REMOTE SIGNALS INTELLIGENCE SYSTEM



FEATURES:

FREQUENCY RANGE 100 kHz TO 3.5 GHz

SWEEP SPEEDS UP TO 50 GHz/SEC

MULTIPLE SOFTWARE-DEFINED ENERGY DETECTORS

MULTIPLE SOFTWARE-DEFINED RADIOS

AM/FM/SSB DETECTION

REAL-TIME DIGITAL AUDIO STREAM

QUICK RELEASE REMOVABLE HARD DRIVE

DEVELOPMENT PLATFORM

The RV product provides a platform for developing a deployable SIGINT system that can be operated as a stand-alone system or integrated into a customer's larger system. As a development platform, the RV product provides a developer with the necessary hardware and software components required for a powerful, multi-functioned SIGINT system.

The RV hardware includes a tuner, digitizer, multi-channel signal processors, system controller and communications controller all contained in a single 19" 1RU rack-mountable package. For more power, several RV chassis can be integrated into a single system by simply interconnecting the chassis via a network data cable. Once a system is ready to deploy, the RV hardware is designed to meet the demanding requirements of use in the field.

The RV software allows a customer to develop applications for all the component levels of the RV system. Software development tools are provided that allow a customer to develop user interfaces on a client computer, integrate the RV product with other systems, and develop custom DSP applications. The software development tools also provide built-in functions for rapid spectrum sweeping, I/Q signal capture, remote communications, multichannel streaming digital audio, modulation recognition, software-defined radios, multichassis integration, as well as many others.

OPTIMIZED FOR REMOTE OPERATION

The RV system's core design provides strong support for deployment of the RV hardware at sites remotely located from the operators and analysts. The RV system is optimized to support remote real-time access to data such as spectrum survey data, multi-channel streaming digital audio, and I/Q data from captured signals. The system allows multiple operators and analysts to remotely access the RV system simultaneously. Also, each operator and analyst can access multiple RV systems.

OPTIMIZED FOR INTEGRATION

The RV products provide extensive user control of the system by way of Application Programming Interfaces (APIs). This makes it easy to integrate an RV system into a larger customer system.

In addition to supporting the development of new SIGINT systems, the RV system is also particularly useful in upgrade programs. Typically the mission of such a program involves replacing a legacy system with newer hardware that is smaller and more powerful, while keeping as many of the existing interfaces as possible. With the RV software development tools, the developer is given the ability to control the RV system using the legacy interfaces. This can save countless hours of retraining operators on the use of a new user interface.

MOBILE OPERATION

The RV-family is the perfect choice for mobile platforms including ground-based, airborne and naval applications. RV products are currently used in Hummer platforms, naval vessels, and aircraft. The success of RV systems in these space-limited environments is due to several factors.

First, the highly integrated RV products provide a complete SIGINT system in a single 1RU rack-mountable chassis or an optional 10" x 11.75" x 3.75 compact chassis. The system can also be packaged per a customer's specifications.

Second, RV systems are designed to operate in mobile environments subject to shock, vibration, and humidity. For instance, the RV system has successfully passed RTCA/DO-160 compliance, the Environmental Conditions and Test Procedures for Airborne Equipment.

Third, RV systems support operation on both AC and DC power sources. RV systems can operate on both 24 VDC and 28 VDC power sources, as well as any of the standard international AC power sources. Also, other sources can be supported per customer specifications.

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INTELLIGENCE SYSTEM

DYNAMIC RECONFIGURATION

An RV system includes multiple processing elements called "SmartCells". Each SmartCell can perform many different functions such as spectrum survey sweeps, new signal detection, modulation recognition, software-defined radios, etc. The system allows each SmartCells to be re-programmed on-the-fly as operational requirements change. For instance, multiple SmartCells can be configured for very rapid spectrum survey sweeps, and then re-configured as needed for modulation recognition or software-defined radios.

OPTIMIZED FOR "LEAVE-BEHIND" MISSIONS

All the data and software in an RV system is stored on the system's disk drive. Since the disk drive is the only non-volatile storage in the RV hardware, the system is rendered unusable when the drive is not present in the system. The disk drive is easily removed in a matter of seconds from the front panel.

SCALABLE SYSTEM

Each RV product has the ability to function simultaneously as both a signal survey device and a signal collection device. When more capability is required in a system, several RV chassis can be integrated into a single system by simply interconnecting the chassis via a network data cable. The RV software development kit (SDK) allows a multi-chassis RV system to be treated as a single integrated system.

SMALL PACKAGE SIZE

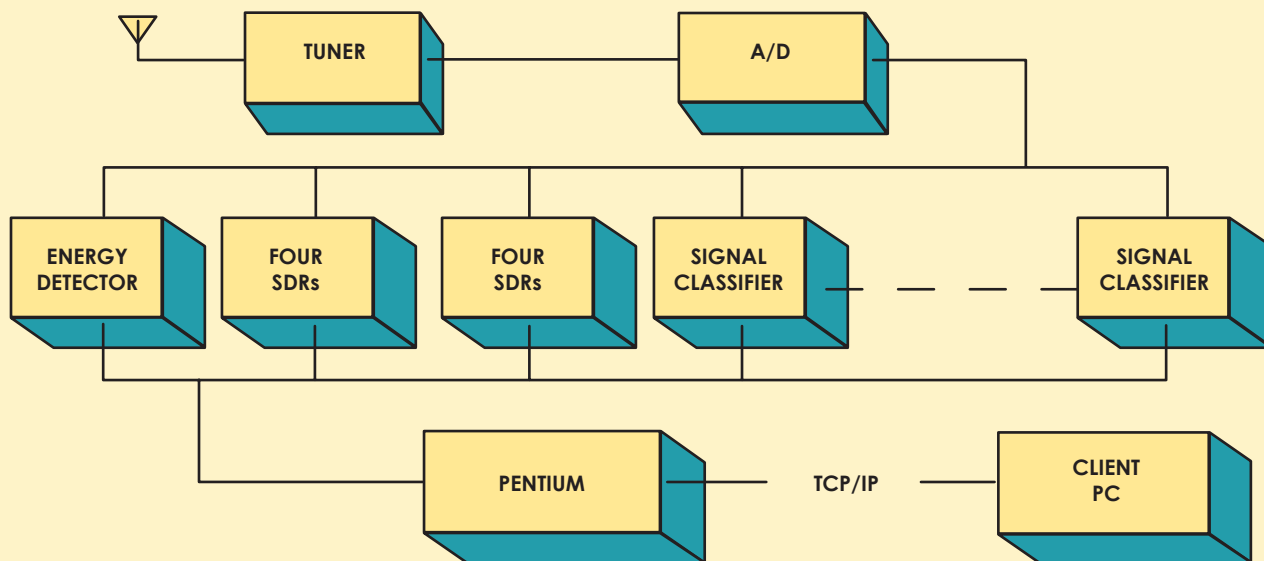
The RV product provides a complete SIGINT spectrum survey and collection system in a package much smaller than traditional systems with the same or less capability. A typical RV product

provides a tuner, digitizer, multi-channel signal processors, system controller and communications controller all contained in a single 19" 1RU rack-mountable package. An optional package style provides the same equipment in 10" x 11.75" x 3.75 compact chassis. The system can also be packaged per a customer's specifications.

CUSTOMIZATION PER CUSTOMER SPECIFICATION

Virtually any RV hardware or software component can be customized or developed to meet a particular customer's requirements. This includes packaging, tuner frequency range, interfaces to third party hardware (such as tuners, handoff receivers, etc.), graphic user interfaces, system integration, DSP software modules, GPS, and communications interfaces.

COMPONENT OVERVIEW



Multiple SmartCells allow diverse configuration possibilities.

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INTELLIGENCE SYSTEM

OPTIONS

RV-SMC:

SMARTCELL IS AN INDEPENDENT, PROGRAMMABLE PROCESSING UNIT THAT ALLOWS SOFTWARE FUNCTIONS TO BE ADDED. FOR EXAMPLE, EACH SMARTCELL CAN BE LOADED WITH VARIOUS FUNCTIONS SUCH AS ENERGY DETECTION, SOFTWARE-DEFINED RADIOS, AND I/Q STREAMING.

RV-SDR:

SOFTWARE DEFINED RADIO (SMARTCELL OPTION) ENABLES A SMARTCELL TO FUNCTION AS A SOFTWARE DEFINED RADIO. UP TO 4 SDRS CAN BE ADDED TO A SMARTCELL. EACH SDR SUPPORTS AM, FM, USB, LSB AND CW DEMODULATION.

RV-SED:

SOFTWARE DEFINED ENERGY DETECTION (SMARTCELL OPTION) ENABLES A SMARTCELL TO PERFORM ENERGY DETECTION. A SMARTCELL EQUIPPED WITH THE RV-SED MAY FUNCTION AS A STAND-ALONE ENERGY DETECTOR, OR BE COMBINED WITH OTHER SIMILARLY EQUIPPED SMARTCELLS FOR INCREASED DETECTION SPEED.

RV-SIQ:

STREAMING I/Q (SMARTCELL OPTION) ENABLES THE SYSTEM TO STREAM OR CAPTURE I/Q DATA. IN STREAM MODE, I/Q DATA IS CAPTURED AND STORED IN THE UNIT UNTIL IT IS REQUESTED BY THE CLIENT-SIDE APPLICATION.

RV-PR2:

PRE-AMP WILL PROVIDE NOISE FIGURE OF 2DB FROM 100 MHZ TO 3.5 GHZ

RV-FWO:

IEEE-1394 (FIREWIRE) COMMUNICATIONS PORT OPTION PROVIDES SIMILAR COMMUNICATION CAPABILITIES AS AN ETHERNET PORT, AND SUPPORTS TCP/IP PROTOCOL.

RV-OCXO:

OVEN CONTROLLED REFERENCE OSCILLATOR PROVIDES +/- 0.0014 PPM FREQUENCY REFERENCE TEMPERATURE STABILITY.

RV-28V:

VDC POWER OPTION ALLOWS UNIT TO BE POWERED

RV-GPS:

INTERNAL GPS RECEIVER PROVIDES POSITION AND TIME INFORMATION. ALSO INCLUDES A PROGRAMMING INTERFACE ALLOWING YOU TO BUILD YOUR OWN CLIENT-SIDE APPLICATION TO PROCESS GPS INFORMATION.

SPECIFICATIONS

NOTE: Export of this product is subject to U.S. export control laws. Export Licenses are approved on a case-by-case basis and sale of any of these products is dependent on approval of the United States Government.

TUNER FREQUENCY:

FREQUENCY RANGE: 100 kHz TO 3.5 GHz

REFERENCE:

THERMAL STABILITY: TCXO: +/- 1.0 PPM
OCXO: +/- 0.01 PPM

TYPICAL PHASE NOISE: <95 dBC/Hz @ 10 KHz OFFSET

RESOLUTION BANDWIDTH RANGE: 100 Hz TO 1 MHz

AMPLITUDE:

MAXIMUM SAFE INPUT POWER: +20 dBm (100mW)

TYPICAL THIRD ORDER INTERCEPT (PRE AMP OFF):

- +12 (100 KHZ – 40 MHZ)
- +11 (40MHZ – 500 MHZ)
- +12 (500 MHZ – 2 GHZ)
- +14 (2 GHZ – 3 GHZ)
- +15 (3 GHZ – 3.5 GHZ)

NOISE FIGURE (PRE AMP ON):

- 11 (100 kHz – 40 MHz)
- 9 (40 MHz – 500 MHz)
- 12 (500 MHz – 2 GHz)
- 15 (2 GHz – 3 GHz)
- 18 (3 GHz – 3.5 GHz)

PHYSICAL AND ENVIRONMENTAL:

DIMENSIONS: 19" RACK MOUNT 1RU, DEPTH 16"
OPTIONAL COMPACT FORM FACTOR 10" X 11.75" X 3.75"

OPERATING TEMPERATURE: 0 TO 50 DEGREES C (SEA LEVEL)

HUMIDITY: 8 TO 90% NON-CONDENSING

ADDITIONAL SPECIFICATIONS:

RS232 SERIAL, ETHERNET, MODEM, WIRELESS MODEM, IEEE-1394 (FIREWIRE) OPTIONAL

PROTOCOL: TCP/IP

POWER REQUIREMENTS: +24 VDC @ 4 TO 7 AMPS MAX
+28 VDC (+20 TO +34 VDC) OPTION
AC ADAPTER AVAILABLE

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INTELLIGENCE SYSTEM

SPECIFICATIONS (CONT)

SOFTWARE DEFINED RADIOS:

FREQUENCY:

INSTANTANEOUS BANDWIDTH (STARE): 40MHz @ 70MHz IF

FREQUENCY RESOLUTION: 1Hz

DEMODULATION MODES: AM, FM, CW, USB, LSB

FINAL IF FILTER:

I.F. BANDWIDTHS (6dB): 150, 300, 600Hz
1, 2, 3, 5, 6, 10, 15, 25, 30, 50, 100, 150, 180, 200, 240kHz

FILTER SHAPE FACTOR: ≤ 2 FOR 6dB: 60dB

DEMODULATION BW: AM, FM: ALL BANDWIDTHS CW, USB, LSB: ≤ 15kHz

AUTOMATIC GAIN CONTROL:

Range: > 80 dB
Attack Time: < 5 mS
Decay Time: adjustable to 5 seconds

AUTOMATIC FREQUENCY CONTROL

TRACKING RANGE: ± 5 TIMES IF BW
ACQUISITION RANGE: ± 50% IF BW
SQUELCH: 90 dB RANGE

DIGITAL OUTPUTS

AUDIO: 16 BIT, ETHERNET
FINAL IF (OPTION): 2 X 16 BIT ETHERNET,
IEEE-1394 (FIREWIRE)

MULTIPLE APPLICATIONS

MANPACK

The system's size and weight make it the perfect system for manpack/field carry applications. Whether the need is to hide the system, reduce the weight of the components carried or leave an analyzer behind, no other system offers the versatility and compact size.



GROUND BASED

Vehicles like Humvees and robots require systems that are compact, light, DC-powered and portable. This system requires just 24 volts (28V optional) and includes Ethernet for remote connectivity.



MARITIME

This system's small footprint economizes on space, leaving room for additional SIGINT components and capabilities. Its real-time data streams can be transmitted using onboard communications systems to authorized users around the world.



AIRBORNE

Sensitivity and rapid energy detection are critical to airborne signals intelligence applications. The system's dynamic range and low noise figure (10 dB) make it the perfect tool for airborne signals intelligence. For enhanced sensitivity, add the Preamp option to reduce the noise figure to 2 db. This allows acquisition of even the most elusive signals.

