New!

Model RTR 2746

Rugged 200 MHz Real-Time Data Recording and Playback Instrument

SystemFlow Cobalt

Features

- Complete multiband recording and playback instrument
- 4U 19 inch rugged rack-mount PC server chassis
- Designed to MIL-STD-810F
- Windows® 7 Professional workstation with high performance Intel® Xeon™ processor
- 200 MHz max. 16-bit A/D sampling for recording, 0 to 8 channels
- 1.25 GHz max. 16-bit D/A sampling for playback, 0 to 8 channels
- 80 MHz max. record and playback signal bandwidths
- Capable of record/playback of IF frequencies to 700 MHz
- Real-time sustained recording rates of up to 1600 MBytes/sec in 4-channel configuration
- Removable SSD drives
- Up to 24 terabytes of storage to NTFS RAID disk array
- RAID levels of 0 ,1, 5 , 6, 10 and 50
- SystemFlow® GUI with signal viewer analysis tool which includes a virtual oscilloscope and spectrum analyzer
- C-callable API for integration of recorder into application
- File headers include time stamping and recording parameters
- DDC decimation and DUC interpolation range from 2 to 65,536
- Optional GPS time and position stamping

Contact factory for options, for number and type of analog channels, recording rates, and disk capacity.

General Information

The Pentek RTR 2746 is a turnkey, multi-band record and playback instrument that is built to operate under harsh conditions. Designed to withstand high vibration and operating temperatures, the RTR 2746 is intended for military, airborne and UAV applications requiring a rugged instrument. With scalable A/Ds, D/As and SSD (solid-state drive) storage, the RTR 2746 can be customized to stream data to and from disk at rates as high as 1600 MB/sec.

The RTR 2746 uses Pentek's high-powered Virtex-6-based Cobalt modules, that provide flexibility in channel count with optional digital downconversion capabilities. Optional 16-bit, 800 MHz D/A converters with digital upconversion allow real-time reproduction of recorded signals.

A/D sampling rates, DDC decimations and bandwidths, D/A sampling rates, and DUC interpolations are among the GUI-selectable system parameters, providing a fully programmable instrument capable of recording and reproducing a wide range of signals.

Optional GPS time and position stamping allows the user to record this critical signal information.

SystemFlow Software

The RTR 2746 includes the SystemFlow® Recording Software. SystemFlow features a Windows-based GUI (graphical user interface) that provides a simple means to configure and control the instrument. Custom configurations can be stored as profiles and later loaded when needed, allowing the user to select preconfigured settings with a single click.

SystemFlow also includes signal viewing and analysis tools, that allow the user to monitor the signal prior to, during, and after a recording session. These tools include a virtual oscilloscope and a virtual spectrum analyzer.

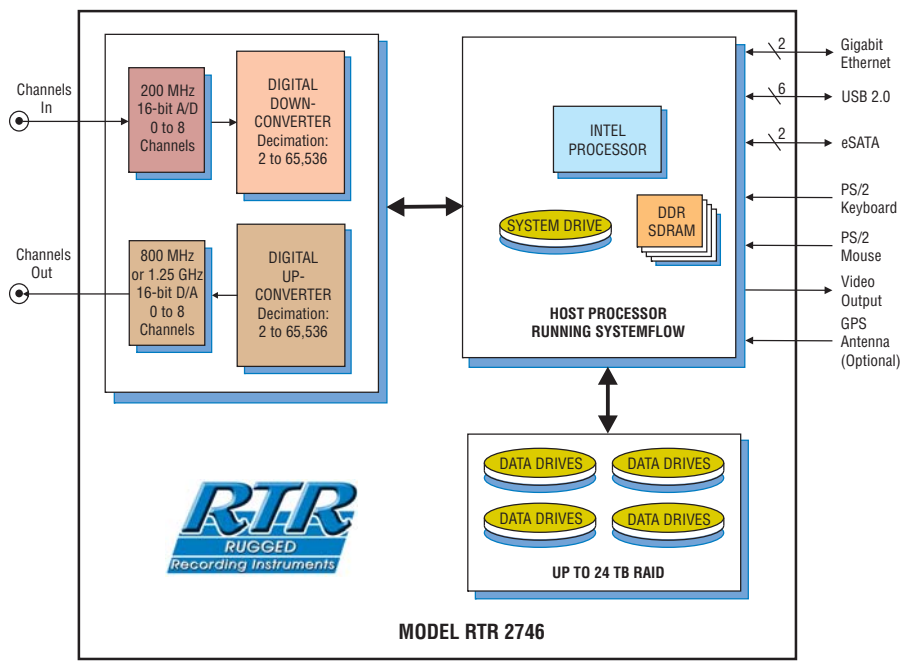
Built on a Windows 7 Professional workstation, the RTR 2746 allows the user to install post processing and analysis tools to operate on the recorded data. The instrument records data to the native NTFS file system, providing immediate access to the recorded data.

The recorder can be configured with up to six data drive packs, each containing up to eight SSDs. This feature allows instant removal of acquired data by simply removing the drive packs for remote copying and analysis. For istallations that demand a minimum of downtime, new drive packs can be imediately swapped for the removed ones.

In installations which have less demanding data off-load requiremetns, two rear access gigabit Ethernet ports or two USB 2.0 ports can be used. Additionally, data can be copied to optical disk, using the 8X double layer DVD ±R/RW drive.

Designed for Harsh Environments

The RTR 2746 is delivered in a Crystal Group, Inc. 4U 19" rugged rack-mountable chassis. Designed to MIL-STD-810F, it is ➤



PENTEK

Pentek, Inc. One Park Way ◆ Upper Saddle River ◆ New Jersey 07458
Tel: 201·818·5900 ◆ Fax: 201·818·5904 ◆ Email: info@pentek.com
www.pentek.com

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➤ built to survive shock and vibration. Stress to the motherboard and CPU heatsink is mitigated by multipe attachment points to stabilize the PCB. All fasteners and connectors are retained with locking mechanisms and shock-isolated drive bays.

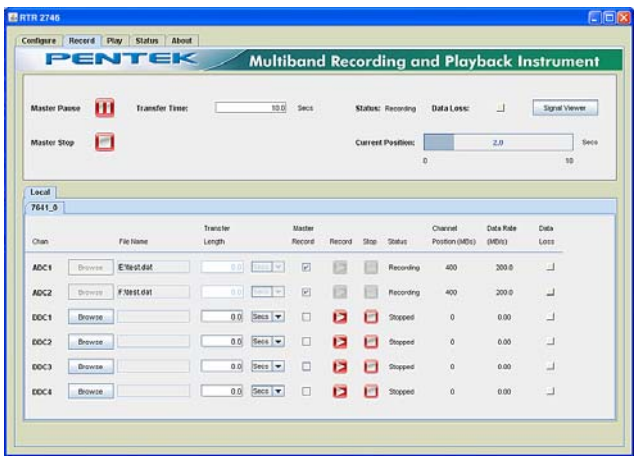
High-speed, high-volume, thermally-controlled fans offer maximum airflow and are designed for long life. Additionally, extended temperature operation is possible with an optional high temperature CPU.

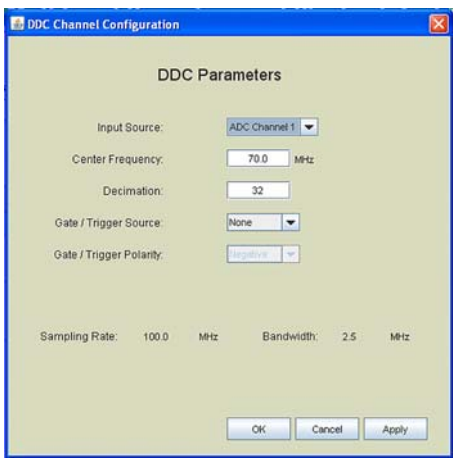
Flexible Architecture

The RTR 2746 is configured in a 4U 19" rack-mountable chassis. Systems are scalable to accommodate multiple chassis, in order to increase channel counts and aggregate data rates. All recorder chassis are connected via Ethernet and can be controlled from a single GUI either locally or from a remote PC.

Multiple RAID levels, including 0, 1, 5, 6, 10 and 50, provide a choice for the required level of redundancy. Up to 48 removable SSD SATA drives are available, allowing up to 24 terabytes of real-time data storage space in a single 4U chassis.

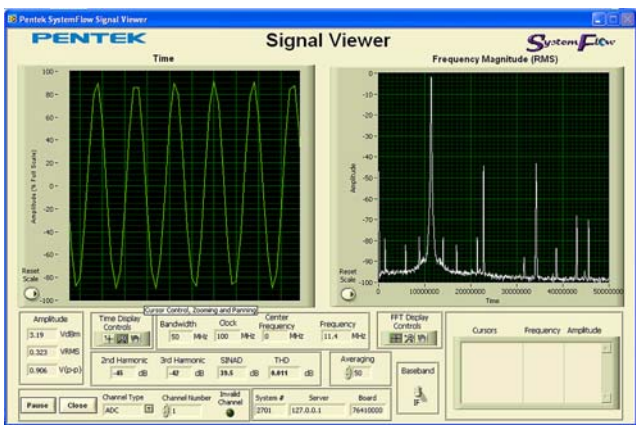
SystemFlow Graphical User Interface





SystemFlow Recorder Interface

The RTR 2746 GUI provides the user with a control interface for the recording instrument. It includes Configuration, Record, Playback and Status screens, each with intuitive controls and indicators. The user can easily move between screens to set configuration parameters, control and monitor a recording, play back a recorded signal and monitor board temperature and voltage levels. The signal viewer, integrated into the recording GUI, allows the user to monitor real-time signals or signals recorded on disk.



SystemFlow Hardware Configuration Interface

The RTR 2746 configuration screens provide a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here, provides entries for input source, center frequency, decimation, as well as gate and trigger information. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Signal Viewer

The SystemFlow Signal Viewer includes a virtual oscilloscope and spectrum analyzer for signal monitoring in both the time and frequency domains. It is extremely useful for previewing live inputs prior to recording, and for monitoring signals as they are being recorded to help ensure successful recording sessions. The viewer can also be used to inspect and analyze the recorded files after the recording is complete.

Advanced signal analysis capabilities include automatic calculators for signal amplitude and frequency, second and third harmonic components, THD (total harmonic distortion) and SINAD (signal to noise and distortion). With time and frequency zoom, panning modes and dual, annotated cursors to mark and measure points of interest, the SystemFlow Signal Viewer can often eliminate the need for a separate oscilloscope or spectrum analyzer in the field.

PENTEK
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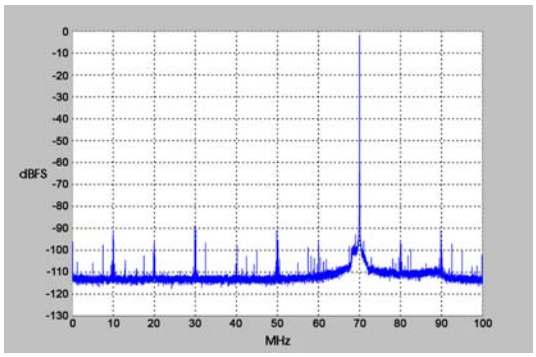
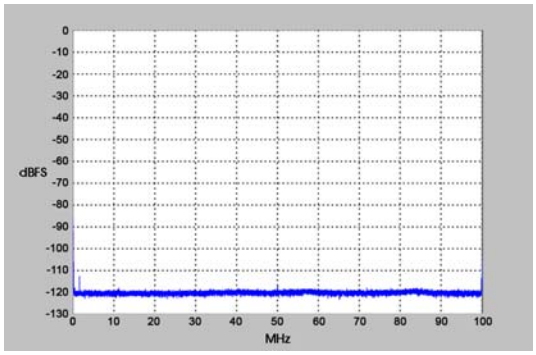
A/D Performance

Spurious Free Dynamic Range



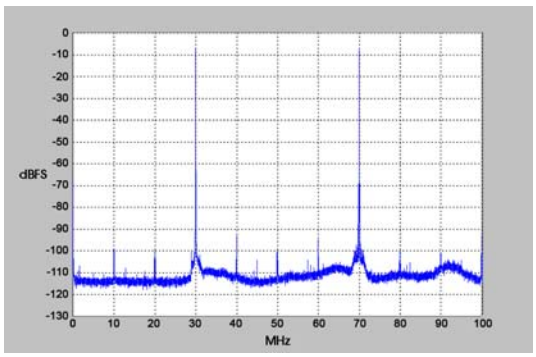
f_{in} = 70 MHz, f_s = 200 MHz, Internal Clock

Spurious Pick-up



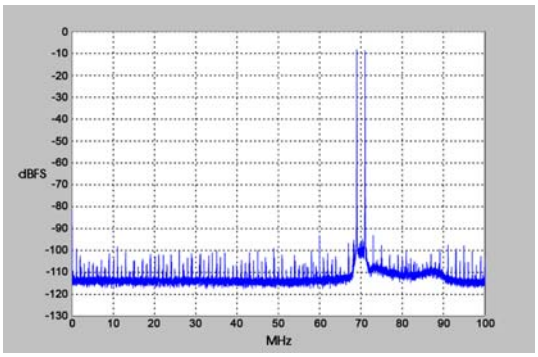
f_s = 200 MHz, Internal Clock

Two-Tone SFDR



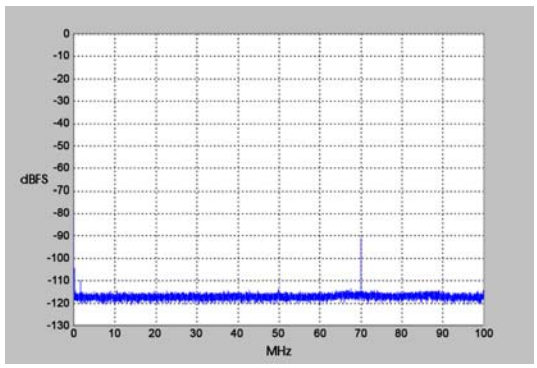
f_1 = 30 MHz, f_2 = 70 MHz, f_s = 200 MHz

Two-Tone SFDR



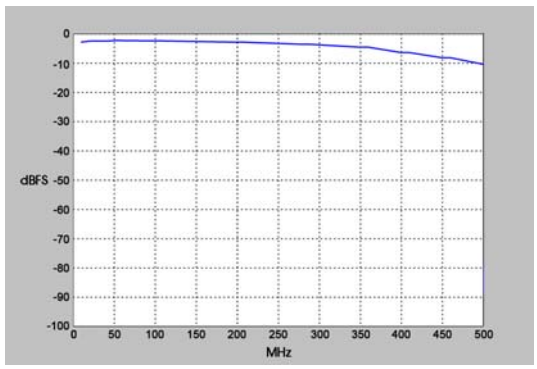
f_1 = 69 MHz, f_2 = 71 MHz, f_s = 200 MHz

Adjacent Channel Crosstalk



$f_{in\ Ch2}$ = 70 MHz, f_s = 200 MHz, Ch 1 shown

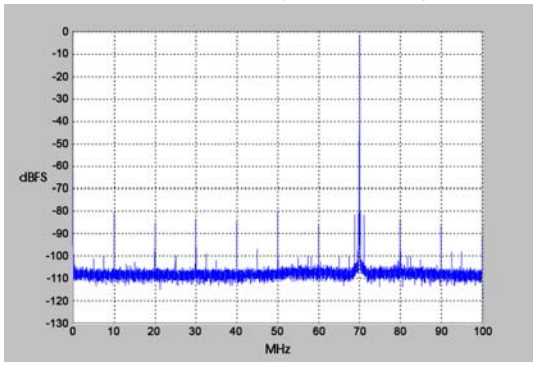
Input Frequency Response



f_s = 200 MHz, Internal Clock

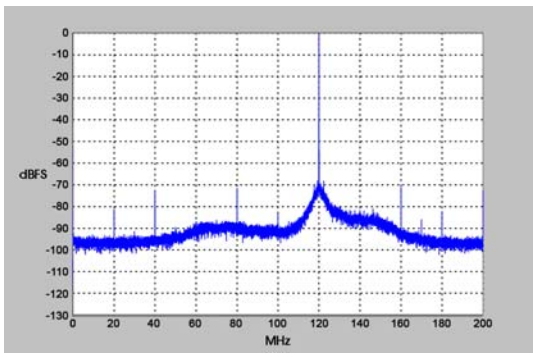
D/A Performance

Spurious Free Dynamic Range



f_{out} = 70 MHz, f_s = 200 MHz, Internal Clock

Spurious Free Dynamic Range



f_{out} = 120 MHz, f_s = 400 MHz, External Clock

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Specifications

PC Workstation (standard configuration)

Operating System: Windows® 7 Professional
Processor: Intel® Xeon™ processor
Clock Speed: 1.8 GHz or greater
SDRAM: 4 GB
RAID
- **Storage:** 1-24 TB
- **Number of Drives:** 2-48, arranged in 6 drive packs each containing up to 8 SSDs
- **Supported Levels:** 0, 1, 5, 6, 10 and 50

Analog Recording Input / Output

Analog Signal Inputs
- **Input Type:** Transformer-coupled, front panel female SSMC connectors
- **Transformer Type:** Coil Craft WBC4-6TLB
- **Full Scale Input:** +8 dBm into 50 ohms
- **3 dB Passband:** 300 kHz to 700 MHz

A/D Converters
- **Type:** Texas Instruments ADS5485
- **Sampling Rate:** 10 MHz to 200 MHz
- **Resolution:** 16 bits

Digital Downconverter
- **Type:** Virtex-6 FPGA-installed DDC IP Core
- **Decimation:** 2 to 65,536 in two stages of 2 to 256
- **Bandwidth:** Up to 80 MHz

Analog Signal Outputs
- **Output Type:** Transformer-coupled, front panel female SSMC connectors
- **Full Scale Output:** +4 dBm into 50 ohms
- **3 dB Passband:** 300 kHz to 700 MHz

Digital Upconverter and D/As
- **Type:** TI DAC5688 and Pentek-installed interpolation IP core
- **Interpolation:** 2 to 65,536 in two stages of 2 to 256
- **Input Data Rate:** 250 MHx max.
- **Output IF:** DC to 400 MHz
- **Output Signal:** Analog, real or quadrature
- **Output Sampling Rate:** 800 MHz max. with 2, 4 or 8 interpolation
- **Resolution:** 16 bits

Clock Sources: Selectable from onboard programmable VCXO, external or LVDS clocks

External Clocks
- **Type:** Front panel female SSMC connector, sine wave, 0 to +10 dBm, AC- coupled, 50 ohms, 10 to 200 MHz

Multi-Recorder Sync/Gate Bus: 26-pin connector, dual clock/sync/gate input/output LVDS buses; one sync/gate input TTL signal

Physical and Environmental

Size: 19" W x 24.125" D x 7" H
Weight: 45-75 lb
Operating Temp: –15° to +55° C; –40 to +71° C with high-temperature CPU option
Storage Temp: –55° to 85° C
Relative Humidity: 5 to 95%, non-cond.
Altitude: 12,500 ft. operation, 40,000 ft. transport
Vibration: 4.43 g_{RMS} 50 to 500 Hz, 75 min./axis

Specifications are subject to change without notice.

Model RTR 2746 Options

Recording Options

Option 201	One Channel Recording
Option 202	Two Channel Recording
Option 203	Three Channel Recording
Option 204	Four Channel Recording
Option 208	Eight Channel Recording

Playback Options

Option 221	One Channel Playback
Option 222	Two Channel Playback
Option 224	Four Channel Playback
Option 228	Eight Channel Playback

Storage Options

Option 240	2 TB Storage
Option 241	4 TB Storage
Option 242	6 TB Storage
Option 243	8 TB Storage
Option 244	12 TB Storage
Option 245	16 TB Storage
Option 246	20 TB Storage
Option 247	24 TB Storage

General Options

Option 260	Digital Downconversion and Upconversion
Option 261	GPS Time & Position Stamping

Contact Pentek for compatible Option combinations

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