

# PENTEK

## COMPANY PROFILE PRODUCT OVERVIEW

DIGITAL SIGNAL PROCESSING BOARDS •

DATA ACQUISITION BOARDS •

SOFTWARE RADIO BOARDS •

RECORDING SYSTEMS •



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SIGNAL VISION SYSTEM

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XMC • FMC • AMC • VPX • cPCI • PCIe

COMMERCIAL • RUGGED • PORTABLE • RACKMOUNT • SFF

## The Quartz Family: Xilinx Zynq UltraScale+ RFSoc

The Pentek Quartz™ family is based on the Xilinx Zynq® UltraScale+™ RFSoc FPGA. Quartz brings the performance and high density integration of the RFSoc to a wide range of different application spaces with a uniquely flexible design path. Quartz is available in standard form factors like 3U VPX, or with the QuartzXM™ Carrier Design Package, it can be deployed on application specific custom carriers. Designed to work with Pentek's Navigator® Design Suite tools, the combination of Quartz and Navigator offers users a streamlined path to IP development and deployment.

### RFSoc Advantages

The Xilinx Zynq UltraScale+ RFSoc Processor integrates eight RF-class 4 GHz 12-bit A/Ds & eight 6.4 GHz 14-bit D/As into the Zynq FPGA fabric and quad ARM Cortex-A53 and dual ARM Cortex-R5 processors, creating a multichannel data conversion and processing solution on a single chip.

### Quartz 3U VPX RFSoc Board Architecture

Complementing the RFSoc's on-chip resources, the Quartz Model 5950 board adds:

- Dual 100 GigE optical interfaces for high-bandwidth data streaming
- 16 GB of DDR4 SDRAM
- High-signal integrity connectors for RF inputs and outputs
- Sophisticated clocking for multi-channel and multi-board synchronization
- x8 PCIe Gen 3 VPX backplane system interface
- QuartzXM eXpress Module design for flexible development and deployment
- Factory-installed IP for waveform generation, real-time data acquisition and more
- Air-cooled and conduction cooled versions

### QuartzXM eXpress Module Speeds Integration for Custom Form Factors

The Model 6001 QuartzXM eXpress Module speeds custom deployment of RFSoc in SWaP critical environments. Measuring only 2.5 by 4 inches, the eight-channel 4 GHz 12-bit A/Ds & 6.4 GHz 14-bit D/As QuartzXM module includes all of the circuitry needed to maximize the performance of the RFSoc. As the central core of the Model 5950 3U VPX board above, the Model 6001 module migrates easily to other carriers with standard or custom form factors.

### QuartzXM Carrier Design Package

The Model 4801 QuartzXM Design Package supports customers interested in building their own carrier for the Model 6001 by sharing Pentek's RFSoc design expertise. QuartzXM module documentation includes thermal profiles, 3D mechanical models, pin definitions, and electrical specifications of all signals. Model 5950 3U VPX carrier documentation includes reference design schematics, PCB design guidelines, routing rules, and much more. A design review by Pentek engineers is included to help speed successful development.

### Ready-to-Use Quartz Development Platform

The Model 8257 is a low cost 3U VPX chassis ideal for developing applications on Pentek's Model 5950 Quartz RFSoc board. Providing power and cooling to match the 5950 in a small desktop footprint, the chassis allows access to all required interfaces on the front panel and the Model 5901 rear transition module. The 8257 can be configured with optional real-panel dual MPO optical connectors to support the 5950's dual 100 GigE interfaces and VITA 66.4.



*Model 5950  
8-Channel A/D & D/A Zynq  
UltraScale+ RFSoc Processor -  
3U VPX*



*Model 6001  
8-Channel A/D & D/A Zynq  
UltraScale+ RFSoc Processor -  
QuartzXM eXpress Module*



*Model 8257  
1-Slot 3U Quartz Development Chassis*



## Extendable IP Design

For applications that require specialized functions, users can install their own custom IP for data processing. The Pentek Navigator FPGA Design Kits (FDK) include the board's entire FPGA design as a block diagram that can be edited in Xilinx's Vivado IP Integrator. In addition to the IP Integrator block diagrams, all source code and complete IP core documentation is included. Developers can integrate their own IP along with the Pentek factory-installed functions or use the Navigator kit to completely replace the Pentek IP with their own.

The Navigator Board Support Package (BSP), the companion product to the Navigator FDK, provides a complete C-callable library for control of the 5950's hardware and IP. The Navigator FDK and BSP libraries mirror each other where each IP function is controlled by a matching software function, simplifying the job of keeping IP and software development synchronized.

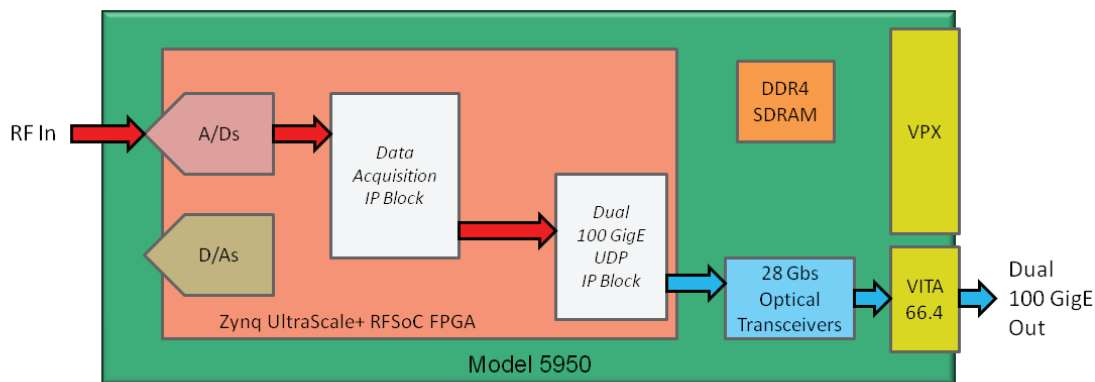
The Navigator BSP includes support for Xilinx's PetaLinux running on the ARM Cortex-A53 processors. When running under PetaLinux, the Navigator BSP libraries enable complete control of the 5950 either from applications running locally on the ARMs, or using the Navigator API, control and command from remote system computers.



## Example Application 1 - High Bandwidth Data Streaming

The RFSoC's eight 4 GSPS A/Ds are capable of producing an aggregate data rate of 64 GBytes/sec when all channels are enabled. While capturing this much raw data is not feasible, the A/Ds built-in digital down converters can reduce this data throughput in many applications to a rate reasonable for the data streaming and storage components downstream in the system.

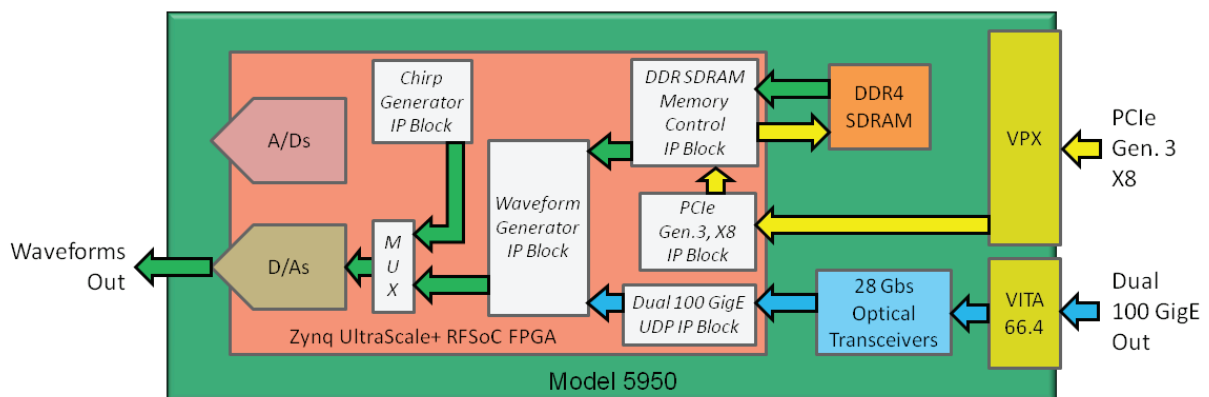
In some applications capturing the raw, full bandwidth data is crucial. The 5950's dual 100 GigE UDP engine provides a high bandwidth path for moving data off of the board. Along with the built-in data acquisition IP, the 5950 can stream two full bandwidth A/D data streams over optical cable to a downstream storage or processing subsystem.



## Example Application 2 - Waveform and Radar Chirp Generator

The 5950's IP includes a flexible waveform generator engine. Multiple waveforms can be loaded into the 5950's DDR4 SDRAM through the PCIe interface. These waveforms can then be output through the D/As based on user programmed sequences and triggers. In an alternate mode, waveforms can be streamed directly to the D/As via the 100 GigE interface.

The 5950 also includes a chirp generator ideal for radar applications. Chirp parameters like length, frequencies and sweep can be programmed and triggered by the front panel trigger input or through a software command.



## The Jade Family

The Jade® family of board-level products is based on the Xilinx Kintex UltraScale FPGAs. Jade includes products for radar, software radio, and communications based on these FPGAs.

## Form Factors

All products in the Jade family are available in the following form factors:

- XMC
- x8 PCI Express
- AMC
- 3U OpenVPX
- 6U OpenVPX
- 3U CompactPCI
- 6U CompactPCI

## The Jade Architecture

The Jade architecture embodies a new streamlined approach to FPGA-based boards, simplifying the design to reduce power and cost, while still providing some of the highest-performance FPGA resources available today. Designed to work with Pentek's Navigator® Design Suite, the combination of Jade and Navigator offers users an efficient path to developing and deploying FPGA-based data acquisition and processing.

As the central feature of the board architecture, the FPGA has access to all data and control paths, enabling factory-installed functions including data multiplexing, channel selection, data packing, gating, triggering and memory control. The Jade architecture organizes the FPGA as a container for data-processing applications where each function exists as an intellectual property (IP) module.

Each member of the Jade family is delivered with factory-installed applications ideally matched to the board's analog interfaces. Typical factory-installed functions may include A/D acquisition IP modules for simplifying data capture and transfer.

Each of the acquisition IP modules contains a powerful, programmable DDC IP core; an IP module for DDR4 SDRAM memory; a controller for all data clocking and synchronization functions; a test signal generator; and a PCIe interface. These complete the factory-installed functions and enable the board to operate as a complete turnkey solution for many applications, thereby saving the cost and time of custom IP development.

## Synchronization

An internal timing bus provides board timing and synchronization. The bus includes a clock, sync and gate or trigger signals. A Clock/Sync connector allows multiple boards to be synchronized. Multiple boards can be driven from the bus master, thereby supporting synchronous sampling and sync functions across all connected boards.

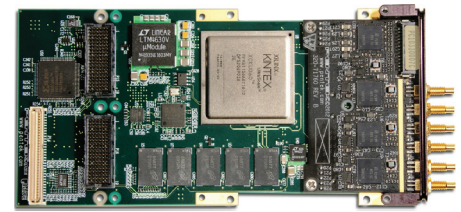
## Ruggedization

Except for the PCIe form factor, all other boards are available in various ruggedized formats up to and including conduction cooling.



The Pentek SPARK® systems are fully-integrated development systems for Pentek Cobalt, Onyx, Flexor, and Jade software radio, data acquisition and I/O boards. They save engineers and system integrators the time and expense of designing and building systems that ensure optimum performance of Pentek boards.

Each SPARK system is delivered with the Pentek board(s) and required software installed and is equipped with sufficient cooling and power to ensure optimum performance.



XMC Module



x8 PCIe



AMC



3U VPX  
COTS (left) and  
Rugged



3U cPCI

6U cPCI  
Double Density

6U VPX  
Double Density

Pentek's Navigator® Design Suite includes the Navigator FDK (FPGA Design Kit) for integrating custom IP into the Pentek factory-shipped design and the Navigator BSP (Board Support Package) for creating host applications. Most modern FPGA-processing applications require development of specialized FPGA IP to run on the hardware, *and* software to control the FPGA hardware from a host computer.

The Navigator Design Suite was designed from the ground up to work with Pentek's Jade and Quartz architectures and provides a better solution to the complex task of IP and software creation.

## Navigator FDK (FPGA Design Kit)

As FPGAs become larger and IP more complex, the need for IP design tools to manage this growing complexity has never been greater.

The Xilinx Vivado Design Suite includes IP Integrator, the industry's first plug-and-play IP integration design environment. Built around a graphical block diagram interface, IP Integrator allows IP developers to leverage existing IP by importing it into their block diagram design. Pentek's Navigator FPGA Design Kit (FDK), was designed with this exact purpose.

Each Navigator FDK provides the complete IP for a specific Jade or Quartz data acquisition and processing board. When the design is opened in Vivado's IP Integrator, the developer can access every component of the Pentek design, replacing or modifying blocks as needed for the application.

## Navigator BSP (Board Support Package)

The companion product to the Navigator FDK is the Pentek Navigator Board Support Package (BSP). While Navigator FDK provides a streamlined path for creating or modifying new IP for the Pentek hardware, the Navigator BSP enables complete operational control of the hardware and all IP functions in the FPGA.

Similar to the FDK, the BSP allows software developers to work at a higher level, abstracting many of the details of the hardware through an intuitive API. The API allows developers to focus on the task of creating the application by letting the API, the hardware and IP-control libraries below it to handle many of the board-specific functions. Developers who want full access to the entire BSP library, enjoy complete C-language source code as well as full documentation.

New applications can be developed on their own or by building on one of the included example programs. All Jade and Quartz boards are shipped with a full suite of build-in functions allowing operation without the need for any custom IP development.

**NAVIGATOR**  
Design Suite

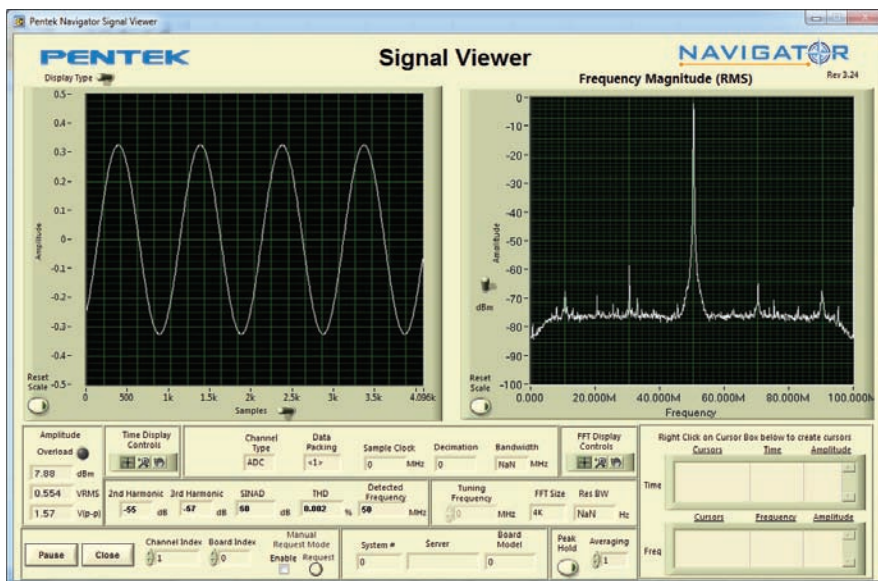


**NAVIGATOR**  
FPGA Design Kit

**NAVIGATOR**  
Board Support Package

**QUARTZ**

**VIVADO**



The Navigator BSP includes the Signal Analyzer, a full-featured analysis tool, that displays data in time and frequency domains. Built-in measurement functions display 2nd and 3rd harmonics, THD (total harmonic distortion), and SINAD (signal to noise and distortion). Interactive cursors allow users to mark data points and instantly calculate amplitude and frequency of displayed signals. With the Signal Analyzer, users can install the Pentek hardware and Navigator BSP and start viewing analog signals immediately.



## The Onyx Family

The Pentek Onyx® family includes radar, and software radio boards based on the Xilinx Virtex-7 FPGA. This comprehensive product line offers products that satisfy a wide range of applications.

## Form Factors

All products in the Onyx family are available in the following form factors:

- XMC
- x8 PCI Express
- AMC
- 3U OpenVPX
- 6U OpenVPX
- 3U CompactPCI
- 6U CompactPCI

## The Onyx Architecture

All of the board's data and control paths are accessible by the FPGA, enabling factory-installed functions including data multiplexing, channel selection, data packing, gating, triggering and memory control. The Onyx architecture organizes the FPGA as a container for data processing applications where each function exists as an (IP) module.

All members of the Onyx family are delivered with factory-installed applications ideally matched to the board's analog interfaces. In addition, IP modules for on-board memories, a controller for all data clocking and synchronization functions, a test signal generator, and a Gen. 3 PCIe interface complete the factory-installed functions and enable the board to operate as a complete turnkey solution without the need to develop any FPGA IP.



For applications that require specialized functions, users can install their own custom IP for data processing. Pentek GateFlow® FPGA Design Kits include all of the installed modules as documented source code. Developers can integrate their own IP with the installed functions or use the GateFlow kit to replace the Pentek IP with their own.



The Onyx architecture includes GateXpress®, a sophisticated FPGA-PCIe configuration manager for loading and reloading the FPGA. At power up, GateXpress immediately presents a PCIe target for the host computer to discover, effectively giving the FPGA time to load from FLASH. This is especially important for larger FPGAs where the loading times can exceed the PCIe discovery window, typically 100 msec on most PCs.

GateXpress handles the hardware negotiation simplifying and streamlining the loading task. In addition, GateXpress preserves the PCIe configuration space allowing dynamic FPGA reconfiguration without needing to reset the host computer.

## Synchronization

An internal timing bus provides board timing and synchronization. The bus includes a clock, sync and gate or trigger signals. A Clock/Sync connector allows multiple boards to be synchronized. Multiple boards can be driven from the bus master, thereby supporting synchronous sampling and sync functions across all connected boards.

## Ruggedization

Except for the PCIe form factor, all other boards are available in various ruggedized formats up to and including conduction cooling.



The Pentek SPARK® systems are fully-integrated development systems for Pentek Cobalt® Onyx® and Flexor® software radio, data acquisition and I/O boards. They save engineers and system integrators the time and expense of designing and building systems that ensure optimum performance of Pentek boards.



XMC Module



x8 PCIe



AMC



3U VPX  
Commercial (left) and  
Rugged



6U cPCI  
Double Density

6U VPX  
Double Density

## The Cobalt Family

The Pentek Cobalt® family includes radar, software radio and digital I/O boards based on the Xilinx Virtex-6 FPGA. This comprehensive product line offers products that satisfy a very wide range of applications.

## Form Factors

All products in the Cobalt family are available in the following form factors:

- XMC
- 3U OpenVPX
- 3U CompactPCI
- x8 PCI Express
- 6U OpenVPX
- 6U CompactPCI
- AMC

## The Cobalt Architecture

The Pentek Cobalt architecture features a Virtex-6 FPGA. All of the board's data and control paths are accessible by the FPGA, enabling factory-installed functions including data multiplexing, channel selection, data packing, gating, triggering and memory control. The Cobalt architecture organizes the FPGA as a container for data-processing applications where each function exists as an intellectual property (IP) module.

Most members of the Cobalt family are delivered with factory-installed applications ideally matched to the board's analog interfaces. In addition, IP modules for on-board memories, a controller for all data clocking and synchronization functions, a test signal generator, and a Gen. 2 PCIe interface complete the factory-installed functions and enable the board to operate as a complete turnkey solution without the need to develop any FPGA IP.



For applications that require specialized functions, users can install their own custom IP for data processing. Pentek GateFlow® FPGA Design Kits include all of the factory-installed modules as documented source code. Developers can integrate their own IP with the Pentek factory-installed functions or use the GateFlow kit to completely replace the Pentek IP with their own.

Many of the Cobalt models come with off-the-shelf installed IP that addresses specific applications. This IP provides additional dedicated functions that range from three broadband DDCs (digital downconverters) to 1100 narrowband DDCs.

## Synchronization

An internal timing bus provides board timing and synchronization. The bus includes a clock, sync and gate or trigger signals. An on-board clock generator receives an external sample clock. This clock can be used directly or divided by a built-in clock synthesizer.

A Clock/Sync connector allows multiple boards to be synchronized. Multiple boards can be driven from the bus master, thereby supporting synchronous sampling and sync functions across all connected boards.

## Ruggedization

Except for the PCIe platform, all other boards are available in various ruggedized formats up to and including conduction cooling.

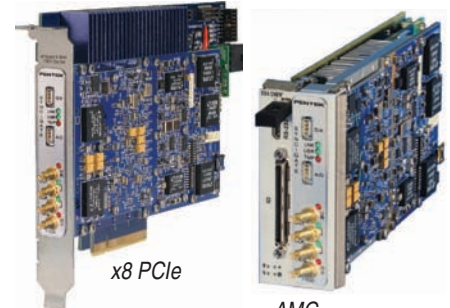


The Pentek SPARK® systems are fully-integrated development systems for Pentek Cobalt® Onyx® and Flexor® software radio, data acquisition, and I/O boards. They save engineers and system integrators the time and expense of designing and building systems that ensure optimum performance of Pentek boards.

A fully-integrated system-level solution, each SPARK development system provides the user with a streamlined, out-of-the-box experience.

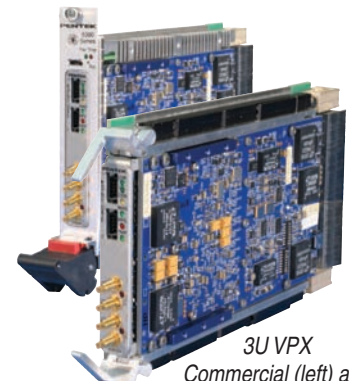


XMC Module



x8 PCIe

AMC



3U VPX  
Commercial (left) and  
Rugged



6U cPCI  
Double Density

6U VPX  
Double Density



## 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.

## Ready-to-Run Recording Systems

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.

These systems are built on a Windows workstation. Users can easily install post-processing and analysis tools to operate on the recorded data.

The recorded files are stored in the native Windows NTFS format, allowing them to be immediately used without the need for post-recording file conversion.

## Systems For All Your Recording Needs

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

**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.

**RTV Lab Systems** are also designed for commercial applications in a lab or office environment. They provide outstanding performance for under \$20,000 US.

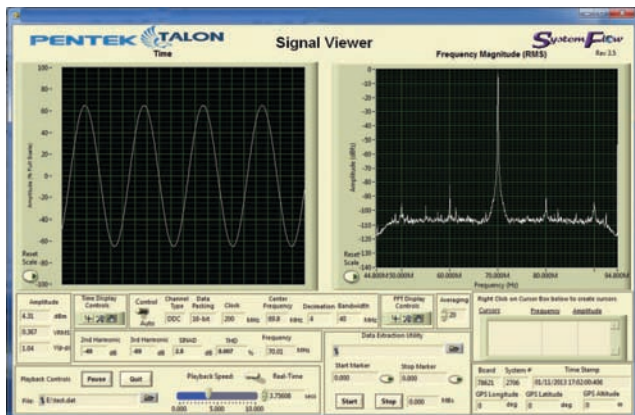
**RTR Rugged Portable Systems** are available in small briefcase-sized enclosures with integral LCD display and keyboard and weigh about 30 lb. They are designed for harsh environment field applications where size and weight is of paramount importance.

**RTR Rugged Rackmount Systems** 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 1/2 ATR chassis. They are designed to operate under extreme environmental conditions using forced-air or conduction-cooling to draw heat from system components.



**Sentinel™ Recorders** add intelligent signal scanning with signal monitoring and detection for Talon real-time recording systems. Users can scan the entire available spectrum or select a region of interest. Selectable-resolution bandwidth allows for the trading of sweep rate for a finer resolution and better dynamic range. 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. The Sentinel hardware resources are controlled through enhancements to Talon's SystemFlow® software package.



## SystemFlow Signal Viewer

The SystemFlow Signal Viewer includes a virtual oscilloscope and a virtual spectrum analyzer for signal monitoring in both the time and frequency domains. You can download and install the free SystemFlow Simulator to your desktop or laptop PC.



RTS Lab System



RTV Lab System



RTR Rugged Portable System



RTR Rugged Rackmount System



RTX Extreme Rackmount System



RTX Extreme 1/2 ATR Portable System



<https://www.pentek.com/systemflow/systemflow.cfm#SystemFlowSimulator>



## The Flexor/OnyxFX Family

The Flexor® line of FMC analog modules and OnyxFX™ FMC carrier boards combines the high performance of the Virtex-7 FPGA with the flexibility of the FMC data converter thereby creating a complete radar and software radio solution.

### FlexorSet

As a FlexorSet® integrated solution, the analog I/O FMC is factory-installed on the FMC carrier. The required FPGA IP is installed and the board set is delivered ready for immediate use.

The delivered FlexorSet is a multichannel, high-speed data converter and is suitable for connection to the HF or IF ports of a communications or radar system. The built-in data capture and generator features a Gen. 3 x8 PCIe interface to make them turnkey solutions.

### Carrier Boards

As stand-alone processors, carrier boards provide an ideal development and deployment platform for demanding signal-processing applications.

The carrier board architecture includes an optional built-in gigabit serial optical interface. Up to 12 high-speed duplex optical lanes are available on an MTP connector. With the installation of a serial protocol in the FPGA, this interface enables a high-bandwidth connection between boards mounted in the same chassis or even over extended distances between them.

### Development Tools and Software Support



While many applications can be satisfied with the board's built-in functions, the OnyxFX carrier boards are an ideal development and deployment platform for custom IP. Supported by the Pentek GateFlow® FPGA Design Kit, users have access to the complete factory-installed IP at the source level, allowing them to extend or even replace the built in functions.



The Pentek GateXpress® PCIe Configuration Manager supports dynamic FPGA re-configuration through software commands as part of the runtime application. This provides an efficient way to quickly reload the FPGA, which occurs many times during development. For deployed environments, GateXpress enables reloading the FPGA without the need to reset the host system, ideal for applications that require dynamic access to multiple processing IP algorithms.



The Pentek ReadyFlow® Board Support Package is available for Windows or Linux operating systems. To accelerate application development, ReadyFlow is provided as a C-callable library, the complete suite of initialization, control and status functions, as well as a rich set of precompiled, ready-to-run-examples.

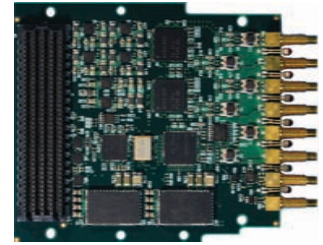
### FMC Interface

Analog modules comply with the VITA 57 FMC specification. The interface provides all data, clocking, synchronization, control, and status signals between the module and the FMC carrier.

### Ruggedization

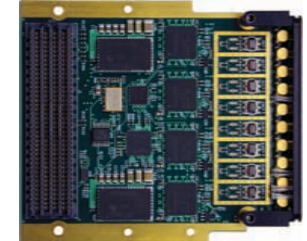
Except for the PCIe Carrier board, all other boards are available in various ruggedized formats up to and including conduction cooling.

Flexor



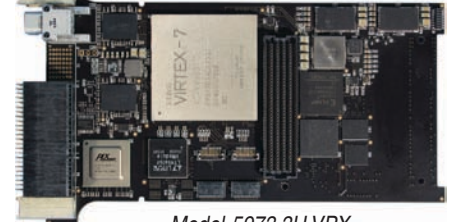
Model 3312 Multichannel  
A/D & D/A FMC module

Flexor



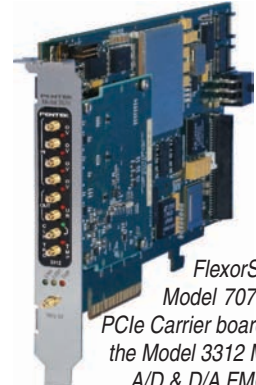
Model 3316 Multichannel  
A/D FMC module

OnyxFX



Model 5973 3U VPX  
FMC Carrier board

OnyxFX



FlexorSet  
Model 7070-312  
PCIe Carrier board shown with  
the Model 3312 Multichannel  
A/D & D/A FMC module

## SPARK Development Systems

The Pentek SPARK™ systems are fully-integrated development systems for Pentek Cobalt®, Onyx®, Flexor®, Jade™, and Quartz™ software radio, data acquisition, and I/O boards. They were created to save engineers and system integrators the time and expense associated with building and testing development systems that ensure optimum performance of Pentek boards.

A fully-integrated system-level solution, each SPARK development system provides the user with a streamlined, out-of-the-box experience. Each comes preconfigured with Pentek hardware, drivers and software examples installed and tested to allow development engineers to run example applications out of the box.

### Ready-to-Run Development Systems

- The **Model 8266 PCIe** development system is equipped with the latest Intel processor, DDR3 SDRAM and a high-performance motherboard. These features accelerate application code development and provide unhindered access to the high-bandwidth data available with Pentek analog and digital interfaces.

This development system uses a 19" 4U rackmount chassis that is 21" deep. It can be configured with 64-bit Windows or Linux operating systems.

- The **Model 8267 3U OpenVPX** development system is equipped with the latest Intel i7 processor, DDR3 SDRAM and a high-performance single-board computer. These features accelerate application code development and provide unhindered access to the high-bandwidth data available with Pentek analog and digital interfaces. The development system can be configured with 64-bit Windows or Linux operating systems.

This development system uses a 19" 4U rackmount chassis that is 12" deep. Nine VPX slots provide ample space for an SBC, a switch card and multiple Pentek boards.

- The **Model 8264 6U OpenVPX** development system is equipped with the latest Intel i7 processor, DDR3 SDRAM and a high-performance single-board computer. These features accelerate application code development and provide unhindered access to the high-bandwidth data available with Pentek analog and digital interfaces. The system can be configured with 64-bit Windows or Linux operating systems.

This development system uses a 19" 9U rackmount chassis that is 16" deep. Nine VPX slots provide ample space for an SBC, a switch card and multiple Pentek boards.

### Ventilation and Power

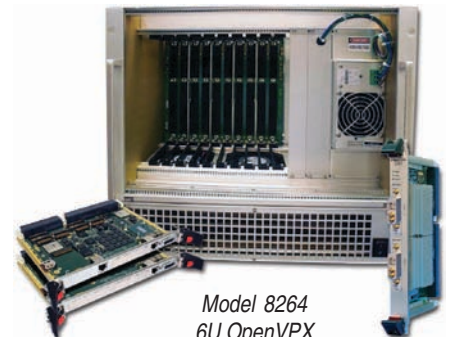
In all development systems, enhanced forced-air ventilation assures adequate cooling for all boards and power supplies guarantee more than adequate power for all installed boards.



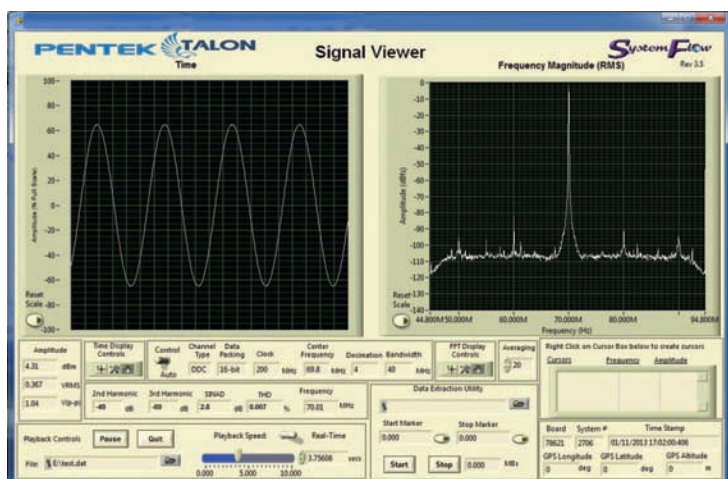
Model 8266  
PCIe Development  
System



Model 8267  
3U OpenVPX  
Development System



Model 8264  
6U OpenVPX  
Development System



### ReadyFlow Software

Available with all development systems, the Ready-Flow® Signal Analyzer is a full-featured analysis tool that continuously displays live signals in both time and frequency domains.



## Analog RF Products

The Bandit® family of analog RF products provides a series of high-performance, stand-alone RF downconverter modules. Offering a low noise figure, programmable gain and high dynamic range, they ensure that there are no gaps in the RF spectrum coverage. The Bandit series are an ideal solution for amplifying and downconverting antenna signals for communications, radar and signal intelligence systems.

- The **Bandit Model 7120** is a two-channel, high-performance, stand-alone analog RF wideband downconverter. It is packaged as a small, shielded PMC/XMC module with front-panel connectors for easy integration into RF systems.

With an input frequency range from 400 to 4000 MHz and a wide IF bandwidth of up to 390 MHz, the 7120 is an ideal solution for amplifying and downconverting antenna signals. The 7120 accepts RF signals on two front-panel SSMC connectors. LNAs (Low Noise Amplifiers) are provided, along with two programmable attenuators allowing downconversion of input signals ranging from -60 dBm to -20 dBm in steps of 0.5 dB.

Output is provided as baseband I and Q signals at bandwidths up to 390 MHz. Alternatively, either I or Q output can be used at some intermediate offset frequency convenient to the application. This output is suitable for A/D conversion using Pentek high-performance signal acquisition products, such as those in the Cobalt® and Onyx® families.

This Model is available in these form factors: PMC/XMC, x8 PCIe, 3U VPX, 6U VPX, AMC, 3U CompactPCI, and 6U CompactPCI.



*Model 7120  
Analog RF Downconverter  
PMC/XMC*

- The **Bandit Model 8111** provides a series of high-performance, stand-alone analog RF slot downconverter modules. Packaged in a small, shielded enclosure with connectors for easy integration into RF systems, the modules offer programmable gain, high dynamic range and low noise figure.

With input options to cover specific frequency bands of the RF spectrum and an IF output optimized for A/D converters, the 8111 is an ideal solution for amplifying and downconverting antenna signals.

The 8111 accepts RF signals on a front panel SMA connector. An LNA is provided along with two programmable attenuators allowing downconversion of input signals ranging from -60 dBm to -20 dBm in steps of 0.5 dB.

Seven different input-frequency band options are offered, each tunable across a 400 MHz band, with an overlap of 100 MHz between adjacent bands. As a group, these seven options accommodate RF input signals from 800 MHz to 3 GHz.

An 80 MHz-wide IF output is provided at a 225 MHz center frequency. This output is suitable for A/D conversion using Pentek high-performance signal acquisition products, such as those in the Cobalt and Onyx families.



*Model 8111  
Analog RF Slot  
Downconverter*



The Pentek ReadyFlow® Board Support Package is available for Windows and Linux operating systems. To accelerate application development, ReadyFlow is provided as a C-callable library, the complete suite of initialization, control and status functions, as well as a rich set of precompiled, ready-to-run-examples.