PENTEK
Talon High-Speed Recording Systems
# High-Speed Recording Systems

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<td>RTR 2727</td>
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</tr>
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</tr>
<tr>
<td>RTX 2767</td>
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</tr>
<tr>
<td>RTR 2728</td>
<td>1 GS/sec RF/IF Rugged Portable Recorder</td>
</tr>
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<td>1 GS/sec RF/IF Rugged Portable Recorder</td>
</tr>
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<td>1 GS/sec RF/IF Rugged Rackmount Recorder</td>
</tr>
<tr>
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<td>RTR 2729A</td>
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<td>3.6 GS/sec Ultra Wideband RF/IF Rugged Rackmount Recorder</td>
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<td>RTR 2549</td>
<td>3.6 GS/sec Ultra Wideband RF/IF Rugged SFF Recorder</td>
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## HIGH-SPEED RECORDING SYSTEMS

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<th>MODEL</th>
<th>DESCRIPTION</th>
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<td>10-Gigabit Ethernet Extreme Rackmount Recorder</td>
</tr>
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<td>1, 10, 40-Gigabit Ethernet Rugged Portable Recorder</td>
</tr>
<tr>
<td>RTV 2602</td>
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</tr>
<tr>
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<td>Serial FPDP Rackmount Recorder</td>
</tr>
<tr>
<td>RTR 2736</td>
<td>Serial FPDP Rugged Portable Recorder</td>
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<tr>
<td>RTR 2736A</td>
<td>Serial FPDP Rugged Portable Recorder</td>
</tr>
<tr>
<td>RTR 2756</td>
<td>Serial FPDP Rugged Rackmount Recorder</td>
</tr>
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<td>RTX 2776</td>
<td>Serial FPDP Extreme Rackmount Recorder</td>
</tr>
<tr>
<td>RTS 2718</td>
<td>LVDS Digital I/O Rackmount Recorder</td>
</tr>
<tr>
<td>RTR 2738A</td>
<td>LVDS Digital I/O Rugged Portable Recorder</td>
</tr>
<tr>
<td>RTR 2758</td>
<td>LVDS Digital I/O Rugged Rackmount Recorder</td>
</tr>
<tr>
<td>RTX 2778</td>
<td>LVDS Digital I/O Extreme Rackmount Recorder</td>
</tr>
<tr>
<td>RTR 2555</td>
<td>1, 10, 40-Gigabit Ethernet Rugged SFF Recorder</td>
</tr>
<tr>
<td>RTR 2556</td>
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<td>RTR 2558</td>
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Talon High-Speed Recording Systems: Flexible and Deployable Solutions

**Talon High-Speed Recording Systems**

Talon® High-Speed Recording Systems eliminate the time and risk associated with new technology system development. With increasing pressure in both the defense and commercial arenas to get to the market first, today’s system engineers are looking for more complete off-the-shelf system offerings.

Out of the box, these systems arrive complete with a full-featured virtual operator control panel ready for immediate data recording and/or playback operation.

Because they consist of modular COTS board-level products and the flexible Pentek SystemFlow software, they are easily scalable to larger multichannel data acquisition and recording applications requiring aggregate recording rates of up to 5.0 GB/sec.

**Ready-to-Run Recording Systems**

Depending on model, the Pentek offerings are fully integrated systems featuring a range of A/D and D/A resources or digital I/O with high-speed disk arrays.

Since these systems are built on a Windows workstation, users can easily install post-processing and analysis tools to operate on the recorded data.

Pentek systems provide a flexible architecture that can be easily customized to meet user needs. Multiple RAID levels of up to 0, 1, 5, 6, 10 and 50, provide a choice for the required level of redundancy.

**Systems Include:**

- High-performance Windows® workstation
- High-performance Intel® Processor
- Pentek SystemFlow® recording software with graphical user interface
- SystemFlow analysis tools such as virtual oscilloscope and spectrum analyzer
- Supported RAID levels of up to 0, 1, 5, 6, 10 and 50
- Time and position stamping support
- Detailed technical documentation

**Systems Benefits:**

- Complete turnkey systems
- Rack-mountable and portable form factors
- C-callable API for integration of recorder into application
- Aggregate recording rates of up to 5.0 GB/sec
- Recording to non-proprietary NTFS file system for easy and immediate data access
- Ideal for communications, radar, wireless, SIGINT, telecom and satcom
- They are easy to use right out-of-the-box
- Can be controlled over the Ethernet or over the Internet

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**RTV Recording Systems are excellent value for under $20,000**

**RTS Recording Systems are designed for commercial applications**

**RTR Recording Systems are designed for harsh environments**

**RTX Recording Systems are designed for extreme environments**

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**Systems for All Recording Needs**

Pentek’s High-Speed Recording Systems are available as Lab Systems, Portable Systems, Rugged, and Extreme Systems.

**RTV and RTS Lab Systems** are housed in a 19-in. rack-mountable chassis in a PC server configuration. They are designed for commercial applications in a lab or office environment.

**RTR Portable Systems** are available in a small briefcase-sized enclosure with an integral LCD display and keyboard. They, too, provide a PC server configuration and are designed for commercial or harsh environment field applications where size and weight is of paramount importance.

**RTR Rugged Rackmount Systems** are housed in a 19-in. rugged rack-mountable chassis. They are built to survive shock and vibration and they target operation in harsh environments and remote locations that may be unsuitable for humans.

**RTX Extreme Systems** are available in either a rackmount chassis designed to military specs, or a ½ ATR chassis.

They are designed to operate under extreme environmental conditions using forced-air or conduction-cooling to draw heat from system components.
Server/Client Architecture
As shown in the block diagram, the SystemFlow architecture provides for easy communication between the recording system Server on the right and the Client PC on the left.

SystemFlow GUI
The SystemFlow architecture features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system. Custom configurations can be stored as profiles and later loaded when needed, allowing the user to select preconfigured settings with a single click.

Function Libraries
The function libraries and tools for controlling the recording and playback functions include the Application Programming Interface, the Graphical User Interface and the integrated Signal Viewer.

SystemFlow API
The SystemFlow API allows developers to configure and customize the system interfaces and operation. Source code is supplied for all client API functions. A well-defined set of plugins allows the user to extend server API functions.

SystemFlow Signal Viewer
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. More information on the Signal Viewer is provided on the next page.

Server/Client Communication
Server and Client communicate through a standard socket connection. This arrangement enables the Server to provide real-time recording and playback functions that can be controlled from a local or a remote Client. It also allows Client and Server to run on different operating systems.

NTFS File System
The NTFS file management system provides immediate access to the recorded data, thereby eliminating time-consuming data conversion processes required with proprietary file management systems. It also eliminates the need for custom hardware and software platforms where the recorded data may need to be physically transported for conversion.
SystemFlow Graphical User Interface

The SystemFlow GUI displays a block diagram of the system and provides the user with a control interface for the recording system. 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.

SystemFlow Recorder Interface

The SystemFlow Recorder Interface 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.

SystemFlow Hardware Configuration Interface

The SystemFlow Configure screen provides a simple and intuitive means for setting up the system parameters. The configuration screen shown here, allows user 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.
Recording and Playback Dataflow

**Recording Dataflow**

Shown in this diagram is the dataflow during a typical recording session. The Pentek Transceiver Board contains a 2-channel 200 MHz A/D for digitizing two input analog channels. The digitized outputs are downconverted by the two DDCs (Digital Downconverters) and moved on to the PC system memory via the PCI Express interface. Both the DDCs and the PCIe interface are implemented in the board’s FPGA. Data then moves from the system memory to the Recording System RAID Controller and is then recorded to disk via the SATA interface. DMA controllers conduct all data transfers, bypassing the CPU for guaranteed real-time operation.

**Playback Dataflow**

During a playback session, data stored on disk moves through the SATA interface of the Playback System RAID Controller. From there, data is passed to the PC system memory through the PCIe interface and then to the Pentek Transceiver board through its PCIe interface, all via hardware DMA controllers for real-time operation. This board also contains DUCs (Digital Upconverters) which upconvert the data to the original IF frequency bands. Two 800 MHz D/As convert the data to analog form and provide signals that are identical to the analog signals that were originally recorded. These can be further analyzed with any Windows-compatible analysis software.
Extreme Rackmount Recorders

Pentek’s Talon® RTX Rackmount series recorders are designed to provide a combination of high performance and large storage capacity in a military-specified rackmount chassis. Designed for field operation, the RTX Rackmount series provides up to 30 TB of SSD storage with aggregate recording rates up to 5 GB/sec.

Military Specifications

All Talon RTX rackmount recorders are designed to meet military specifications for temperature, altitude, shock, vibration, radiated emissions, conducted emissions, ESD, sand and dust.

The following list contains these military specifications.

- **Vibration**: MIL-STD-810F, method 514.5
- **Shock**: MIL-STD-810F, method 516.5
- **EMI/EMC**: MIL-STD-461E, CE101, CE102, CS101 CS114, RE101, RE102, RS101, RS103
- **ESD**: MIL-STD-1686A
- **Sand & Dust**: MIL-STD-810F, method 510

Chassis Design

All Talon RTX rackmount chassis are specially designed using heavy-duty wrought aluminum extrusions to provide superior torsional strength. Extrusions are partially overlapped for superior EMC. The chassis is 4U in height, with a depth of only 22”. A fully-loaded chassis weighs as little as 45 lb.

Rear-panel I/O includes bulk-head mounted SMA connectors, a 4-pin 38999 power connector as well as motherboard I/O. Rear-panels are modular and customizable allowing the end-user to specify the desired connectors.

The Operating System drive can be internally hard-mounted or can be made removable. Additionally an internally-mounted optical DVD writer is optional. All drives, OS, DVD and data drives are protected from dust with EMI filters.

QuickPac Canisters

In order to provide field engineers the ability to quickly remove and replace storage drives in the field, Pentek has developed the QuickPac™ canisters for use in the Talon RTX rackmount chassis. These canisters hold eight SSDs, providing up to 7.68 TB of storage capacity in each canister. Up to four QuickPac canisters can be installed in a Talon RTX rackmount chassis, providing a total storage capacity of 30 TB.

Fastened by four thumbscrews, QuickPac canisters can easily be swapped in the field, allowing users to replace those filled with data with new, empty ones with very little down time. QuickPac canisters can be transported to the lab for offload or analysis, using one of Pentek’s Talon offload or playback systems.

Floating Inner Chassis

In order to withstand conditions of high vibration and shock, the RTX rackmount chassis is designed to isolate all critical system components by placing them on a floating inner chassis.

This inner chassis is suspended using multiaxis mounts that attenuate externally-transmitted shock and vibration energy. This allows the system to perform flawlessly in aircraft, ships, ground vehicles, UAVs or any other areas of high shock or vibration.
Cooling and Filtering

Every RTX recorder includes a high-powered forced air-cooling system, to allow the proper transfer of heat from hot system components out the back of the chassis. Cool air is pulled from the front of the system through the QuickPac drive packs and forced over the hottest system components to ensure optimal cooling.

High-powered fans can be controlled via system software to allow the system to run quietly with lower cooling levels or at maximum air flow levels. This can be adjusted to match the user’s application.

Every RTX recorder includes filtering necessary to protect the system as well as the surrounding operating environment. EMI filters are placed on the front and rear of the chassis, to protect the surrounding environment from radiated emissions. A removable front panel filter protects the system against dust and sand.

Modular Power Supply

Every Talon RTX rackmount Recorder includes a 600 Watt, 85 – 264 V, 47– 400 Hz AC power supply. The power supply has an inline EMI filter to protect against conducted emissions and is isolated from the other electronics in the system, via an isolated chassis compartment. The 400 Hz rating allows every RTX rackmount recorder to operate in aircraft and other environments where smaller, 400 Hz generators are used. For applications that require DC power, 24 V and 28 V DC power supplies are available to replace the AC power supply.

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**Talon Solutions Chart**

The chart below compares Pentek’s different Talon Recording System solutions. As seen here, the RTX Rackmount series provide high performance and large storage capacity in a rugged package that meets high-level military specifications.

<table>
<thead>
<tr>
<th>Talon Chassis Type</th>
<th>RTS-COTS Rackmount</th>
<th>RTR Portable</th>
<th>RTR Rackmount</th>
<th>RTX Rackmount</th>
<th>RTX 1/2 ATR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (H&quot;xW&quot;xL&quot;)</td>
<td>7x19x26</td>
<td>13.4x16.9x9.5</td>
<td>7x19x21/26</td>
<td>7x19x22</td>
<td>8.1x7.1x16.5</td>
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<tr>
<td>Weight (lb)</td>
<td>60–85</td>
<td>30–35</td>
<td>45–85</td>
<td>45–60</td>
<td>30–35</td>
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<tr>
<td>Cooling</td>
<td>Forced-air</td>
<td>Forced-air</td>
<td>Forced-air</td>
<td>Forced-air</td>
<td>Conduction</td>
</tr>
<tr>
<td>Storage Drive Type</td>
<td>HDD</td>
<td>SSD</td>
<td>SSD</td>
<td>SSD</td>
<td>SSD</td>
</tr>
<tr>
<td>Max. Storage Capacity (TB)</td>
<td>60</td>
<td>7.6</td>
<td>38.4</td>
<td>SSD</td>
<td>30.7</td>
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<tr>
<td>Max. Record Rate (MB/sec)</td>
<td>1600</td>
<td>1600</td>
<td>5000</td>
<td>5000</td>
<td>500</td>
</tr>
<tr>
<td>Drive Removal</td>
<td>Individual (with trays)</td>
<td>Individual (no trays)</td>
<td>Individual (with trays)</td>
<td>QuickPac Canisters</td>
<td>Internal (needs disassembly)</td>
</tr>
<tr>
<td>Operating Temperature (deg C)</td>
<td>5 to 45</td>
<td>0 to 50</td>
<td>–10 to 55</td>
<td>–20 to 55</td>
<td>–40 to 71</td>
</tr>
<tr>
<td>Operating Altitude (ft)</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>15,000</td>
<td>65,000</td>
</tr>
<tr>
<td>Shock</td>
<td>–</td>
<td>15 g</td>
<td>15 g</td>
<td>MIL-STD-810F Method 516.5</td>
<td>MIL-STD-810F Method 516.5</td>
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<tr>
<td>Vibration</td>
<td>–</td>
<td>1.4 g</td>
<td>1.4 g</td>
<td>MIL-STD-810F Method 514.5</td>
<td>MIL-STD-810F Method 514.5</td>
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<tr>
<td>ESD</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>MIL-STD-1686A</td>
<td>–</td>
</tr>
<tr>
<td>Sand and Dust</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>MIL-STD-810F Method 510</td>
<td>MIL-STD-810F Method 510</td>
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## Appendix A - System Specifications Summary

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<thead>
<tr>
<th>Parameter</th>
<th>Condition</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>Operating</td>
<td>−20° C to +55° C</td>
</tr>
<tr>
<td></td>
<td>Non-operating</td>
<td>−40° C to +70° C</td>
</tr>
<tr>
<td>Altitude</td>
<td>Operating</td>
<td>0 to 15,000 ft</td>
</tr>
<tr>
<td></td>
<td>Non-operating</td>
<td>0 to 40,000 ft</td>
</tr>
<tr>
<td>Humidity</td>
<td>Operating</td>
<td>0–95%, non-condensing</td>
</tr>
<tr>
<td>Fungus</td>
<td>Operating</td>
<td>No fungus nutrient material shall be used</td>
</tr>
<tr>
<td>Shock</td>
<td>Operating</td>
<td>MIL-STD-810F, Method 516.5, Procedure I (functional shock), 20 g half sine, 12 msec in each axis</td>
</tr>
<tr>
<td>Vibration</td>
<td>Operating</td>
<td>MIL-STD-810F, Method 514.5, Procedure I</td>
</tr>
<tr>
<td>Airborne Noise</td>
<td>Operating</td>
<td>60 dBA max at 1 meter from the equipment</td>
</tr>
<tr>
<td>Structure-borne Noise</td>
<td>Operating</td>
<td>Maximum structure-borne noise per MIL-STD-704-2 is no greater than 60 dB one-third octave $L_{wa}$ (Type III)</td>
</tr>
<tr>
<td>Blowing Dust</td>
<td>Operating</td>
<td>The unit shall resume specified performance after exposed to settling-dust conditions defined in MIL-STD-810F, Method 510, Procedure II - See Note 1</td>
</tr>
<tr>
<td>Inclination Angles</td>
<td>Operating</td>
<td>The unit shall maintain specified performance when subjected to:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● A static pitch angle of ±5°</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● A list angle of 15°</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● A roll angle of 45°</td>
</tr>
</tbody>
</table>

Note 1: Standard maintenance includes cleaning of the dust filter(s) as required.

## Appendix B - Emissions Specifications Summary

- **CE101**: Conducted Emissions, Power Leads, 30 Hz to 10 kHz
- **CE102**: Conducted Emissions, Power Leads, 10 kHz to 10 MHz
- **CS101**: Conducted Susceptibility, Power Leads, 30 Hz to 50 kHz
- **CS114**: Conducted Susceptibility, Bulk Cable Injection, 10 kHz to 400 MHz
- **CS116**: Conducted Susceptibility, Damped Sinusoidal Transients, Cable and Power Leads, 10 kHz to 100 MHz
- **RE101**: Radiated Emissions, Magnetic Field, 30 Hz to 100 kHz
- **RE102**: Radiated Emissions, Electric Field, 10 kHz to 18 GHz
- **RS101**: Radiated Susceptibility, Magnetic Field, 30 Hz to 100 kHz
- **RS103**: Radiated Susceptibility, Electric Field, 10 kHz to 40 GHz

*Specifications are subject to change without notice*
**General Information**

The Talon© RTV 2601 is a turnkey multiband recording and playback system used for recording and reproducing signals with bandwidths up to 80 MHz. The RTV 2601 uses a 16-bit, 200 MHz A/D converter to provide real-time sustained recording rates to disk of up to 400 MB/sec. The A/D is complemented with a 16-bit 800 MHz D/A that provides the ability to reproduce signals captured in the field.

The RTV 2601 comes in a 4U 19 in. rackmount package that is 22.75 in. deep. Signal I/O is provided in the rear of the unit, while the hot-swappable data drives are available at the front. Air is pulled through the system from front to back allowing it to operate at ambient temperatures from 5 to 35 deg C.

The RTV 2601 includes a programmable digital downconverter so users can configure the system to capture signals with frequencies as low as 300 kHz and as high as 700 MHz. Corresponding signal bandwidths range from a few kilohertz to 80 MHz. A digital upconverter and D/A produce an analog output matching the recorded IF signal frequency.

The system includes a built-in sample clock synthesizer programmable to any desired frequency from 10 MHz to 200 MHz. This clock synthesizer can be locked to an external 10 MHz reference clock and has excellent phase noise characteristics. Alternatively, the user can supply an external sample clock to drive the A/D and D/A converters. The RTV 2601 also supports external triggering, allowing users to trigger a recording or playback on an external signal.

As an option, a GPS or IRIG receiver card can be supplied with the system providing accurate time stamping of recorded data. Additionally, the GPS receiver delivers GPS position information that can be recorded along with the analog input signal.

**SystemFlow Software and API**

The RTV 2601 includes the Pentek SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the recorder.

Custom configurations can be stored as profiles and later loaded when needed, so users can select preconfigured settings with a single click.

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

In addition to the GUI, the RTV 2601 provides a C-callable API, which allows the user to integrate the recorder control into any application. A simple set of commands that provide configuration and control come with source code and examples to allow for an exceptionally fast integration.

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**Features**

- Single-channel multiband recording and playback system.
- 4U 19-inch industrial rackmount PC server chassis
- Windows® 7 Professional workstation with high-performance Intel® Core™ i3 processor
- 200 MHz max. 16-bit A/D sampling for recording
- 800 MHz max. 16-bit D/A sampling for playback
- 80 MHz recording and playback signal bandwidths
- Capable of record/playback of IF frequencies to 700 MHz
- Real-time aggregate recording rates up to 400 MB/sec
- 4 TB of data storage to NTFS RAID disk array
- SystemFlow™ recording software with signal viewer analysis tool
- 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

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For more information, visit www.pentek.com.
Model RTV 2601

200 MS/sec RF/IF Rackmount Value Recorder

➤ SystemFlow Graphical User Interface

![Image of SystemFlow Graphical User Interface]

SystemFlow Recorder Interface

The RTV 2601 GUI provides the user with a control interface for the recording system. 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 RTV 2601 Configure screens provide a simple and intuitive means for setting up the system parameters. The configuration screen shown here, allows user 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.

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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.

➤
Model RTV 2601

200 MS/sec RF/IF Rackmount Value Recorder

A/D Performance

- **Spurious Free Dynamic Range**
  
  ![Graph](image1)

  \[ f_m = 70 \text{ MHz}, f_s = 200 \text{ MHz}, \text{ Internal Clock} \]

- **Spurious Pick-up**
  
  ![Graph](image2)

  \[ f_s = 200 \text{ MHz}, \text{ Internal Clock} \]

Two-Tone SFDR

- **f_1 = 30 MHz, f_2 = 70 MHz, f_s = 200 MHz**
  
  ![Graph](image3)

- **f_1 = 69 MHz, f_2 = 71 MHz, f_s = 200 MHz**
  
  ![Graph](image4)

Input Frequency Response

- **f_s = 200 MHz, Internal Clock**
  
  ![Graph](image5)

D/A Performance

- **Spurious Free Dynamic Range**
  
  ![Graph](image6)

  \[ f_{out} = 70 \text{ MHz}, f_s = 200 \text{ MHz}, \text{ Internal Clock} \]

- **Spurious Free Dynamic Range**
  
  ![Graph](image7)

  \[ f_{out} = 120 \text{ MHz}, f_s = 400 \text{ MHz}, \text{ External Clock} \]
Model RTV 2601 200 MS/sec RF/IF Rackmount Value Recorder

➤ System Architecture

Built on a Windows 7 Professional workstation, the RTV 2601 allows the user to install post-processing and analysis tools to operate on the recorded data. The recorder stores data in the native NTFS file system, providing immediate access to any installed Windows application. Alternately, the NTFS drive can be accessed remotely over the built-in gigabit Ethernet link from a remote Windows or Linux machine.

Recorded data can be off-loaded via the rear-panel gigabit Ethernet port, two front-panel USB 3.0 ports, two rear-panel USB 3.0 ports or four rear-panel USB 2.0 ports. A built-in DVD +/- R/RW drive allows the user to burn recorded data to disk. Hot-swappable front-panel drives can be easily removed and replaced with empty drives to provide additional data storage.

Specifications

PC Workstation (standard configuration)

Operating System: Windows 7 Professional
Processor: Intel Core i3 processor
Clock Speed: 2.0 GHz or higher
SDRAM: 8 GB
RAID
  Storage: 4 TB
  Number of Drives: Six, removable, front panel access
  Optical Drive: DVD+/- R/RW, front panel access
  USB Ports: Front panel: 2x USB 3.0; rear panel: 2x USB 3.0, 4x USB 2.0
  Ethernet: Single 1GbE, rear panel
Supported RAID Levels: 0

Analog Recording Input

Analog Signal Inputs
  Input Type: Transformer-coupled, rear-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 ($f_s$): 10 MHz to 200 MHz
  Resolution: 16 bits
  A/D Record Bandwidth: $f_s/2 = \text{Nyquist bandwidth}$
  Anti-Aliasing Filter: External, user-supplied

Digital Downconverter
  Type: Virtex-6 FPGA, Pentek DDC IP Core
  Decimation(D): 2 to 65,536
  IF Center Frequency Tuning: DC to $f_s$, 32 bits
  DDC Usable Bandwidth: $0.8*f_s/D$

Analog Recording Output

Output Type: Transformer-coupled, rear-panel female SSMC connector
Full Scale Output: +4 dBm into 50 ohms
3 dB Passband: 300 kHz to 700 MHz

Digital Upconverter and D/As
  Interpolation: 2 to 65,536
  Input Data Rate: 250 MHz max.
  Bandwidth: matches digital downconverter
  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 or external

External Clocks
  Function: Synthesizer reference clock (10 MHz typical) or A/D or D/A sample clock
  Type: Rear-panel female SSMC connector, sine wave, 0 to +10 dBm, AC-coupled, 50 ohms, 10 to 800 MHz

Physical and Environmental

Size: 19” W x 22.75” D x 7” H
Weight: 50 lbs
Operating Temp: +5° to +35° C
Storage Temp: –40° to +85° C
Relative Humidity: 5 to 95%, non-condensing
Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Model RTV 2601 Options Information

General Options

Option -261 GPS time & position stamping
Option -264 IRIG-B time stamping

Specifications are subject to change without notice
**General Information**

The Talon® RTS 2706 is a turnkey, multiband recording and playback system for recording and reproducing high-bandwidth signals. The RTS 2706 uses 16-bit, 200 MHz A/D converters and provides sustained recording rates up to 1.6 GB/sec in four-channel configuration.

The RTS 2706 uses Pentek’s high-powered Virtex-6-based Cobalt® modules, that provide flexibility in channel count, with optional digital downconversion capabilities. Optional 16-bit, 1.25 GHz 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 system 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 RTS 2706 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system.

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 RTS 2706 allows the user to install post processing and analysis tools to operate on the recorded data. The RTS 2706 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via two gigabit Ethernet ports, six USB 2.0 ports or two eSATA ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

**Flexible Architecture**

The RTS 2706 is configured in a 4U 19” rack-mountable chassis, with hot-swappable data drives, front panel USB ports and I/O connectors on the rear panel. Systems are scalable to accommodate multiple chassis 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. The hot-swappable HDDs provide storage capacities of up to 100 TB in a single 6U chassis.

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**Features**

- Complete multiband recording and playback system
- 4U 19-inch industrial rack-mount PC server chassis
- Windows® 7 Professional workstation with high-performance Intel® Core™ i7 processor
- 200 MHz max. 16-bit A/D sampling for recording, up to to eight channels
- 800 MHz 16-bit D/A sampling for playback, up to eight channels
- 80 MHz recording and playback signal bandwidths
- Capable of record/playback of IF frequencies to 700 MHz
- Real-time aggregate recording rates of up to 1.6 GB/sec
- Up to 100 terabytes storage to NTFS RAID disk array
- RAID levels of 0, 1, 5, 6, 10 and 50
- SystemFlow® GUI with signal viewer analysis tool
- 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, number and type of analog channels, recording rates, and disk capacity.*
**SystemFlow Graphical User Interface**

![SystemFlow Graphical User Interface](image1)

**SystemFlow Recorder Interface**

The RTS 2706 GUI provides the user with a control interface for the recording system. 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 RTS 2706 Configure screens provide a simple and intuitive means for setting up the system parameters. The 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.
Model RTS 2706
200 MS/sec RF/IF Rackmount Recorder

➤ A/D Performance

A/D Performance

Spurious Free Dynamic Range

![Graph showing spurious free dynamic range with parameters: f_{in} = 70 MHz, f_s = 200 MHz, Internal Clock.]

Spurious Pick-up

![Graph showing spurious pick-up with parameter: f_s = 200 MHz, Internal Clock.]

Two-Tone SFDR

![Graph showing two-tone SFDR with parameters: f_1 = 30 MHz, f_2 = 70 MHz, f_s = 200 MHz.]

Two-Tone SFDR

![Graph showing two-tone SFDR with parameters: f_1 = 69 MHz, f_2 = 71 MHz, f_s = 200 MHz.]

Adjacent Channel Crosstalk

![Graph showing adjacent channel crosstalk with parameter: f_{in, Ch2} = 70 MHz, f_s = 200 MHz, Ch 1 shown.]

Input Frequency Response

![Graph showing input frequency response with parameter: f_s = 200 MHz, Internal Clock.]

D/A Performance

Spurious Free Dynamic Range

![Graph showing spurious free dynamic range with parameters: f_{out} = 70 MHz, f_s = 200 MHz, Internal Clock.]

Spurious Free Dynamic Range

![Graph showing spurious free dynamic range with parameters: 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 Core i7 processor
- Clock Speed: 2.0 GHz or higher
- SDRAM: 6 GB
- RAID
  - Storage: 2–100 TB
  - Supported RAID Levels: 0, 1, 5, 6, 10 and 50

Analog Recording Inputs/Outputs
- 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 \(f_s\): 10 MHz to 200 MHz
  - Resolution: 16 bits
  - A/D Record Bandwidth: \(f_s/2\) = Nyquist bandwidth
  - Anti-Aliasing Filters: External, user-supplied

Digital Downconverter
- Type: Virtex-6 FPGA, Pentek DDC IP Core
- Decimation Range (D): 2 to 65,536
- IF Center Frequency Tuning: DC to \(f_s\), 32 bits
- DDC Usable Bandwidth: \(0.8\times f_s/D\) (80 MHz max)

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
- Input Data Rate: 250 MHz 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 26” D x 7” H
- Weight: 60-85 lb
- Operating Temp: +5° to +45° C
- Storage Temp: –40° to +85° C
- Relative Humidity: 5 to 95%, non-condensing
- Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Model RTS 2706 Ordering Information and Options

Channel Configurations
- Option -201: 1-channel recording
- Option -202: 2-channel recording
- Option -203: 3-channel recording
- Option -204: 4-channel recording
- Option -208: 8-channel recording
- Option -221: 1-channel playback
- Option -222: 2-channel playback
- Option -224: 4-channel playback
- Option -228: 8-channel playback

Storage Options
- Option -406: 2.0 TB HDD storage capacity
- Option -411: 4.0 TB HDD storage capacity
- Option -416: 8.0 TB HDD storage capacity
- Option -421: 16.0 TB HDD storage capacity
- Option -423: 20.0 TB HDD storage capacity
- Option -439: 30.0 TB HDD storage capacity
- Option -450: 45.0 TB HDD storage capacity
- Option -460: 60.0 TB HDD storage capacity
- Option -480: 100.0 TB HDD storage capacity

Note: Options -450 and -460 require a 5U Chassis; Option -480 requires a 6U chassis

General Options (append to all options)
- Option -261: GPS time & position stamping
- Option -264: IRIG-B time stamping

Specifications subject to change without notice

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information
General Information

The Talon® RTR 2726 is a turnkey, multi-band recording and playback system that allows the user to record and reproduce high-bandwidth signals with a lightweight, portable and rugged package. The RTR 2726 provides aggregate recording rates of up to 2.4 GB/sec and is ideal for the user who requires both portability and solid performance in a compact recording system.

The RTR 2726 is supplied in a small footprint portable package measuring only 16.9” W x 9.5” D x 13.4” H and weighing just 30 pounds. With measurements similar to a small briefcase, this portable workstation includes an Intel® Core™ i7 processor a high-resolution 17” LCD monitor, and a high-performance SATA RAID controller.

At the heart of the RTR 2726 are Pentek Cobalt® Series Virtex-6 software radio boards featuring A/D and D/A converters, DDCs (Digital Downconverters), DUCs (Digital Upconverters), and complementary FPGA IP cores. This architecture allows the system engineer to take full advantage of the latest technology in a turnkey system.

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

SystemFlow Software

Included in this system is the Pentek SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system. 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 2726 allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2726 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded through two 1 Gb Ethernet ports, eight USB 2.0 ports or two eSATA ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD+R/RW drive.

Rugged & Flexible Architecture

The RTR 2726 is configured in a portable, lightweight chassis with hot-swap SSDs, front panel USB ports and I/O connections on the side panel. It is built on an extremely rugged, 100% aluminum alloy unit, reinforced with shock absorbing rubber corners and an impact-resistant protective glass. Using shock- and vibration-resistant SSDs, the RTR 2726 is designed to reliably operate as a portable field instrument.

The hot-swappable SSDs provide storage capacities of up to 7.6 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels, including 0,1,5 and 6, provide a choice for the required level of redundancy.

Contact the factory for options, for number and type of analog channels, recording rates, and disk capacity.
Model RTR 2726
200 MS/sec RF/IF Rugged Portable Recorder

➤ SystemView Graphical User Interface

The SystemView Graphical User Interface provides a comprehensive platform for managing and analyzing your data. The interface is designed to be intuitive and user-friendly, allowing you to easily view and manipulate your data in real-time.

SystemFlow Recorder Interface
The RTR 2726 GUI provides the user with a control interface for the recording system. 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 recorded signals on disk.

SystemFlow Hardware Configuration Interface
The RTR 2726’s Configure screens provide a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here, allows user 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.

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Model RTR 2726  200 MS/sec RF/IF Rugged Portable Recorder

A/D Performance

<table>
<thead>
<tr>
<th>Spurious Free Dynamic Range</th>
<th>Spurious Pick-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Graph" /></td>
<td><img src="image2" alt="Graph" /></td>
</tr>
<tr>
<td>(f_{in} = 70,\text{MHz}, f_s = 200,\text{MHz}, \text{Internal Clock})</td>
<td>(f_s = 200,\text{MHz}, \text{Internal Clock})</td>
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</table>

Two-Tone SFDR

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><img src="image3" alt="Graph" /></td>
</tr>
<tr>
<td>(f_1 = 30,\text{MHz}, f_2 = 70,\text{MHz}, f_s = 200,\text{MHz})</td>
</tr>
<tr>
<td><img src="image4" alt="Graph" /></td>
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<tr>
<td>(f_1 = 69,\text{MHz}, f_2 = 71,\text{MHz}, f_s = 200,\text{MHz})</td>
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</table>

Adjacent Channel Crosstalk

<table>
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<th>Adjacent Channel Crosstalk</th>
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</thead>
<tbody>
<tr>
<td><img src="image5" alt="Graph" /></td>
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<tr>
<td>(f_{in,\text{Ch2}} = 70,\text{MHz}, f_s = 200,\text{MHz}, \text{Ch 1 shown})</td>
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</tbody>
</table>

Input Frequency Response

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td><img src="image6" alt="Graph" /></td>
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<tr>
<td>(f_s = 200,\text{MHz}, \text{Internal Clock})</td>
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</table>

D/A Performance

<table>
<thead>
<tr>
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<th>Spurious Free Dynamic Range</th>
</tr>
</thead>
<tbody>
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<td><img src="image7" alt="Graph" /></td>
<td><img src="image8" alt="Graph" /></td>
</tr>
<tr>
<td>(f_{out} = 70,\text{MHz}, f_s = 200,\text{MHz}, \text{Internal Clock})</td>
<td>(f_{out} = 120,\text{MHz}, f_s = 400,\text{MHz}, \text{External Clock})</td>
</tr>
</tbody>
</table>
Model RTR 2726 Ordering Information and Options

<table>
<thead>
<tr>
<th>Channel Configurations</th>
<th>Storage Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -201 1-channel recording</td>
<td>Option -405 1.9 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -202 2-channel recording</td>
<td>Option -410 3.8 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -203 3-channel recording</td>
<td>Option -415 7.6 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -204 4-channel recording</td>
<td></td>
</tr>
<tr>
<td>Option -208 8-channel recording</td>
<td></td>
</tr>
<tr>
<td>Option -221 1-channel playback</td>
<td></td>
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<tr>
<td>Option -222 2-channel playback</td>
<td></td>
</tr>
<tr>
<td>Option -224 4-Channel playback</td>
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</tr>
<tr>
<td>Option -228 8-Channel playback</td>
<td></td>
</tr>
</tbody>
</table>

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice
General Information

The Talon® RTR 2726A is a turnkey, multiband recording and playback system that allows the user to record and reproduce high-bandwidth signals with a lightweight, portable and rugged package. The RTR 2726A provides sustained recording rates of up to 3.2 GB/sec in a four-channel system and is ideal for the user who requires both portability and solid performance in a compact recording system.

The RTR 2726A is supplied in a small footprint portable package measuring only 16.0” W x 6.9” D x 13.0” H and weighing just less than 30 pounds. With measurements similar to a small briefcase, this portable workstation includes an Intel Core i7 processor a high-resolution 17” LCD monitor, and up to 30.7 TB of SSD storage.

At the heart of the RTR 2726A are Pentek Cobalt® Series Virtex-6 software radio boards featuring A/D and D/A converters, DDCs (Digital Downconverters), DUCs (Digital Upconverters), and complementary FPGA IP cores. This architecture allows the system engineer to take full advantage of the latest technology in a turnkey system.

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

SystemFlow Software

Included in this system is the Pentek SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system. It also includes a C-callable API that allows users to easily integrate the Talon recorder into a larger system.

The GUI provides a very simple interface for system setup. This includes pull-down selections for a handful of parameters, a checkbox to enable/disable the DDC and a data-entry field for the sample rate. Once set up, the GUI provides the ability to save profiles that can be reloaded at the click of a button.

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 spectrum analyzer.

Built on a Windows 7 Professional workstation, the RTR 2726A allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2726A records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via gigabit Ethernet, USB 2.0 and USB 3.0 ports. Additionally, data can be copied to optical disk using the 8X double-layer DVD±R/RW drive.

Option -625 replaces the DVD±R/RW drive with a removable operating system drive; an external DVD drive can be used.

Rugged Chassis with SSD Storage

The RTR 2726A is configured with hot-swappable SSDs, front panel USB ports, and I/O connectors on the side panel. It is built in an extremely rugged steel and aluminum chassis and is tested for shock and vibration. The SSDs provide storage capacities of up to 61.4 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels, including 0, 5, and 6, provide a choice for the required level of redundancy.

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

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www.pentek.com
Model RTR 2726A 200 MS/sec RF/IF Rugged Portable Recorder

➤ SystemView Graphical User Interface

The RTR 2726A GUI provides the user with a control interface for the recording system. 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 recorded signals on disk.

SystemFlow Recorder Interface

The RTR 2726A’s Configure screens provide a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here, allows user 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 Hardware Configuration Interface

The RTR 2726A’s Configure screens provide a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here, allows user 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.
Model RTR 2726A  200 MS/sec RF/IF Rugged Portable Recorder

➤ A/D Performance

Spurious Free Dynamic Range

Spurious Pick-up

f_in = 70 MHz, f_s = 200 MHz, Internal Clock

f_s = 200 MHz, Internal Clock

Two-Tone SFDR

Two-Tone SFDR

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

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

Adjacent Channel Crosstalk

Input Frequency Response

f_in Ch2 = 70 MHz, f_s = 200 MHz, Ch 1 shown

f_s = 200 MHz, Internal Clock

Spurious Free Dynamic Range

D/A Performance

Spurious Free Dynamic Range

f_out = 70 MHz, f_s = 200 MHz, Internal Clock

f_out = 120 MHz, f_s = 400 MHz, External Clock
Model RTR 2726A  200 MS/sec RF/IF Rugged Portable Recorder

Specifications

**PC Workstation (standard configuration)**
- **Operating System**: Windows workstation
- **Processor**: Intel Core i7 processor
- **Clock Speed**: 3.0 GHz or higher
- **Operating System Drive**: 128 GB SSD
- **SDRAM**: 8 GB
- **Monitor**: Built-in 17.3” high-resolution LCD, 1920 x 1080 pixels, 16:9 aspect ratio, anti-glare surface
  - Brightness: 300 cd/m²; Contrast ratio: 400:1 typical

**RAID**
- **Total Storage**: 3.8 TB – 61.4 TB
- **Supported RAID Levels**: 0, 5 and 6
- **Drive Bays**: Hot-swap, removable, side panel
- **USB 2.0 Ports**: Four on left side, two on front panel
- **USB 3.0 Ports**: Two on left side
- **1 Gb Ethernet Ports**: Two on left side
- **Aux Video Output**: 15-pin VGA on left side

**Analog Signal Inputs**
- **Connectors**: 1, 2, 3, or 4 transformer-coupled, female SSMC
- **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** ($f_s$): 10 MHz to 200 MHz
- **Resolution**: 16 bits
- **A/D Record Bandwidth**: $f_s/2 = $Nyquist bandwidth
- **Anti-Aliasing Filters**: External, user-supplied

**Digital Downconverter**
- **Type**: Virtex-6 FPGA, Pentek DDC IP Core
- **Decimation (D)**: 2 to 65,536
- **IF Center Frequency Tuning**: DC to $f_s$ 32 bits
- **DDC Usable Bandwidth**: $0.8 * f_s / D$

**Analog Signal Outputs**
- **Connectors**: 1 or 2, transformer-coupled, female SSMC
- **Full Scale Output**: +4 dBm into 50 ohms
- **3 dB Passband**: 300 kHz to 700 MHz

**Digital Upconverter, Interpolator and D/As**
- **D/A Resolution**: 16 bits
- **Output Signal**: Analog, real or quadrature
- **Type**: TI DAC5688 and Pentek-installed IP core interpolator
- **IP Core Interpolation**: 2 to 65,536
- **DAC5688 Interpolation**: 2, 4 or 8
- **Overall Interpolation**: 2 to 524,288
- **Input Data Rate to DAC5688**: 250 MS/sec max.
- **Output Sampling Rate**: 800 MHz max
- **Output IF**: DC to 400 MHz
- **Bandwidth Range**: Matches recording bandwidths
- **Clock Sources**: Selectable from onboard programmable VCXO, external or LVDS clocks

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

**Optional DC Power supply**
- **Voltage**: 10 to 36 VDC
- **Input Current**: 42 to 26 A (39 A at 24 VDC)
- **Inrush Current**: 100 A at 24 VDC
- **Temperature Range**: Oper.: 0° to 50° C, Store: –0° to 80° C
- **Efficiency**: >80% typical at 24 V full load
- **Power Good Signal**: On delay 100 to 500 msec
- **OverPower Protection**: 110% to 160%
- **Remote Control**: On/Off
- **Safety**: Meets UL, TUV, CB specifications

**Physical and Environmental**
- **Size**: 16.0” W x 6.9” D x 13.0” H
- **Weight**: 30 lb max.
- **Operating Temp**: 0° to +50° C
- **Storage Temp**: –40° to +85° C
- **Relative Humidity**: 5 to 95%, non-condensing
- **Operating Shock**: 30 g max. (11 msec, half-sine wave)
- **Operating Vibration**: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
- **Non-operating Vibration**: 5 to 500 Hz: 2.06 g RMS
- **Power Requirements**: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

**Model RTR 2726A Ordering Information and Options**

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Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice
Model RTR 2746

200 MS/sec RF/IF Rugged Rackmount Recorder

General Information

The Talon® RTR 2746 is a turnkey, multi-band record and playback system 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 system. With scalable A/Ds, D/A and SSD (Solid-State Drive) storage, the RTR 2746 can be configured to stream data to and from disk at rates as high as 3.2 GB/sec.

The RTR 2746 uses Pentek’s high-powered Virtex-6-based Cobalt® boards, that provide flexibility in channel count with optional digital downconversion capabilities. Optional 16-bit, 1.25 GHz 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 system 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 system. 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 RTR 2746 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded through two rear-access gigabit Ethernet ports or two USB 2.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

Rugged and Flexible Architecture

Because SSDs operate reliably under conditions of shock and vibration, the RTR 2746 performs well in ground, shipborne and airborne environments. The hot-swappable SSDs provide storage capacity of up to 46 TB. The drives can be easily removed or exchanged during or after a mission to retrieve recorded data.

The RTR 2746 is configured in a 4U 19" rack-mountable chassis, with hot-swap data drives, front panel USB ports and I/O connectors on the rear panel.

Systems are scalable to accommodate multiple chassis 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.

Features

- Designed to operate under conditions of shock and vibration
- 4U 19-inch rugged rackmount PC server chassis
- Windows® 7 Professional workstation with high-performance Intel® Core™ i7 processor
- 200 MHz max. 16-bit A/D sampling for recording, up to eight channels
- 80 MHz recording and playback signal bandwidths
- Capable of record/playback of IF frequencies to 700 MHz
- Real-time aggregate recording rates of up to 3.2 GB/sec
- Removable SSD drives
- Up to 46 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
- 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, number and type of analog channels, recording rates, and disk capacity.
Model RTR 2746

200 MS/sec RF/IF Rugged Rackmount Recorder

➤ SystemFlow Graphical User Interface

![Graphical User Interface Image]

**SystemFlow Recorder Interface**

The RTR 2746 GUI provides the user with a control interface for the recording system. 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 Configure screens provide a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here, allows user 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.

![Hardware Configuration Interface Image]

**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.

➤
Model RTR 2746

200 MS/sec RF/IF Rugged Rackmount Recorder

**A/D Performance**

### Spurious Free Dynamic Range

- **fin** = 70 MHz, **fs** = 200 MHz, Internal Clock
- **fout** = 70 MHz, **fs** = 200 MHz, Internal Clock

### Spurious Pick-up

- **fs** = 200 MHz, Internal Clock

### Two-Tone SFDR

- **f₁** = 30 MHz, **f₂** = 70 MHz, **fs** = 200 MHz
- **f₁** = 69 MHz, **f₂** = 71 MHz, **fs** = 200 MHz

### Adjacent Channel Crosstalk

- **fin Ch2** = 70 MHz, **fs** = 200 MHz, Ch 1 shown

### Input Frequency Response

- **fs** = 200 MHz, Internal Clock

### D/A Performance

### Spurious Free Dynamic Range

- **fout** = 70 MHz, **fs** = 200 MHz, Internal Clock

- **fout** = 120 MHz, **fs** = 400 MHz, External Clock
## Specifications

### PC Workstation (standard configuration)
- **Operating System**: Windows 7 Professional
- **Processor**: Intel Core i7 processor
- **Clock Speed**: 2.0 GHz or higher
- **SDRAM**: 6 GB
- **RAID**
  - **Storage**: 3.8, 7.6, 15.3, 30.7 or 46.0 TB
  - **Supported Levels**: 0, 1, 5, 6, 10 and 50

### Analog Recording Inputs
- **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
  - **A/D Record Bandwidth**: $f_s/2 = \text{Nyquist bandwidth}$
  - **Anti-Aliasing Filters**: External, user-supplied

### Digital Downconverter
- **Type**: Virtex-6 FPGA Pentek DDC IP Core
- **Decimation (D)**: 2 to 65,536
- **IF Center Frequency Tuning**: DC to $f_s$, 32 bits
- **DDC Usable Bandwidth**: $0.8 \times f_s/D$

### 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
- **Input Data Rate**: 250 MHz 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
- **Dimensions**
  - 4U Short Chassis: 19” W x 21” D x 7” H
- **Weight**: 50 lb, approx.
- **Operating Temp**: 0° to +50° C
- **Storage Temp**: -40° to +85° C
- **Relative Humidity**: 5 to 95%, non-condensing
- **Operating Shock**: 15 g max. (11 msec, half sine wave)
- **Operating Vibration**: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
- **Power Requirements**: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

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### Model RTR 2746 Ordering Information and Options

#### Channel Configurations
- **Option -201**: 1-channel recording
- **Option -202**: 2-channel recording
- **Option -203**: 3-channel recording
- **Option -204**: 4-channel recording
- **Option -208**: 8-channel recording
- **Option -221**: 1-channel playback
- **Option -222**: 2-channel playback
- **Option -224**: 4-Channel playback
- **Option -228**: 8-Channel playback

#### Storage Options
- **Option -261**: GPS time & position stamping
- **Option -264**: IRIG-B time stamping

#### Storage and Channel-count Options
- **Option -410**: 3.8 TB SSD storage capacity
- **Option -415**: 7.6 TB SSD storage capacity
- **Option -420**: 15.3 TB SSD storage capacity
- **Option -430**: 30.7 TB SSD storage capacity
- **Option -440**: 46.0 TB SSD storage capacity

#### General Options (append to all options)
- **Option -261**: GPS time & position stamping
- **Option -264**: IRIG-B time stamping

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Contact Pentek for compatible Option combinations

Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice
## General Information

The Talon® RTX 2766 is a turnkey, multiband record and playback system that is built to operate under harsh conditions. Designed to withstand high vibration and operating temperatures, the RTX 2766 is intended for military, airborne and UAV applications requiring a rugged system. With scalable A/Ds, D/As and SSD (Solid-State Drive) storage, the RTX 2766 can be configured to stream data to and from disk at rates as high as 3.2 GB/sec.

The RTX 2766 uses Pentek’s high-powered Virtex-6-based Cobalt® boards 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 system 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 RTX 2766 includes the SystemFlow® Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system.

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 RTX 2766 allows the user to install post-processing and analysis tools to operate on the recorded data. The RTX 2766 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via two rear-access gigabit Ethernet ports, two USB 3.0 ports or up to four USB 2.0 ports.

## Rugged Mil-Spec Chassis

The Talon RTX 2766 uses a shock- and vibration-isolated inner chassis and solid-state drives to assure reliability under harsh conditions. The chassis uses an in-line EMI filter along with rear-panel MIL-style connectors to meet MIL-STD-461 emissions specifications.

Up to four front-panel removable QuickPac drive canisters are provided, each containing up to eight SSDs. Each drive canister can hold up to 7.6 TB of data storage and allows for quick and easy removal of mission-critical data.

Forced-air cooling draws air from the front of the chassis and pushes it out the back via exhaust fans. A hinged front door with a serviceable air filter provides protection against dust and sand.

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<td></td>
<td>Channels</td>
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</tr>
</tbody>
</table>

### Features

- Designed to meet MIL-STD-810 shock and vibration
- Designed to meet EMC/EMI per MIL-STD-461 EMC
- 4U 19-inch rugged rackmount PC server chassis, 22” deep
- Windows® 7 Professional workstation with high-performance Intel® Core™ i7 processor
- 200 MHz max. 16-bit A/D sampling for recording, up to eight channels
- 800 MHz max. 16-bit D/A sampling for playback, up to eight channels
- 80 MHz record and playback signal bandwidths
- Capable of record/playback of IF frequencies to 700 MHz
- Real-time aggregate recording rates up to 3.2 GB/sec
- Up to four front-panel removable QuickPac SSD drive canisters with eight drives each
- Up to 30 terabytes of storage to NTFS RAID disk array
- SystemFlow® GUI with signal viewer analysis tool
- C-callable API for integration of recorder into application
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping

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**Pentek, Inc.**

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www.pentek.com
SystemFlow Graphical User Interface

SystemFlow Recorder Interface

The RTX 2766 GUI provides the user with a control interface for the recording system. 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 RTX 2766 Configure screens provide a simple and intuitive means for setting up the system parameters. The configuration screen shown here, allows user 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

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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.
**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

- $f_1 = 69$ 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

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

PC Workstation (standard configuration)
Operating System: Windows 7 Professional
Processor: Intel Core i7 processor
Clock Speed: 3.0 GHz or higher
SDRAM: 8 GB

Data Storage
Style: Up to four front-panel removable QuickPac drive canisters; up to eight SSDs contained in each canister
Location: Front panel
Capacity: Up to 30.7 TB
Number of Drives: Up to 32 total
Supported RAID Levels: 0, 1, 5 and 6

Analog Recording Input Channels
Analog Signal Inputs
Connector Type: Rear-panel female SMA connectors
Input Type: Transformer-coupled
Full Scale Input: +20 dBm into 50 ohms
3 dB Passband: 300 kHz to 700 MHz

A/D Converters
Type: Texas Instruments ADS5485
Sample Rate \( f_s \): 10 MHz to 200 MHz
Resolution: 16 bits
A/D Record Bandwidth: \( f_s/2 \) = Nyquist bandwidth
Anti-Aliasing Filters: External, user-supplied

Digital Downconverter
Type: Virtex-6 FPGA, Pentek interpolation IP core
Decimation(D): 2 to 65,536
IF Center Frequency Tuning: DC to \( f_s/32 \), 32 bits
DDC Usable Bandwidth: \( 0.8 f_s/\text{D} \)

Sample and Reference Clocks
External Sample Clock: Sine wave, 0 to +10 dBm, AC-coupled, 50 ohms 100 MHz, common to all D/As
VCXO Sample Clock: Programmable, 1 to 200 MHz, phase-locked to 10MHz reference, common to all D/As
Reference Clock: Sine wave, 0 to +10 dBm, A-C coupled, 50 ohms, 10 MHz, used for phase-locking the VCXO
Connector Type: Rear panel female SMA connector for external sample or reference clock input

External Trigger
Number: One common trigger for all input channels
Input Level: LVTTL with selectable rising or falling edge

Physical and Environmental
Dimensions: 19” W x 22” D x 7” H
Weight: 50 lb, approx.
Operating Temp: –20° to +50° C
Storage Temp: –40° to +85° C
Relative Humidity: 10% to 95%, non-condensing

EMI/EMC: Designed to MIL-STD 461E, CE101, CE102, CS101, CS103
New Jersey 07458

Digital Upconverters
Type: Virtex-6 FPGA, Pentek interpolation IP core
Overall Interpolation: 2 to 65,536 including D/A

Sample and Reference Clocks
External Sample Clock: Sine wave, 0 to +10 dBm, AC-coupled, 50 ohms, 800 MHz or 1.25 GHz, common to all D/As
VCXO Sample Clock: Programmable, up to 1.25 GHz, phase-locked to 10MHz reference, common to all D/As
Reference Clock: Sine wave, 0 to +10 dBm, A-C coupled, 50 ohms, 10 MHz, used for phase-locking the VCXO
Connector Type: Rear panel female SMA connector for external sample or reference clock input

External Trigger
Number: One common trigger for all output channels
Input Level: LVTTL with selectable rising or falling edge
Connector Type: Rear panel female SMA connector

Storage Options
Option -410 3.8 TB SSD storage capacity
Option -415 7.6 TB SSD storage capacity
Option -418 11.5 TB SSD storage capacity
Option -420 15.3 TB SSD storage capacity
Option -425 23.0 TB SSD storage capacity
Option -430 30.7 TB SSD storage capacity

General Options (append to all options)
Option -261 GPS time & position stamping
Option -264 IRIG-B time stamping
Option -680 28 VDC power supply
Option -625 Front-panel removable OS drive

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information
Specifications are subject to change without notice

Model RTX 2766 Order Information and Options

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<td>Option -410 3.8 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -202 2-channel recording</td>
<td>Option -415 7.6 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -203 3-channel recording</td>
<td>Option -418 11.5 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -204 4-channel recording</td>
<td>Option -420 15.3 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -208 8-channel recording</td>
<td>Option -425 23.0 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -221 1-channel playback</td>
<td>Option -430 30.7 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -222 2-channel playback</td>
<td></td>
</tr>
</tbody>
</table>
Model RTX 2786

200 MS/sec RF/IF Extreme 3U VPX Recorder

General Information

The Talon® RTX 2786 is a turnkey, RF/IF signal recorder designed to operate under extreme environmental conditions. Housed in a ½ ATR chassis, the RTX 2786 leverages Pentek’s 3U VPX SDR modules to provide a rugged recording system with up to four 16-bit, 200 MHz A/D converters with built-in digital downconversion capabilities.

Optionally, the RTX 2786 provides one 800 MHz, 16-bit D/A converter with a digital upconverter for signal playback or waveform generation. As shown in the block diagram below, the maximum number of record channels with this option is three.

The RTX2786 can record and play back analog signals with bandwidths ranging from a few kHz up to 80 MHz, either as baseband signals or as IF signals with center frequencies tunable across a 700 MHz range.

The RTX 2786 uses conduction cooling to draw heat from the system components allowing it to operate in reduced air environments. It includes 1.92 TB of solid-state data storage, that allows it to operate with no degradation under conditions of extreme shock and vibration. The system is hermetically sealed and provides five D38999 connectors for power and I/O. Four SMA connectors are used for analog I/O.

The recorder includes a graphical user interface for quick and simple out-of-the-box operation. It also includes a user API (Application Programming Interface) to easily integrate the system into the user’s application.

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

Features

- Multiband recording and playback system
- ½ ATR 3U VPX chassis
- Designed to MIL-STD-704F, 810F and 461F
- Windows® 7 Professional workstation with high performance Intel® Core™ i7 processor
- 200 MHz 16-bit A/Ds for recording up to four channels
- 800 MHz 16-bit D/A for playback of one channel
- 80 MHz recording and playback signal bandwidths
- Capable of record/playback of IF frequencies to 700 MHz
- Real-time sustained recording rates of up to 500 MB/sec
- 1.92 TB of storage to NTFS RAID disk array
- RAID levels of 0, 1, 5 and 6
- 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

SystemFlow Software

The RTX 2786 includes Pentek’s SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system. 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.

The user API allows users to integrate the recorder as a subsystem of a larger system. The API is provided as a C-callable library and allows for the recorder to be controlled over Ethernet, thus providing the ability to remotely control the recorder from a custom interface.

Built on a Windows 7 Professional workstation, the RTX 2786 allows the user to install post-processing and analysis tools on the system itself to operate on the recorded data. The RTX 2786 records data to the Windows’ native NTFS file system, providing immediate access to all recorded data. Data can be off-loaded via dual gigabit Ethernet ports or four USB 2.0 ports.

Four built-in solid-state drives provide reliable, high-speed storage with a total capacity of 1.92 TB.
Model RTX 2786

200 MS/sec RF/IF Extreme 3U VPX Recorder

► SystemFlow Graphical User Interface

![Graphical User Interface](image)

**SystemFlow Recorder Interface**

The RTX 2786 GUI provides the user with a control interface for the recording system. 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, playback 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

![Hardware Configuration](image)

**SystemFlow Hardware Configuration Interface**

The RTX 2786 Configure screens provide a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here, allows user 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.

![Hardware Configuration](image)

**SystemFlow Recorder Interface**

The RTX 2786 GUI provides the user with a control interface for the recording system. 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, playback 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 Signal Viewer

![Signal Viewer](image)

**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.
Model RTX 2786  
200 MS/sec RF/IF Extreme 3U VPX Recorder

**A/D Performance**

**Spurious Free Dynamic Range**

- \( f_{in} = 70 \text{ MHz}, f_s = 200 \text{ MHz}, \text{Internal Clock} \)

**Spurious Pick-up**

- \( f_s = 200 \text{ MHz}, \text{Internal Clock} \)

**Two-Tone SFDR**

- \( f_1 = 30 \text{ MHz}, f_2 = 70 \text{ MHz}, f_s = 200 \text{ MHz} \)

- \( f_1 = 69 \text{ MHz}, f_2 = 71 \text{ MHz}, f_s = 200 \text{ MHz} \)

**Adjacent Channel Crosstalk**

- \( f_{in \text{ Ch2}} = 70 \text{ MHz}, f_s = 200 \text{ MHz}, \text{Ch 1 shown} \)

**D/A Performance**

**Spurious Free Dynamic Range**

- \( f_{out} = 70 \text{ MHz}, f_s = 200 \text{ MHz}, \text{Internal Clock} \)

- \( f_{out} = 120 \text{ MHz}, f_s = 400 \text{ MHz}, \text{External Clock} \)
Model RTX 2786

200 MS/sec RF/IF Extreme 3U VPX Recorder

Specifications

Ruggedized Computer
Operating System: Windows 7 Professional
Processor: Intel Core i7 processor
SDRAM: 4 GB

I/O Connections
Connectors: D38999 circular
Ethernet: Dual 1 GbE
Serial: Dual RS-232/422/485
USB: Four USB 2.0
Video: Hi-Res VGA
Audio: In/Out Stereo
Switch: Reboot

RAID
Storage: 1.92 TB
Storage Type: Internal SSDs

Analog Signal Input
Input Type: Transformer-coupled
Connectors: Bulkhead SMA female
Full Scale Input: +8 dBm into 50 ohms
Transformer Type: Coil Craft WBC4-6TLB
3 dB Passband: 300 kHz to 700 MHz

A/D Converters
Type: Texas Instruments ADS5485
Sample Rate ($f_s$): 10 MHz to 200 MHz
Resolution: 16 bits
A/D Record Bandwidth: $f_s/2 = \text{Nyquist bandwidth}$
Anti-Aliasing Filters: External, user-supplied

Digital Downconverter
Type: Virtex-6 FPGA, Pentek DDC IP Core
Decimation(D): 2 to 65,536
IF Center Frequency Tuning: DC to $f_s/2$, 32 bits
DDC Usable Bandwidth: $0.8f_s/D$

Analog Signal Output
Output Type: Transformer-coupled
Connectors: Bulkhead SMA female
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 FPGA interpolation IP core
Overall Interpolation: 2x to 524,288x in two stages of 2x to 256x and one stage of 2x, 4x, or 8x
Output Bandwidth: 200 MHz maximum
Output IF Center Frequency: Up to 400 MHz
Output Sampling Rate: 800 MHz maximum
Resolution: 16 bits

Sample Clock Selections:
On-board programmable VCXO
External 10 MHz reference for phase-locking VCXO
External direct sample clock

External Clock Input
Connector: Bulkhead female SMA connector
Clock Input Type: 10 MHz reference to lock VCXO or direct input sample clock
Clock Signal: Sine wave, 0 to +10 dBm, AC-coupled, 50 ohms, 10 to 200 MHz

Physical and Environmental
Size: 7.1” W x 16.5” D x 8.1” H
Weight: 40 lb

Requirements:
MIL-STD-810F
EMC: MIL-STD-461F - CE101, CE102, CS101, RE101, RE102, and RS101

Operating Temperature: -40°C to +55°C

Cooling Options: Conduction, to cold plate
Conduction, to forced air side wall heat exchangers, four variable-speed rear fans

Power Requirements: 24 to 32 VDC, per MIL-STD-704F with 50 msec transient holdup

Recording/Playback Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -201</td>
<td>One-channel recording and one-channel playback</td>
</tr>
<tr>
<td>Option -202</td>
<td>Two-channel recording and one-channel playback</td>
</tr>
<tr>
<td>Option -203</td>
<td>Three-channel recording and one-channel playback</td>
</tr>
<tr>
<td>Option -204</td>
<td>Four-channel recording and no playback</td>
</tr>
</tbody>
</table>

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
**Model RTR 2750**

**250 MS/sec RF/IF Rugged Rackmount Recorder**

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**General Information**

The Talon® RTR 2750 is a turnkey recording system that provides phase-coherent recording of 16 independent input channels. Each input channel includes a 250 MHz 16-bit A/D and an FPGA-based digital down-converter with programmable decimations from 2-32768, thereby providing the ability to capture RF signals with bandwidths up to 100 MHz.

With options for AC- or DC-coupled input channels, RF signals up to 700 MHz in frequency can be sampled and streamed to disk in real-time at sustained aggregate recording rates up to 8 GB/sec in a 4U rackmount solution.

Designed to operate under conditions of vibration and extended operating temperatures, the RTR 2750 is ideal for military, airborne and field applications that require a rugged system. The hot-swappable solid state drive storage provides the highest level of performance under harsh conditions and allows for quick removal of mission-critical data.

A/D sampling rates, DDC decimations and trigger settings are among the selectable system parameters, providing a system that is simple to configure and operate.

An optional GPS time and position stamping facility allows the user to time-stamp each acquisition as well as track the location of a system in motion.

**SystemFlow Software**

The Talon RTR 2750 includes Pentek’s SystemFlow® Recording Software. SystemFlow features a Windows-based GUI that provides a simple means to configure and control the system. User configurations can be stored as profiles and later loaded when needed, allowing the user to select preconfigured setups with a single click.

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

For users who wish to create a custom user interface or to integrate the Talon recording system into a larger application, a C-callable API is also provided as part of SystemFlow. Source code and examples are supplied to allow for a quick and simple integration effort.

Built on a Windows 7 Professional workstation, the RTR 2750 allows the user to install post-processing and analysis tools directly onto the recording system. The RTR 2750 records data to the native NTFS file system, providing immediate access to the recorded data; no file conversion is required.

Data can be off-loaded through rear-access gigabit Ethernet ports or USB 3.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive. Dual 10 or 40 gigabit Ethernet cards can be added to the system to provide an even faster offload facility.

**Rugged and Flexible Architecture**

The RTR 2750 is configured in a 4U 19” rack-mountable chassis, with hot-swap data drives, front panel USB ports and I/O connectors on the rear panel. Systems are scalable to accommodate multiple chassis 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.

The RTR 2750 includes as many as 32 hot-swappable SSDs to provide flexible storage capacities up to 61 TB. The 2.5-inch SSDs can be easily removed or exchanged during a mission to retrieve recorded data. Multiple RAID levels, including 0, 1, 5, and 6 provide a choice for the required level of redundancy.

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**Features**

- Sixteen 250 MHz 16-bit A/Ds
- Sixteen independently-configurable DDC decimations ranging from 2 to 32768
- Sixteen independently-configurable DDC tuning frequencies
- Capable of recording RF frequencies to 700 MHz
- Capable of recording signals with bandwidths to 100 MHz
- 8 GB/s real-time aggregate recording rate
- 4U 19-inch rugged rackmount PC server chassis
- Windows® 7 Professional workstation with high-performance Intel® Core™ i7 processor
- Front panel removable-SSD drives
- Up to 61 terabytes of storage to NTFS RAID disk array
- Multiple RAID levels of 0, 1, 5 and 6
- SystemFlow® GUI with signal viewer analysis tool
- Optional GPS time and position stamping

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

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www.pentek.com
SystemFlow Recorder Interface
The RTR 2750 GUI provides the user with a control interface for the recording system. It includes Configuration, Record, 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, 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 2750 Configure screens provide a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here, allows user 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.
Specifications

PC Workstation (standard configuration)
Operating System: Windows 7 Professional
Processor: Intel Core i7 processor
Clock Speed: 3.0 GHz or higher
SDRAM: 16 GB
RAID
  Storage: 15.3, 30.7 or 61.4 TB
  Supported Levels: 0, 1, 5 and 6

Analog Recording Inputs
Analog Signal Inputs
  Connector Type: Rear-panel female MMCX connectors
  Input Type: Transformer-coupled, optional DC-coupled
  Full-Scale Input: +4 dBm into 50 ohms
  3 dB Passband: 300 kHz to 700 MHz
  Anti-Aliasing Filters: External, user-supplied

A/D Converters
  Type: Texas Instruments ADS42LB69
  Sampling Rate ($f_s$): User selectable, 10 MHz to 250 MHz
  Resolution: 16 bits
  SNR: 73.2 dBFS
  SFDR: 87 dBc (HD2 and HD3)
  100 dBc (Non HD2 and HD3)

Digital Downconverters
  Type: Virtex-7 FPGA Pentek DDC IP Core
  Decimation (D): User selectable 2 to 32768
  IF Center Frequency Tuning: User selectable, 32-bit resolution
  DDC Usable Bandwidth: $0.8 \times f_s / D$, factory-supplied DDC coefficient tables

Clock and Trigger
A/D Clock
  Clock Sources: Selectable from onboard programmable VCXO or external clocks

External Clocks
  Connector Type: Rear panel female MMCX connector
  Input Type: Transformer-coupled
  Full-scale Input: 0 to +10 dBm

Trigger
  Connector Type: Rear panel female MMCX connector
  Input Type: LVTTL

Physical and Environmental
Dimensions
  4U Short Chassis: 19” W x 21” D x 7” H

Weight: 50 lb, approx.

Operating Temp: 0° to +50° C

Storage Temp: -40° to +85° C

Relative Humidity: 5 to 95%, non-condensing

Operating Shock: 15 g max. (11 msec, half sine wave)

Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration

Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Model RTR 2750 Ordering Information and Options

<table>
<thead>
<tr>
<th>Storage Options</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -420</td>
<td>15.3 TB SSD total storage, 960 GB per channel</td>
</tr>
<tr>
<td>Option -430</td>
<td>30.7 TB SSD total storage, 1.92 TB per channel</td>
</tr>
<tr>
<td>Option -461</td>
<td>61.4 TB SSD total storage, 3.84 TB per channel</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General Options (append to all options)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -261</td>
<td>GPS time &amp; position stamping</td>
</tr>
<tr>
<td>Option -264</td>
<td>IRIG-B time stamping</td>
</tr>
<tr>
<td>Option -004</td>
<td>D-C coupled inputs</td>
</tr>
</tbody>
</table>

Contact Pentek for compatible Option combinations

Storage Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
### General Information

The Talon® RTS 2707 is a turnkey, multiband recording and playback system for recording and reproducing high-bandwidth signals. The RTS 2707 uses 12-bit, 500 MHz A/D converters and provides aggregate recording rates up to 1.6 GB/sec.

The RTS 2707 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 system 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 RTS 2707 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the recorder.

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 RTS 2706 allows the user to install post processing and analysis tools to operate on the recorded data. The RTS 2706 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via gigabit Ethernet ports or USB 2.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

### Flexible Architecture

The RTS 2707 is configured in a 4U 19” rack-mountable chassis, with hot-swappable data drives, front panel USB ports and I/O connectors on the rear panel. Systems are scalable to accommodate multiple chassis 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. The hot-swappable HDDs provide storage capacities of up to 100 TB in a single 6U chassis.

Contact factory for options, number and type of analog channels, recording rates, and disk capacity.
Model RTS 2707  
500 MS/sec RF/IF Rackmount Recorder

➤ SystemFlow Graphical User Interface

SystemFlow Recorder Interface

The RTS 2707 GUI provides the user with a control interface for the recording system. 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, playback 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 RTS 2707 Configure screens provide a simple and intuitive means for setting up the system parameters. The input channel configuration screen shown here, allows user 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.
Specifications

PC Workstation (standard configuration)
- **Operating System:** Windows 7 Professional
- **Processor:** Intel Core i7 processor
- **Clock Speed:** 3.0 GHz or higher
- **SDRAM:** 8 GB
- **RAID**
  - Storage: 8–100 TB
  - Supported RAID Levels: 0, 1, 5, 6, 10 and 50

Analog Recording Inputs
- **Analog Signal Inputs**
  - Input Type: Transformer-coupled, rear panel female SSMC connectors
  - Transformer Type: Coil Craft WBC4-6TLB
  - Full Scale Input: +5 dBm into 50 ohms
  - 3 dB Passband: 300 kHz to 700 MHz

A/D Converters
- Type: Texas Instruments AD55463 or AD55474 (Option -014)
- Sampling Rate \( f_s \): 20 MHz to 500 MHz or 20 MHz to 400 MHz (Option -014)
- Resolution: 12 bits or 14 bits (Option -014)
- A/D Record Bandwidth: \( f_s/2 \) = Nyquist bandwidth
- Anti-Aliasing Filters: External, user-supplied

Digital Downconverter
- Type: Virtex-6 FPGA, Pentek DDC IP Core
- Decimation(D): 2 to 65,536
- IF Center Frequency Tuning: DC to \( f_s \), 32 bits
- DDC Usable Bandwidth: \( 0.8f_s/D \)

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

Digital Upconverter and D/A
- **Type:** TI DAC6588 and Pentek-installed interpolation IP core
- Interpolation: 2 to 65,536
- **Input Data Rate to DAC6588:** 250 MS/sec max.
- **Output IF:** 250 MHz max.
- **Output Sampling Rate:** 800 MHz max.
- **Resolution:** 16 bits

Bandwidth Range: Matches recording bandwidths

Clock Sources: Selectable from onboard programmable or external clocks

External Clock
- **Type:** Female SSMC connector, sine wave, 0 to +12 dBm, AC-coupled, 50 ohms, accepts 10 to 500 MHz divider input clock or PLL system reference

Internal Clock
- **Type:** Programmable VCXO from 10 to 810 MHz

Physical and Environmental
- **Size:** 19" W x 26" D x 7" H
- **Weight:** 60-85 lb
- **Operating Temp:** +5° to +45° C
- **Storage Temp:** –40° to +85° C
- **Relative Humidity:** 5 to 95%, non-condensing
- **Power Requirements:** 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Model RTS 2707 Ordering Information and Options

### Channel Configurations

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-201</td>
<td>1-channel recording</td>
</tr>
<tr>
<td>-202</td>
<td>2-channel recording</td>
</tr>
<tr>
<td>-204</td>
<td>4-channel recording</td>
</tr>
<tr>
<td>-221</td>
<td>1-channel playback</td>
</tr>
<tr>
<td>-222</td>
<td>2-channel playback</td>
</tr>
</tbody>
</table>

### Storage Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Storage Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>-416</td>
<td>8.0 TB HDD</td>
</tr>
<tr>
<td>-421</td>
<td>16.0 TB HDD</td>
</tr>
<tr>
<td>-423</td>
<td>20.0 TB HDD</td>
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<tr>
<td>-439</td>
<td>30.0 TB HDD</td>
</tr>
<tr>
<td>-450</td>
<td>45.0 TB HDD</td>
</tr>
<tr>
<td>-460</td>
<td>60.0 TB HDD</td>
</tr>
<tr>
<td>-480</td>
<td>100.0 TB HDD</td>
</tr>
</tbody>
</table>

**Note:** Options -450 and -460 require a 5U Chassis; Option -480 requires a 6U chassis

### General Options (append to all options)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-014</td>
<td>400 MHz, 14-bit A/Ds</td>
</tr>
<tr>
<td>-261</td>
<td>GPS time &amp; position</td>
</tr>
<tr>
<td>-264</td>
<td>IRIG-B time stamping</td>
</tr>
</tbody>
</table>

Specifications subject to change without notice
**General Information**

The Talon® RTR 2727 is a turnkey, multi-band recording and playback system that allows the user to record and reproduce high-bandwidth signals with a lightweight, portable and rugged package. The RTR 2727 provides aggregate recording rates of up to 2.4 GB/sec in a two-channel system and is ideal for the user who requires both portability and solid performance in a compact recording system.

The RTR 2727 is supplied in a small foot-print portable package measuring only 16.9” W x 9.5” D x 13.4” H and weighing just 30 pounds. With measurements similar to a small briefcase, this portable workstation includes an Intel® Core™ i7 processor a high-resolution 17” LCD monitor, and a high-performance SATA RAID controller.

At the heart of the RTR 2727 are Pentek Cobalt® Series Virtex-6 software radio boards featuring A/D and D/A converters, DDCs (Digital Downconverters), DUCs (Digital Upconverters), and complementary FPGA IP cores. This architecture allows the system engineer to take full advantage of the latest technology in a turnkey system.

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

**SystemFlow Software**

Included in this system is the Pentek SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system.

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 2727 allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2727 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded through two 1 Gb Ethernet ports, eight USB 2.0 ports or two eSATA ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

**Rugged & Flexible Architecture**

The RTR 2727 is configured in a portable, lightweight chassis with hot-swap SSDs, front panel USB ports and I/O connections on the side panel. It is built on an extremely rugged, 100% aluminum alloy unit, reinforced with shock absorbing rubber corners and an impact-resistant protective glass.

Using shock- and vibration-resistant SSDs, the RTR 2727 is designed to operate reliably as a portable field instrument.

The hot-swappable SSDs provide storage capacities of up to 7.6 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels, including 0,1,5, and 6 provide a choice for the required level of redundancy.

---

Contact the factory for options, for number and type of analog channels, recording rates, and disk capacity.
SystemView Graphical User Interface

The SystemView Graphical User Interface (GUI) provides a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here allows users to set 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 Recorder Interface

The RTR 2727 GUI provides the user with a control interface for the recording system. 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 recorded signals on disk.

SystemFlow Hardware Configuration Interface

The RTR 2727’s Configure screens provide a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here allows users to set 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.
Specifications

PC Workstation (standard configuration)
Operating System: 64-bit Windows 7 Professional
Processor: Intel Core i7 processor
Clock Speed: 2.0 GHz or higher
Operating System Drive: 128 GB SSD
SDRAM: 8 GB
Monitor: Built-in 17" high-resolution LCD
1440 x 900 pixels, 200 nits
RAID
Total Storage: 1.9, 3.8 or 7.6 TB
Supported RAID Levels: 0, 1, 5, and 6
Drive Bays: Hot-swap, removable, rear panel
USB 2.0 Ports: Eight on left side, two on front panel
USB 3.0 Ports: Two on left side
1 Gb Ethernet Port: Two on left side
eSATA 3 Ports: Two on left side
Aux Video Output: 15-pin VGA on left side

Analog Recording Inputs
Analog Signal Inputs
Quantity: 1 or 2
Input Type: Transformer-coupled, female SSMC connectors
Transformer Type: Coil Craft WBC4-6TLB
Full Scale Input: +5 dBm into 50 ohms
3 dB Passband: 300 kHz to 700 MHz
A/D Converters
Type: Texas Instruments AD5463 or AD5474 (Option -014)
Sampling Rate (f_s): 20 MHz to 500 MHz or 20 MHz to 400 MHz (Option -014)
Resolution: 12 bits or 14 bits (Option -014)
A/D Record Bandwidth: f_s/2 = Nyquist bandwidth
Anti-Aliasing Filters: External, user-supplied
Digital Downconverter
Type: Virtex-6 FPGA Pentek DDC IP Core
Decimation (D): 2 to 65,536
DDC Usable Bandwidth: 0.8*f_s/D

Analog Playback Output
Analog Signal Outputs
Quantity: 1
Output Type: Transformer-coupled, female SSMC connectors
Full Scale Output: +4 dBm into 50 ohms
3 dB Passband: 300 kHz to 700 MHz

Digital Upconverter and D/A
Output Signal: Analog, real or quadrature
Type: TI DAC5688 and Pentek-installed interpolation IP core
Interpolation: 2 to 65,536
Input Data Rate to DAC5688: 250 MS/sec max.
Output Sampling Rate: 800 MHz, max.
Output IF: 250 MHz, max.
D/A Resolution: 16 bits
Bandwidth Range: Matches recording bandwidths

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

External Clock
Type: Female SSMC connector, sine wave, 0 to +12 dBm, AC-coupled, 50 ohms, accepts 10 to 500 MHz divider input clock or PLL system reference

Internal Clock
Type: Programmable VCXO from 10 to 810 MHz

Physical and Environmental
Dimensions: 16.9" W x 9.5" D x 13.4" H
Weight: 30 lb, approximately
Power: 90 to 265 VAC, 50 - 60 Hz
Operating Temp: 5° to +45° C
Storage Temp: –40° to +85° C
Relative Humidity: 5 to 95%, non-condensing
Operating Shock: 15 g max. (11 msec, half sine wave)
Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Channel Configurations

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -201</td>
<td>1-channel recording</td>
</tr>
<tr>
<td>Option -202</td>
<td>2-channel recording</td>
</tr>
<tr>
<td>Option -204</td>
<td>4-channel recording</td>
</tr>
<tr>
<td>Option -221</td>
<td>1-channel playback</td>
</tr>
<tr>
<td>Option -222</td>
<td>2-channel playback</td>
</tr>
</tbody>
</table>

Storage Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Storage Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -405</td>
<td>1.9 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -410</td>
<td>3.8 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -415</td>
<td>7.6 TB SSD storage capacity</td>
</tr>
</tbody>
</table>

General Options (append to all options)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -014</td>
<td>400 MHz, 14-bit A/D</td>
</tr>
<tr>
<td>Option -261</td>
<td>GPS time &amp; position stamping</td>
</tr>
<tr>
<td>Option -264</td>
<td>IRIG-B time stamping</td>
</tr>
</tbody>
</table>

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice
General Information

The Talon® RTR 2727A is a turnkey, multi-band recording and playback system that allows the user to record and reproduce high-bandwidth signals with a lightweight, portable and rugged package. The RTR 2727A provides aggregate recording rates of up to 4.0 GB/sec in a two-channel system and is ideal for the user who requires both portability and solid performance in a compact recording system.

The RTR 2727A is supplied in a small footprint portable package measuring only 16.0” W x 6.9” D x 13.0” H and weighing just less than 30 pounds. With measurements similar to a small briefcase, this portable workstation includes an Intel Core i7 processor a high-resolution 17” LCD monitor, and up to 61.4 TB of SSD storage.

At the heart of the RTR 2727A are Pentek Cobalt® Series Virtex-6 software radio boards featuring A/D and D/A converters, DDCs (Digital Downconverters), DUCs (Digital Upconverters), and complementary FPGA IP cores. This architecture allows the system engineer to take full advantage of the latest technology in a turnkey system.

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

SystemFlow Software

Included in this system is the Pentek SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system. It also includes a C-callable API that allows users to easily integrate the Talon recorder into a larger system.

The GUI provides a very simple interface for system setup. This includes pull-down selections for a handful of parameters, a checkbox to enable/disable the DDC and a data-entry field for the sample rate. Once set up, the GUI provides the ability to save profiles that can be reloaded at the click of a button.

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 spectrum analyzer.

Built on a Windows 7 Professional workstation, the RTR 2727A allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2727A records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via gigabit Ethernet, USB 2.0 and USB 3.0 ports. Additionally, data can be copied to optical disk, using the 8X double-layer DVD+R/RW drive.

Option -625 replaces the DVD±R/RW drive with a removable operating system drive; an external DVD drive can be used.

Rugged Chassis with SSD Storage

The RTR 2727A is configured with hot-swappable SSDs, front panel USB ports, and I/O connectors on the side panel. It is built in an extremely rugged steel and aluminum chassis and is tested for shock and vibration. The SSDs provide storage capacities of up to 61.4 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels, including 0, 1, 5, and 6, provide a choice for the required level of redundancy.
Model RTR 2727A  
500 MS/sec RF/IF Rugged Portable Recorder

➤ SystemView Graphical User Interface

SystemFlow Recorder Interface
The RTR 2727A GUI provides the user with a control interface for the recording system. 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, playback 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 recorded signals on disk.

SystemFlow Hardware Configuration Interface
The RTR 2727A’s Configure screens provide a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here, allows user 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. ➤
Specifications

PC Workstation (standard configuration)
- Operating System: 64-bit Windows workstation
- Processor: Intel Core i7 processor
- Clock Speed: 3.0 GHz or higher
- Operating System Drive: 128 GB SSD
- SDRAM: 8 GB
- Monitor: Built-in 17.3” high-resolution LCD, 1920 x 1080 pixels, 16:9 aspect ratio, anti-glare surface
  - Brightness: 300 cd/m²; Contrast ratio: 400:1 typical

RAID
- Total Storage: 3.8 – 60.4 TB
- Supported RAID Levels: 0, 5 and 6
- Drive Bays: Hot-swap, removable, side panel
- USB 2.0 Ports: Four on left side, two on front panel
- USB 3.0 Ports: Two on left side
- 1 Gb Ethernet Ports: Two on left side
- Aux Video Output: 15-pin VGA on left side

Analog Signal Inputs
- Connectors: 1 or 2, transformer-coupled, female SSMC
- Transformer Type: Coil Craft WBC4-6TLB
- Full Scale Input: ±5 dBm into 50 ohms
- 3 dB Passband: 300 kHz to 700 MHz

A/D Converters
- Type: Texas Instruments ADS5463 or ADS5474 (Option -014)
- Sampling Rate (f_s): 20 MHz to 500 MHz or 20 MHz to 400 MHz (Option -014)
- Resolution: 12 bits or 14 bits (Option -014)
- A/D Record Bandwidth: f_s/2 = Nyquist bandwidth
- Anti-Aliasing Filters: External, user-supplied

Digital Downconverter
- Type: Virtex-6 FPGA Pentek DDC IP Core
- Decimation (D): 2 to 65,536
- DDC Usable Bandwidth: 0.8*f_s/D

Analog Signal Output
- Connector: Transformer-coupled, female SSMC
- Full Scale Output: +4 dBm into 50 ohms
- 3 dB Passband: 300 kHz to 700 MHz

Digital Upconverter and D/A
- Output Signal: Analog, real or quadrature
- Type: TI DAC5688 and Pentek-installed interpolation IP core
- Interpolation: 2 to 65,536
- Input Data Rate to DAC5688: 250 MS/sec max.
- Output Sampling Rate: 800 MHz, max.
- Output IF: 250 MHz, max.
- D/A Resolution: 16 bits
- Bandwidth Range: Matches recording bandwidths

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

External Clock
- Type: Female SSMC connector, sine wave, 0 to +12 dBm, AC-coupled, 50 ohms, accepts 10 to 500 MHz divider input clock or PLL system reference

Internal Clock
- Type: Programmable VCXO from 10 to 810 MHz

Optional DC Power supply
- Voltage: 10 to 36 VDC
- Input Current: 42 to 26 A (39 A at 24 VDC)
- Input Current: 100 A at 24 VDC
- Temperature Range: Oper.: 0° to 50° C, Store: -0° to 80° C
- Efficiency: >80% typical at 24 V full load
- Power Good Signal: On delay 100 to 500 msec
- OverPower Protection: 110% to 160%
- Remote Control: On/Off

Safety: Meets UL, TUV, CB specifications

Physical and Environmental
- Size: 16.0” W x 6.9” D x 13.0” H
- Weight: 30 lb max.
- Operating Temp: 0° to +50° C
- Storage Temp: -40° to +85° C
- Relative Humidity: 5 to 95%, non-condensing
- Operating Shock: 30 g max. (11 msec, half-sine wave)
- Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
- Non-operating Vibration: 5 to 500 Hz: 2.06 g RMS
- Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Specifications subject to change without notice
Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information
General Information

The Talon® RTR 2747 is a turnkey, multi-band record and playback system that is built to operate under harsh conditions. Designed to withstand high vibration and operating temperatures, the RTR 2747 is intended for military, airborne and UAV applications requiring a rugged system. With scalable A/Ds, D/As and SSD (Solid-State Drive) storage, the RTR 2747 can be configured to stream data to and from disk at aggregate rates as high as 4.0 GB/sec.

The RTR 2747 uses Pentek’s high-powered Virtex-6-based Cobalt® boards, that provide flexibility in channel count with optional digital downconversion and upconversion capabilities.

A/D sampling rates, DDC decimations and bandwidths, D/A sampling rates, and DUC interpolations are among the selectable system parameters, that provide a fully programmable system 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 2747 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system. 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 2747 allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2747 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded through two rear-access gigabit Ethernet ports or two USB 2.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

Rugged and Flexible Architecture

Because SSDs operate reliably under conditions of shock and vibration, the RTR 2747 performs well in ground, shipborne and airborne environments. The hot-swap- pable SSDs provide storage capacity of up to 46 TB. The drives can be easily removed or exchanged during or after a mission to retrieve recorded data.

The RTR 2747 is configured in a 4U 19” rack-mountable chassis, with hot-swappable data drives, front panel USB ports and I/O connectors on the rear panel.

Systems are scalable to accommodate multiple chassis 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.

Contact factory for options, number and type of analog channels, recording rates, and disk capacity.
Model RTR 2747

500 MS/sec RF/IF Rugged Rackmount Recorder

➤ SystemFlow Graphical User Interface

The SystemFlow Graphical User Interface is a powerful tool for managing and visualizing RF/IF signals. It includes features such as a SystemFlow Signal Viewer, which provides a virtual oscilloscope and spectrum analyzer for monitoring signals in both the time and frequency domains. The SystemFlow Recorder Interface allows for easy configuration, recording, playback, and monitoring of signals. 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, the SystemFlow Signal Viewer can often eliminate the need for a separate oscilloscope or spectrum analyzer in the field.

SystemFlow Recorder Interface

The RTR 2747 GUI provides a control interface for the recording system. 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 2747 Configure screens provide a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here allows user 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.
# Specifications

**PC Workstation (standard configuration)**
- **Operating System:** 64-bit Windows 7 Professional
- **Processor:** Intel Core i7 processor
- **Clock Speed:** 2.0 GHz or higher
- **SDRAM:** 8 GB
- **RAID**
  - Storage: 3.8, 7.6, 15.3, 30.7 or 46 TB
  - Supported Levels: 0, 1, 5, 6, 10 and 50

**Analog Recording Inputs**
- **Analog Signal Inputs**
  - **Input Type:** Transformer-coupled, front panel female SSMC connectors
  - **Transformer Type:** Coil Craft WBC4-6TLB
  - **Full Scale Input:** +5 dBm into 50 ohms
  - **3 dB Passband:** 300 kHz to 700 MHz
- **A/D Converters**
  - **Type:** Texas Instruments ADS5463 or ADS5474 (Option -014)
  - **Sampling Rate ($f_s$):** 20 MHz to 500 MHz or 20 MHz to 400 MHz (Option -014)
  - **Resolution:** 12 bits or 14 bits (Option -014)
  - **A/D Record Bandwidth:** $f_s/2$ = Nyquist bandwidth
- **Anti-Aliasing Filters:** External, user-supplied

**Digital Downconverter**
- **Type:** Virtex-6 FPGA, Pentek DDC IP Core
- **Decimation(D):** 2 to 65,536
- **IF Center Frequency Tuning:** DC to $f_d$, 32 bits
- **DDC Usable Bandwidth:** $0.8f_s/D$

**Analog Playback 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/A**
- **Type:** TI DAC5688 and Pentek-installed interpolation IP core
- **Interpolation:** 2 to 65,536
- **Input Data Rate to DAC5688:** 250 MS/sec max.
- **Output IF:** 250 MHz max.
- **Output Signal:** Analog, real or quadrature
- **Output Sampling Rate:** 800 MHz max.
- **Resolution:** 16 bits

**Bandwidth Range:** Matches recording bandwidth

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

**External Clock**
- **Type:** Female SSMC connector, sine wave, 0 to +12 dBm, AC-coupled, 50 ohms, accepts 10 to 500 MHz divider input clock or PLL system reference

**Internal Clock**
- **Type:** Programmable VCXO from 10 to 810 MHz

**Physical and Environmental**

**Dimensions**
- **4U Short Chassis:** 19” W x 21” D x 7” H
- **Weight:** 50 lb, approx.
- **Operating Temp:** 0° to +50° C
- **Storage Temp:** −40° to +85° C
- **Relative Humidity:** 5 to 95%, non-condensing
- **Operating Shock:** 15 g max. (11 msec, half sine wave)
- **Operating Vibration:** 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
- **Power Requirements:** 100 to 240 VAC, 50 to 60 Hz, 500 W max.

## Model RTR 2747 Ordering Information and Options

### Channel Configurations

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-201</td>
<td>1-channel recording</td>
</tr>
<tr>
<td>-202</td>
<td>2-channel recording</td>
</tr>
<tr>
<td>-204</td>
<td>4-channel recording</td>
</tr>
<tr>
<td>-208</td>
<td>8-channel recording</td>
</tr>
<tr>
<td>-221</td>
<td>1-channel playback</td>
</tr>
<tr>
<td>-222</td>
<td>2-channel playback</td>
</tr>
</tbody>
</table>

### Storage Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-410</td>
<td>3.8 TB SSD storage capacity</td>
</tr>
<tr>
<td>-415</td>
<td>7.6 TB SSD storage capacity</td>
</tr>
<tr>
<td>-420</td>
<td>15.3 TB SSD storage capacity</td>
</tr>
<tr>
<td>-430</td>
<td>30.7 TB SSD storage capacity</td>
</tr>
<tr>
<td>-440</td>
<td>46.0 TB SSD storage capacity</td>
</tr>
</tbody>
</table>

**Note:** Options -430 and -440 require a 26-inch deep chassis

### General Options (append to all options)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-014</td>
<td>400 MHz, 14-bit A/Ds</td>
</tr>
<tr>
<td>-261</td>
<td>GPS time &amp; position stamping</td>
</tr>
<tr>
<td>-264</td>
<td>IRIG-B time stamping</td>
</tr>
</tbody>
</table>

**Contact Pentek for compatible Option combinations**

Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice
General Information
The Talon® RTX 2767 is a turnkey, multi-band record and playback system that is built to operate under harsh conditions. Designed to withstand high vibration and operating temperatures, the RTX 2767 is intended for military, airborne and UAV applications requiring a rugged system. With scalable A/Ds, D/A and SSD (Solid-State Drive) storage, the RTX 2767 can be configured to stream data to and from disk at rates as high as 4.0 GB/sec.

The RTX 2767 uses Pentek’s high-powered Virtex-6-based Cobalt® boards 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 system 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 RTX 2767 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the recorder.

Custom configurations can be stored as profiles and later loaded when needed.

Features
- Designed to meet MIL-STD-810 shock and vibration
- Designed to meet EMC/EMI per MIL-STD-461 EMC
- 4U 19-inch rugged rackmount PC server chassis, 22” deep
- Windows® 7 Professional workstation with high-performance Intel® Core™ i7 processor
- 500 MHz 12-bit A/Ds or 400 MHz 14-bit A/Ds
- 800 MHz 16-bit D/A
- Real-time aggregate recording rates of up to 4.0 GB/sec
- 200 MHz max. record and playback signal bandwidths
- Capable of record/playback of IF frequencies to 700 MHz
- Up to four front-panel removable QuickPac SSD drive canisters with eight drives each
- Up to 30 terabytes of storage to NTFS RAID disk array
- SystemFlow® GUI with signal viewer analysis tool
- C-callable API for integration of recorder into application
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping

Rugged Mil-Spec Chassis
The Talon RTX 2767 uses a shock- and vibration-isolated inner chassis and solid-state drives to assure reliability under harsh conditions. The chassis uses an in-line EMI filter along with rear-panel MIL-style connectors to meet MIL-STD-461 emissions specifications.

Up to four front-panel removable QuickPac drive canisters are provided, each containing up to eight SSDs. Each drive canister can hold up to 7.6 TB of data storage and allows for quick and easy removal of mission-critical data.

Forced-air cooling draws air from the front of the chassis and pushes it out the back via exhaust fans. A hinged front door with a serviceable air filter provides protection against dust and sand.

MODEL RTX 2767
SystemFlow Recorder Interface

The RTX 2767 GUI provides the user with a control interface for the recording system. 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 RTS 2767 Configure screens provide a simple and intuitive means for setting up the system parameters. The configuration screen shown here, allows user 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.
Specifications

**Model RTX 2767 500 MS/sec RF/IF Extreme Rackmount Recorder**

**Specifications**

- **PC Workstation (standard configuration)**
- **Operating System:** Windows 7 Professional
- **Processor:** Intel Core i7 processor
- **Clock Speed:** 3.0 GHz or higher
- **SDRAM:** 8 GB

**Data Storage**

- **Style:** Up to four front-panel removable QuickPac drive canisters; up to eight SSDs contained in each canister
- **Location:** Front panel
- **Capacity:** Up to 30 TB
- **Number of Drives:** Up to 32 total
- **Supported RAID Levels:** 0, 1, 5 and 6

**Analog Recording Inputs**

- **Connector Type:** Rear-panel female SMA connectors
- **Input Type:** Transformer-coupled
- **Full Scale Input:** +5 dBm into 50 ohms
- **3 dB Passband:** 300 kHz to 700 MHz

**A/D Converters**

- **Type:** Texas Instruments ADS5463 or ADS5474 (Option -014)
- **Sample Rate:** f_s/2 MHz to 500 MHz or 20 MHz to 400 MHz (Option -014)
- **Resolution:** 12 bits or 14 bits (Option -014)
- **A/D Record Bandwidth:** f_s/2 = Nyquist bandwidth
- **Anti-Aliasing Filters:** External, user-supplied

**Digital Downconverter**

- **Type:** Virtex-6 FPGA, Pentek interpolation IP core
- **Decimation(D):** 2 to 65,536
- **IF Center Frequency Tuning:** DC to f_s/2, 32 bits
- **DDC Usable Bandwidth:** 0.8*f_s/D

**Sample and Reference Clocks**

- **External Sample Clock:** Sine wave, 0 to +10 dBm, AC-coupled, 50 ohms 20 to 500 MHz, common to all A/Ds
- **VCXO Sample Clock:** Programmable, 20 to 500 MHz, phase-locked to 10 MHz frequency, common to all A/Ds
- **Reference Clock:** Sine wave, 0 to +10 dBm, A-C coupled, 50 ohms, 10 MHz, used for phase-locking the VCXO
- **Connector Type:** Rear panel female SMA connector for external sample or reference clock input

**External Trigger**

- **Number:** One common trigger for all input channels

**Physical and Environmental**

- **Dimensions:** 19” W x 22” D x 7” H
- **Weight:** 50 lb, approx.
- **Operating Temp.:** -20° to +50° C
- **Storage Temp.:** -40° to +85° C
- **Relative Humidity:** 10% to 95%, non-condensing
- **Operating Shock:** Designed to MIL-STD 810F, method 514.5, procedures I and VI
- **Operating Vibration:** Designed to MIL-STD 810F, method 514.5, procedure I
- **EMI/EMC:** Designed to MIL-STD 461E, CE101, CE102, CS101, CS113, RE101, RE102, RS101, RS103
- **Input Power:** 85 to 264 VAC, 47 – 400 Hz, 600 W max.

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**Model RTX 2767 Order Information and Options**

<table>
<thead>
<tr>
<th>Channel Configurations</th>
<th>Max. Data Rate</th>
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<td>Option -204</td>
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<table>
<thead>
<tr>
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<td>Option -425</td>
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<tr>
<td>Option -430</td>
<td>30.7 TB SSD storage</td>
</tr>
</tbody>
</table>

**General Options (append to all options)**

- **Option -014:** 400 MHz 14-bit A/Ds
- **Option -261:** GPS time & position stamping
- **Option -264:** IRIG-B time stamping
- **Option -680:** 28 VDC power supply
- **Option -625:** Front-panel removable OS drive

Contact Pentek for compatible Option combinations

Storage and Channel-count Options may change, contact Pentek for the latest information

 Specifications are subject to change without notice
Model RTR 2728

1 GS/sec RF/IF Rugged Portable Recorder

Features
- Portable system measuring 16.9" W x 9.5" D x 13.4" H
- Lightweight: approximately 30 pounds
- Rugged aluminum alloy chassis
- Shock- and vibration-resistant SSDs perform well in vehicles, ships and aircraft
- 1 GHz 12-bit A/D
- 1 GHz 16-bit D/A
- 400 MHz recording and playback signal bandwidths
- Recording of IF signals up to 2 GHz
- Real-time aggregate recording rates up to 2.4 GB/sec
- Up to 7.6 TB storage with hot-swappable SSD drives
- NTFS file format
- Complete high-performance Windows® workstation with Intel® Core™ i7 processor
- SystemFlow® GUI with Signal Viewer analysis tool
- File headers include time stamping and recording parameters
- Ideal for communications, radar, wireless, SIGINT, telecom and satcom
- Optional GPS time and position stamping

General Information
The Talon® RTR 2728 is a turnkey, multi-band recording and playback system that allows the user to record and reproduce high-bandwidth signals with a lightweight, portable and rugged package. The RTR 2728 provides recording rates of up to 2.4 GB/sec and is ideal for the user who requires portability and solid performance in a compact recording system.

The RTR 2728 is supplied in a small footprint portable package measuring only 16.9" W x 9.5" D x 13.4" H and weighing just 30 pounds. With measurements similar to a small briefcase, this portable workstation includes an Intel Core i7 processor a high-resolution 17" LCD monitor, and a high-performance SATA RAID controller.

At the heart of the RTR 2728 are Pentek Cobalt® Series Virtex-6 software radio boards featuring A/D and D/A converters. This architecture allows the system engineer to take full advantage of the latest technology in a turnkey system.

GPS time and position stamping is optionally available.

SystemFlow Software
Included in this system is the Pentek SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system.

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 2728 allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2728 records data to the native NTFS file format, providing immediate access to the recorded data.

Data can be off-loaded through two 1 Gb Ethernet ports, eight USB 2.0 ports or two eSATA ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD+R/RW drive.

Rugged & Flexible Architecture
The RTR 2728 is configured in a portable, lightweight chassis with hot-swap SSDs, front panel USB ports and I/O connections on the side panel. It is built on an extremely rugged, 100% aluminum alloy unit, reinforced with shock absorbing rubber corners and an impact-resistant protective glass. Using shock- and vibration-resistant SSDs, the RTR 2728 is designed to operate reliably as a portable field instrument.

The hot-swappable SSDs provide storage capacities of up to 7.6 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data.

Multiple RAID levels including 0, 1, 5, and 6 provide a choice for the required level of redundancy.

Contact the factory for options, for number and type of analog channels, recording rates, and disk capacity.
SystemView Graphical User Interface

The SystemView Graphical User Interface (GUI) provides a comprehensive monitoring and analysis solution. It includes multiple views for signal monitoring:

- The **Signal Viewer** shows real-time and recorded signals, allowing users to inspect and analyze data in real-time.
- The **Frequency Magnitude (RMS)** view displays frequency content, aiding in the identification of harmonics and spectral features.

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.

SystemFlow Recorder Interface

The RTR 2728 GUI provides user-friendly control for the recording system. It includes Configuration, Record, Playback and Status screens, each with intuitive controls and indicators. Users can easily navigate through screens to set configuration parameters, control recording, and monitor a recording. The Signal Viewer, integrated into the recording GUI, allows real-time monitoring of signals.

Advanced signal analysis capabilities include automatic calculators for signal amplitude and frequency, second and third harmonic components, THD and SINAD. 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.

SystemFlow Hardware Configuration Interface

The RTR 2728’s Configure screens provide a simple and intuitive means for setting system parameters. The ADC configuration screen shown here allows for setting gate/trigger mode, gate/trigger polarity, and sync source. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

Advanced signal analysis capabilities include automatic calculators for signal amplitude and frequency, second and third harmonic components, THD and SINAD. 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.
Model RTR 2728

Specifications

PC Workstation (standard configuration)
Operating System: 64-bit Windows 7 Professional
Processor: Intel Core i7 processor
Clock Speed: 3.0 GHz or higher
Operating System Drive: 128 GB SSD
SDRAM: 8 GB
Monitor: Built-in 17” high-resolution LCD 1440 x 900 pixels, 200 nits

RAID
Total Storage: 1.9, 3.8 or 7.6 TB
Supported RAID Levels: 0, 1, 5, and 6
Drive Bays: Hot-swap, removable, rear panel
USB 2.0 Ports: Eight on left side, two on front panel
USB 3.0 Ports: Two on left side
1 Gb Ethernet Port: Two on left side
eSATA 3 Ports: Two on left side
Aux Video Output: 15-pin VGA on left side

Analog Recording Inputs
Analog Signal Inputs
Quantity: 1
Input Type: Transformer-coupled, female SSMC connector
Transformer Type: Macom ETC1-1-13TR
Full Scale Input: +10 dBm into 50 ohms
3 dB Passband: 5 MHz to 2 GHz

A/D Converter
Type: Texas Instruments ADS5400
Sampling Rate ($f_s$): 100 MHz to 1 GHz
Resolution: 12 bits
A/D Record Bandwidth: $f_s/2$ = Nyquist bandwidth
Anti-Aliasing Filters: External, user-supplied

Analog Playback Output
Analog Signal Outputs
Quantity: 1
Output Type: Transformer-coupled, female SSMC connector
Full Scale Output: +4 dBm into 50 ohms
3 dB Passband: 5 kHz to 700 MHz

D/A Converter
Type: TI DAC5681Z
Interpolation: 1x, 2x or 4x
Input Data Rate to DAC5681Z: 500 MS/sec max.
Output Sampling Rate: 1 GHz, max.
Output IF: 700 MHz, max.
D/A Resolution: 16 bits

Clock Sources: Selectable from onboard programmable VCXO or external clock

External Clock
Type: Female SSMC connector, sine wave, 0 to +10 dBm, AC-coupled, 50 ohms, accepts 100 MHz to 1 GHz input clock or 10 MHz system reference

Physical and Environmental
Dimensions: 16.9” W x 9.5” D x 13.4” H
Weight: 30 lb, approximately
Power: 90 to 265 VAC, 50 - 60 Hz
Operating Temp: 5° to +45° C
Storage Temp: –40° to +85° C
Relative Humidity: 5 to 95%, non-condensing

Operating Shock: 15 g max. (11 msec, half sine wave)
Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Model RTR 2728 Ordering Information and Options

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</thead>
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<td>Option -405</td>
</tr>
<tr>
<td>1-channel recording</td>
<td>1.9 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -202</td>
<td>Option -410</td>
</tr>
<tr>
<td>2-channel recording</td>
<td>3.8 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -221</td>
<td>Option -415</td>
</tr>
<tr>
<td>1-channel playback</td>
<td>7.6 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -222</td>
<td></td>
</tr>
<tr>
<td>2-channel playback</td>
<td></td>
</tr>
</tbody>
</table>

General Options (append to all options)
Option -261: GPS time & position stamping
Option -264: IRIG-B time stamping

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice
Features

- Designed to operate under conditions of shock and vibration
- Portable system measuring 16.0" W x 6.9" D x 13.0" H
- Lightweight, just less than 30 pounds
- Shock- and vibration-resistant SSDs perform well in vehicles, ships and aircraft
- 1 GHz 12-bit A/D
- 1 GHz 16-bit D/A
- 400 MHz recording and playback signal bandwidths
- Recording and playback of IF signals up to 2 GHz
- Real-time aggregate recording rates up to 4.0 GB/sec
- Windows® workstation with high performance Intel® Core™ i7 processor
- Up to 61 terabytes of SSD storage to NTFS RAID solid state disk array
- SystemFlow® GUI with Signal Viewer analysis tool
- Optional file headers include time stamping and recording parameters
- Optional GPS time and position stamping
- Optional 10–36 VDC power supply

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

General Information

The Talon® RTR 2728A is a turnkey, multi-band recording and playback system that allows the user to record and reproduce high-bandwidth signals with a lightweight, portable and rugged package. The RTR 2728A provides recording rates of up to 4.0 GB/sec and is ideal for the user who requires portability and solid performance in a compact recording system.

The RTR 2728A is supplied in a small-footprint portable package measuring only 16.0" W x 6.9" D x 13.0" H and weighing just less than 30 pounds. With measurements similar to a small briefcase, this portable workstation includes an Intel Core i7 processor a high-resolution 17" LCD monitor, and up to 61.4 TB of SSD storage.

At the heart of the RTR 2728A are Pentek Cobalt® Series Virtex-6 software radio boards featuring A/D and D/A converters. This architecture allows the system engineer to take full advantage of the latest technology in a turnkey system.

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

SystemFlow Software

Included in this system is the Pentek SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system. It also includes a C-callable API that allows users to easily integrate the Talon recorder into a larger system.

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 2728A allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2728A records data to the native NTFS file format, providing immediate access to the recorded data.

Data can be off-loaded via gigabit Ethernet, USB 2.0 and USB 3.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

Option -625 replaces the DVD±R/RW drive with a removable operating system drive; an external DVD drive can be used.

Rugged Chassis with SSD Storage

The RTR 2728A is configured with hot-swappable SSDs, front panel USB ports, and I/O connectors on the side panel. It is built in an extremely rugged steel and aluminum chassis and is tested for shock and vibration. The SSDs provide storage capacities of up to 61.4 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data.

Multiple RAID levels, including 0, 5, and 6, provide a choice for the required level of redundancy.

Contact the factory for options, for number and type of analog channels, recording rates, and disk capacity.
SystemView Graphical User Interface

The SystemView Graphical User Interface (GUI) provides a user-friendly interface for system configuration, recording, and playback. It includes a signal viewer that can display signals in both the time and frequency domains. The signal viewer 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. This viewer can also be used to inspect and analyze the recorded files after the recording is complete.

SystemFlow Recorder Interface

The SystemFlow Recorder Interface allows the user to control the recording system. It includes screens for configuration, recording, playback, and status monitoring. Each screen is equipped with intuitive controls and indicators, making it easy for users to set up and monitor a recording. The signal viewer integrated into the recording GUI allows the user to monitor real-time signals or recorded signals on disk.

SystemFlow Hardware Configuration Interface

The SystemFlow Hardware Configuration Interface provides a simple and intuitive means for setting up the system parameters. The ADC configuration screen shown here allows user entries for gate/trigger mode, gate/trigger polarity, and sync source. 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. This 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.
Specifications

PC Workstation (standard configuration)
- Operating System: 64-bit Windows workstation
- Processor: Intel Core i7 processor
- Clock Speed: 3.0 GHz or higher
- Operating System Drive: 128 GB SSD
- SDRAM: 8 GB
- Monitor: Built-in 17.3” high-resolution LCD, 1920 x 1080 pixels, 16:9 aspect ratio, anti-glare surface
- Brightness: 300 cd/m²; Contrast ratio: 400:1 typical
- RAID
  - Total Storage: 3.8 – 61.4 TB
  - Supported RAID Levels: 0, 5 and 6
- USB 2.0 Ports: Four on left side, two on front panel
- USB 3.0 Ports: Two on left side
- 1 Gb Ethernet Ports: Two on left side
- Aux Video Output: 15-pin VGA on left side

Analog Signal Input
- Connector: Transformer-coupled, female SSMC
- Transformer Type: Macom ETC1-1-13TR
- Full Scale Input: +10 dBm into 50 ohms
- 3 dB Passband: 5 MHz to 2 GHz

A/D Converter
- Type: Texas Instruments ADS5400
- Sampling Rate (fs): 100 MHz to 1 GHz
- Resolution: 12 bits
- A/D Record Bandwidth: f/fs = Nyquist bandwidth
- Anti-Aliasing Filters: External, user-supplied

Analog Signal Output
- Connector: Transformer-coupled, female SSMC
- Full Scale Output: +4 dBm into 50 ohms
- 3 dB Passband: 300 kHz to 700 MHz

D/A Converter
- Type: TI DAC5681Z
- Interpolation: 1x, 2x or 4x
- Input Data Rate to DAC5681Z: 500 MS/sec max.
- Output Sampling Rate: 1 GHz, max.
- Output IF: 700 MHz, max.
- D/A Resolution: 16 bits
- Clock Sources: Selectable from onboard programmable VCXO or external clock

External Clock
- Type: Female SSMC connector, sine wave, 0 to +10 dBm, AC-coupled, 50 ohms, accepts 100 MHz to 1 GHz input clock or 10 MHz system reference

Internal Clock
- Type: Programmable VCXO
- VCXO Frequency Ranges: 100 to 945 MHz, 970 MHz to 1 GHz

Optional DC Power supply
- Voltage: 10 to 36 VDC
- Input Current: 42 to 26 A (39 A at 24 VDC)
- Inrush Current: 100 A at 24 VDC
- Temperature Range: Oper.: 0° to 50° C, Store: -0° to 80° C
- Efficiency: >80% typical at 24 V full load
- Power Good Signal: On delay 100 to 500 msec
- OverPower Protection: 110% to 160%
- Remote Control: On/Off
- Safety: Meets UL, TUV, CB specifications

Physical and Environmental
- Size: 16.0” W x 6.9” D x 13.0” H
- Weight: 30 lb max.
- Operating Temp: 0° to +50° C
- Storage Temp: -40° to +85° C
- Relative Humidity: 5 to 95%, non-condensing
- Operating Shock: 30 g max. (11 msec, half-sine wave)
- Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
- Non-operating Vibration: 5 to 500 Hz: 2.06 g RMS
- Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice

Model RTR 2728A Ordering Information and Options

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<td>Option -311</td>
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<td>64 GB System Memory</td>
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</table>

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
Model RTR 2748
1 GS/sec RF/IF Rugged Rackmount Recorder

General Information
The Talon® RTR 2748 is a turnkey recording and playback system that allows users to record and reproduce signals with bandwidths up to 500 MHz. The RTR 2748 can be configured as a one- or two-channel system to provide real-time recording and playback rates up to 4.0 GB/sec to an array of solid-state drives.

The RTR 2748 uses Pentek’s high-powered Virtex-6-based Cobalt® boards that provide the data streaming engine for the high-speed A/D converters.

A built-in synchronization module is provided to allow for multichannel phase-coherent operation.

GPS time and position stamping is optionally available.

SystemFlow Software
The RTR 2748 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system.

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 2748 allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2748 records data to the native NTFS file system that provides immediate access to the recorded data.

Data can be off-loaded via two gigabit Ethernet ports, six USB 2.0 ports or two eSATA ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD+R/RW drive.

Rugged and Flexible Architecture
Because SSDs operate reliably under conditions of shock and vibration, the RTR 2748 performs well in ground, shipborne and airborne environments. The drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Available in a 21” deep, 24-bay or a 26” deep, 40-bay chassis, the system can be populated with SSD storage up to 46 TB.

The RTR 2748 is configured in a rugged rackmount chassis, with hot-swappable data drives, front panel USB ports and I/O connectors on the rear panel.

Systems are scalable to accommodate multiple chassis 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.

Features
- Designed to operate under conditions of shock and vibration
- Recording of IF signals up to 2 GHz
- 1 GHz 12-bit A/Ds
- 1 GHz 16-bit D/As
- 400 MHz recording and playback signal bandwidths
- Real-time aggregate recording rates up to 4.0 GB/sec
- 4U 19-inch rugged rackmount PC server chassis
- Available in 21” deep 24-bay rackmount chassis or 26” deep 40-bay rackmount chassis
- Up to 46 terabytes of SSD storage to NTFS RAID solid state disk array
- RAID levels of 0, 1, 5, 6, 10 and 50
- Complete high-performance Windows® workstation with Intel® Core™ i7 processor
- SystemFlow® GUI with signal viewer analysis tool
- C-callable API for integration of recorder into application
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping

Contact factory for options, for number and type of analog channels, recording rates, and disk capacity.
Model RTR 2748
1 GS/sec RF/IF Rugged Rackmount Recorder

➤ SystemFlow Graphical User Interface

SystemFlow Recorder Interface
The RTR 2748 GUI provides the user with a control interface for the recording system. 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 2748 Configure screens provide a simple and intuitive means for setting up the system parameters. The A/D configuration screen shown here, allows user entries for gate/trigger mode, gate/trigger polarity, and trigger source. 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.
Specifications

PC Workstation (standard configuration)
Operating System: Windows 7 Professional
Processor: Intel Core i7 processor
Clock Speed: 3.0 GHz or higher
SDRAM: 8 GB
RAID
  Storage: 3.8, 7.6, 15.3, 30.7 or 46.0 TB
  Drive Type: SATA III SSDs
  Supported RAID Levels: 0, 1, 5, 6, 10 and 50

Analog Recording Input
Input Type: Transformer-coupled, female SSMC connector
Transformer Type: Macom ETC1-1-13TR
Full Scale Input: +10 dBm into 50 ohms
3 dB Passband: 5 MHz to 2 GHz
A/D Converter
  Type: Texas Instruments ADS5400
  Sampling Rate ($f_s$): 100 MHz to 1 GHz
  Resolution: 12 bits
  A/D Record Bandwidth: $f_s/2 = $Nyquist bandwidth
  Anti-Aliasing Filters: External, user-supplied

Analog Playback Output
  Output Type: Transformer-coupled, female SSMC connector
  Full Scale Output: +4 dBm into 50 ohms
  3 dB Passband: 300 kHz to 700 MHz
D/A Converter
  Type: TI DAC5681Z
  Interpolation: 1x, 2x or 4x
  Input Data Rate to DAC5681Z: 500 MS/sec max.
  Output Sampling Rate: 1 GHz, max.
  Output IF: 700 MHz, max.
  D/A Resolution: 16 bits
Clock Sources: Selectable from onboard programmable VCXO or external clock

External Clock
  Type: Female SSMC connector, sine wave, 0 to +10 dBm, AC-coupled, 50 ohms, accepts 100 MHz to 1 GHz input clock or 10 MHz system reference

Internal Clock
  Type: Programmable VCXO
  VCXO Frequency Ranges: 100 to 945 MHz, 970 MHz to 1 GHz

Physical and Environmental
Size
  Width: 19"
  Height: 7"
  Depth: 21" (24-drive chassis)
  Depth: 26" (40-drive chassis)
Weight: 60-85 lb
Operating Temp: 0° to +50° C
Storage Temp: -40° to +85° C
Relative Humidity: 5 to 95%, non-condensing
Operating Shock: 15 g max. (11 msec, half sine wave)
Operating Vibration: 10 to 20 Hz: 0.02 inch peak,
  20 to 500 Hz: 1.4 g peak acceleration
Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Model RTR 2748 Ordering Information and Options

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<tr>
<td>Note: Options -430 and -440 require a 26-inch deep chassis</td>
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</table>

General Options (append to all options)
Option -261 GPS time & position stamping
Option -264 IRIG-B time stamping

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice
General Information

The Talon® RTX 2768 is a turnkey recording and playback system that is built to operate under harsh conditions. Designed to withstand high vibration and operating temperatures, the RTX 2768 is intended for military, airborne and UAV applications requiring a rugged system. With scalable A/Ds, D/As and SSD (Solid-State Drive) storage, the RTX 2768 can be configured to stream data to and from disk at rates as high as 4.0 GB/sec.

The RTX 2768 uses Pentek’s high-powered Virtex-6-based Cobalt® boards that provide the data-streaming engine for the high-speed A/D and D/A converters. This system allows users to record and reproduce signals with bandwidths up to 400 MHz.

A built-in synchronization module is provided to allow for multichannel phase-coherent operation.

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

SystemFlow Software

The RTX 2768 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system.

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 RTX 2768 allows the user to install post-processing and analysis tools to operate on the recorded data. The RTX 2768 records data to the native NTFS file system that provides immediate access to the recorded data.

Data can be off-loaded via two rear-access gigabit Ethernet ports, two USB 3.0 ports or up to four USB 2.0 ports.

Rugged Mil-Spec Chassis

The Talon RTX 2768 uses a shock- and vibration-isolated inner chassis and solid-state drives to assure reliability under harsh conditions. The chassis uses an in-line EMI filter along with rear-panel MIL-style connectors to meet MIL-STD-461 emissions specifications.

Up to four front-panel removable QuickPac drive canisters are provided, each containing up to eight SSDs. Each drive canister can hold up to 7.6 TB of data storage and allows for quick and easy removal of mission-critical data.

Forced-air cooling draws air from the front of the chassis and pushes it out the back via exhaust fans. A hinged front door with a serviceable air filter provides protection against dust and sand.
SystemFlow Recorder Interface
The RTX 2768 GUI provides the user with a control interface for the recording system. 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 RTX 2768 Configure screens provide a simple and intuitive means for setting up the system parameters. The A/D configuration screen shown here, allows user entries for gate/trigger mode, gate/trigger polarity, and trigger source. 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.
Specifications

PC Workstation (standard configuration)

Operating System: Windows 7 Professional
Processor: Intel Core i7 processor
Clock Speed: 3.0 GHz or higher
SDRAM: 8 GB
Data Storage
Style: Up to four front-panel removable QuickPac drive canisters; up to eight SSDs contained in each canister
Location: Front panel
Capacity: Up to 30 TB
Number of Drives: Up to 32 total
Supported RAID Levels: 0, 1, 5 and 6

Analog Recording Input Channels

Analog Signal Inputs
Connector Type: Rear-panel female SMA connectors
Input Type: Transformer-coupled
Full Scale Input: +10 dBm into 50 ohms
3 dB Passband: 5 MHz to 2 GHz

A/D Converters
Type: Texas Instruments ADS5400
Sample Rate (f_s): 100 MHz to 1 GHz
Resolution: 12 bits
A/D Record Bandwidth: f_s/2 = Nyquist bandwidth
Anti-Aliasing Filters: External, user-supplied

Sample and Reference Clocks
External Sample Clock: Sine wave, 0 to +10 dBm, AC-coupled, 50 ohms 100 MHz to 1 GHz, common to both A/Ds
VCXO Sample Clock: Programmable, 10 to 1000 MHz, phase-locked to 10MHz reference, common to both A/Ds
Reference Clock: Sine wave, 0 to +10 dBm, A-C coupled, 50 ohms, 10 MHz, used for phase-locking the VCXO
Connector Type: Rear panel female SMA connector for external sample or reference clock input

External Trigger
Number: One common trigger for both input channels
Input Level: LVTTTL with selectable rising or falling edge
Connector Type: Rear panel female SMA connector

Physical and Environmental
Dimensions: 19" W x 22” D x 7” H
Weight: 50 lb, approx.
Operating Temp: -20° to +50° C
Storage Temp: -40° to +85° C
Relative Humidity: 10% to 95%, non-condensing
Operating Shock: Designed to MIL-STD 810F, method 514.5, procedures I and VI
Operating Vibration: Designed to MIL-STD 810F, method 514.5, procedure I
EMI/EMC: Designed to MIL-STD 461E, CE101, CE102, CS101, CS113, RE101, RE102, RS101, RS103
Input Power: 85 to 264 VAC, 47–400 Hz, 600 W max.

Model RTX 2768 Order Information and Options

Channel Configurations
Option -201 1-channel recording
Option -202 2-channel recording
Option -221 1-channel playback
Option -222 2-channel playback

Storage Options
Option -410 3.8 TB SSD storage 4.0 GB/sec
Option -415 7.6 TB SSD storage 4.0 GB/sec
Option -418 11.5 TB SSD storage 4.0 GB/sec

Analog Playback Output Channels

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

D/A Converters
Type: Texas Instruments DAC5681Z
Output Sampling Rate: 1 GHz, max.
Resolution: 16 bits
Input Sample Data Rate: 500 MS/sec max.
Output IF: 700 MHz, max.
Interpolation: 1x, 2x or 4x

Sample and Reference Clocks
External Sample Clock: Sine wave, 0 to +10 dBm, AC-coupled, 50 ohms 100 MHz to 1 GHz, common to both A/Ds
VCXO Sample Clock: 100 to 945 MHz, 970 MHz to 1 GHz, phase-locked to 10MHz reference, common to all D/As
Reference Clock: Sine wave, 0 to +10 dBm, A-C coupled, 50 ohms, 10 MHz, used for phase-locking the VCXO
Connector Type: Rear panel female SMA connector for external sample or reference clock input

External Trigger
Number: One common trigger for both output channels
Input Level: LVTTTL with selectable rising or falling edge
Connector Type: Rear panel female SMA connector

General Options (append to all options)
Option -261 GPS time & position stamping
Option -264 IRIG-B time stamping
Option -680 28 VDC power supply
Option -625 Front-panel removable OS drive

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
General Information

The Talon® RTR 2729A is a turnkey system that allows users to record very high-bandwidth signals in a lightweight and rugged portable package. Equipped with a 3.6 GHz 12-bit A/D converter and user-programmable DDC (digital downconverter) the RTR 2729A is capable of capturing RF/IF signals with bandwidths as high as 360 MHz continuously for over four hours.

The RTR 2729A is supplied in a small-footprint portable package measuring only 16.0”W x 6.9” D x 13.0”H and weighing just less than 30 pounds. With measurements similar to a small briefcase, this portable workstation includes an Intel Core i7 processor, a high-resolution 17” LCD monitor and up to 61.4 TB of SSD storage.

The RTR 2729A uses a high-powered Pentek Virtex-7-based Onyx® board that includes a PCIe Gen. 3 engine to provide data streaming for the high-speed A/D converter. Coupled with a high-performance PCIe Gen. 3 SATA III RAID controller, the RTR 2729A is capable of streaming contiguous data to disk in real-time at rates up to 4.0 GB/sec.

The RTR 2729A can operate as a single-channel 3.6 GHz or a two-channel 1.8 GHz recorder. The channel mode operation, sample rate, DDC settings, packing modes and trigger settings are controllable via the built-in SystemFlow GUI (Graphical User Interface).

An optional GPS receiver and timing card can be added to the system to provide precise time and position stamping of the recorded data.

SystemFlow Software

The RTR 2729A includes Pentek’s SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system. It also includes a C-callable API that allows users to easily integrate the Talon recorder into a larger system.

The GUI provides a very simple interface for system setup. This includes pull-down selections for a handful of parameters, a checkbox to enable/disable the DDC and a data-entry field for the sample rate. Once set up, the GUI provides the ability to save profiles that can be reloaded at the click of a button.

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 spectrum analyzer.

Built on a Windows 7 Professional workstation, the RTR 2729A allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2729A records data in the native NTFS file system for immediate access to the data.

Data can be off-loaded via gigabit Ethernet, USB 2.0 and USB 3.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

Option -625 replaces the DVD±R/RW drive with a removable operating system drive; an external DVD drive can be used.

Rugged Chassis with SSD Storage

The RTR 2729A is configured with hot-swappable SSDs, front panel USB ports, and I/O connectors on the side panel. It is built in an extremely rugged steel and aluminum chassis and is tested for shock and vibration. The SSDs provide storage capacities of up to 61.4 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels, including 0, 5, and 6, provide a choice for the required level of redundancy.

Features

- Designed to operate under conditions of shock and vibration
- Portable system measuring 16.0”W x 6.9” D x 13.0”H
- Lightweight, just less than 30 pounds
- Sample rates up to 3.6 GHz in single-channel mode
- Sample rates up to 1.8 GHz in dual-channel mode
- 12-bit A/D, with 16- and 8-bit packing modes
- Capable of recording RF/IF frequencies to 2.8 GHz in single-channel mode
- Capable of recording RF/IF frequencies to 2.8 GHz in dual-channel mode
- Real-time sustained recording rates of up to 4.0 GB/sec
- Windows® workstation with high performance Intel® Core™ i7 processor
- Up to 61.4 terabytes of SSD storage to NTFS RAID solid state disk array
- SystemFlow® GUI with signal viewer analysis tool
- Optional file headers include time stamping and recording parameters
- Optional GPS time and position stamping
- Optional 10–36 VDC power supply

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
Model RTR 2729A
3.6 GS/sec Ultra Wideband RF/IF Rugged Portable Recorder

**SystemFlow Graphical User Interface**

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.

**SystemFlow Recorder Interface**

The RTR 2729A GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, 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 2729A Configure screens provide a simple and intuitive means for setting up the system parameters. The configuration screen shown here, allows user entries for input source, sampling 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.

**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.**
Specifications

PC Workstation (standard configuration)

- Operating System: 64-bit Windows workstation
- Processor: Intel Core i7 processor
- Clock Speed: 3.0 GHz or higher
- Operating System Drive: 128 GB SSD
- SDRAM: 8 GB
- Monitor: Built-in 17.3” high-resolution LCD, 1920 x 1080 pixels, 16:9 aspect ratio, anti-glare surface, Brightness: 300 cd/m²; Contrast ratio: 400:1 typical

RAID
- Total Storage: 7.6 – 61.4 TB
- Supported RAID Levels: 0, 5 and 6
- Drive Bays: Hot-swap, removable, side panel
- USB 2.0 Ports: Four on left side, two on front panel
- USB 3.0 Ports: Two on left side
- 1 Gb Ethernet Ports: Two on left side

Analog Signal Inputs
- Connectors: Two side panel SSMC connectors, In 1 & In 2
- Input Type: Single-ended, non-inverting
- Full Scale Input: +4 dBm into 50 ohms
- Coupling: Transformer-coupled
- Input Transformers
- Bandwidth: 4.5 kHz to 3.0 GHz

A/D Converters
- Type: Texas Instruments ADC12D1800
- Sampling Rate
  - Single-channel mode: 500 MHz to 3.6 GHz
  - Dual-channel mode: 150 MHz to 1.8 GHz
- Resolution: 12 bits
- Maximum Usable Input Frequency
  - Single-channel mode: 1.75 GHz
  - Dual-channel mode: 2.8 GHz
- Anti-Aliasing Filters: External, user-supplied

Digital Downconverters
- Modes: One or two channels, programmable
- Supported Sample Rate ($f_s$):
  - One-channel mode: 3.6 GHz
  - Two-channel mode: 1.8 GHz
- Decimation Range (D):
  - One-channel mode: 8x, 16x, 32x, bypass
  - Two-channel mode: 4x, 8x, 16x, bypass
- DDC Usable Bandwidth: $0.8 \times f_s / D$

Sampling Clock Source: Internal fixed-frequency or programmable oscillator (selectable by option); in single-channel mode, the sample rate is $2x$ the clock frequency; in dual-channel mode, the sample rate equals the clock frequency

Frequency Reference: Accepts external 10 MHz reference at 0 to +4 dBm to phase-lock the clock oscillator

Optional DC Power supply
- Voltage: 10 to 36 VDC
- Input Current: 42 to 26 A (39 A at 24 VDC)
- Inrush Current: 100% to 160%

Remote Control: On/Off

Safety: Meets UL, TUV, CB specifications

Physical and Environmental
- Size: 16.0” W x 6.9” D x 13.0” H
- Weight: 30 lb max.
- Operating Temp: 0° to +50° C
- Storage Temp: -40° to +85° C
- Relative Humidity: 5 to 95%, non-condensing
- Operating Shock: 30 g max. (11 msec, half-sine wave)
- Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
- Non-operating Vibration: 5 to 500 Hz: 2.06 g RMS
- Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Sample Clock Options

<table>
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<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -910</td>
<td>User-Programmable Sample Clock</td>
</tr>
<tr>
<td>Option -911</td>
<td>1.5 / 3.0 GHz sample clock</td>
</tr>
<tr>
<td>Option -912</td>
<td>1.6 / 3.2 GHz sample clock</td>
</tr>
<tr>
<td>Option -915</td>
<td>1.8 / 3.6 GHz sample clock</td>
</tr>
<tr>
<td>Note</td>
<td>Custom fixed-frequency sample clocks available upon request.</td>
</tr>
</tbody>
</table>

Storage Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
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</thead>
<tbody>
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<td>Option -415</td>
<td>7.6 TB SSD Storage</td>
</tr>
<tr>
<td>Option -420</td>
<td>15.3 TB SSD Storage</td>
</tr>
<tr>
<td>Option -430</td>
<td>30.7 TB SSD Storage</td>
</tr>
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<td>Option -460</td>
<td>61.4 TB SSD Storage</td>
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Additional Options

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</thead>
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<td>Option -311</td>
<td>64 GB System Memory</td>
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<tr>
<td>Option -625</td>
<td>Removable Operating System Drive</td>
</tr>
<tr>
<td>Option -681</td>
<td>10 to 36 VDC Power Supply</td>
</tr>
</tbody>
</table>

Contact Pentek for compatible Option combinations

Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
Model RTR 2749
3.6 GS/sec Ultra Wideband RF/IF Rugged Rackmount Recorder

General Information
The Talon® RTR 2749 is a turnkey system, used for recording high-bandwidth signals. The RTR 2749 uses 12-bit, 3.6 GHz A/D converters. It can be configured as a one- or two-channel system and can record sampled data, packed as 8-bit- or 16-bit-wide consecutive samples (12-bit digitized samples residing in the 12 MSBs of the 16-bit word). A high-speed RAID array provides a maximum streaming recording rate to disk of 4.8 GB/sec.

The RTR 2749 uses Pentek’s high-powered Virtex-7-based Onyx® boards that provide the data streaming engine for the high-speed A/D converters. Channel and packing modes as well as gate and trigger settings are among the GUI-selectable system parameters, providing complete control over this ultra wideband recording system.

Optional GPS time and position stamping allows the user to capture this critical information in the header of each data file.

SystemFlow Software
The RTR 2749 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system. 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 2749 allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2749 records data to the native NTFS file system that provides immediate access to the recorded data.

Data can be off-loaded via two gigabit Ethernet ports, six USB 2.0 ports or two eSATA ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD+R/RW drive.

Rugged and Flexible Architecture
Because SSDs operate reliably under conditions of vibration and shock, the RTR 2749 performs well in ground, shipborne and airborne environments. The hot-swappable SSDs provide storage capacity of up to 46 TB. The drives can be easily removed or exchanged during or after a mission to retrieve recorded data.

The RTR 2749 is configured in a 4U 19” rugged rackmount chassis, with hot-swappable data drives, front panel USB ports and I/O connectors on the rear panel. Systems are scalable to accommodate multiple chassis 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.

Features
- Designed to operate under conditions of shock and vibration
- Sample rates up to 3.6 GHz in single-channel mode
- Sample rates up to 1.8 GHz in dual-channel mode
- Capable of recording RF/IF frequencies to 1.75 GHz in single-channel mode
- Capable of recording RF/IF frequencies to 2.8 GHz in dual-channel mode
- 12-bit A/D, with 16- and 8-bit packing modes
- Real-time aggregate recording rates of up to 4.8 GB/sec
- 4U 19-inch rugged rackmount PC server chassis
- Windows® 7 Professional workstation with high performance Intel® Core™ i7 processor
- Up to 46 terabytes of SSD storage to NTFS RAID solid state disk array
- RAID levels of 0 , 1, 5, 6, 10 and 50
- N+1 redundant power supply
- SystemFlow® GUI with signal viewer analysis tool
- C-callable API for integration of recorder into application
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping

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

The RTR 2749 GUI provides the user with a control interface for the recording system. 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 2749 Configure screens provide a simple and intuitive means for setting up the system parameters. The configuration screen shown here, allows user entries for input source, sampling frequency, 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.
Model RTR 2749 3.6 GS/sec Ultra Wideband RF/IF Rugged Rackmount Recorder

Specifications

PC Workstation (standard configuration)
- Operating System: Windows 7 Professional
- Processor: Intel Core i7 processor
- Clock Speed: 2.0 GHz or higher
- SDRAM: 8 GB
- RAID Storage: 7.6, 15.3, 30.7 or 46.0 TB
- Drive Type: SATA III SSDs
- Supported RAID Levels: 0, 1, 5, 6, 10 and 50

Analog Signal Inputs
- Connectors: Two rear panel SSMC connectors, In 1 & In 2
- Input Type: Single-ended, non-inverting
- Full Scale Input: +4 dBm into 50 ohms
- Coupling: Transformer-coupled
- Analog Input Transformers
- Bandwidth: 4.5 kHz to 3.0 GHz

A/D Converters
- Type: Texas Instruments ADC12D1800
- Sampling Rate:
  - Single-channel mode: 500 MHz to 3.6 GHz
  - Dual-channel mode: 150 MHz to 1.8 GHz
- Resolution: 12 bits
- Maximum Usable Input Frequency
  - Single-channel mode: 1.75 GHz
  - Dual-channel mode: 2.8 GHz
- Anti-Aliasing Filters: External, user-supplied

Digital Downconverters
- Modes: One or two channels, programmable
- Supported Sample Rate ($f_s$):
  - One-channel mode: 3.6 GHz
  - Two-channel mode: 1.8 GHz
- Decimation Range ($D$):
  - One-channel mode: 8x, 16x, 32x, bypass
  - Two-channel mode: 4x, 8x, 16x, bypass
- Usable Output Bandwidth: 0.8/$f_s$/D
- Sampling Clock Source: Internal fixed-frequency or programmable oscillator (selectable by option);
  in single-channel mode, the sample rate is $2x$ the clock frequency; in dual-channel mode, the sample rate equals the clock frequency
- Frequency Reference: Accepts external 10 MHz reference at 0 to +4 dBm to phase-lock the clock oscillator

Physical and Environmental
- Size: 19” W x 26” D x 7” H
- Weight: 60-85 lb
- Operating Temp: 0° to +50° C
- Storage Temp: −40° to +85° C
- Relative Humidity: 5 to 95%, non-condensing
- Operating Shock: 15 g max. (11 msec, half sine wave)
- Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
- Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Sample Clock Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-910</td>
<td>User-Programmable Sample Clock</td>
</tr>
<tr>
<td>-911</td>
<td>Fixed-frequency clock</td>
</tr>
<tr>
<td>-912</td>
<td>Fixed-frequency clock</td>
</tr>
</tbody>
</table>

Sample Clock Options

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</tr>
</tbody>
</table>

Storage Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-415</td>
<td>7.6 TB SSD storage capacity</td>
</tr>
<tr>
<td>-420</td>
<td>15.3 TB SSD storage capacity</td>
</tr>
<tr>
<td>-430</td>
<td>30.7 TB SSD storage capacity</td>
</tr>
<tr>
<td>-440</td>
<td>46.0 TB SSD storage capacity</td>
</tr>
</tbody>
</table>

General Options (append to all options)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-261</td>
<td>GPS time &amp; position stamping</td>
</tr>
<tr>
<td>-264</td>
<td>IRIG-B time stamping</td>
</tr>
</tbody>
</table>

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
SystemFlow Graphical User Interface

SystemFlow Recorder Interface

The RTX 2769 GUI provides the user with a control interface for the recording system. It includes Configuration, Record 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 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 RTX 2769 Configure screens provide a simple and intuitive means for setting up the system parameters. The configuration screen shown here, allows user entries for input source, sampling frequency, 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.
Specifications

PC Workstation (standard configuration)
Operating System: Windows 7 Professional
Processor: Intel Core i7 processor
Clock Speed: 3.0 GHz or higher
SDRAM: 8 GB
Data Storage
  Style: Up to four front-panel removable QuickPac drive canisters; up to eight SSDs contained in each canister
  Location: Front panel
  Capacity: Up to 61 TB
  Number of Drives: Up to 32 total
  Supported RAID Levels: 0, 1, 5 and 6

Analog Recording Input Channels
Analog Signal Inputs
  Connector Type: Rear-panel female SMA connectors
  Input Type: Transformer-coupled
  Full Scale Input: +4 dBm into 50 ohms
  Input Transformers
    3 dB Passband: 4.5 kHz to 3.0 GHz
A/D Converters
  Type: Texas Instruments ADC12D1800
  Sampling Rate:
    Single-channel mode: 500 MHz to 3.6 GHz
    Dual-channel mode: 150 MHz to 1.8 GHz
  Resolution: 12 bits
  Maximum Usable Input Frequency
    Single-channel mode: 1.75 GHz
    Dual-channel mode: 2.8 GHz
  Full Scale Input: +2 dBm to +4 dBm, programmable

Digital Downconverters
  Modes: One or two channels, programmable
  Supported Sample Rate (\(f_s\)):
    One-channel mode: 3.6 GHz
    Two-channel mode: 1.8 GHz
  Decimation Range (D):
    One-channel mode: 8x, 16x, 32x, bypass
    Two-channel mode: 4x, 8x, 16x, bypass
  DDC Usable Bandwidth: \(0.8 f_s / D\)

Sample and Reference Clocks
  Sample Clock Source: Internal fixed-frequency or programmable oscillator (selectable by Option number); in single-channel mode, the sample rate is 2x the clock frequency; in dual-channel mode, the sample rate equals the clock frequency
  Reference Clock: External 10 MHz reference at 0 to +4 dBm to phase-lock the clock oscillator
  Connector Type: Rear-panel female SMA connector

External Trigger
  Number: One common trigger for both channels
  Input Level: LVTTL with selectable rising or falling edge
  Connector Type: Rear panel female SMA connector

Physical and Environmental
  Dimensions: 19” W x 22” D x 7” H
  Weight: 50 lb, approx.
  Operating Temp: -20° to +50° C
  Storage Temp: -40° to +85° C
  Relative Humidity: 10% to 95%, non-condensing
  Operating Shock: Designed to MIL-STD 810F, method 514.5, procedures I and VI
  Operating Vibration: Designed to MIL-STD 810F, method 514.5, procedure I
  EMI/EMC: Designed to MIL-STD 461E, CE101, CE102, CS101, CS113, RE101, RE102, RS101, RS103
  Input Power: 85 to 264 VAC, 47 – 400 Hz, 600 W max.

Sample Clock Options

<table>
<thead>
<tr>
<th>Option -910</th>
<th>User-Programmable Sample Clock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dual-channel mode sample clock range</td>
</tr>
<tr>
<td></td>
<td>150 MHz – 945 MHz</td>
</tr>
<tr>
<td></td>
<td>970 MHz – 1134 MHz</td>
</tr>
<tr>
<td></td>
<td>1213 MHz – 1417.5 MHz</td>
</tr>
<tr>
<td></td>
<td>Single-channel mode sample clock range</td>
</tr>
<tr>
<td></td>
<td>500 MHz – 1890 MHz</td>
</tr>
<tr>
<td></td>
<td>1940 MHz – 2268 MHz</td>
</tr>
<tr>
<td></td>
<td>2426 MHz – 2835 MHz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option -911</th>
<th>Fixed-frequency clock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.5 / 3.0 GHz sample clock</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option -912</th>
<th>Fixed-frequency clock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.6 / 3.2 GHz sample clock</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option -915</th>
<th>Fixed-frequency clock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.8 / 3.6 GHz sample clock</td>
</tr>
</tbody>
</table>

Sample rates are set up for dual-channel mode first and single-channel mode second: e.g. 1.5 / 3.0 is 1.5 in dual-channel mode and 3.0 in single-channel mode.

Storage Options

<table>
<thead>
<tr>
<th>Option -410</th>
<th>3.8 TB SSD storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -415</td>
<td>7.6 TB SSD storage</td>
</tr>
<tr>
<td>Option -420</td>
<td>15.3 TB SSD storage</td>
</tr>
<tr>
<td>Option -430</td>
<td>30.7 TB SSD storage</td>
</tr>
<tr>
<td>Option -460</td>
<td>61.0 TB SSD storage</td>
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</tbody>
</table>

General Options

<table>
<thead>
<tr>
<th>Option -261</th>
<th>GPS time &amp; position stamping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -264</td>
<td>IRIG-B time stamping</td>
</tr>
<tr>
<td>Option -680</td>
<td>28 VDC power supply</td>
</tr>
<tr>
<td>Option -625</td>
<td>Front-panel removable OS drive</td>
</tr>
</tbody>
</table>

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
Model RTR 2613

Talon 3 GHz RF/IF Sentinel Intelligent Signal Scanning Portable Recorder

General Information

The Talon® RTR 2613 combines Pentek’s Sentinel Intelligent Signal Scanning software with real-time recording in a lightweight, portable and rugged package. The RTR 2613 provides SIGINT engineers the ability to scan the 3 GHz spectrum for signals of interest and monitor or record bandwidths up to 40 MHz wide once a signal band of interest is detected.

A spectral scan facility allows the user to sweep the spectrum at 30 GHz/sec, while threshold detection allows the system to automatically lock onto and record signal bands. Scan results are displayed in a waterfall plot and can also be recorded to allow users to look back at some earlier spectral activity.

Once a signal of interest is detected, the real-time recorder can capture and store up to 61.4 terabytes of data to disk, allowing users to store days’-worth of data.

Hardware Features

The Pentek Model 78621 Cobalt board transceiver serves as the engine of the RTR 2613 and is coupled with a 3 GHz tuner to provide excellent dynamic range across the entire spectrum. The 200 MHz 16-bit A/D board provides 86 dB of spurious-free dynamic range and 75 dB of SNR.

The FPGA-based DDC with selectable decimations up to 64 k provides exceptional processing gain while allowing users to zoom into communications signals of varying bandwidths.

The RTR 2613 is supplied in a small footprint portable package measuring only 16.0” W x 6.9” D x 13.0” H and weighing just less than 30 pounds. With measurements similar to a small briefcase, this portable workstation includes an Intel Core i7 processor a high-resolution 17 in. LCD monitor, and up to 61.4 TB of SSD storage.

An optional GPS receiver and built-in PLLs allow all devices in the RF chain to be locked in phase and correlated to GPS time. GPS position information can optionally be recorded, allowing the recorder’s position to be tracked while acquiring RF signals.

Sentinel Features

Pentek’s Sentinel™ recorders add intelligent signal monitoring and detection for Talon real-time recording systems. The intuitive GUI allows users to monitor the entire spectrum or select a region of interest, while a selectable resolution bandwidth allows the user to trade sweep rate for a finer resolution and better dynamic range. Scan settings can be saved as profiles to allow for quick setup in the field.

RF energy in each band of the scan is detected and presented in a waterfall display. Any RF band can be selected for real-time monitoring or recording. In addition to manually selecting a band for recording, a recording can be automatically started by configuring signal strength threshold levels to trigger a recording.

The Sentinel hardware resources are controlled through enhancements to Talon’s SystemFlow® software package that includes a virtual oscilloscope, virtual spectrum analyzer and spectrogram displays. These provide a complete suite of analysis tools to compliment the Sentinel hardware resources.

Features

- Search and capture system using Pentek’s Sentinel™ Intelligent Signal Scanner
- Captures RF signals up to 3 GHz
- Capture and scan bandwidths up to 40 MHz
- 30 GHz/sec scan rate
- Selectable threshold triggered or manual record modes
- 16-bit A/D with 75 dB SNR & 86 dB SFDR
- Built-in DDC with selectable decimation range from 2 to 65,536
- Portable system measuring 16.0” W x 6.9” D x 13.0” H
- Lightweight, just less than 30 pounds
- Storage capacities to 61.4 TB
- RAID levels 0, 5, and 6
- Windows® workstation with Intel Core™ i7 processor
- Optional RF upconversion
- SystemFlow GUI with virtual oscilloscope, spectrum analyzer and spectrogram displays

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
Graphical User Interface

RF Scanner GUI

An RF Scanner GUI allows complete control of the system through a single interface. Start and stop frequencies of a scan can be set by the user as well as the resolution bandwidth. All user parameters can be saved as profiles for easy setup in the field.

Frequency slices from the waterfall display can be selected and monitored, allowing the user to zoom into bands of interest. Threshold triggering levels can be set to record signals that exceed a specified energy. Recordings can also be manually started and stopped from the RF Scanner GUI.

SystemFlow Recorder Interface

The RTR 2613 GUI provides the user with a control interface for the recording system. 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, and play back a recorded signal. The signal viewer, integrated into the recording GUI, allows the user to monitor real-time signals or signals recorded on disk.

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.

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).
Model: RTR 2613

Talon 3 GHz RF/IF Sentinel Intelligent Signal Scanning Portable Recorder

➤ SystemFlow Software

The RTR 2613 includes the SystemFlow® Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the recorder.

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 virtual oscilloscope, spectrum analyzer and spectrogram displays.

Built on a Windows workstation, the RTR 2613 allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2613 records data to the native NTFS file system providing immediate access to the recorded data.

Data can be off-loaded via gigabit Ethernet ports or USB 3.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

Specifications

RF Tuner Specifications

- **RF Tuner Frequency Range**: 30 to 3000 MHz
- **Tuning resolution**: 1 kHz
- **Internal frequency accuracy**: ±1.0 ppm (-20 to +60°C)
- **External Reference Input Frequency**: 10 MHz
- **External Reference Input Level**: 0 dBm ±3 dBm
- **RF input**: 50 ohms nominal
- **Noise figure**: 13 dB typical, 16 dB max
- **Maximum RF input without damage**: +15 dBm
- **In-Band Input IP3**: +3 dBm typical, -3 dBm min
- **In-Band Input IP2**: +30 dBm min, +36 dBm typical
- **IF bandwidth**: Nominal 40 MHz bandwidth (3 dB)
PC Workstation Specifications

- Operating System: Windows workstation
- Processor: Intel Core i7 processor
- Clock Speed: 3.2 GHz or higher
- SDRAM: 8 GB
- RAID:
  - Storage: 480 GB – 61.4 TB
  - Supported RAID Levels: 0, 5 and 6

A/D Converter Specifications

- Type: Texas Instruments ADS5485
- Sampling Rate: 10 MHz to 200 MHz
- Resolution: 16 bits
- SNR: 75 dBf typical at 70 MHz
- SFDR: 86 dBc typical at 70 MHz
- 2nd Harmonic: 95 dBc typical at 70 MHz
- 3rd Harmonic: 87 dBc typical at 70 MHz
- Next Worst Harmonic/Spurious: 90 dBc typical at 70 MHz
- THD: 85 dBc typical at 70 MHz
- SINAD: 73.7 dBc typical at 70 MHz
- ENOB: 12.1 bits typical at 10 MHz

Digital Downconverter IP Core Specifications

- Decimation Range: 2 to 64 k in two programmable stages of 2 to 256
- LO Tuning Frequency Resolution: 32 bits, 0 to $f_s$
- LO SFDR: >120 dB
- FIR Filter: 16-bit coefficients, 24-bit output with user programmable coefficients
- Default Filter Set: 80% bandwidth, <0.3 dB passband ripple >100 dB stopband attenuation

Optional DC Power supply

- Voltage: 10 to 36 VDC
- Input Current: 42 to 26 A (39 A at 24 VDC)
- Inrush Current: 100 A at 24 VDC
- Temperature Range: Oper.: 0° to 50°C, Store: -40° to 85°C
- Efficiency: >80% typical at 24 V full load
- Power Good Signal: On delay 100 to 500 msec
- OverPower Protection: 110% to 160%
- Remote Control: On/Off
- Safety: Meets UL, TUV, CB specifications

Physical and Environmental Specifications

- Dimensions:
  - Height: 13.0”
  - Width: 16.0”
  - Depth: 6.9”
- Weight: 30 lb max.
- Operating Temperature: 0 to +50 deg C
- Storage Temperature: -40 to +85 deg C
- Relative Humidity: 5 to 95%, non-condensing
- Operating Shock: 30 g max. (11 msec, half-sine wave)
- Operating Vibration:
  - 10 to 20 Hz: 0.02 inch peak,
  - 20 to 500 Hz: 1.4 g peak acceleration
- Non-operating Vibration: 5 to 500 Hz: 2.06 g RMS
- Power Requirements: 100 to 240 VAC, 50-60 Hz, ~500 W max.

Model RTR 2613 Ordering Information and Options

<table>
<thead>
<tr>
<th>General Options</th>
<th>Storage Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -261</td>
<td>Option -402</td>
</tr>
<tr>
<td>GPS Time and Position Stamping</td>
<td>480 GB SSD Storage Capacity</td>
</tr>
<tr>
<td>Option -264</td>
<td>Option -410</td>
</tr>
<tr>
<td>IRIG-B Time Stamping</td>
<td>3.8 TB SSD Storage Capacity</td>
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<tr>
<td>Option -285</td>
<td>Option -415</td>
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<tr>
<td>RAID 5 Configuration</td>
<td>7.6 TB SSD Storage Capacity</td>
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<tr>
<td>Option -286</td>
<td>Option -420</td>
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<tr>
<td>RAID 6 Configuration</td>
<td>15.3 TB SSD Storage Capacity</td>
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<tr>
<td>Option -309</td>
<td>Option -430</td>
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<tr>
<td>16 GB System Memory</td>
<td>30.7 TB SSD Storage Capacity</td>
</tr>
<tr>
<td>Option -311</td>
<td>Option -460</td>
</tr>
<tr>
<td>64 GB System Memory</td>
<td>61.4 TB SSD Storage Capacity</td>
</tr>
<tr>
<td>Option -625</td>
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<tr>
<td>Removable Operating System Drive</td>
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<tr>
<td>Option -681</td>
<td></td>
</tr>
<tr>
<td>10 to 36 VDC Power Supply</td>
<td></td>
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</tbody>
</table>

Contact Pentek for compatible Option combinations
Storage and General Options may change, contact Pentek for the latest information

Specifications subject to change without notice
Model RTR 2623

Talon 6 GHz RF/IF Sentinel Intelligent Signal Scanning Portable Recorder

General Information

The Talon® RTR 2623 combines Pentek’s Sentinel Intelligent Signal Scanning software with real-time recording in a lightweight, portable and rugged package. The RTR 2623 provides SIGINT engineers the ability to scan the 6 GHz spectrum for signals of interest and monitor or record bandwidths up to 40 MHz wide once a signal band of interest is detected.

A spectral scan facility allows the user to sweep the spectrum at 30 GHz/sec, while threshold detection allows the system to automatically lock onto and record signal bands. Scan results are displayed in a waterfall plot and can also be recorded to allow users to look back at some earlier spectral activity.

Once a signal of interest is detected, the real-time recorder can capture and store up to 30 terabytes of data to disk, allowing users to store days worth of data.

Hardware Features

The Pentek Model 78621 Cobalt board transceiver serves as the engine of the RTR 2623 and is coupled with a 6 GHz tuner to provide excellent dynamic range across the entire spectrum. The 200 MHz 16-bit A/D board provides 86 dB of spurious-free dynamic range and 74 dB of SNR.

The Virtex-6-based DDC with selectable decimations up to 64 k provides exceptional processing gain while allowing users to zoom into communications signals of varying bandwidths.

The RTR 2623 is supplied in a small footprint portable package measuring only 16.0” W x 6.9” D x 13.0” H and weighing just less than 30 pounds. With measurements similar to a small briefcase, this portable workstation includes an Intel Core i7 processor a high-resolution 17 in. LCD monitor, and up to 61.4 TB of SSD storage.

An optional GPS receiver and built-in PLLs allow all devices in the RF chain to be locked in phase and correlated to GPS time. GPS position information can optionally be recorded, allowing the recorder’s position to be tracked while acquiring RF signals.

Sentinel Features

Pentek’s Sentinel™ recorders add intelligent signal monitoring and detection for Talon real-time recording systems. The intuitive GUI allows users to monitor the entire spectrum or select a region of interest, while a selectable resolution bandwidth allows the user to trade sweep rate for a finer resolution and better dynamic range. Scan settings can be saved as profiles to allow for quick setup in the field.

RF energy in each band of the scan is detected and presented in a waterfall display. Any RF band can be selected for real-time monitoring or recording. In addition to manually selecting a band for recording, a recording can be automatically started by configuring signal strength threshold levels to trigger a recording.

The Sentinel hardware resources are controlled through enhancements to Talon’s SystemFlow® software package that includes a Virtual Oscilloscope, Virtual Spectrum Analyzer and Spectrogram displays. These provide a complete suite of analysis tools to compliment the Sentinel hardware resources.

Features

- Search and capture system using Pentek’s Sentinel™ Intelligent Signal Scanner
- Captures RF signals up to 6 GHz
- Capture and scan bandwidths up to 40 MHz
- 30 GHz/sec scan rate
- Selectable threshold triggered or manual record modes
- 16-bit A/D with 75 dB SNR & 87 dB SFDR
- Built-in DDC with selectable decimation range from 2 to 65,536
- Portable system measuring 16.0” W x 6.9” D x 13.0” H
- Lightweight, just less than 30 pounds
- Storage capacities to 61 TB
- RAID levels 0, 5, and 6
- Windows workstation with Intel Core™ i7 processor
- Optional RF upconversion
- SystemFlow GUI with virtual Oscilloscope, Spectrum Analyzer and Spectrogram displays
RF Scanner GUI

An RF Scanner GUI allows complete control of the system through a single interface. Start and stop frequencies of a scan can be set by the user as well as the resolution bandwidth. All user parameters can be saved as profiles for easy setup in the field.

SystemFlow Recorder Interface

The RTR 2623 GUI provides the user with a control interface for the recording system. 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, and play back a recorded signal. The signal viewer, integrated into the recording GUI, allows the user to monitor real-time signals or signals recorded on disk.

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.

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).
### Model RTR 2623

Talon 6 GHz RF/IF Sentinel Intelligent Signal Scanning Portable Recorder

➤ **SystemFlow Software**

The RTR 2623 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the recorder.

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 virtual oscilloscope, spectrum analyzer and spectrogram displays.

Built on a Windows 7 Professional workstation, the RTR 2623 allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2623 records data to the native NTFS file system providing immediate access to the recorded data.

Data can be off-loaded via gigabit Ethernet ports or USB 3.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

### Specifications

#### RF Tuner Specifications

- **RF Tuner Frequency Range:** 30 to 6000 MHz
- **Tuning resolution:** 1 kHz
- **Internal frequency accuracy:** ±1.0 ppm (-20 to +60°C)
- **External Reference Input Frequency:** 10 MHz
- **External Reference Input Level:** 0 dBm ±3 dBm
- **RF input:** 50 ohms nominal
- **Noise figure:** 13 dB typical, 16 dB max
- **Maximum RF input without damage:** +15 dBm
- **In-Band Input IP3:** +3 dBm typical, -3 dBm min
- **In-Band Input IP2:** +30 dBm min, +36 dBm typical
- **IF bandwidth:** Nominal 40 MHz bandwidth (3dB)

#### IF Specifications

- **IF center frequency:** 70 MHz center
- **Gain:** +15 dB nominal above RF input
- **Gain control:** Manual –40 dB range (min)
- **Image rejection:** 65 dB min (> 80 dB typical)
- **IF rejection:** 65 dB min (80 dB typical)
- **Phase noise at 5000 MHz:**
  - 1 kHz offset: –75 dBc/Hz typical
  - 20 kHz offset: –80 dBc/Hz max
  - 100 kHz offset: –100 dBc/Hz typical
  - 1 MHz offset: –125 dBc/Hz typical
- **Internally generated spurious:** –100 dBm equivalent
  - RF input typical

Specifications continued on next page ➤
Model RTR 2623 Talon 6 GHz RF/IF Sentinel Intelligent Signal Scanning Portable Recorder

PC Workstation Specifications

Operating System: Windows workstation
Processor: Intel Core i7 processor
Clock Speed: 3.2 GHz or higher
SDRAM: 8 GB
RAID:
  Storage: 1.9 - 61.4 TB
  Supported RAID Levels: 0, 5 and 6

A/D Converter Specifications

Type: Texas Instruments ADS5485
Sampling Rate: 10 MHz to 200 MHz
Resolution: 16 bits
SNR: 75 dB_{fs} typical at 70 MHz
SFDR: 87 dBc typical at 70 MHz
2nd Harmonic: 95 dBc typical at 70 MHz
3rd Harmonic: 87 dBc typical at 70 MHz
Next Worst Harmonic/Spurious: 90 dBc typical at 70 MHz
THD: 85 dBc typical at 70 MHz
SINAD: 73.7 dBc typical at 70 MHz
ENOB: 12.1 bits typical at 10 MHz

Digital Downconverter IP Core Specifications

Decimation Range: 2 to 64 k in two programmable stages of 2 to 256
LO Tuning Frequency Resolution: 32 bits, 0 to f_s
LO SFDR: >120 dB
FIR Filter: 16-bit coefficients, 24-bit output
  with user programmable coefficients
Default Filter Set: 80% bandwidth, <0.3 dB passband ripple
  >100 dB stopband attenuation

Optional DC Power supply

Voltage: 10 to 36 VDC
Input Current: 42 to 26 A (39 A at 24 VDC)
Inrush Current: 100 A at 24 VDC
Temperature Range: Oper.: 0° to 50° C, Store: -40° to 80° C
Efficiency: >80% typical at 24 V full load
Power Good Signal: On delay 100 to 500 msec
OverPower Protection: 110% to 160%
Remote Control: On/Off
Safety: Meets UL, TUV, CB specifications

Physical and Environmental Specifications

Dimensions:
  Height: 13.0”
  Width: 16.0”
  Depth: 6.9”
Weight: 30 lb max.
Operating Temperature: 0 to +50 deg C
Storage Temperature: -40 to +85 deg C
Relative Humidity: 5 to 95%, non-condensing
Operating Shock: 30 g max. (11 msec, half-sine wave)
Operating Vibration: 10 to 20 Hz: 0.02 inch peak,
  20 to 500 Hz: 1.4 g peak acceleration
Non-operating Vibration: 5 to 500 Hz: 2.06 g RMS
Power Requirements: 100 to 240 VAC, 50-60 Hz, ~500 W max.

Model RTR 2623 Ordering Information and Options

<table>
<thead>
<tr>
<th>General Options</th>
<th>Storage Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -261 GPS Time and Position Stamping</td>
<td>Option -405 1.9 TB HDD Storage Capacity</td>
</tr>
<tr>
<td>Option -264 IRIG-B Time Stamping</td>
<td>Option -410 3.8 TB HDD Storage Capacity</td>
</tr>
<tr>
<td>Option -285 RAID 5 Configuration</td>
<td>Option -415 7.6 TB HDD Storage Capacity</td>
</tr>
<tr>
<td>Option -286 RAID 6 Configuration</td>
<td>Option -420 15.3 TB HDD Storage Capacity</td>
</tr>
<tr>
<td>Option -309 16 GB System Memory</td>
<td>Option -430 30.7 TB HDD Storage Capacity</td>
</tr>
<tr>
<td>Option -311 64 GB System Memory</td>
<td>Option -460 61.4 TB HDD Storage Capacity</td>
</tr>
<tr>
<td>Option -625 Removable Operating System Drive</td>
<td></td>
</tr>
<tr>
<td>Option -681 10 to 36 VDC Power Supply</td>
<td></td>
</tr>
</tbody>
</table>

Contact Pentek for compatible Option combinations
Storage and General Options may change, contact Pentek for the latest information

Specifications subject to change without notice
### Features

- Housed in a small chassis measuring 5.25” H x 8.5” W x 14” D
- Weighs 17 lb (7.7 kg)
- Shock and vibration-resistant SSDs perform well in vehicles, ships and aircraft
- 200 MHz 16-bit A/Ds
- 800 MHz 16-bit D/As
- Real-time aggregate recording rates of up to 1.6 GB/sec
- DDC decimation and DUC interpolation range from 2 to 65,536
- 80 MHz record and playback signal bandwidths
- Recording and playback of IF signals up to 700 MHz
- Up to 30 terabytes of SSD storage to NTFS RAID solid state disk array
- Windows® workstation with high performance Intel® Core™ i7 processor
- SystemFlow® GUI with Signal Viewer analysis tool
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping

### General Information

Optimized for SWaP (size, weight and power), the Pentek Talon® RTR Small Form Factor (SFF) product line provides the performance and storage capacity previously only possible in much larger rackmountable chassis. Measuring 5.25” H x 8.5” W x 14” D and weighing only 17 pounds (7.7 kg), this small package can hold up to 30.6 TB of SSD storage.

Configured with four 200 MS/sec 16-bit A/Ds the RTR 2546 is capable of recording the full four-channel bandwidth at a 1.6 GB/sec sustained rate to disk. An 800 MHz 16-bit D/A allows for real-time full-bandwidth signal reproduction.

Built-in digital downconverters and upconverters allow for IF signals to be converted to baseband and reproduced at the original IF frequency.

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 system capable of recording and reproducing a wide range of signals.

An ATX power supply accepts 110-240 VAC, drawing under 150 W and typically around 100 W. SFF Models have the option for a 6-30 VDC power supply.

Eight front panel data drives can be easily removed along with a front panel removable OS drive to allow all non-volatile memory to be removed from the system in seconds. An optional GPS receiver allows for precise GPS time and position stamping.

### SystemFlow Software

All Talon Rugged Small Form Factor recorders include the Pentek SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the recorder. A user API is also included to allow custom recorder control interfaces to be easily built.

SystemFlow provides 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, spectrum analyzer and spectrogram displays.

Built on a Windows Professional workstation, all Talon SFF recorders allow the user to install post-processing and analysis tools to operate on the recorded data. The system records data to the native NTFS file system, providing immediate access to the recorded data files.

### Rugged Chassis with SSD Storage

The SFF system is configured with hot-swappable SSDs, front-panel USB ports, and I/O connectors on the rear panel. It is built in an extremely rugged steel and aluminum chassis and is tested for shock and vibration. The SSDs provide storage capacities of up to 30.6 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels, including 0, 5, and 6, provide a choice for the required level of redundancy.

A push of a button unlatches each of the data drives and the OS drive. Drives are mounted on sleds and can be easily transferred to an offload system while the recorder stays in the field.

PC and signal I/O are available on the rear panel with standard connectors.

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### Channels

<table>
<thead>
<tr>
<th>Channels In</th>
<th>Channels Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 MHz 16-bit A/D</td>
<td>800 MHz 16-bit D/A</td>
</tr>
</tbody>
</table>

### Image

- **Model RTR 2546**
- **200 MS/sec RF/IF Rugged SFF Recorder**

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**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](http://www.pentek.com)
The RTR 2546 GUI provides the user with a control interface for the recording system. 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, playback 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 recorded signals on disk.

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.
Model RTR 2546  200 MS/sec RF/IF Rugged SFF Recorder

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

Adjacent Channel Crosstalk

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

D/A Performance

Spurious Free Dynamic Range

- $f_{out} = 70$ MHz, $f_s = 200$ MHz, Internal Clock
- $f_{out} = 120$ MHz, $f_s = 400$ MHz, External Clock

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www.pentek.com
Model RTR 2546 200 MS/sec RF/IF Rugged SFF Recorder

Specifications

PC Workstation (standard configuration)
Operational System: Windows workstation
Processor: Intel i7 7700K (7th Gen) quad core processor
Clock Speed: 4.2 GHz
Operating System Drive: 250 GB SSD
SDRAM: 8 standard, 16 or 32 GB optional
RAID
- Total Storage: 3.8 TB – 30.6 TB
- Supported RAID Levels: 0, 5 and 6
- Drive Bays: Hot-swap, removable, front panel

Rear Panel I/O
- Four USB 3.0 ports
- Two Gigabit RJ45 ports
- Two HDMI and One DVI ports
- Audio and PS2 ports
- USB 3.0 Type-C port
- Two Wi-Fi antenna ports

Front Panel I/O
- Two USB 2.0 ports
- Power and recessed RESET buttons
- LED indicators for power and HDD access

Analog Signal Inputs
- Transformer-coupled, 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 ($f_s$): 10 MHz to 200 MHz
- Resolution: 16 bits
- A/D Record Bandwidth: $f_s/2$ = Nyquist bandwidth
- Anti-Aliasing Filters: External, user-supplied

Digital Downconverter
- Type: Pentek IP Core
- Decimation(D): 2 to 65,536
- IF Center Frequency Tuning: DC to $f_s$, 32 bits
- DDC Usable Bandwidth: $0.8f_s/D$

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

Digital Upconverter, Interpolator and D/As
- D/A Resolution: 16 bits
- Output Signal: Analog, real or quadrature
- Type: TI DAC5688 and Pentek-installed IP core interpolator
- Interpolation: 2 to 65,536

Input Data Rate to DAC5688: 250 MS/sec max.
- Output Sampling Rate: 800 MHz max
- Output IF: DC to 400 MHz

Bandwidth Range: Matches recording bandwidths

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

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

Physical and Environmental
- Size: 5.25” H x 8.5” W x 14.0” D
- Weight: 17 lb (7.7 kg)
- Operating Temp: 0° to +50° C
- Storage Temp: –40° to +85° C
- Relative Humidity: 5 to 95%, non-condensing
- Operating Shock: 15 g max. (11 msec, half-sine wave)
- Operating Vibration: 10 to 20 Hz: 0.02 inch peak,
  20 to 500 Hz: 1.4 g peak acceleration
- Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 150 W max.

Specifications subject to change without notice
Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Model RTR 2546 Ordering Information and Options

Channel Configurations

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-201</td>
<td>1-Channel Recording</td>
</tr>
<tr>
<td>-202</td>
<td>2-Channel Recording</td>
</tr>
<tr>
<td>-203</td>
<td>3-Channel Recording</td>
</tr>
<tr>
<td>-204</td>
<td>4-Channel Recording</td>
</tr>
<tr>
<td>-221</td>
<td>1-Channel Playback</td>
</tr>
<tr>
<td>-222</td>
<td>2-Channel Playback</td>
</tr>
<tr>
<td>-224</td>
<td>4-Channel Playback</td>
</tr>
</tbody>
</table>

Storage Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-410</td>
<td>3.8 TB SSD Storage</td>
</tr>
<tr>
<td>-415</td>
<td>7.6 TB SSD Storage</td>
</tr>
<tr>
<td>-420</td>
<td>15.3 TB SSD Storage</td>
</tr>
<tr>
<td>-430</td>
<td>30.6 TB SSD Storage</td>
</tr>
</tbody>
</table>

Additional Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>-261</td>
<td>GPS Time and Position Stamping</td>
</tr>
<tr>
<td>-285</td>
<td>Raid 5 Configuration</td>
</tr>
<tr>
<td>-286</td>
<td>Raid 6 Configuration</td>
</tr>
<tr>
<td>-309</td>
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</tr>
<tr>
<td>-310</td>
<td>32 GB System Memory</td>
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<tr>
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Specifications subject to change without notice
Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

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www.pentek.com
General Information

Optimized for SWaP (size, weight and power), the Pentek Talon® RTR Small Form Factor (SFF) product line provides the performance and storage capacity previously only possible in much larger rackmountable chassis. Measuring 5.25” H x 8.5” W x 14” D and weighing only 17 pounds (7.7 kg), this small package can hold up to 30.6 TB of SSD storage. Configured with two A/Ds and two D/As, the 2547 provides the ability to play back two channels of real data or one channel of complex data with the available DUC.

Built-in digital downconverters and upconverters allow for IF signals to be converted to baseband and reproduced at the original IF frequency. 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 system capable of recording and reproducing a wide range of signals. An ATX power supply accepts 110-240 V AC, drawing under 150 W and typically around 100 W. SFF Models have the option for a 6-30 VDC power supply.

Eight front panel data drives can be easily removed along with a front panel removable OS drive to allow all non-volatile memory to be removed from the system in seconds. An optional GPS receiver allows for precise GPS time and position stamping.

SystemFlow Software

All Talon Rugged Small Form Factor recorders include the Pentek SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the recorder. A user API is also included to allow custom recorder control interfaces to be easily built. SystemFlow provides 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, spectrum analyzer and spectrogram displays.

Built on a Windows Professional workstation, all Talon SFF recorders allow the user to install post-processing and analysis tools to operate on the recorded data. The system records data to the native NTFS file system, providing immediate access to the recorded data files.

Rugged and Flexible Architecture

The SFF system is configured with hot-swappable SSDs, front-panel USB ports, and I/O connectors on the rear panel. It is built in an extremely rugged steel and aluminum chassis and is tested for shock and vibration. The SSDs provide storage capacities of up to 30.6 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels, including 0, 5, and 6, provide a choice for the required level of redundancy.

A push of a button unlatches each of the data drives and the OS drive. Drives are mounted on sleds and can be easily transferred to an offload system while the recorder stays in the field.

PC and signal I/O is available on the rear panel with standard connectors.

Features

- Housed in a small chassis measuring 5.25” H x 8.5” W x 14” D
- Weighs 17 pounds (7.7 kg)
- Shock and vibration-resistant SSDs perform well in vehicles, ships and aircraft
- 500 MHz 12-bit A/Ds or 400 MHz 14-bit A/Ds
- 800 MHz 16-bit D/As
- 200 MHz record and playback signal bandwidths
- Real-time aggregate recording rates of up to 2.0 GB/sec
- DDC decimation and DUC interpolation range from 2 to 65,536
- Up to 200 MHz record and playback signal bandwidths
- Recording and playback of IF signals up to 700 MHz
- Up to 30 terabytes of SSD storage to NTFS RAID solid state disk array
- Windows® workstation with high performance Intel® Core™ i7 processor
- SystemFlow® GUI with Signal Viewer analysis tool
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping
➤ SystemFlow Graphical User Interface

SystemFlow Recorder Interface
The RTR 2747 GUI provides the user with a control interface for the recording system. 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 2747 Configure screens provide a simple and intuitive means for setting up the system parameters. The DDC configuration screen shown here, allows user 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. ➤
Specifications

PC Workstation (standard configuration)
- Operating System: Windows workstation
- Processor: Intel i7 7700K (7th Gen) quad core processor
- Clock Speed: 4.2 GHz
- Operating System Drive: 250 GB SSD
- SDRAM: 8 GB standard, 16 GB or 32 GB optional
- RAID
  - Total Storage: 3.8 TB – 30.6 TB
  - Supported RAID Levels: 0, 5 and 6
- Drive Bays: Hot-swap, removable, front panel

Rear Panel I/O
- Four USB 3.0 ports
- Two Gigabit RJ45 ports
- Two HDMI and One DVI ports
- Audio and PS2 ports
- USB 3.0 Type-C port
- Two Wi-Fi antenna ports

Front Panel I/O
- Two USB 2.0 ports
- Power and recessed RESET buttons
- LED indicators for power and HDD access

Analog Signal Inputs
- Transformer-coupled, female SSMC connectors
- Transformer Type: Coil Craft WBC4-6TLB
- Full Scale Input: +5 dBm into 50 ohms
- 3 dB Passband: 300 kHz to 700 MHz

A/D Converters
- Type: Texas Instruments AD55463 or AD55474 (Option-014)
- Sampling Rate (f_s): 10 MHz to 500 MHz
- Resolution: 12 Bits or 14 bits (Option -014)
- A/D Record Bandwidth: f_s/2 = Nyquist bandwidth
- Anti-Aliasing Filters: External, user-supplied

Digital Downconverter
- Type: Pentek IP Core
- Decimation(D): 2 to 65,536
- IF Center Frequency Tuning: DC to f_s, 32 bits
- DDC Usable Bandwidth: 0.8f_s/D

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

Digital Upconverter, Interpolator and D/As
- D/A Resolution: 16 bits
- Output Signal: Analog, real or quadrature
- Type: TI DAC5688 and Pentek-installed IP core interpolator
- Interpolation: 2 to 65,536
- Input Data Rate to DAC5688: 250 MS/sec max.
- Output Sampling Rate: 800 MHz max
- Output IF: DC to 400 MHz
- Bandwidth Range: Matches recording bandwidths

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

External Clocks
- Type: Female SSMC connector, sine wave, 0 to +12 dBm, AC-coupled, 50 ohms, 10 to 500 MHz divider input clock or PLL system reference
- Internal Clock: Type: Programmable VCXO from 10 to 810 MHz

Physical and Environmental
- Size: 5.25” H x 8.5” W x 14.0” D
- Weight: 17 lb (7.7 kg)
- Operating Temp: 0° to +50° C
- Storage Temp: –40° to +85° C
- Relative Humidity: 5 to 95%, non-condensing
- Operating Shock: 15 g max. (11 msec, half-sine wave)
- Operating Vibration: 10 to 20 Hz: 0.02 inch peak,
  20 to 500 Hz: 1.4 g peak acceleration
- Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 150 W max.

Channel Configurations
- Option -201: 1-channel recording
- Option -202: 2-channel recording
- Option -221: 1-channel playback
- Option -222: 2-channel playback

Storage Options
- Option -410: 3.8 TB SSD storage capacity
- Option -415: 7.6 TB SSD storage capacity
- Option -420: 15.3 TB SSD storage capacity
- Option -430: 30.6 TB SSD storage capacity

Additional Options
- Option -261: GPS Time and Position Stamping
- Option -285: Raid 5 Configuration
- Option -286: Raid 6 Configuration
- Option -309: 16 GB System Memory
- Option -310: 32 GB System Memory
- Option -014: 400 MHz, 14-bit A/Ds
- Option -630: 6 to 30 VDC Power Supply

Specifications subject to change without notice

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information
General Information

Optimized for SWaP (size, weight and power,) the Pentek Talon® RTR Small Form Factor (SFF) product line provides the performance and storage capacity previously only possible in much larger rackmountable chassis. Measuring 5.25” H x 8.5” W x 14” D and weighing only 17 pounds (7.7 kg), this small package can hold up to 30.6 TB of SSD storage.

Configured with 1.0 GS/sec 12-bit A/D the RTR 2548 is capable of recording the full-channel bandwidth at a 2.0 GB/sec sustained rate to disk. A 1.0 GHz 16-bit D/A allows for real-time full-bandwidth signal reproduction.

A/D and D/A sampling rates are among the GUI-selectable system parameters, providing a fully programmable system capable of recording and reproducing a wide range of signals. A built-in synchronization module is provided to allow for multichannel phase-coherent operation.

An ATX power supply accepts 110-240 VAC, drawing under 150 W and typically around 100 W. SFF Models have the option for a 6-30 VDC power supply.

Eight front panel data drives can be easily removed along with a front panel removable OS drive to allow all non-volatile memory to be removed from the system in seconds. An optional GPS receiver allows for precise GPS time and position stamping.

SystemFlow Software

All Talon Rugged Small Form Factor recorders include the Pentek SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the recorder. A user API is also included to allow custom recorder control interfaces to be easily built.

SystemFlow provides 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, spectrum analyzer and spectrogram displays.

Built on a Windows Professional workstation, all Talon SFF recorders allow the user to install post-processing and analysis tools to operate on the recorded data. The system records data to the native NTFS file system, providing immediate access to the recorded data files.

Rugged Chassis with SSD Storage

The SFF system is configured with hot-swappable SSDs, front-panel USB ports, and I/O connectors on the rear panel. It is built in a rugged steel and aluminum chassis and is tested for shock and vibration.

The SSDs provide storage capacities of up to 30.6 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels including 0, 5, and 6, provide a choice for the required level of redundancy.

A push of a button unlatches each of the data drives and the OS drive. Drives are mounted on sleds and can be easily transferred to an offload system while the recorder stays in the field.

PC and signal I/O is available on the rear panel with standard connectors.

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**Features**

- Housed in a small chassis measuring 5.25” H x 8.5” W x 14” D
- Weighs 17 lb (7.7 kg)
- Shock and vibration-resistant SSDs perform well in vehicles, ships and aircraft
- 1 GHz 12-bit A/D
- 1 GHz 16-bit D/A
- Real-time aggregate recording rate of up to 2.0 GB/sec
- 400 MHz record and playback signal bandwidth
- Recording of IF signals up to 2.0 GHz.
- Up to 30 terabytes of SSD storage to NTFS RAID solid state disk array
- RAID levels of 0, 5 and 6
- Windows® workstation with high-performance Intel® Core™ i7 processor
- SystemFlow® GUI with Signal Viewer analysis tool
- C-callable API for integration of recorder into application
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping
**SystemFlow Graphical User Interface**

The RTR 2548 GUI provides the user with a control interface for the recording system. 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 Recorder Interface**

The RTR 2548 GUI provides the user with a control interface for the recording system. 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 2548 Configure screens provide a simple and intuitive means for setting up the system parameters. The A/D configuration screen shown here, allows user entries for gate/trigger mode, gate/trigger polarity, and trigger source. 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.
Model RTR 2548
1 GS/sec RF/IF Rugged SFF Recorder

Specifications

PC Workstation (standard configuration)
Operating System: Windows workstation
Processor: Intel i7 7700K (7th Gen) quad core processor
Clock Speed: 4.2 GHz
Operating System Drive: 250 GB SSD
SDRAM: 8 GB standard, 16 GB or 32 GB optional
RAID
Total Storage: 3.8 TB – 30.6 TB
Supported RAID Levels: 0, 5 and 6
Drive Bays: Hot-swap, removable, front panel
Rear Panel I/O
Four USB 3.0 ports
Two Gigabit RJ45 ports
Two HDMI and One DVI ports
Audio and PS2 ports
USB 3.0 Type-C port
Two Wi-Fi antenna ports
Front Panel I/O
Two USB 2.0 ports
Power and recessed RESET buttons
LED indicators for power and HDD access

Analog Recording Input
Input Type: Transformer-coupled, female SSMC connector
Transformer Type: Macom ETC1-1-13TR
Full Scale Input: +10 dBm into 50 ohms
3 dB Passband: 5 MHz to 2 GHz
A/D Converter
Type: Texas Instruments ADS5400
Sampling Rate ($f_s$): 100 MHz to 1 GHz
Resolution: 12 bits
A/D Record Bandwidth: $f_s/2 = Nyquist bandwidth$
Anti-Aliasing Filters: External, user-supplied

Analog Playback Output
Output Type: Transformer-coupled, female SSMC connector
Full Scale Output: +4 dBm into 50 ohms
3 dB Passband: 300 kHz to 700 MHz
D/A Converter
Type: TI DAC5681Z
Interpolation: 1x, 2x or 4x
Input Data Rate to DAC5681Z: 500 MS/sec max.
Output Sampling Rate: 1 GHz, max.
Output IF: 700 MHz, max.
D/A Resolution: 16 bits
Clock Sources: Selectable from onboard programmable VCXO or external clock
External Clock
Type: Female SSMC connector, sine wave, 0 to +10 dBm, AC-coupled, 50 ohms, accepts 100 MHz to 1 GHz input clock or 10 MHz system reference
Internal Clock
Type: Programmable VCXO
VCXO Frequency Ranges: 100 to 945 MHz, 970 MHz to 1 GHz

Physical and Environmental
Size: 5.25” H x 8.5” W x 14.0” D
Weight: 17 lb (7.7 kg)
Operating Temp: 0° to +50° C
Storage Temp: –40° to +85° C
Relative Humidity: 5 to 95%, non-condensing
Operating Shock: 15 g max. (11 msec, half-sine wave)
Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 150 W max.

Model RTR 2548 Ordering Information and Options

Channel Configurations
Option -201 1-channel recording
Option -221 1-channel playback

Storage Options
Option -410 3.8 TB SSD storage capacity
Option -415 7.6 TB SSD storage capacity
Option -420 15.3 TB SSD storage capacity
Option -430 30.6 TB SSD storage capacity

Additional Options
Option -261 GPS Time and Position Stamping
Option -285 Raid 5 Configuration
Option -286 Raid 6 Configuration
Option -309 16 GB System Memory
Option -310 32 GB System Memory
Option -630 6 to 30 VDC Power Supply

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice
Model RTR 2548
1 GS/sec RF/IF Rugged SFF Recorder

Specifications

PC Workstation (standard configuration)
Operating System: Windows workstation
Processor: Intel i7 7700K (7th Gen) quad core processor
Clock Speed: 4.2 GHz
Operating System Drive: 250 GB SSD
SDRAM: 8 GB standard, 16 GB or 32 GB optional

RAID
- Total Storage: 3.8 TB – 30.6 TB
- Supported RAID Levels: 0, 5 and 6
- Drive Bays: Hot-swap, removable, front panel

Rear Panel I/O
- Four USB 3.0 ports
- Two Gigabit RJ45 ports
- Two HDMI and One DVI ports
- Audio and PS2 ports
- USB 3.0 Type-C port
- Two Wi-Fi antenna ports

Front Panel I/O
- Two USB 2.0 ports
- Power and recessed RESET buttons
- LED indicators for power and HDD access

Analog Recording Input
Input Type: Transformer-coupled, female SSMC connector
- Transformer Type: Macom ETC1-1-13TR
- Full Scale Input: +10 dBm into 50 ohms
- 3 dB Passband: 5 MHz to 2 GHz

A/D Converter
Type: Texas Instruments ADS5400
- Sampling Rate ($f_s$): 100 MHz to 1 GHz
- Resolution: 12 bits
- A/D Record Bandwidth: $f_s/2 = $ Nyquist bandwidth
- Anti-Aliasing Filters: External, user-supplied

Analog Playback Output
Output Type: Transformer-coupled, female SSMC connector
- Full Scale Output: +4 dBm into 50 ohms
- 3 dB Passband: 300 kHz to 700 MHz

D/A Converter
Type: TI DAC5681Z
- Interpolation: 1x, 2x or 4x
- Input Data Rate to DAC5681Z: 500 MS/sec max.
- Output Sampling Rate: 1 GHz, max.
- Output IF: 700 MHz, max.
- D/A Resolution: 16 bits

Clock Sources: Selectable from onboard programmable VCXO or external clock

External Clock
Type: Female SSMC connector, sine wave, 0 to +10 dBm, AC-coupled, 50 ohms, accepts 100 MHz to 1 GHz input clock or 10 MHz system reference

Internal Clock
Type: Programmable VCXO
- VCXO Frequency Ranges: 100 to 945 MHz, 970 MHz to 1 GHz

Physical and Environmental
Size: 5.25" H x 8.5" W x 14.0" D
Weight: 17 lb (7.7 kg)
Operating Temp: 0° to +50° C
Storage Temp: –40° to +85° C
Relative Humidity: 5 to 95%, non-condensing
Operating Shock: 15 g max. (11 msec, half-sine wave)
Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 150 W max.

Model RTR 2548 Ordering Information and Options

<table>
<thead>
<tr>
<th>Channel Configurations</th>
<th>Storage Options</th>
<th>Additional Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -201</td>
<td>Option -410</td>
<td>Option -261</td>
</tr>
<tr>
<td>Option -221</td>
<td>Option -415</td>
<td>Option -285</td>
</tr>
<tr>
<td></td>
<td>Option -420</td>
<td>Option -286</td>
</tr>
<tr>
<td></td>
<td>Option -430</td>
<td>Option -309</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Option -310</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Option -630</td>
</tr>
</tbody>
</table>

- Option -201: 1-channel recording
- Option -221: 1-channel playback
- Option -410: 3.8 TB SSD storage capacity
- Option -415: 7.6 TB SSD storage capacity
- Option -420: 15.3 TB SSD storage capacity
- Option -430: 30.6 TB SSD storage capacity
- Option -261: GPS Time and Position Stamping
- Option -285: Raid 5 Configuration
- Option -286: Raid 6 Configuration
- Option -309: 16 GB System Memory
- Option -310: 32 GB System Memory
- Option -630: 6 to 30 VDC Power Supply

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice

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www.pentek.com
Model RTR 2549

3.6 GS/sec Ultra Wideband RF/IF Rugged SFF Recorder

General Information

Optimized for SWaP (size, weight and power,) the Pentek Talon® RTR Small Form Factor (SFF) product line provides the performance and storage capacity previously only possible in much larger rackmountable chassis. Measuring 5.25” H x 8.5” W x 14” D and weighing only 17 pounds (7.7 kg), this small package can hold up to 30.6 TB of SSD storage.

The RTR 2549 uses 12-bit, 3.6 GHz A/D converters. It can be configured as a one- or two-channel system and can record sampled data, packed as 8-bit or 16-bit-wide consecutive samples (12-bit digitized samples residing in the 12 MSBs of the 16-bit word). A high-speed RAID array provides a maximum streaming recording rate to disk of 4.0 GB/sec.

An ATX power supply accepts 110-240 VAC, drawing under 150 W and typically around 100 W. SFF Models have the option for a 6-30 VDC power supply.

Eight front panel data drives can be easily removed along with a front panel removable OS drive to allow all non-volatile memory to be removed from the system in seconds. Optional GPS time and position stamping allows the user to capture this critical information in the header of each data file.

SystemFlow Software

All Talon Rugged Small Form Factor recorders include the Pentek SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the recorder. A user API is also included to allow custom recorder control interfaces to be easily built.

SystemFlow provides 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, spectrum analyzer and spectrogram displays.

Built on a Windows Professional workstation, all Talon SFF recorders allow the user to install post-processing and analysis tools to operate on the recorded data. The system records data to the native NTFS file system, providing immediate access to the recorded data files.

Rugged Chassis with SSD Storage

The SFF system is configured with hot-swappable SSDs, front-panel USB ports, and I/O connectors on the rear panel. It is built in a rugged steel and aluminum chassis and is tested for shock and vibration.

The SSDs provide storage capacities of up to 30.6 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels including 0, 5, and 6, provide a choice for the required level of redundancy.

A push of a button unlatches each of the data drives and the OS drive. Drives are mounted on sleds and can be easily transferred to an offload system while the recorder stays in the field.

PC and signal I/O is available on the rear panel with standard connectors.

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Features

- Housed in a small chassis measuring 5.25” H x 8.5” W x 14” D
- Weighs 17 lb (7.7 kg)
- Shock and vibration-resistant SSDs perform well in vehicles, ships and aircraft
- Sample rates up to 3.6 GHz in single-channel mode
- Sample rates up to 1.8 GHz in dual-channel mode
- Capable of recording RF/IF frequencies to 1.75 GHz in single-channel mode
- Capable of recording RF/IF frequencies to 2.8 GHz in dual-channel mode
- 12-bit A/D, with 16-bit and 8-bit packing modes
- Real-time aggregate recording rate of up to 4.0 GB/sec
- Up to 30 terabytes of SSD storage to NTFS RAID solid state disk array
- Windows® workstation with high-performance Intel® Core™ i7 processor
- SystemFlow® GUI with Signal Viewer analysis tool
- C-callable API for integration of recorder into application
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping
SystemFlow Graphical User Interface

The RTR 2549 GUI provides the user with a control interface for the recording system. 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, playback 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 Recorder Interface

The RTR 2549 GUI provides the user with a control interface for the recording system. 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, playback 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 2549 Configure screens provide a simple and intuitive means for setting up the system parameters. The configuration screen shown here, allows user entries for input source, sampling frequency, 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.
Specifications

PC Workstation (standard configuration)
Operating System: Windows workstation
Processor: Intel i7 7700K (7th Gen) quad core processor
Clock Speed: 4.2 GHz
Operating System Drive: 250 GB SSD
SDRAM: 8 GB standard, 16 GB or 32 GB optional
RAID
  Total Storage: 3.8 TB – 30.6 TB
  Supported RAID Levels: 0, 5 and 6
  Drive Bays: Hot-swap, removable, front panel
Rear Panel I/O
  Four USB 3.0 ports
  Two Gigabit RJ45 ports
  Two HDMI and One DVI ports
  Audio and PS2 ports
  USB 3.0 Type-C port
  Two Wi-Fi antenna ports
Front Panel I/O
  Two USB 2.0 ports
  Power and recessed RESET buttons
  LED indicators for power and HDD access

Analog Signal Inputs
  Connectors: Two rear panel SSMC connectors, In 1 & In 2
  Input Type: Single-ended, non-inverting
  Full Scale Input: +4 dBm into 50 ohms
  Coupling: Transformer-coupled
  Analog Input Transformers:
    Bandwidth: 4.5 kHz to 3.0 GHz
A/D Converters
  Type: Texas Instruments ADC12D1800
  Sampling Rate:
    Single-channel mode: 500 MHz to 3.6 GHz
    Dual-channel mode: 150 MHz to 1.8 GHz
  Resolution: 12 bits
  Maximum Usable Input Frequency
    Single-channel mode: 1.75 GHz
    Dual-channel mode: 2.8 GHz
  Anti-Aliasing Filters: External, user-supplied

Digital Downconverters
  Modes: One or two channels, programmable
  Supported Sample Rate ($f_s$):
    One-channel mode: 3.6 GHz
    Two-channel mode: 1.8 GHz
  Decimation Range ($D$):
    One-channel mode: 8x, 16x, 32x, bypass
    Two-channel mode: 4x, 8x, 16x, bypass
  Usable Output Bandwidth: $0.8f_s/D$

Physical and Environmental
  Size: 5.25” H x 8.5” W x 14.0” D
  Weight: 17 lb (7.7 kg)
  Operating Temp: 0° to +50° C
  Storage Temp: -40° to +85° C
  Relative Humidity: 5 to 95%, non-condensing
  Operating Shock: 15 g max. (11 msec, half-sine wave)
  Operating Vibration: 10 to 20 Hz: 0.02 inch peak,
  20 to 500 Hz: 1.4 g peak acceleration
  Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 150 W max.

Storage Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Storage Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>-415</td>
<td>7.6 TB SSD</td>
</tr>
<tr>
<td>-420</td>
<td>15.3 TB SSD</td>
</tr>
<tr>
<td>-430</td>
<td>30.6 TB SSD</td>
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</tbody>
</table>

Additional Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>-261</td>
<td>GPS Time and Position Stamping</td>
</tr>
<tr>
<td>-285</td>
<td>Raid 5 Configuration</td>
</tr>
<tr>
<td>-286</td>
<td>Raid 6 Configuration</td>
</tr>
<tr>
<td>-309</td>
<td>16 GB System Memory</td>
</tr>
<tr>
<td>-310</td>
<td>32 GB System Memory</td>
</tr>
<tr>
<td>-630</td>
<td>6 to 30 VDC Power Supply</td>
</tr>
</tbody>
</table>

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
Model RTS 2715

10-Gigabit Ethernet Rackmount Recorder

General Information

The Talon® RTS 2715 is a complete turn-key recording system for storing one or two ten-gigabit Ethernet (10GbE) streams. It is ideal for capturing any type of streaming sources including live transfers from sensors or data from other computers and supports both TCP and UDP protocols.

Using highly-optimized disk storage technology, the system achieves aggregate recording rates up to 1.6 GB/sec.

Rear panel SFP+ connectors accommodate copper, multi-mode or single-mode fibre interfaces.

Optional GPS time and position stamping accurately identifies each record in the file header.

SystemFlow Software

The RTS 2715 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple and intuitive means to configure and control the system.

Custom configurations can be stored as profiles and later loaded as needed, allowing the user to select preconfigured settings with a single click.

Features

- Records 10-gigabit Ethernet streams
- TCP and UDP protocols
- Copper or optical 10GbE interfaces
- Aggregate recording rates to 1.6 GB/sec
- 4U or 5U 19-inch industrial rackmount PC server chassis
- Windows® 7 Professional workstation with a high performance Intel® Core™ i7 processor
- Up to 100 terabytes storage to NTFS RAID disk array
- RAID levels of 0, 1, 5, 6, 10 and 50
- SystemFlow® GUI virtual instrumentation panel for fast, intuitive operation
- C-callable API for integration of recorder into applications
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping

Built on a server-class Windows 7 Professional workstation, the RTS 2715 allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTS 2715 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via two gigabit Ethernet ports or six USB 2.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

Flexible Architecture

The RTS 2715 is configured in a 4U or 5U 19" rack-mountable chassis, with hot-swap data drives, front panel USB ports and I/O connectors on the rear panel.

Systems are scalable to accommodate multiple chassis 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. The hot-swappable HDDs provide storage capacities of up to 100 TB in a single 6U chassis.

Contact factory for options, number of channels, recording rates, and disk capacity.
SystemFlow Main Interface
The RTS 2715 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface
The Configure screen presents operational system parameters including temperature and voltages. Parameters are entered for each input or output channel specifying UDP or TCP protocol, client or server connection, the IP address and port number. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Record Interface
The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress.
**SystemFlow API**

SystemFlow includes a complete API (Application Programming Interface) supporting control and status queries of all operations of the RTS 2715 from a custom application.

High-level C-language function calls and the supporting device drivers allow users to incorporate the RTS 2715 as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

**Specifications**

**PC Workstation**

- **Operating System:** Windows 7 Professional
- **Processor:** Intel Core i7 processor
- **Clock Speed:** 3.0 GHz or higher
- **SDRAM:** 8 GB
- **RAID**
  - Storage: 2–100 TB
  - Drive Type: Hard disk drives
- **Supported Levels:** 0, 1, 5, 6, 10 and 50

**Physical and Environmental**

- **Dimensions**
  - 4U Long Chassis: 19” W x 26” D x 7” H
  - 5U Long Chassis: 19” W x 26” D x 8.75” H
- **Weight:** 50–80 lb
- **Operating Temp:** +5° to +45° C
- **Storage Temp:** –40° to +85° C
- **Relative Humidity:** 5 to 95%, non-condensing
- **Power Requirements:** 100 to 240 VAC, 50 to 60 Hz, 500 W max.

**Interface Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-101</td>
<td>Gigabit Ethernet</td>
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<tr>
<td>-102</td>
<td>10-Gigabit Ethernet</td>
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**Channel Configuration**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-201</td>
<td>1-Ethernet port</td>
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<tr>
<td>-202</td>
<td>2-Ethernet ports</td>
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<tr>
<td>-204</td>
<td>4-Ethernet ports</td>
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<tr>
<td>-208</td>
<td>8-Ethernet ports</td>
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</table>

**10GbE Interface**

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<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-280</td>
<td>SFP+ connectors</td>
</tr>
<tr>
<td>-281</td>
<td>Multi-mode optical, LC connectors</td>
</tr>
<tr>
<td>-282</td>
<td>Single-mode optical, LC connectors</td>
</tr>
<tr>
<td>-284</td>
<td>RJ45 Connector</td>
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**Storage Options**

<table>
<thead>
<tr>
<th>Option</th>
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</thead>
<tbody>
<tr>
<td>-406</td>
<td>2.0 TB HDD storage capacity</td>
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<td>-411</td>
<td>4.0 TB HDD storage capacity</td>
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<td>8.0 TB HDD storage capacity</td>
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<td>-421</td>
<td>16.0 TB HDD storage capacity</td>
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<td>-423</td>
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<td>-439</td>
<td>30.0 TB HDD storage capacity</td>
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<td>-450</td>
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<td>-460</td>
<td>60.0 TB HDD storage capacity</td>
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<td>-480</td>
<td>100.0 TB HDD storage capacity</td>
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**General Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-261</td>
<td>GPS time &amp; position stamping</td>
</tr>
<tr>
<td>-264</td>
<td>IRIG-B time stamping</td>
</tr>
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</table>

Contact Pentek for compatible Option combinations

Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice
The Talon® RTR 2755 is a complete turn-key recording system for storing 10-Gigabit Ethernet (10GbE) streams. It is ideal for capturing any type of streaming sources including live transfers from sensors or data from other computers and supports both TCP and UDP protocols.

Using highly-optimized disk storage technology, the system guarantees loss-free performance at aggregate recording rates up to 4.0 GB/sec.

Two rear panel SFP+ LC connectors for 850 nm multi-mode or single-mode fibre cables, or CX4 connectors for copper twinax cables accommodate all popular 10GbE interfaces.

Optional GPS time and position stamping accurately identifies each record in the file header.

SystemFlow Software

The RTR 2755 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple and intuitive means to configure and control the system.

Custom configurations can be stored as profiles and later loaded as needed, allowing the user to select preconfigured settings with a single click.

Built on a server-class Windows 7 Professional workstation, the RTR 2755 allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTR 2755 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via two gigabit Ethernet ports or six USB 2.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

Rugged and Flexible Architecture

Because SSDs operate reliably under conditions of shock and vibration, the RTR 2755 performs well in ground, shipborne and airborne environments. The hot-swappable SSDs provide storage capacity of up to 46 TB. The drives can be easily removed or exchanged during or after a mission to retrieve recorded data.

The RTR 2755 is configured in a 4U 19” rack-mountable chassis, with hot-swap data drives, front panel USB ports and I/O connectors on the rear panel.

Systems are scalable to accommodate multiple chassis 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.

Features

- Designed to operate under conditions of shock and vibration
- Records 10-Gigabit Ethernet streams
- TCP and UDP protocols
- Copper or optical 10GbE interfaces
- Aggregate recording rates to 4.0 GB/sec
- Removable SSD drives
- 4U short 19-inch rugged rackmount PC server chassis
- Windows® 7 Professional workstation with high-performance Intel® Core™ i7 processor
- Up to 46 terabytes of storage to NTFS RAID solid state disk array
- RAID levels of 0, 1, 5, 6, 10 and 50
- SystemFlow® GUI virtual instrumentation panel for fast, intuitive operation
- C-callable API for integration of recorder into applications
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping

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

Model RTR 2755

10-Gigabit Ethernet Rugged Rackmount Recorder
SystemFlow Graphical User Interface

SystemFlow Main Interface
The RTR 2755 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface
The Configure screen presents operational system parameters including temperature and voltages. Parameters are entered for each input or output channel specifying UDP or TCP protocol, client or server connection, the IP address and port number. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Record Interface
The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress.
## SystemFlow API

SystemFlow includes a complete API (Application Programming Interface) supporting control and status queries of all operations of the RTR 2755 from a custom application. High-level C-language function calls and the supporting device drivers allow users to incorporate the RTR 2755 as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

### Specifications

#### PC Workstation

<table>
<thead>
<tr>
<th>Operating System: Windows 7 Professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor: Intel Core i7 processor</td>
</tr>
<tr>
<td>Clock Speed: 3.0 GHz or higher</td>
</tr>
<tr>
<td>SDRAM: 8 GB</td>
</tr>
<tr>
<td>RAID</td>
</tr>
<tr>
<td>Storage: 3.8, 7.6, 15.3, 30.7 or 46.0 TB</td>
</tr>
<tr>
<td>Drive Type: Solid-state drive</td>
</tr>
<tr>
<td>Supported Levels: 0, 1, 5, 6, 10 and 50</td>
</tr>
</tbody>
</table>

#### 10-Gigabit Ethernet Interface

<table>
<thead>
<tr>
<th>Option 280: SFP+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity: 2 ports</td>
</tr>
<tr>
<td>Connector Type: SFP+</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option 281: Multi-mode Fibre Optical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity: 2 ports</td>
</tr>
<tr>
<td>Cable: Multi-mode fibre, 850 nm</td>
</tr>
<tr>
<td>Connector Type: LC</td>
</tr>
<tr>
<td>Max. Cable Length: Up to 300 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option 282: Single-mode Fibre Optical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity: 2 ports</td>
</tr>
<tr>
<td>Cable: Single-mode fibre, 1310 nm</td>
</tr>
<tr>
<td>Connector Type: LC</td>
</tr>
<tr>
<td>Max Cable Length: Up to 10 km</td>
</tr>
</tbody>
</table>

### Physical and Environmental

<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>4U Short Chassis: 19” W x 21” D x 7” H</td>
</tr>
<tr>
<td>Weight: 50 lb, approx.</td>
</tr>
<tr>
<td>Operating Temp: 0° to +50° C</td>
</tr>
<tr>
<td>Storage Temp: -40° to +85° C</td>
</tr>
<tr>
<td>Relative Humidity: 5 to 95%, non-condensing</td>
</tr>
<tr>
<td>Operating Shock: 15 g max. (11 msec, half sine wave)</td>
</tr>
<tr>
<td>Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration</td>
</tr>
<tr>
<td>Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.</td>
</tr>
</tbody>
</table>

### Interface Options

<table>
<thead>
<tr>
<th>Option -101</th>
<th>Gigabit Ethernet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -102</td>
<td>10-Gigabit Ethernet</td>
</tr>
</tbody>
</table>

### Channel Configuration

<table>
<thead>
<tr>
<th>Option -201</th>
<th>1-Ethernet port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -202</td>
<td>2-Ethernet ports</td>
</tr>
<tr>
<td>Option -204</td>
<td>4-Ethernet ports</td>
</tr>
<tr>
<td>Option -208</td>
<td>8-Ethernet ports</td>
</tr>
</tbody>
</table>

**Note:** Option -208 available only with Option -101

### 10GbE Interface

<table>
<thead>
<tr>
<th>Option -280</th>
<th>SFP+ connectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -281</td>
<td>Multi-mode optical, LC connectors</td>
</tr>
<tr>
<td>Option -282</td>
<td>Single-mode optical, LC connectors</td>
</tr>
</tbody>
</table>

### Storage Options

<table>
<thead>
<tr>
<th>Option -410</th>
<th>3.8 TB SSD storage capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -415</td>
<td>7.6 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -420</td>
<td>15.3 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -430</td>
<td>30.7 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -440</td>
<td>46.0 TB SSD storage capacity</td>
</tr>
</tbody>
</table>

**Note:** Options -430 and 440 require a 26-inch deep chassis

### General Options (append to all options)

<table>
<thead>
<tr>
<th>Option -261</th>
<th>GPS time and position stamping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -264</td>
<td>IRIG-B Time Stamping</td>
</tr>
</tbody>
</table>

Contact Pentek for other configurations

Storage and Channel-count Options may change, contact Pentek for the latest information
**General Information**

The Talon® RTX 2775 is a turnkey record and playback system that is built to operate under harsh conditions. Designed to withstand high vibration and operating temperatures, the RTX 2775 is intended for military, airborne and UAV applications requiring a rugged system.

The RTX 2775 records one or two 10-gigabit Ethernet (10GbE) streams; it is ideal for capturing any type of streaming sources, including live transfers from sensors or data from other computers, and supports both TCP and UDP protocols.

Using highly-optimized disk storage technology, the system guarantees loss-free performance at aggregate recording rates up to 4.0 GB/sec.

Two rear panel SFP+ LC connectors for 850 nm multi-mode or single-mode fibre cables, or CX4 connectors for copper twinax cables accommodate all popular 10GbE interfaces.

Optional GPS time and position stamping accurately identifies each record in the file header.

**SystemFlow Software**

The RTX 2775 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple and intuitive means to configure and control the system.

Custom configurations can be stored as profiles and later loaded as needed, allowing the user to select preconfigured settings with a single click.

Built on a server-class Windows 7 Professional workstation, the RTX 2775 allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTX 2775 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via two rear-access gigabit Ethernet ports, two USB 3.0 ports or up to four USB 2.0 ports.

**Rugged Mil-Spec Chassis**

The Talon RTX 2775 uses a shock- and vibration-isolated inner chassis and solid-state drives to assure reliability under harsh conditions. The chassis uses an in-line EMI filter along with rear-panel MIL-style connectors to meet MIL-STD-461 emissions specifications.

Up to four front-panel removable QuickPac drive canisters are provided, each containing up to eight SSDs. Each drive canister can hold up to 7.6 TB of data storage and allows for quick and easy removal of mission-critical data.

Forced-air cooling draws air from the front of the chassis and pushes it out the back via exhaust fans. A hinged front door with a serviceable air filter provides protection against dust and sand.

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**Features**

- Designed to meet MIL-STD-810 shock and vibration
- Designed to meet EMC/EMI per MIL-STD-461 EMC
- 4U 19-inch rugged rackmount PC server chassis, 22” deep
- Windows® 7 Professional workstation with high-performance Intel® Core™ i7 processor
- Records 10-gigabit Ethernet streams
- One or two channels
- TCP and UDP protocols
- Copper or optical 10GbE interfaces
- Real-time aggregate recording rates up to 4.0 GB/sec
- Up to four front-panel removable QuickPac SSD drive canisters with eight drives each
- Up to 30 terabytes of storage to NTFS RAID disk array
- SystemFlow® GUI virtual instrumentation panel for fast, intuitive operation
- C-callable API for integration of recorder into application
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping

---

**Model RTX 2775**

![Model RTX 2775 Diagram](image-url)
SystemFlow Graphical User Interface

The RTX 2775 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Main Interface

The RTX 2775 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface

The Configure screen presents operational system parameters including temperature and voltages. Parameters are entered for each input or output channel specifying UDP or TCP protocol, client or server connection, the IP address and port number. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Record Interface

The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress.
SystemFlow API

SystemFlow includes a complete API (Application Programming Interface) supporting control and status queries of all operations of the RTR 2755 from a custom application. High-level C-language function calls and the supporting device drivers allow users to incorporate the RTR 2755 as a high-performance server front-end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

Specifications

PC Workstation (standard configuration)

- Operating System: Windows 7 Professional
- Processor: Intel Core i7 processor
- Clock Speed: 3.0 GHz or higher
- SDRAM: 8 GB

Data Storage

- Style: Up to four front-panel removable QuickPac drive canisters; up to eight SSDs contained in each canister
- Location: Front panel
- Capacity: Up to 30 TB
- Number of Drives: Up to 32 total
- Supported RAID Levels: 0, 1, 5 and 6

Ten-Gigabit Ethernet Interface

- Option 280: SFP+
  - Quantity: 2 ports
  - Connector Type: SFP+
- Option 281: Multi-mode Fibre Optical
  - Quantity: 2 ports
  - Cable: Multi-mode fibre, 850 nm
  - Connector Type: LC
  - Max. Cable Length: Up to 300 m
- Option 282: Single-mode Fibre Optical
  - Quantity: 2 ports
  - Cable: Single-mode fibre, 1310 nm
  - Connector Type: LC
  - Max. Cable Length: Up to 10 km

Physical and Environmental

- Dimensions: 19” W x 22” D x 7” H
- Weight: 50 lb, approx.
- Operating Temp: –20° to +50° C
- Storage Temp: –40° to +85° C
- Relative Humidity: 10% to 95%, non-condensing
- Operating Shock: Designed to MIL-STD 810F, method 514.5, procedures I and VI
- Operating Vibration: Designed to MIL-STD 810F, method 514.5, procedure I
- EMI/EMC: Designed to MIL-STD 461E, CE101, CE102, CS101, CS113, RE101, RE102, RS101, RS103
- Input Power: 85 to 264 VAC, 47–400 Hz, 600 W max.

Model RTX 2775 Ordering Information and Options

<table>
<thead>
<tr>
<th>Interface Options</th>
<th>Storage Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -101 Gigabit</td>
<td>Option -410 3.8 TB SSD</td>
</tr>
<tr>
<td>Option -102 10Gigabit Ethernet</td>
<td>Option -415 7.6 TB SSD</td>
</tr>
<tr>
<td>Option -201 1-Ethernet port</td>
<td>Option -418 11.5 TB SSD</td>
</tr>
<tr>
<td>Option -202 2-Ethernet ports</td>
<td>Option -420 15.3 TB SSD</td>
</tr>
<tr>
<td>Option -204 4-Ethernet ports</td>
<td>Option -425 23.0 TB SSD</td>
</tr>
<tr>
<td>Option -208 8-Ethernet ports</td>
<td>Option -430 30.7 TB SSD</td>
</tr>
<tr>
<td>Note: Option -208 available only with Option -101</td>
<td></td>
</tr>
</tbody>
</table>

10GbE Interface

- Option -280 SFP+ connectors
- Option -281 Multi-mode optical, LC connectors
- Option -282 Single-mode optical, LC connectors

General Options (append to all options)

- Option -261 GPS time and position stamping
- Option -264 IRIG-B Time Stamping
- Option -680 28 VDC power supply
- Option -625 Front-panel removable OS drive

Contact Pentek for other configurations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
General Information

The Talon® RTR 2735A can accommodate multiple Ethernet datastreams. It is ideal for capturing any type of streaming sources including live transfers from sensors or data from other computers and supports both TCP and UDP protocols.

The RTR 2735A can accommodate gigabit, 10-gigabit and 40-gigabit Ethernet interfaces.

Using highly-optimized disk storage technology, the system achieves aggregate recording rates up to 4.0 GB/sec.

Rear panel SFP+ or RJ45 connectors accommodate copper, multi-mode or single-mode fibre interfaces.

Optional GPS time and position stamping allows the user to mark the beginning of a recording in the recording file’s header.

SystemFlow Software

The RTR 2735A includes the Pentek SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple and intuitive means to configure and control the system.

Custom configurations can be stored as profiles and later loaded as needed, allowing the user to select preconfigured settings with a single click.

Features

- Designed to operate under conditions of shock and vibration
- Portable system measuring 16.0” W x 6.9” D x 13.0” H
- Lightweight, approximately 25 pounds
- Shock- and vibration-resistant SSDs perform well in vehicles, ships and aircraft
- Records gigabit, 10-gigabit or 40-gigabit Ethernet streams
- TCP and UDP protocols
- Copper or optical interfaces
- Aggregate recording rates to 4.0 GB/sec
- Windows workstation with a high performance Intel® Core™ i7 processor
- Up to 61 terabytes of SSD storage to NTFS RAID solid state disk array
- Multiple RAID levels, including 0, 5, and 6,
- SystemFlow® GUI with Signal Viewer analysis tool
- C-callable API for integration of recorder into applications
- Optinal file headers include time stamping and recording parameters
- Optional GPS time and position stamping
- Optional 10–36 VDC power supply

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

Built on a server-class Windows Server 2016 workstation, the RTR 2735A allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTR 2735A records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via gigabit Ethernet, USB 2.0 and USB 3.0 ports. Additionally, data can be copied to optical disk using the 8X double layer DVD+R/RW drive.

Option -625 replaces the DVD+R/RW drive with a removable operating system drive; an external DVD drive can be used.

Rugged Chassis with SSD Storage

The RTR 2735A is configured with hot-swappable SSDs, front panel USB ports, and I/O connectors on the side panel. It is built in an extremely rugged steel and aluminum chassis and is tested for shock and vibration.

The SSDs provide storage capacities of up to 61,4 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels, including 0, 5, and 6, provide a choice for the required level of redundancy.

Contact factory for options, number of channels, recording rates, and disk capacity.
SystemFlow Main Interface

The RTR 2735A GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface

The Configure screen presents operational system parameters including temperature and voltages. Parameters are entered for each input or output channel specifying UDP or TCP protocol, client or server connection, the IP address and port number. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Record Interface

The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress.
SystemFlow API

SystemFlow includes a complete API (Application Programming Interface) supporting control and status queries of all operations of the RTR 2735A from a custom application.

High-level C-language function calls and the supporting device drivers allow users to incorporate the RTR 2735A as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

Specifications

PC Workstation (standard configuration)
- Operating System: 64-bit Windows workstation
- Processor: Intel Core i7 processor
- Clock Speed: 3.0 GHz or higher
- Operating System Drive: 250 GB SSD
- SDRAM: 8 GB standard, optionally up to 64 GB
- Monitor: Built-in 17.3” high-resolution LCD, 1920 x 1080 pixels, 16:9 aspect ratio, anti-glare surface
- Brightness: 300 cd/m²; Contrast ratio: 400:1 typical
- RAID
  - Storage: 3.8 to 61.4 TB
  - Drive Type: Solid-state drives
  - Supported RAID Levels: 0, 5, and 6
  - Drive Bays: Hot-swap, removable, side panel
- USB 2.0 Ports: Four on left side, two on front panel
- USB 3.0 Ports: Two on left side
- 1 Gb Ethernet Ports: Two on left side
- Aux Video Output: 15-pin VGA on left side

Optional DC Power supply
- Voltage: 10 to 36 VDC
- Input Current: 42 to 26 A (39 A at 24 VDC)
- Inrush Current: 100 A at 24 VDC
- Temperature Range: Oper.: 0° to 50° C, Store: -0° to 80° C
- Efficiency: >80% typical at 24 V full load
- Power Good Signal: On delay 100 to 500 msec
- OverPower Protection: 110% to 160%
- Remote Control: On/Off
- Safety: Meets UL, TUV, CB specifications

Physical and Environmental
- Size: 16.0” W x 6.9” D x 13.0” H
- Weight: 30 lb max.
- Operating Temp: 0° to +50° C
- Storage Temp: -40° to +85° C
- Relative Humidity: 5 to 95%, non-condensing
- Operating Shock: 30 g max. (11 msec, half-sine wave)
- Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
- Non-operating Vibration: 5 to 500 Hz: 2.06 g RMS
- Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Model RTR 2735A Ordering Information and Options

Interface Options
- Option -101: Gigabit Ethernet
- Option -102: 10-Gigabit Ethernet
- Option -103: 40-Gigabit Ethernet

Channel Configuration
- Option -201: 1-Ethernet port
- Option -202: 2-Ethernet ports
- Option -204: 4-Ethernet ports
- Option -208: 8-Ethernet ports

10GBE Interfaces available with Option -102
- Option -280: SFP+ connectors
- Option -281: Multi-mode optical, LC connectors
- Option -282: Single-mode optical, LC connectors
- Option -284: RJ45 Connector

Storage Options
- Option -410: 3.8 TB SSD storage capacity
- Option -415: 7.6 TB SSD storage capacity
- Option -420: 15.3 TB SSD storage capacity
- Option -430: 30.7 TB SSD storage capacity
- Option -460: 61.4 TB SSD Storage Capacity

Additional Options
- Option -261: GPS Time & Position Stamping
- Option -264: IRIG-B Time Stamping
- Option -285: RAID 5 Configuration
- Option -286: RAID 6 Configuration
- Option -309: 16 GB System Memory
- Option -311: 64 GB System Memory
- Option -625: Removable Operating System Drive
- Option -681: 10 to 36 VDC Power Supply

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice

Model RTR 2735A 1-, 10-, 40-Gigabit Portable Ethernet Recorder
Model RTV 2602

Serial FPDP Rackmount Value Recorder

General Information

The Talon® RTV 2602 Serial FPDP Value Recorder is designed to provide a low-cost solution to users looking to capture and play back multiple Serial FPDP streams. It can record up to four Serial FPDP channels to the built-in 4 TB RAID consisting of cost-effective, enterprise-class HDD storage. It is a complete turnkey recording system, ideal for capturing any type of streaming sources. These include live transfers from sensors or data from other computers and is fully compatible with the VITA 17.1 specification.

Like all Talon recorders in the RTV Value Recorder series, the RTV 2602 ships from stock allowing users to be up and running in the field just days after purchase.

The RTV 2602 comes in a 4U 19 in. rack-mount package that is 22.75 in. deep. Signal I/O is provided in the rear of the unit, while the hot-swappable data drives are available in the front. Air is pulled through the system from front to back to allow operation at ambient temperatures from 5° to 35° C.

The RTV 2606 can be populated with up to four SFP connectors supporting Serial FPDP over copper, single-mode, or multi-mode fiber, to accommodate all popular Serial FPDP interfaces. It is capable of both receiving and transmitting data over these links and supports real-time data storage to disk.

Programmable modes include flow control in both receive and transmit directions, CRC support, and copy/loop modes. The system is capable of handling 1.0625, 2.125, 2.5, 3.125 and 4.25 GBaud link rates. Up to four channels can be recorded simultaneously with an aggregate recording rate of up to 400 MB/sec.

As an option, a GPS or IRIG receiver card can be supplied with the system providing accurate time stamping of recorded data. Additionally, the GPS receiver delivers GPS position information that can be recorded along with the input signals.

SystemFlow Software and API

The RTV 2602 includes the Pentek SystemFlow recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the recorder.

Custom configurations can be stored as profiles and later loaded when needed, so users can select preconfigured settings with a single click.

In addition to the GUI, the RTV 2602 provides a C-callable API that allows the user to integrate the recorder control into any application. A simple set of commands that provide configuration and control come with source code and examples to allow for an exceptionally fast integration.
SystemFlow Graphical User Interface

The RTV 2602 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Main Interface

The Configure screen presents operational system parameters including temperature and voltages. Parameters are entered for each input or output channel specifying the flow control settings and the recognition of a CRC in the data stream. Each channel can also be set up to utilize Serial FPDP’s copy/loop mode. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Hardware Configuration Interface

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified and monitoring functions inform the operator of recording progress.

SystemFlow Record Interface

The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem such as a disk full condition.
➤ **System Architecture**

Built on a Windows 7 Professional workstation, the RTV 2602 allows the user to install post-processing and analysis tools to operate on the recorded data. The recorder stores data in the native NTFS file system, providing immediate access to any installed Windows application. Alternately, the NTFS drive can be accessed remotely over the built-in gigabit Ethernet link from a remote Windows or Linux machine.

Recorded data can be off-loaded via the rear-panel gigabit Ethernet port, two front-panel USB 3.0 ports, two rear-panel USB 3.0 ports or four rear-panel USB 2.0 ports. A built-in DVD +/- R/RW drive allows the user to burn recorded data to disk. Hot-swappable front-panel drives can be easily removed and replaced with empty drives to provide additional data storage.

**Specifications**

**PC Workstation (standard configuration)**

- **Operating System:** Windows 7 Professional
- **Processor:** Intel Core i3 processor
- **Clock Speed:** 2.0 GHz or higher
- **SDRAM:** 8 GB
- **RAID**
  - **Storage:** 4 TB
  - **Number of Drives:** Six, removable, front panel access
  - **Optical Drive:** DVD+/ - R/RW, front panel access
  - **USB Ports:** Front panel: Two USB 3.0; rear panel:
    - Two USB 3.0; Four USB 2.0
  - **Ethernet:** Single 1GbE, rear panel
  - **Supported RAID Levels:** 0

**Serial FPDP Interface**

- **Copper - Option 280**
  - **Cable:** 100-ohm shielded twin-ax
  - **Connector Type:** SFP+
  - **Max. Cable Length:** 20 m
- **Multi-mode Fiber Optical - Option 281**
  - **Cable:** Multi-mode fiber, 850 nm
  - **Connector Type:** LC
  - **Max. Cable Length:** Up to 300 m
- **Single-mode Fiber Optical - Option 282**
  - **Cable:** Single-mode fiber
  - **Connector Type:** LC
  - **Max. Cable Length:** Up to 10 km

**Physical and Environmental**

- **Size:** 19” W x 22.75” D x 7” H
- **Weight:** 50 lbs
- **Operating Temp:** +5° to +35° C
- **Storage Temp:** –40° to +85° C
- **Relative Humidity:** 5 to 95%, non-condensing
- **Power Requirements:** 100 to 240 VAC, 50 to 60 Hz, 500 W max.

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**Model RTV 2602 Options Information**

<table>
<thead>
<tr>
<th>General Options</th>
<th>Serial FPDP Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -261</td>
<td>Option -280  SFP+ connectors</td>
</tr>
<tr>
<td>GPS time &amp; position stamping</td>
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</tr>
<tr>
<td>Option -264</td>
<td>Option -282  Single-mode optical, LC connectors</td>
</tr>
<tr>
<td>IRIG-B time stamping</td>
<td></td>
</tr>
</tbody>
</table>

Specifications are subject to change without notice
General Information

The Talon® RTS 2716 is a complete turn-key recording system capable of recording and playing multiple Serial FPDP data streams. It is ideal for capturing any type of streaming sources including live transfers from sensors or data from other computers and is fully compatible with the VITA 17.1 specification. Using highly-optimized disk storage technology, the system achieves aggregate recording rates up to 1.6 GB/sec.

The RTS 2716 can be populated with up to eight SFP connectors supporting Serial FPDP over copper, single-mode, or multi-mode fiber, to accommodate all popular Serial FPDP interfaces. It is capable of both receiving and transmitting data over these links and supports real-time data storage to disk.

Programmable modes include flow control in both receive and transmit directions, CRC support, and copy/loop modes. The system is capable of handling 1.0625, 2.125, 2.5, 3.125 and 4.25 GBaud link rates supporting data transfer rates of up to 420 MB/sec per Serial FPDP link.

Optional GPS time and position stamping allows the user to mark the beginning of a recording in the recording file’s header.

SystemFlow Software

The RTS 2716 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple and intuitive means to configure and control the system.

Custom configurations can be stored as profiles and later loaded as needed, allowing the user to select preconfigured settings with a single click.

Built on a server-class Windows 7 Professional workstation, the RTS 2716 allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTS 2716 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be offloaded via two gigabit Ethernet ports or six USB 2.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD+R/RW drive.

Flexible Architecture

The RTS 2716 is configured in a 4U or 5U 19” rack-mountable chassis, with hot-swap data drives, front panel USB ports and I/O connectors on the rear panel.

Systems are scalable to accommodate multiple chassis 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. The hot-swappable HDDs provide storage capacities of up to 100 TB in a single 6U chassis.

Features

- Complete Serial FPDP record and playback system
- Up to eight I/O channels in a single 4U or 5U 19” inch industrial rackmount PC server chassis
- Supports Flow Control, CRC, and Copy/Loop Mode as a receiver and transmitter
- Supports 1.0625, 2.125, 2.5, 3.125 and 4.25 GBaud link rates
- Copper, single-mode and multi-mode fiber interfaces available
- Real-time aggregate recording rates of up to 1.6 GB/sec
- Up to 100 terabytes of storage to NTFS RAID disk array
- RAID levels of 0, 1, 5, 6, 10 and 50
- SystemFlow® GUI virtual instrumentation panel for fast, intuitive operation
- C-callable API for integration of recorder into application
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping
- Windows® 7 Professional workstation with high performance Intel® Core™ i7 processor

Contact factory for options, number of channels, recording rates, and disk capacity.
SystemFlow Graphical User Interface

The RTS 2716 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Main Interface

The RTS 2716 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface

The Configure screen presents operational system parameters including temperature and voltages. Parameters are entered for each input or output channel specifying the flow control settings and the recognition of a CRC in the data stream. Each channel can also be set up to utilize Serial FPDP’s copy/loop mode. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Record Interface

The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress.
➤ **SystemFlow API**

SystemFlow includes a complete API (Application Programming Interface) that supports control and status queries of all operations of the RTS 2716 from a custom application. High-level C-language function calls and the supporting device drivers allow users to incorporate the RTS 2716 as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

### Specifications

**PC Workstation**
- **Operating System:** Windows 7 Professional
- **Processor:** Intel Core i7 processor
- **Clock Speed:** 3.0 GHz or greater
- **SDRAM:** 6 GB
- **RAID**
  - Storage: 2.0–100.0 TB
  - Drive Type: 3.5” HDD
  - **Supported Levels:** 0, 1, 5, 6, 10 and 50

**Serial FPDP Interface**
- **Copper - Option 280**
  - Cable: 100-ohm shielded twin-ax
  - Connector Type: SFP+
  - Max. Cable Length: 20 m
- **Multi-mode Fiber Optical - Option 281**
  - Cable: Multi-mode fiber, 850 nm
  - Connector Type: LC
  - Max. Cable Length: Up to 300 m
- **Single-mode Fiber Optical - Option 282**
  - Cable: Single-mode fiber
  - Connector Type: LC
  - Max. Cable Length: Up to 10 km

### Physical and Environmental

**Dimensions**
- Full 4U Chassis: 19” W x 26” D x 7” H
- **Weight:** 30 – 80 lb
- **Operating Temp:** +5° to +45° C
- **Storage Temp:** –40° to +85° C
- **Relative Humidity:** 5 to 95%, non-condensing
- **Power Requirements:** 100 to 240 VAC, 50 to 60 Hz, 500 W max.

### Model RTS 2716 Ordering Information and Options

<table>
<thead>
<tr>
<th>Channel Configuration</th>
<th>Storage Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -204 4-channel recording</td>
<td>Option -406 2.0 TB HDD storage capacity</td>
</tr>
<tr>
<td>Option -208 8-channel recording</td>
<td>Option -411 4.0 TB HDD storage capacity</td>
</tr>
<tr>
<td><strong>SFPDP Interface</strong></td>
<td>Option -416 8.0 TB HDD storage capacity</td>
</tr>
<tr>
<td>Option -280 SFP+ connectors</td>
<td>Option -421 16.0 TB HDD storage capacity</td>
</tr>
<tr>
<td>Option -281 Multi-mode optical, LC connectors</td>
<td>Option -423 20.0 TB HDD storage capacity</td>
</tr>
<tr>
<td>Option -282 Single-mode optical, LC connectors</td>
<td>Option -439 30.0 TB HDD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -450 45.0 TB HDD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -460 60.0 TB HDD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -480 100.0 TB HDD storage capacity</td>
</tr>
<tr>
<td><strong>General Options</strong> (append to all options)</td>
<td>Note: Options -450 and -460 require a 5U Chassis; Option -480 requires a 6U chassis</td>
</tr>
<tr>
<td>Option -261 GPS time &amp; position stamping</td>
<td></td>
</tr>
<tr>
<td>Option -264 IRIG-B time stamping</td>
<td></td>
</tr>
</tbody>
</table>

Contact Pentek for compatible Option combinations

Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice
General Information

The Talon® RTR 2736 is a complete turn-key recording system capable of recording and playing back multiple Serial FPDP data streams in a rugged, lightweight portable package. It is ideal for capturing any type of streaming sources including live transfers from sensors or data from other computers and is fully compatible with the VITA 17.1 specification. Using highly-optimized disk storage technology, the system achieves aggregate recording rates up to 2.4 GB/sec.

The RTR 2736 can be populated with up to eight SFP connectors supporting Serial FPDP over copper, single-mode, or multi-mode fiber, to accommodate all popular Serial FPDP interfaces. It is capable of both receiving and transmitting data over these links and supports real-time data storage to disk.

Programmable modes include flow control in both receive and transmit directions, CRC support, and copy/loop modes. The system is capable of handling 1.0625, 2.125, 2.5, 3.125 and 4.25 GBaud link rates supporting data transfer rates of up to 420 MB/sec per Serial FPDP link.

Optional GPS time and position stamping allows the user to mark the beginning of a recording in the recording file’s header.

SystemFlow Software

The RTR 2736 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple and intuitive means to configure and control the system.

Custom configurations can be stored as profiles and later loaded as needed, allowing the user to select preconfigured settings with a single click.

Built on a server-class Windows 7 Professional workstation, the RTR 2736 allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTR 2736 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via a gigabit Ethernet port, eight USB 2.0 ports, two USB 3.0 ports or two eSATA 3 Ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

Rugged and Flexible Architecture

The RTR 2736 is configured in a portable, lightweight chassis with hot-swap SSDs, front panel USB ports and I/O connections on the side panel. It is built on an extremely rugged, 100% aluminum alloy unit, reinforced with shock absorbing rubber corners and an impact-resistant protective glass. Using shock- and vibration-resistant SSDs, the RTR 2736 is designed to reliably operate as a portable field instrument.

The hot-swappable SSDs provide storage capacities of up to 7.6 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels, including 0, 1, 5 and 6, provide a choice for the required level of redundancy.

Contact factory for options, number of channels, recording rates, and disk capacity.
➤ SystemFlow Graphical User Interface

The RTR 2736 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Main Interface

The RTR 2736 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface

The Configure screen presents operational system parameters including temperature and voltages. Parameters are entered for each input or output channel specifying the flow control settings and the recognition of a CRC in the data stream. Each channel can also be set up to utilize Serial FPDP’s copy/loop mode. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Record Interface

The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress. ➤
Model RTR 2736
Serial FPDP Rugged Portable Recorder

➤ SystemFlow API

SystemFlow includes a complete API (Application Programming Interface) supporting control and status queries of all operations of the RTR 2736 from a custom application.

High-level C-language function calls and the supporting device drivers allow users to incorporate the RTR 2736 as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

Specifications

PC Workstation

Operating System: Windows 7 Professional
Processor: Intel Core i7 processor
Clock Speed: 2.0 GHz or greater
SDRAM: 6 GB
Monitor: Built-in 17” high-resolution LCD, 1440 x 900 pixels, 200 nits
RAID
  Storage: 1.9, 3.8, or 7.6 TB
  Supported RAID Levels: 0, 1, 5 and 6
  Drive Bays: Hot-swap, removable, rear panel
USB 2.0 Ports: Eight left side, two front panel
USB 3.0 Ports: Two left side
1 Gb Ethernet Port: One left side
eSATA Ports: Two left side
Aux Video Output: 15-pin VGA left side

Serial FPDP Interface

Copper - Option 280
  Cable: 100-ohm shielded twin-ax
  Connector Type: SFP+
  Max. Cable Length: 20 m
Multi-mode Fiber Optical - Option 281
  Cable: Multi-mode fiber, 850 nm
  Connector Type: LC
  Max. Cable Length: Up to 300 m
Single-mode Fiber Optical - Option 282
  Cable: Single-mode fiber
  Connector Type: LC
  Max. Cable Length: Up to 10 km

Physical and Environmental

Dimensions: 16.9” W x 9.5” D x 13.4” H
Weight: 30 lb, approximately
Operating Temp: 0° to +50° C
Storage Temp: –40° to +85° C
Relative Humidity: 5 to 95%, non-condensing
Operating Shock: 15 g max. (11 msec, half sine wave)
Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Model RTR 2736 Ordering Information and Options

<table>
<thead>
<tr>
<th>Channel Configurations</th>
<th>Storage Options</th>
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</thead>
<tbody>
<tr>
<td>Option -204</td>
<td>Option -405 1.9 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -208</td>
<td>Option -410 3.8 TB SSD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -415 7.6 TB SSD storage capacity</td>
</tr>
</tbody>
</table>

Serial FPDP Interface (append to all options)

Option -280 Copper, SFP+ connectors
Option -281 Multi-mode optical, LC connectors
Option -282 Single-mode optical, LC connectors

General Options (append to all options)

Option -261 GPS time & position stamping
Option -264 IRIG-B time stamping

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
General Information

The Talon® RTR 2736A is a complete turn-key recording system capable of recording and playing back multiple Serial FPDP data streams in a rugged, lightweight portable package. It is ideal for capturing any type of streaming sources including live transfers from sensors or data from other computers and is fully compatible with the VITA 17.1 specification. Using highly-optimized disk storage technology, the system achieves aggregate recording rates up to 3.2 GB/sec.

The RTR 2736A can be populated with up to eight SFP connectors supporting Serial FPDP over copper, single-mode, or multi-mode fiber, to accommodate all popular Serial FPDP interfaces. It is capable of both receiving and transmitting data over these links and supports real-time data storage to disk.

Programmable modes include flow control in both receive and transmit directions, CRC support, and copy/loop modes. The system is capable of handling 1.0625, 2.125, 2.5, 3.125, and 4.25 GBaud link rates supporting data transfer rates of up to 420 MB/sec per Serial FPDP link.

Optional GPS time and position stamping allows the user to mark the beginning of a recording in the recording file’s header.

SystemFlow Software

The RTR 2736A includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple and intuitive means to configure and control the system. It also includes a C-callable API that allows users to easily integrate the Talon recorder into a larger system.

Custom configurations can be stored as profiles and later loaded as needed, allowing the user to select preconfigured settings with a single click.

Built on a server-class Windows workstation, the RTR 2736A allows the user to install post-processing and analysis tools to operate on the recorded data. The RTR 2736A records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via gigabit Ethernet, USB 2.0 and USB 3.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD+R/RW drive. Option -625 replaces the DVD+R/RW drive with a removable operating system drive; an external DVD drive can be used.

Rugged Chassis with SSD Storage

The RTR 2736A is configured with hot-swappable SSDs, front panel USB ports, and I/O connectors on the side panel. It is built in an extremely rugged steel and aluminum chassis and is tested for shock and vibration. The SSDs provide storage capacities of up to 61.4 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels, including 0, 5, and 6, provide a choice for the required level of redundancy.

Features

- Designed to operate under conditions of shock and vibration
- Portable system measuring 16.0" W x 6.9" D x 13.0" H
- Lightweight, just less than 30 pounds
- Shock- and vibration-resistant SSDs perform well in vehicles, ships and aircraft
- Up to eight I/O channels
- Supports Flow Control, CRC, and Copy/Loop Mode as a receiver and transmitter
- Supports 1.0625, 2.125, 2.5, 3.125 and 4.25 GBaud link rates
- Copper, single-mode and multi-mode fiber interfaces available
- Real-time aggregate recording rates of up to 3.2 GB/sec
- Windows® workstation with high performance Intel® Core™ i7 processor
- Up to 61 terabytes of SSD storage to NTFS RAID solid state disk array
- SystemFlow® GUI with Signal Viewer analysis tool
- Optional file headers include time stamping and recording parameters
- Optional GPS time and position stamping
- Optional 10–36 VDC power supply

Contact factory for options, number of channels, recording rates, and disk capacity.
SystemFlow Graphical User Interface

The RTR 2736A GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Main Interface

The RTR 2736A GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface

The Configure screen presents operational system parameters including temperature and voltages. Parameters are entered for each input or output channel specifying the flow control settings and the recognition of a CRC in the data stream. Each channel can also be set up to utilize Serial FPDP’s copy/loop mode. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Record Interface

The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress.
SystemFlow API

SystemFlow includes a complete API (Application Programming Interface) supporting control and status queries of all operations of the RTR 2736A from a custom application. High-level C-language function calls and the supporting device drivers allow users to incorporate the RTR 2736A as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

Specifications

PC Workstation (standard configuration)
Operating System: 64-bit Windows 7 Professional
Processor: Intel Core i7 processor
Clock Speed: 3.0 GHz or higher
Operating System Drive: 128 GB SSD
SDRAM: 8 GB
Monitor: Built-in 17.3” high-resolution LCD, 1920 x 1080 pixels, 16:9 aspect ratio, anti-glare surface
Brightness: 300 cd/m²; Contrast ratio: 400:1 typical

RAID
Total Storage: 1.9, 3.8, 7.6 or 15.3 TB
Supported RAID Levels: 0, 1, 5 and 6
Drive Bays: Hot-swap, removable, side panel
USB 2.0 Ports: Four on left side, two on front panel
USB 3.0 Ports: Two on left side
1 Gb Ethernet Ports: Two on left side
Aux Video Output: 15-pin VGA on left side

Serial FPDP Interface
Copper - Option 280
- Cable: 100-ohm shielded twin-ax
- Connector Type: SFP+
- Max. Cable Length: 20 m
Multi-mode Fiber Optical - Option 281
- Cable: Multi-mode fiber, 850 nm
- Connector Type: LC
- Max. Cable Length: Up to 300 m
Single-mode Fiber Optical - Option 282
- Cable: Single-mode fiber
- Connector Type: LC
- Max. Cable Length: Up to 10 km

Optional DC Power supply
- Voltage: 18 to 36 VDC
- Input Current: 42 to 26 A (39 A at 24 VDC)
- Inrush Current: 100 A at 24 VDC
- Temperature Range: Oper.: 0° to 50° C, Store: –0° to 80° C
- Efficiency: >80% typical at 24 V full load
- Power Good Signal: On delay 100 to 500 msec
- OverPower Protection: 110% to 160%
- Remote Control: On/Off
- Safety: Meets UL, TUV, CB specifications

Physical and Environmental
Size: 16.0” W x 6.9” D x 13.0” H
Weight: 30 lb max.
Operating Temp: 0° to +50° C
Storage Temp: –40° to +85° C
Relative Humidity: 5 to 95%, non-condensing
Operating Shock: 30 g max. (11 msec, half-sine wave)
Operating Vibration: 10 to 20 Hz: 0.02 inch peak,
20 to 500 Hz: 1.4 g peak acceleration
Non-operating Vibration: 5 to 500 Hz: 2.06 g RMS
Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Model RTR 2736A Ordering Information and Options

Channel Configurations
Option -204 4-channel recording
Option -208 8-channel recording

Storage Options
Option -405 1.9 TB SSD storage capacity
Option -410 3.8 TB SSD storage capacity
Option -415 7.6 TB SSD storage capacity
Option -420 15.3 SSD storage capacity

Serial FPDP Interface (append to all options)
Option -280 Copper, SFP+ connectors
Option -281 Multi-mode optical, LC connectors
Option -282 Single-mode optical, LC connectors

General Options (append to all options)
Option -261 GPS time & position stamping
Option -264 IRIG-B time stamping
Option -625 Removable operating system drive
Option -681 18 to 36 VDC Power Supply

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
General Information

The Talon® RTR 2756 is a complete turn-key recording system capable of recording and playing back multiple Serial FPDP data streams. It is ideal for capturing any type of streaming sources including live transfers from sensors or data from other computers and is fully compatible with the VITA 17.1 specification. Using highly-optimized disk storage technology, the system achieves aggregate recording rates up to 3.2 GB/sec.

The RTR 2756 can be populated with up to eight SFP connectors supporting Serial FPDP over copper, single-mode, or multi-mode fiber, to accommodate all popular Serial FPDP interfaces. It is capable of both receiving and transmitting data over these links and supports real-time data storage to disk. Programmable modes include flow control in both receive and transmit directions, CRC support, and copy/loop modes. The system is capable of handling 1.0625, 2.125, 2.5, 3.125 and 4.25 Gb/s link rates supporting data transfer rates of up to 425 MB/sec per Serial FPDP link.

Optional GPS time and position stamping allows the user to mark the beginning of a recording in the recording file’s header.

SystemFlow Software

The RTR 2756 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple and intuitive means to configure and control the system. Custom configurations can be stored as profiles and later loaded as needed, allowing the user to select preconfigured settings with a single click.

Built on a server-class Windows 7 Professional workstation, the RTR 2756 allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTR 2756 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via two gigabit Ethernet ports or six USB 2.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD±R/RW drive.

Rugged and Flexible Architecture

Because SSDs operate reliably under conditions of shock and vibration, the RTR 2756 performs well in ground, shipborne and airborne environments. Configurable with hot-swappable SSDs, the RTR 2756 can provide storage capacities of up to 46 TB in a rugged chassis. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data.

The RTR 2756 is configured in a 4U 19” rack-mountable chassis, with hot-swap data drives, front-panel USB ports and I/O connectors on the rear panel.

Systems are scalable to accommodate multiple chassis 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 on redundancy. Redundant power supplies are optionally available to provide a robust and reliable high-performance recording system.
Model RTR 2756 Serial FPDP Rugged Rackmount Recorder

➤ SystemFlow Graphical User Interface

![SystemFlow Graphical User Interface](image)

SystemFlow Main Interface
The RTR 2756 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface
The Configure screen presents operational system parameters including temperature and voltages. Parameters are entered for each input or output channel specifying the flow control settings and the recognition of a CRC in the data stream. Each channel can also be set up to utilize Serial FPDP’s copy/loop mode. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

![SystemFlow Hardware Configuration Interface](image)

SystemFlow Record Interface
The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress.

![SystemFlow Record Interface](image)
## SystemFlow API
SystemFlow includes a complete API (Application Programming Interface) supporting control and status queries of all operations of the RTR 2756 from a custom application. High-level C-language function calls and the supporting device drivers allow users to incorporate the RTR 2756 as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

## Specifications

### PC Workstation
- **Operating System:** Windows 7 Professional
- **Processor:** Intel Core i7 processor
- **Clock Speed:** 2.0 GHz or greater
- **SDRAM:** 6 GB
- **RAID**
  - **Storage:** 3.8, 7.6, 15.3, 30.7 or 46.0 TB
  - **Supported Levels:** 0, 1, 5, 6, 10 and 50

### Serial FPDP Interface
- **Copper - Option 280**
  - **Cable:** 100-ohm shielded twin-ax
  - **Connector Type:** SFP+
  - **Max. Cable Length:** 20 m
- **Multi-mode Fiber Optical - Option 281**
  - **Cable:** Multi-mode fiber, 850 nm
  - **Connector Type:** LC
  - **Max. Cable Length:** Up to 300 m
- **Single-mode Fiber Optical - Option 282**
  - **Cable:** Single-mode fiber
  - **Connector Type:** LC
  - **Max. Cable Length:** Up to 10 km

### Physical and Environmental
- **Dimensions & Weights**
  - **All options except 085:** 19” W x 21” D x 7” (4U) H
  - **Weight:** 50 lb, approx.
  - **Option 085:** 19” W x 26” D x 7” (4U) H
  - **Weight:** 65-90 lb
- **Operating Temp:** 0° to +50° C
- **Storage Temp:** –40° to +85° C
- **Relative Humidity:** 5 to 95%, non-condensing
- **Operating Shock:** 15 g max. (11 msec, half sine wave)
- **Operating Vibration:** 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz; 1.4 g peak acceleration

## Model RTR 2756 Ordering Information and Options

<table>
<thead>
<tr>
<th>Channel Configurations</th>
<th>Storage Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -204 4-channel recording</td>
<td>Option -410 3.8 TB SSD storage capacity</td>
</tr>
<tr>
<td>Option -208 8-channel recording</td>
<td>Option -415 7.6 TB SSD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -420 15.3 TB SSD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -430 30.7 TB SSD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -440 46.0 TB SSD storage capacity</td>
</tr>
<tr>
<td>Note: Options -430 and-440 require 26-inch deep chassis</td>
<td></td>
</tr>
</tbody>
</table>

### Serial FPDP Interface (append to all options)
- **Option -280** Copper, SFP+ connectors
- **Option -281** Multi-mode optical, LC connectors, 4 ports
- **Option -282** Single-mode optical, LC connectors, 4 ports

### General Options (append to all options)
- **Option -261** GPS time & position stamping
- **Option -264** IRIG-B time stamping

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
General Information

The Talon® RTX 2776 is a turnkey record and playback system that is built to operate under harsh conditions. Designed to withstand high vibration and operating temperatures, the RTX 2776 is intended for military, airborne and UAV applications requiring a rugged system.

The Talon RTX 2776 is a complete turnkey recording system capable of recording and playing back multiple Serial FPDP data streams. It is ideal for capturing any type of streaming sources including live transfers from sensors or data from other computers and is fully compatible with the VITA 17.1 specification. Using highly-optimized disk storage technology, the system achieves aggregate recording rates up to 3.2 GB/sec.

The RTX 2776 can be populated with up to eight SFP connectors supporting Serial FPDP over copper, single-mode, or multi-mode fiber, to accommodate all popular Serial FPDP interfaces. It is capable of both receiving and transmitting data over these links and supports real-time data storage to disk.

Programmable modes include flow control in both receive and transmit directions, CRC support, and copy/loop modes. The system is capable of handling 1.0625, 2.125, 2.5, 3.125 and 4.25 GBaud link rates.

Optional GPS time and position stamping allows the user to mark the beginning of a recording in the recording file’s header.

SystemFlow Software

The RTX 2776 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple and intuitive means to configure and control the system.

Custom configurations can be stored as profiles and later loaded as needed, allowing the user to select preconfigured settings with a single click.

Built on a server-class Windows 7 Professional workstation, the RTX 2776 allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTX 2776 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via two rear-access gigabit Ethernet ports, two USB 3.0 ports or up to four USB 2.0 ports.

Rugged Mil-Spec Chassis

The Talon RTX 2776 uses a shock and vibration-isolated inner chassis and solid-state drives to assure reliability under harsh conditions. The chassis uses an in-line EMI filter along with rear-panel MIL-style connectors to meet MIL-STD-461 emissions specifications.

Up to four front-panel removable QuickPac drive canisters are provided, each containing up to eight SSDs. Each drive canister can hold up to 7.6 TB of data storage and allows for quick and easy removal of mission-critical data.

Forced-air cooling draws air from the front of the chassis and pushes it out the back via exhaust fans. A hinged front door with a serviceable air filter provides protection against dust and sand.
SystemFlow Graphical User Interface

The RTX 2776 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Main Interface

The RTX 2776 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface

The Configure screen presents operational system parameters including temperature and voltages. Parameters are entered for each input or output channel specifying the flow control settings and the recognition of a CRC in the data stream. Each channel can also be set up to utilize Serial FPDP’s copy/loop mode. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Record Interface

The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress.
SystemFlow API

SystemFlow includes a complete API (Application Programming Interface) supporting control and status queries of all operations of the RTX 2776 from a custom application.

High-level C-language function calls and the supporting device drivers allow users to incorporate the RTX 2776 as a high-performance server front-end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

Specifications

PC Workstation (standard configuration)

Operating System: Windows 7 Professional
Processor: Intel Core i7 processor
Clock Speed: 3.0 GHz or higher
SDRAM: 8 GB

Data Storage
Style: Up to four front-panel removable QuickPac drive canisters; up to eight SSDs contained in each canister
Location: Front panel
Capacity: Up to 30 TB
Number of Drives: Up to 32 total
Supported RAID Levels: 0, 1, 5 and 6

Serial FPDP Interface

Copper - Option 280
  - Cable: 100-ohm shielded twin-ax
  - Connector Type: SFP+
  - Max. Cable Length: 20 m

Multi-mode Fiber Optical - Option 281
  - Cable: Multi-mode fiber, 850 nm
  - Connector Type: LC
  - Max. Cable Length: Up to 300 m

Single-mode Fiber Optical - Option 282
  - Cable: Single-mode fiber
  - Connector Type: LC
  - Max. Cable Length: Up to 10 km

Physical and Environmental

Dimensions: 19” W x 22” D x 7” H
Weight: 50 lb, approx.
Operating Temp: -20° to +50° C
Storage Temp: -40° to +85° C
Relative Humidity: 10% to 95%, non-condensing

Operating Shock: Designed to MIL-STD 810F, method 514.5, procedures I and VI
Operating Vibration: Designed to MIL-STD 810F, method 514.5, procedure I

EMI/EMC: Designed to MIL-STD 461E, CE101, CE102, CS101, CS113, RE101, RE102, RS101, RS103
Input Power: 85 to 264 VAC, 47– 400 Hz, 600 W max.

Model RTX 2776 Ordering Information and Options

<table>
<thead>
<tr>
<th>Channel Configuration</th>
<th>Storage Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -204</td>
<td>4-channel record/payback</td>
</tr>
<tr>
<td>Option -208</td>
<td>8-channel record/playback</td>
</tr>
<tr>
<td>Option -280</td>
<td>3.8 TB SSD storage</td>
</tr>
<tr>
<td>Option -281</td>
<td>7.6 TB SSD storage</td>
</tr>
<tr>
<td>Option -282</td>
<td>11.5 TB SSD storage</td>
</tr>
<tr>
<td>Option -410</td>
<td>15.3 TB SSD storage</td>
</tr>
<tr>
<td>Option -415</td>
<td>23.0 TB SSD storage</td>
</tr>
<tr>
<td>Option -418</td>
<td>30.7 TB SSD storage</td>
</tr>
<tr>
<td>Option -420</td>
<td>28 VDC power supply</td>
</tr>
<tr>
<td>Option -425</td>
<td>Front-panel removable OS drive</td>
</tr>
<tr>
<td>Option -430</td>
<td>GPS time and position stamping</td>
</tr>
<tr>
<td>Option -261</td>
<td>IRIG-B Time Stamping</td>
</tr>
<tr>
<td>Option -264</td>
<td>28 VDC power supply</td>
</tr>
<tr>
<td>Option -680</td>
<td>Front-panel removable OS drive</td>
</tr>
<tr>
<td>Option -625</td>
<td>28 VDC power supply</td>
</tr>
</tbody>
</table>

Contact Pentek for other configurations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
General Information

The Talon® RTS 2718 is a complete turn-key system for recording and playing back digital data using the Pentek Model 78610 LVDS digital I/O board. Using highly optimized disk storage technology, the system achieves sustained recording rates of up to 1.6 GB/sec.

The RTS 2718 utilizes a 32-bit LVDS interface that can be clocked at speeds up to 250 MHz. It includes Data Valid and Suspend signals and provides the ability to turn these signals on and off as well as control their polarity.

Optional GPS time and position stamping accurately identifies each record in the file header.

SystemFlow Software

The RTS 2718 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system.

Custom configurations can be stored as profiles and later loaded when needed, allowing the user to select preconfigured settings with a single click.

Built on a Windows 7 Professional workstation, the RTS 2718 allows the user to install post-processing and analysis tools to operate on the recorded data.

Data can be off-loaded via two gigabit Ethernet ports or eight USB ports. Additionally, data can be copied to optical disk using the 8X double layer DVD±R/RW drive.

Flexible Architecture

The RTS 2718 is configured in a 4U 19" rack-mountable chassis, with hot-swap data drives, front panel USB ports and I/O connectors on the rear panel.

Systems are scalable to accommodate multiple chassis 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 16 hot-swappable SATA drives are optionally available, allowing up to 20 terabytes of real-time data storage space in a single 4U chassis.

SystemFlow API

SystemFlow includes a complete API (Application Programming Interface) that supports control and status queries of all operations of the RTS 2718 from a custom application.

High-level C-language function calls and the supporting device drivers allow users to incorporate the RTS 2718 as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

Features

- 32 bits of LVDS digital I/O
- LVDS clock, Data Valid and Data Suspend signals
- Supports clock rates up to 250 MHz
- Real-time aggregate recording rates up to 1.6 GB/s
- Up to 20 terabytes of storage to NTFS RAID disk array
- RAID levels of 0, 1, 5, 6, 10 and 50
- SystemFlow® GUI virtual instrumentation panel for fast, intuitive operation
- C-callable API for integration of recorder into application
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping
- Windows® 7 Professional workstation with high-performance Intel® Core™ i7 processor

Contact factory for options, recording rates, and disk capacity.

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
**SystemFlow Graphical User Interface**

The RTS 2718 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

**SystemFlow Main Interface**

The RTS 2718 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

**SystemFlow Hardware Configuration Interface**

The Configure screen presents operational system parameters including temperature and voltages. These parameters include data valid and suspend enables, as well as polarity control for both signals. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

**SystemFlow Record Interface**

The SystemFlow Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress.
Model RTS 2718
LVDS Digital I/O Rackmount Recorder

Specifications

**PC Workstation**
- **Operating System:** Windows 7 Professional
- **Processor:** Intel Core i7 processor
- **Clock Speed:** 3.0 GHz or higher
- **SDRAM:** 8 GB
- **RAID**
  - **Storage:** 2.0–100.0 TB
  - **Drive Type:** 3.5” HDD
  - **Supported RAID Levels:** 0, 1, 5, 6, 10 and 50

**LVDS Interface**
- **Cable:** 80-pin ribbon cable
- **Connector Type:** 2x40 pin IDC
- **Data Lines:** 32 LVDS pairs, 2.5 V compliant
- **Clock:** One LVDS pair, 2.5 V compliant
- **Data Valid:** One LVDS pair, 2.5 V compliant
- **Data Suspend:** One LVDS pair, 2.5 V compliant

**Physical and Environmental**

**Dimensions**
- **4U Long Chassis:** 19” W x 26” D x 7” H
- **Size:** 19” W x 26” D x 7” H
- **Weight:** 50-80 lb
- **Operating Temp:** +5° to +45° C
- **Storage Temp:** –40° to +85° C
- **Relative Humidity:** 5 to 95%, non-condensing
- **Power Requirements:** 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Model RTS 2716 Ordering Information and Options

<table>
<thead>
<tr>
<th>Channel Configuration</th>
<th>Storage Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -201  Recording interface</td>
<td>Option -406  2.0 TB HDD storage capacity</td>
</tr>
<tr>
<td>Option -221  Playback interface</td>
<td>Option -411  4.0 TB HDD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -416  8.0 TB HDD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -421  16.0 TB HDD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -423  20.0 TB HDD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -439  30.0 TB HDD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -450  45.0 TB HDD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -460  60.0 TB HDD storage capacity</td>
</tr>
<tr>
<td></td>
<td>Option -480  100.0 TB HDD storage capacity</td>
</tr>
<tr>
<td><strong>Note:</strong> Options -450 and -460 require a 5U Chassis; Option -480 requires a 6U chassis</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General Options (append to all options)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option -261  GPS time &amp; position stamping</td>
</tr>
<tr>
<td>Option -264  IRIG-B time stamping</td>
</tr>
</tbody>
</table>

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications subject to change without notice
Model RTR 2738A
LVDS Digital I/O Rugged Portable Recorder

General Information
The Talon® RTR 2738A is a complete turn-key system for recording and playing back digital data using the Pentek Model 78610 LVDS digital I/O board. Using highly optimized disk storage technology, the rugged, lightweight portable package achieves sustained recording rates of up to 1.0 GB/sec.

The RTR 2738A utilizes a 32-bit LVDS interface that can be clocked at speeds up to 250 MHz. It includes Data Valid and Suspend signals and provides the ability to turn these signals on and off as well as control their polarity.

Optional GPS time and position stamping allows the user to mark the beginning of a recording in the recording file’s header.

SystemFlow Software
The RTR 2738A includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system. It also includes a C-callable API that allows users to easily integrate the Talon recorder into a larger system.

Custom configurations can be stored as profiles and later loaded when needed, allowing the user to select preconfigured settings with a single click.

Built on a server-class Windows 7 Professional workstation, the RTR 2738A allows the user to install post-processing and analysis tools to operate on the recorded data.

Data can be off-loaded via gigabit Ethernet, USB 2.0 and USB 3.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD+R/RW drive.

Option -625 replaces the DVD+R/RW drive with a removable operating system drive; an external DVD drive can be used.

Rugged Chassis with SSD Storage
The RTR 2736A is configured with hot-swappable SSDs, front panel USB ports, and I/O connectors on the side panel. It is built in an extremely rugged steel and aluminum chassis and is tested for shock and vibration. The SSDs provide storage capacities of up to 61.4 TB. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data. Multiple RAID levels, including 0, 5, and 6, provide a choice for the required level of redundancy.

SystemFlow API
SystemFlow includes a complete API (Application Programming Interface) that supports control and status queries of all operations of the RTR 2738A from a custom application.

High-level C-language function calls and the supporting device drivers allow users to incorporate the RTR 2738A as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

Features
- Designed to operate under conditions of shock and vibration
- Portable system measures 16.0” W x 6.9” D x 13.0” H
- Lightweight, just less than 30 pounds
- Shock- and vibration-resistant SSDs perform well in vehicles, ships and aircraft
- 32 bits of LVDS digital I/O
- LVDS clock, Data Valid and Data Suspend signals
- Supports clock rates up to 250 MHz
- Real-time aggregate recording rates up to 1.0 GB/s
- Windows® workstation with high performance Intel® Core™ i7 processor
- Up to 81 terabytes of SSD storage to NTFS RAID solid state disk array
- SystemFlow® GUI with Signal Viewer analysis tool
- Optional file headers include time stamping and recording parameters
- Optional GPS time and position stamping
- Optional 18–36 VDC power supply

Contact factory for options, recording rates, and disk capacity.

Pentek, Inc. One Park Way ● Upper Saddle River ● New Jersey 07458
Tel: 201 818-9000 ● Fax: 201 818-9504 ● Email: info@pentek.com
SystemFlow Main Interface

The RTR 2738A GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface

The Configure screen presents operational system parameters including temperature and voltages. These parameters include data valid and suspend enables, as well as polarity control for both signals. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Record Interface

The SystemFlow Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress.
Model RTR 2738A LVDS Digital I/O Rugged Portable Recorder

Specifications

PC Workstation (standard configuration)

- **Operating System**: 64-bit Windows workstation
- **Processor**: Intel Core i7 processor
- **Clock Speed**: 3.0 GHz or higher
- **Operating System Drive**: 128 GB SSD
- **SDRAM**: 8 GB
- **Monitor**: Built-in 17.3” high-resolution LCD, 1920 x 1080 pixels, 16:9 aspect ratio, anti-glare surface
  - Brightness: 300 cd/m²; Contrast ratio: 400:1 typical

RAID

- **Total Storage**: 3.8 – 61.4 TB
- **Supported RAID Levels**: 0, 5 and 6
- **Drive Bays**: Hot-swap, removable, side panel
- **USB 2.0 Ports**: Four on left side, two on front panel
- **USB 3.0 Ports**: Two on left side
- **1 Gb Ethernet Ports**: Two on left side
- **Aux Video Output**: 15-pin VGA on left side

LVDS Interface

- **Cable**: 80-pin ribbon cable
- **Connector Type**: 2x40 pin IDC
- **Data Lines**: 32 LVDS pairs, 2.5 V compliant
- **Clock**: One LVDS pair, 2.5 V compliant
- **Data Valid**: One LVDS pair, 2.5 V compliant
- **Data Suspend**: One LVDS pair, 2.5 V compliant

Optional DC Power supply

- **Voltage**: 10 to 36 VDC
- **Input Current**: 42 to 26 A (39 A at 24 VDC)
- **Inrush Current**: 100 A at 24 VDC
- **Temperature Range**:
  - Oper.: 0° to 50° C, Store: –0° to 80° C
  - Efficiency: >80% typical at 24 V full load
- **Power Good Signal**: On delay 100 to 500 msec
- **OverPower Protection**: 110% to 160%
- **Remote Control**: On/Off
- **Safety**: Meets UL, TUV, CB specifications

Physical and Environmental

- **Size**: 16.0” W x 6.9” D x 13.0” H
- **Weight**: 30 lb max.
- **Operating Temp**: 0° to +50° C
- **Storage Temp**: –40° to +85° C
- **Relative Humidity**: 5 to 95%, non-condensing
- **Operating Shock**: 30 g max. (11 msec, half-sine wave)
- **Operating Vibration**: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz: 1.4 g peak acceleration
- **Non-operating Vibration**: 5 to 500 Hz: 2.06 g RMS
- **Power Requirements**: 100 to 240 VAC, 50 to 60 Hz, 500 W max.

Model RTR 2738A Ordering Information and Options

Channel Configurations

- Option -201: Recording Interface
- Option -221: Playback Interface

Storage Options

- Option -410: 3.8 TB SSD Storage
- Option -415: 7.6 TB SSD Storage
- Option -420: 15.3 TB SSD Storage
- Option -430: 30.7 TB SSD Storage
- Option -460: 61.4 TB SSD Storage

Additional Options

- Option -261: GPS Time & Position Stamping
- Option -264: IRIG-B Time Stamping
- Option -285: RAID 5 Configuration
- Option -286: RAID 6 Configuration
- Option -309: 16 GB System Memory
- Option -311: 64 GB System Memory
- Option -625: Removable Operating System Drive
- Option -681: 10 to 36 VDC Power Supply

Contact Pentek for compatible Option combinations

Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
General Information

The Talon® RTR 2758 is a complete turn-key system for recording and playing back digital data using the Pentek Model 78610 LVDS digital I/O board. Using highly optimized disk storage technology, the system achieves sustained recording rates of up to 1.0 GB/sec.

The RTR 2758 utilizes a 32-bit LVDS interface that can be clocked at speeds up to 250 MHz. It includes Data Valid and Suspend signals and provides the ability to turn these signals on and off as well as control their polarity.

Optional GPS time and position stamping accurately identifies each record in the file header.

SystemFlow Software

The RTR 2758 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system.

Custom configurations can be stored as profiles and later loaded when needed, allowing the user to select preconfigured settings with a single click.

Built on a Windows 7 Professional workstation, the RTR 2758 allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTR 2758 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via two gigabit Ethernet ports or six USB ports. Additionally, data can be copied to optical disk using the 8X double layer DVD+R/RW drive.

Rugged and Flexible Architecture

Because SSDs operate reliably under conditions of shock and vibration, the RTR 2758 performs well in ground, shipborne and airborne environments. Configurable with hot-swappable SSDs, the RTR 2758 can provide storage capacities of up to 46 TB in a rugged 4U chassis. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data.

The RTR 2758 is configured in a 4U 19" rack-mountable chassis, with hot-swap SSD drives, front panel USB ports and I/O connectors on the rear panel.

Systems are scalable to accommodate multiple chassis 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 on redundancy. Redundant power supplies are optionally available to provide a robust and reliable high-performance recording system.

Contact factory for options, recording rates, and disk capacity.
Model RTR 2758
LVDS Digital I/O Rugged Rackmount Recorder

➤ SystemFlow Graphical User Interface

SystemFlow Main Interface

The RTR 2758 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface

The Configure screen presents operational system parameters including temperature and voltages. These parameters include data valid and suspend enables, as well as polarity control for both signals. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Record Interface

The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress. ➤
► SystemFlow API

SystemFlow includes a complete API (Application Programming Interface) that supports control and status queries of all operations of the RTR 2758 from a custom application.

High-level C-language function calls and the supporting device drivers allow users to incorporate the RTR 2758 as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

Specifications

PC Workstation
Operating System: Windows 7 Professional
Processor: Intel Core i7 processor
Clock Speed: 3.0 GHz or higher
SDRAM: 8 GB
RAID
  Storage: 3.8, 7.6, 15.3, 30.7 or 46.0 TB
  Supported Levels: 0, 1, 5, 6, 10 and 50

LVDS Interface
  Cable: 80-pin ribbon cable
  Connector Type: 2x40 pin IDC
  Data Lines: 32 LVDS pairs, 2.5 V compliant
  Clock: One LVDS pair, 2.5 V compliant
  Data Valid: One LVDS pair, 2.5 V compliant
  Data Suspend: One LVDS pair, 2.5 V compliant

Physical and Environmental

Dimensions & Weights
  Dimensions: 19” W x 21” D x 7” (4U) H
  Weight: 50 lb, approx.
Operating Temp: 0° to +50° C
Storage Temp: −40° to +85° C
Relative Humidity: 5 to 95%, non-condensing
Operating Shock: 15 g max. (11 msec, half sine wave)
Operating Vibration: 10 to 20 Hz: 0.02 inch peak, 20 to 500 Hz;
  1.4 g peak acceleration

Channel Configurations

<table>
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<tr>
<th>Option</th>
<th>Description</th>
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</thead>
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<tr>
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<tr>
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Storage Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
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<tr>
<td>-410</td>
<td>3.8 TB SSD storage capacity</td>
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<td>-415</td>
<td>7.6 TB SSD storage capacity</td>
</tr>
<tr>
<td>-420</td>
<td>15.3 TB SSD storage capacity</td>
</tr>
<tr>
<td>-430</td>
<td>30.7 TB SSD storage capacity</td>
</tr>
<tr>
<td>-440</td>
<td>46.0 TB SSD storage capacity</td>
</tr>
</tbody>
</table>

Note: Options -430 and -440 require 26-inch deep chassis

General Options (append to all options)

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<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
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<tr>
<td>-264</td>
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</table>

Model RTR 2758 Ordering Information and Options

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
General Information

The Talon® RTX 2778 is a turnkey record and playback system that is built to operate under harsh conditions. Designed to withstand high vibration and operating temperatures, the RTX 2778 is intended for military, airborne and UAV applications requiring a rugged system.

The RTX 2778 records and plays back digital data using the Pentek Model 78610 LVDS digital I/O board. Using highly optimized disk storage technology, the system achieves aggregate recording rates of up to 1.0 GB/sec.

The RTX 2778 utilizes a 32-bit LVDS interface that can be clocked at speeds up to 250 MHz. It includes Data Valid and Suspend signals and provides the ability to turn these signals on and off as well as control their polarity.

Optional GPS time and position stamping accurately identifies each record in the file header.

SystemFlow Software

The RTX 2778 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system.

Custom configurations can be stored as profiles and later loaded when needed, allowing the user to select preconfigured settings with a single click.

Built on a Windows 7 Professional workstation, the RTX 2778 allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTX 2778 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via two rear-access gigabit Ethernet ports, two USB 3.0 ports or up to four USB 2.0 ports.

Rugged Mil-Spec Chassis

The Talon RTX 2778 uses a shock- and vibration-isolated inner chassis and solid-state drives to assure reliability under harsh conditions. The chassis uses an in-line EMI filter along with rear-panel MIL-style connectors to meet MIL-STD-461 emissions specifications.

Up to four front-panel removable QuickPac drive canisters are provided, each containing up to eight SSDs. Each drive canister can hold up to 7.6 TB of data storage and allows for quick and easy removal of mission-critical data.

Forced-air cooling draws air from the front of the chassis and pushes it out the back via exhaust fans. A hinged front door with a serviceable air filter provides protection against dust and sand.

![Diagram of Model RTX 2778 LVDS Digital I/O Extreme Rackmount Recorder]
SystemFlow Graphical User Interface

The RTX 2778 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Main Interface

The RTX 2778 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface

The Configure screen presents operational system parameters including temperature and voltages. These parameters include data valid and suspend enables, as well as polarity control for both signals. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Record Interface

The SystemFlow Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress.
SystemFlow API

SystemFlow includes a complete API (Application Programming Interface) supporting control and status queries of all operations of the RTX 2776 from a custom application.

High-level C-language function calls and the supporting device drivers allow users to incorporate the RTX 2776 as a high-performance server front-end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

Specifications

PC Workstation (standard configuration)
- Operating System: Windows 7 Professional
- Processor: Intel Core i7 processor
- Clock Speed: 3.0 GHz or higher
- SDRAM: 8 GB
- Data Storage:
  - Style: Up to four front-panel removable QuickPac drive canisters; up to eight SSDs contained in each canister
  - Location: Front panel
  - Capacity: Up to 30 TB

Number of Drives: Up to 32 total
Supported RAID Levels: 0, 1, 5 and 6

LVDS Interface
- Cable: 80-pin ribbon cable
- Connector Type: 2x40 pin IDC
- Data Lines: 32 LVDS pairs, 2.5 V compliant
- Clock: One LVDS pair, 2.5 V compliant
- Data Valid: One LVDS pair, 2.5 V compliant
- Data Suspend: One LVDS pair, 2.5 V compliant

Physical and Environmental
- Dimensions: 19” W x 22” D x 7” H
- Weight: 50 lb, approx.
- Operating Temp: −20° to +50° C
- Storage Temp: −40° to +85° C
- Relative Humidity: 10% to 95%, non-condensing
- Operating Shock: Designed to MIL-STD 810F, method 514.5, procedures I and VI
- Operating Vibration: Designed to MIL-STD 810F, method 514.5, procedure I
- EMI/EMC: Designed to MIL-STD 461E, CE101, CE102, CS101, CS113,RE101,RE102, RS101, RS103
- Input Power: 85 to 264 VAC, 47– 400 Hz, 600 W max.

Model RTX 2778 Ordering Information and Options

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<th>Storage Options</th>
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<td>Option -221 Playback interface</td>
<td>Option -415 7.6 TB SSD storage</td>
</tr>
<tr>
<td></td>
<td>Option -418 11.5 TB SSD storage</td>
</tr>
<tr>
<td></td>
<td>Option -420 15.3 TB SSD storage</td>
</tr>
<tr>
<td></td>
<td>Option -425 23.0 TB SSD storage</td>
</tr>
<tr>
<td></td>
<td>Option -430 30.7 TB SSD storage</td>
</tr>
</tbody>
</table>

General Options (append to all options)
- Option -261 GPS time and position stamping
- Option -264 IRIG-B Time Stamping
- Option -680 28 VDC power supply
- Option -625 Front-panel removable OS drive

Contact Pentek for other configurations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
Model RTR 2555

1-, 10-, 40-Gigabit Ethernet Rugged SFF Recorder

General Information
Optimized for SWaP (size, weight and power) the Pentek Talon® RTR Small Form Factor (SFF) product line provides the performance and storage capacity previously only possible in much larger rackmountable chassis. Measuring 5.25” H x 8.5” W x 14” D and weighing only 17 pounds (7.7 kg), this small package can hold up to 30.6 TB of SSD storage.

The Talon® RTR 2555 is a complete turnkey recording and playback system for storing 1-, 10- and 40-gigabit Ethernet streams. It is ideal for capturing any type of streaming sources including live transfers from sensors or data from other computers and supports both TCP and UDP protocols.

An ATX power supply accepts 110-240 VAC, drawing under 150 W and typically around 100 W. These models have the option for a 6-30 VDC power supply.

Eight front panel data drives can be easily removed along with a front panel removable OS drive to allow all non-volatile memory to be removed from the system in seconds.

Optional GPS time and position stamping accurately identifies each record in the file header.

SystemFlow Software
The RTR 2555 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system.

Custom configurations can be stored as profiles and later loaded when needed, allowing the user to select preconfigured settings with a single click.

Built on a Windows 7 Professional workstation, the RTR 2555 allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTR 2555 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via two gigabit Ethernet ports or six USB ports. Additionally, data can be copied to optical disk using the 8X double layer DVD+R/RW drive.

Rugged and Flexible Architecture
Because SSDs operate reliably under conditions of shock and vibration, the RTR 2555 performs well in ground, shipborne and airborne environments.

Configurable with hot-swappable SSDs, the RTR 2555 can provide storage capacities of up to 30.6 TB in a rugged chassis. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data.

The RTR 2555 is configured with hot-swap data drives, front panel USB ports and I/O connectors on the rear panel. Systems are scalable to accommodate multiple chassis 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, 5 and 6 provide a choice for the required level of redundancy.

Features
- Housed in a small chassis measuring 5.25” H x 8.5” W x 14” D
- Weighs 17 lb (7.7 kg)
- Shock and vibration-resistant SSDs perform well in vehicles, ships and aircraft
- Records gigabit, 10-gigabit or 40-gigabit Ethernet streams
- TCP and UDP protocols
- Copper or optical interfaces
- Aggregate recording rates to 4.0 GB/sec
- Up to 30 terabytes of storage to NTFS RAID disk array
- RAID levels of 0, 5 and 6
- SystemFlow® GUI virtual instrumentation panel for fast, intuitive operation
- C-callable API for integration of recorder into applications
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping
- Windows® 7 Professional workstation with high-performance Intel® Core™ i7 processor
Model RTR 2555  1-, 10-, 40-Gigabit Ethernet Rugged SFF Recorder

➤ SystemFlow Graphical User Interface

![SystemFlow Main Interface](image1)

The RTR 2555 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

![SystemFlow Hardware Configuration Interface](image2)

The Configure screen presents operational system parameters including temperature and voltages. Parameters are entered for each input or output channel specifying UDP or TCP protocol, client or server connection, the IP address and port number. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

![SystemFlow Record Interface](image3)

The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress. ➤
Model RTR 2555

1-, 10-, 40-Gigabit Ethernet Rugged SFF Recorder

➤ SystemFlow API

SystemFlow includes a complete API (Application Programming Interface) supporting control and status queries of all operations of the RTR 2555 from a custom application.

High-level C-language function calls and the supporting device drivers allow users to incorporate the RTR 2555 as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

Specifications

PC Workstation (standard configuration)

Operating System: Windows workstation
Processor: Intel i7 7700K (7th Gen) quad core processor
Clock Speed: 4.2 GHz
Operating System Drive: 250 GB SSD
SDRAM: 8 standard, 16 or 32 GB optional
RAID
  Total Storage: 3.8 TB – 30.6 TB
  Supported RAID Levels: 0, 5 and 6
  Drive Bays: Hot-swap, removable, front panel

Rear Panel I/O

Four USB 3.0 ports
Two Gigabit RJ45 ports
Two HDMI and One DVI ports
Audio and PS2 ports
USB 3.0 Type-C port
Two Wi-Fi antenna ports

Front Panel I/O

Two USB 2.0 ports
Power and recessed RESET buttons
LED indicators for power and HDD access

Physical and Environmental

Size: 5.25” H x 8.5” W x 14.0” D
Weight: 17 lb (7.7 kg)
Operating Temp: 0° to +50° C
Storage Temp: −40° to +85° C
Relative Humidity: 5 to 95%, non-condensing
Operating Shock: 15 g max. (11 msec, half-sine wave)
Operating Vibration: 10 to 20 Hz: 0.02 inch peak,
20 to 500 Hz: 1.4 g peak acceleration
Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 150 W max.

Ethernet Interface Options

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<td>Option -284</td>
<td>RJ45 connectors</td>
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</table>

Storage Options

<table>
<thead>
<tr>
<th>Option -410</th>
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<tr>
<td>Option -415</td>
<td>7.6 TB SSD storage</td>
</tr>
<tr>
<td>Option -420</td>
<td>15.3 TB SSD storage</td>
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<tr>
<td>Option -430</td>
<td>30.6 TB SSD storage</td>
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General Options

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<td>Option -630</td>
<td>6 to 30 VDC Power Supply</td>
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</table>

Model RTR 2555 Ordering Information and Options

Contact Pentek for other configurations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
General Information

Optimized for SWaP (size, weight and power) the Pentek Talon® RTR Small Form Factor (SFF) product line provides the performance and storage capacity previously only possible in much larger rackmountable chassis. Measuring 5.25” H x 8.5” W x 14” D and weighing only 17 pounds (7.7 kg), this small package can hold up to 30.6 TB of SSD storage.

Configured as a complete turnkey system capable of recording and playing back multiple Serial FPDP data streams, it is ideal for integrating any type of streaming sources such as live transfers from sensors or data from other computers. It is fully compatible with the VITA 17.1 specification. Using highly-optimized disk storage technology, the system achieves aggregate recording rates up to 3.2 GB/sec.

The RTR 2556 can be populated with up to four SFP connectors supporting Serial FPDP over copper, single-mode, or multi-mode fiber, to accommodate all popular Serial FPDP interfaces. It is capable of both receiving and transmitting data over these links and supports real-time data storage to disk.

Programmable modes include flow control in both receive and transmit directions, CRC support, and copy/loop modes. The system is capable of handling 1.0625, 2.125, 2.5, 3.125 and 4.25 GBaud link rates supporting data transfer rates of up to 425 MB/sec per Serial FPDP link.

Eight front panel data drives can be easily removed along with a front panel removable OS drive to allow all non-volatile memory to be removed from the system in seconds.

SystemFlow Software

The RTR 2556 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple and intuitive means to configure and control the system.

Custom configurations can be stored as profiles and later loaded as needed, allowing the user to select preconfigured settings with a single click.

Built on a server-class Windows 7 Professional workstation, the RTR 2556 allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTR 2556 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via two gigabit Ethernet ports or six USB 2.0 ports. Additionally, data can be copied to optical disk, using the 8X double layer DVD+R/RW drive.

Rugged and Flexible Architecture

Because SSDs operate reliably under conditions of shock and vibration, the RTR 2556 performs well in ground, shipborne and airborne environments. Configurable with hot-swappable SSDs, the RTR 2556 can provide storage capacities of up to 30.6 TB in a rugged chassis. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data.

The RTR 2556 is configured with hot-swap data drives, front-panel USB ports and I/O connectors on the rear panel. Systems are scalable to accommodate multiple chassis to increase channel counts and aggregate data rates. Multiple RAID levels, including 0, 5, and 6 provide a choice for the required level of redundancy.

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Features

- Housed in a small chassis measuring 5.25” H x 8.5” W x 14” D
- Weighs 17 lb (7.7 kg)
- Shock and vibration-resistant SSDs perform well in vehicles, ships and aircraft
- Complete Serial FPDP record and playback system
- Up to four I/O channels
- Removable SSDs
- Up to 30 terabytes of storage to NTFS RAID disk array
- Copper, single-mode and multi-mode fiber interfaces available
- Real-time aggregate recording rates of up to 1.6 GB/sec
- Supports Flow Control, CRC, and Copy/Loop Mode as a receiver and transmitter
- Supports 1.0625, 2.125, 2.5, 3.125 and 4.25 GBaud link rates
- RAID levels of 0, 5 and 6
- SystemFlow® GUI virtual instrumentation panel for fast, intuitive operation
- C-callable API for integration of recorder into application
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping
- Windows® 7 Professional workstation with high-performance Intel® Core™ i7 processor

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➤ SystemFlow Graphical User Interface

SystemFlow Main Interface
The RTR 2556 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Hardware Configuration Interface
The Configure screen presents operational system parameters including temperature and voltages. Parameters are entered for each input or output channel specifying the flow control settings and the recognition of a CRC in the data stream. Each channel can also be set up to utilize Serial FPDP’s copy/loop mode. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

SystemFlow Record Interface
The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress. ➤
SystemFlow includes a complete API (Application Programming Interface) supporting control and status queries of all operations of the RTR 2556 from a custom application.

High-level C-language function calls and the supporting device drivers allow users to incorporate the RTR 2556 as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet port, either to a local host or through an internet link for remote, stand-alone acquisition. Recorded NTFS files can be easily retrieved through the same connection.

Specifications

PC Workstation (standard configuration)
Operating System: Windows workstation
Processor: Intel i7 7700K (7th Gen) quad core processor
Clock Speed: 4.2 GHz
Operating System Drive: 250 GB SSD
SDRAM: 8 standard, 16 or 32 GB optional
RAID
  Total Storage: 3.8 TB – 30.6 TB
  Supported RAID Levels: 0, 5 and 6
  Drive Bays: Hot-swap, removable, front panel

Rear Panel I/O
  Four USB 3.0 ports
  Two Gigabit RJ45 ports
  Two HDMI and One DVI ports
  Audio and PS2 ports
  USB 3.0 Type-C port
  Two Wi-Fi antenna ports

Front Panel I/O
  Two USB 2.0 ports
  Power and recessed RESET buttons
  LED indicators for power and HDD access

Physical and Environmental
Size: 5.25” H x 8.5” W x 14.0” D
Weight: 17 lb (7.7 kg)
Operating Temp: 0° to +50° C
Storage Temp: -40° to +85° C
Relative Humidity: 5 to 95%, non-condensing
Operating Shock: 15 g max. (11 msec, half-sine wave)
Operating Vibration: 10 to 20 Hz: 0.02 inch peak,
  20 to 500 Hz: 1.4 g peak acceleration
Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 150 W max.

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
General Information

Optimized for SWaP (size, weight and power) the Pentek Talon® RTR Small Form Factor (SFF) product line provides the performance and storage capacity previously only possible in much larger rackmountable chassis. Measuring 5.25” H x 8.5” W x 14” D and weighing only 17 pounds (7.7 kg), this small package can hold up to 30.6 TB of SSD storage.

The Talon® RTR 2558 is a complete turn-key system for recording or playing back digital data. Using highly optimized disk storage technology, the system achieves sustained recording rates of up to 1.0 GB/sec.

The RTR 2758 utilizes a 32-bit LVDS interface that can be clocked at speeds up to 250 MHz. It includes Data Valid and Suspend signals and provides the ability to turn these signals on and off as well as control their polarity.

An ATX power supply accepts 110-240 VAC, drawing under 150 W and typically around 100 W. These models have the option for a 6-30 VDC power supply.

Eight front panel data drives can be easily removed along with a front panel removable OS drive to allow all non-volatile memory to be removed from the system in seconds.

Optional GPS time and position stamping accurately identifies each record in the file header.

SystemFlow Software

The RTR 2558 includes the SystemFlow Recording Software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the system.

Features

- Housed in a small chasis measuring 5.25”H x 8.5”W x 14”D
- Weighs 17 lb (7.7 kg)
- Shock and vibration-resistant SSDs perform well in vehicles, ships and aircraft
- 32 bits of LVDS digital I/O
- LVDS clock, Data Valid and Data Suspend signals
- Supports clock rates up to 250 MHz
- Real-time aggregate recording rates up to 1.0 GB/sec
- Up to 30 terabytes storage to NTFS RAID disk array
- RAID levels of 0, 5, and 6
- SystemFlow® GUI virtual instrumentation panel for fast, intuitive operation
- C-callable API for integration of recorder into application
- File headers include time stamping and recording parameters
- Optional GPS time and position stamping
- Windows® 7 Professional workstation with high-performance Intel® Core™ i7 processor

Custom configurations can be stored as profiles and later loaded when needed, allowing the user to select preconfigured settings with a single click.

Built on a Windows 7 Professional workstation, the RTR 2758 allows the user to install post-processing and analysis tools to operate on the recorded data.

The RTR 2558 records data to the native NTFS file system, providing immediate access to the recorded data.

Data can be off-loaded via two gigabit Ethernet ports or six USB ports. Additionally, data can be copied to optical disk using the 8X double layer DVD±R/RW drive.

Rugged and Flexible Architecture

Because SSDs operate reliably under conditions of shock and vibration, the RTR 2758 performs well in ground, shipborne and airborne environments.

Configurable with hot-swappable SSDs, the RTR 2558 can provide storage capacities of up to 30.6 TB in a rugged chassis. Drives can be easily removed or exchanged during or after a mission to retrieve recorded data.

The RTR 2558 is configured with hot-swap data drives, front panel USB ports and I/O connectors on the rear panel. Systems are scalable to accommodate multiple chassis 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, 5, and 6 provide a choice for the required level of redundancy.

➤
SystemFlow Graphical User Interface

The RTR 2558 GUI shows a block diagram of the system and provides the user with a control interface for the recording system. It includes Configure, Record, Playback, and Status screens, each with intuitive controls and indicators. The user can easily move between screens to configure parameters, control and monitor a recording, and play back a recorded stream.

SystemFlow Record Interface

The Record screen allows you to browse a folder and enter a file name for the recording. The length of the recording for each channel can be specified in megabytes or in seconds. Intuitive buttons for Record, Pause and Stop simplify operation. Status indicators for each channel display the mode, the number of recorded bytes, and the average data rate. A Data Loss indicator alerts the user to any problem, such as a disk full condition.

SystemFlow Hardware Configuration Interface

The Configure screen presents operational system parameters including temperature and voltages. These parameters include data valid and suspend enables, as well as polarity control for both signals. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.

By checking the Master Record boxes, any combination of channels in the lower screen can be grouped for synchronous recording via the upper Master Record screen. The recording time can be specified, and monitoring functions inform the operator of recording progress.
SystemFlow API
SystemFlow includes a complete API (Application Programming Interface) that supports control and status queries of all operations of the RTR 2558 from a custom application.

High-level C-language function calls and the supporting device drivers allow users to incorporate the RTR 2558 as a high-performance server front end to a larger system. This is supported using a socket interface through the Ethernet interface.

Specifications
PC Workstation (standard configuration)
Operating System: Windows workstation
Processor: Intel i7 7700K (7th Gen) quad core processor
Clock Speed: 4.2 GHz
Operating System Drive: 250 GB SSD
SDRAM: 8 standard, 16 or 32 GB optional
RAID
Total Storage: 3.8 TB – 30.6 TB
Supported RAID Levels: 0, 5 and 6
Drive Bays: Hot-swap, removable, front panel

Rear Panel I/O
Four USB 3.0 ports
Two Gigabit RJ45 ports
Two HDMI and One DVI ports
Audio and PS2 ports
USB 3.0 Type-C port
Two Wi-Fi antenna ports

Front Panel I/O
Two USB 2.0 ports
Power and recessed RESET buttons
LED indicators for power and HDD access

LVDS Interface
Cable: 80-pin ribbon cable
Connector Type: 2x40 pin IDC
Data Lines: 32 LVDS pairs, 2.5 V compliant
Clock: One LVDS pair, 2.5 V compliant
Data Valid: One LVDS pair, 2.5 V compliant
Data Suspend: One LVDS pair, 2.5 V compliant

Physical and Environmental
Size: 5.25” H x 8.5” W x 14.0” D
Weight: 17 lb (7.7 kg)
Operating Temp: 0° to +50° C
Storage Temp: −40° to +85° C
Relative Humidity: 5 to 95%, non-condensing
Operating Shock: 15 g max. (11 msec, half-sine wave)
Operating Vibration: 10 to 20 Hz: 0.02 inch peak,
20 to 500 Hz: 1.4 g peak acceleration
Power Requirements: 100 to 240 VAC, 50 to 60 Hz, 150 W max.

Specifications are subject to change without notice
Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Model RTR 2558 Ordering Information and Options

Channel Configurations
Option -201 Recording interface
Option -221 Playback interface
Note: Record and playback interfaces not available together.

Additional Options
Option -261 GPS Time and Position Stamping
Option -285 Raid 5 Configuration
Option -286 Raid 6 Configuration
Option -309 16 GB System Memory
Option -310 32 GB System Memory
Option -630 6 to 30 VDC Power Supply

Storage Options
Option -410 3.8 TB SSD storage capacity
Option -415 7.6 TB SSD storage capacity
Option -420 15.3 TB SSD storage capacity
Option -430 30.6 TB SSD storage capacity

Contact Pentek for compatible Option combinations
Storage and Channel-count Options may change, contact Pentek for the latest information

Specifications are subject to change without notice
Customer Information

Placing an Order
When placing a purchase order for Pentek products, please provide the model number and product description. You may place your orders by letter, telephone, email or fax; you should confirm a verbal order by mail, email or fax.

All orders should specify a purchase order number, bill-to and ship-to address, method of shipment, and a contact name and telephone number.

U.S. orders should be made out to Pentek, Inc. and may be placed directly at our office address, or c/o our authorized sales representative in your area.

International orders may be placed with us, or with our authorized distributor in your country. They have pricing and availability information and they will be pleased to assist you.

Prices and Price Quotations
All prices are F.O.B. factory in U.S. dollars. Shipping charges and applicable import, federal, state or local taxes, are paid by the purchaser.

We’re glad to respond to your request for price quotation just contact the corporate office, or your local representative. Price and delivery quotations are valid for 30 days, unless otherwise stated.

Quantity discounts for large orders are available and will be included in our price quotation, if applicable.

Terms
Terms are Net 30 days for accounts with established credit; until credit is established, we require prepayment, or will ship C.O.D.

Shipping
For new orders, we normally ship UPS ground with shipping charges prepaid and added to our invoice. If you are in a hurry, we will ship UPS Red, UPS Blue, FedEx, or the carrier of your choice, as you request.

Order Cancellation and Returns
All orders placed with Pentek are considered binding and are subject to cancellation charges. Hardware products may be returned within 30 days after receipt, subject to a restocking charge. Before returning a product, please call Customer Service to obtain a Return Material Authorization (RMA) number. Software purchases are final and we cannot allow returns.

Warranty
Pentek warrants its products to conform to published specifications and to be free from defects in materials and workmanship for a period of one year from the date of delivery, when used under normal operating conditions and within the service conditions for which they were furnished.

The obligation of Pentek arising from a warranty claim shall be limited to repairing or, optionally, replacing without charge any product which proves to be defective within the term and scope of the warranty.

Pentek must be notified of the defect or nonconformity within the warranty period. The affected product must be returned with shipping charges and insurance prepaid. Pentek will pay shipping charges for the return of product to buyer, except for products returned from outside the USA.

Limitations of Warranty
This warranty does not apply to products which have been repaired or altered by anyone other than Pentek or its authorized representatives.

The warranty does not extend to products that have been damaged by misuse, neglect, improper installation, unauthorized modification, or extreme environmental conditions, that fall outside of the scope of the product’s environmental specifications.

Due to the normal, finite write-cycle limits of Solid State Drives (SSDs), Pentek shall not be liable for warranty coverage of SSDs caused by wear-related issues that arise as an SSD reaches its write-cycle limit.

Pentek specifically disclaims merchantability or fitness for a particular purpose. Pentek shall not be held liable for incidental or consequential damages arising from the sale, use, or installation of any Pentek product. Regardless of circumstances, Pentek’s liability under this warranty shall not exceed the purchase price of the product.

Extended Warranty
You may purchase an extended warranty on our board-level products for a fee of 1% of the list price per month of coverage, or 10% of the list price per year of coverage.

All Pentek software products (excluding 3rd-party products) include free maintenance and free upgrades for one year. Extended software maintenance is available for one, two, and three years, starting after the first year.

Service and Repair
You must obtain a Return Material Authorization (RMA) before returning any product to Pentek for service or repair. RMA requests must be submitted online at: Return Material Authorization Form

After the form is completed in its entirety and submitted, Pentek shall email you a receipt and start processing your request. Once your request has been approved, Pentek shall e-mail you an RMA number, shipping instructions, and a quotation if the product is out of warranty.

Carefully package the product in its original packaging, if it is still available, and ship it to Pentek prepaid (if within the US) or free domicile DDP (if outside the US). Pentek shall not be responsible for loss or damage in shipment to Pentek, so you are strongly encouraged to insure the shipment for its full replacement value.

When the work is completed, we will return the product to you along with a statement of work performed.

Customer Service phone: 201-818-5900 • fax: 201-818-5697 • email: custsvc@pentek.com

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