Model 2742	Ultra Wideband RF/IF	Talon RTR Rugged Recorder	Rackmount

Features

- Sample rates up to 6 GHz
- Real-time sustained recording rates up to 6 GB/sec
- Integrated DDCs and DUCs
- Record up to 2.4 GHz wide bandwidth signals
- Playback up to 1.28 GHz wide bandwidth signals
- Up to 122 TB of front-panel removable solid state storage
- 4U 19-inch industrial grade server chassis
- SystemFlow GUI with Signal Viewer analysis tool
- C-callable API for integration

TALON RTR RUGGED RECORDER

General Information

Talon RTR 2742 is a turn-key record and playback system for ultra-wideband analog RF/IF signals. Using two 12-bit, 6.4 GHz A/D converters, this system can achieve sustained recording of 2.4 GHz bandwidth signals at rates up to 6 GBytes per second. It can be configured as a one- or two-channel system and can record real samples or complex I+Q digitally down-converted samples.

Complemented by a 16-bit, 6.4 GHz D/A converter, the RTR 2742 is capable of playing back analog signal bandwidths up to 1.28 GHz. Built-in digital down- and up-converters provide flexible bandwidth and tuning frequency selection for both record and playback.

The RTR 2742 includes a 12-bit 6.4 GHz A/D that can be clocked at rates from 1.6 to 6 GHz in single-channel mode. Data can be truncated and packed as 8-bit samples, to support continuous recording up to the maximum sample rate. The D/A is capable of reproducing signals with up to 1.28 GHz of instantaneous bandwidth and includes a wide range of interpolations.

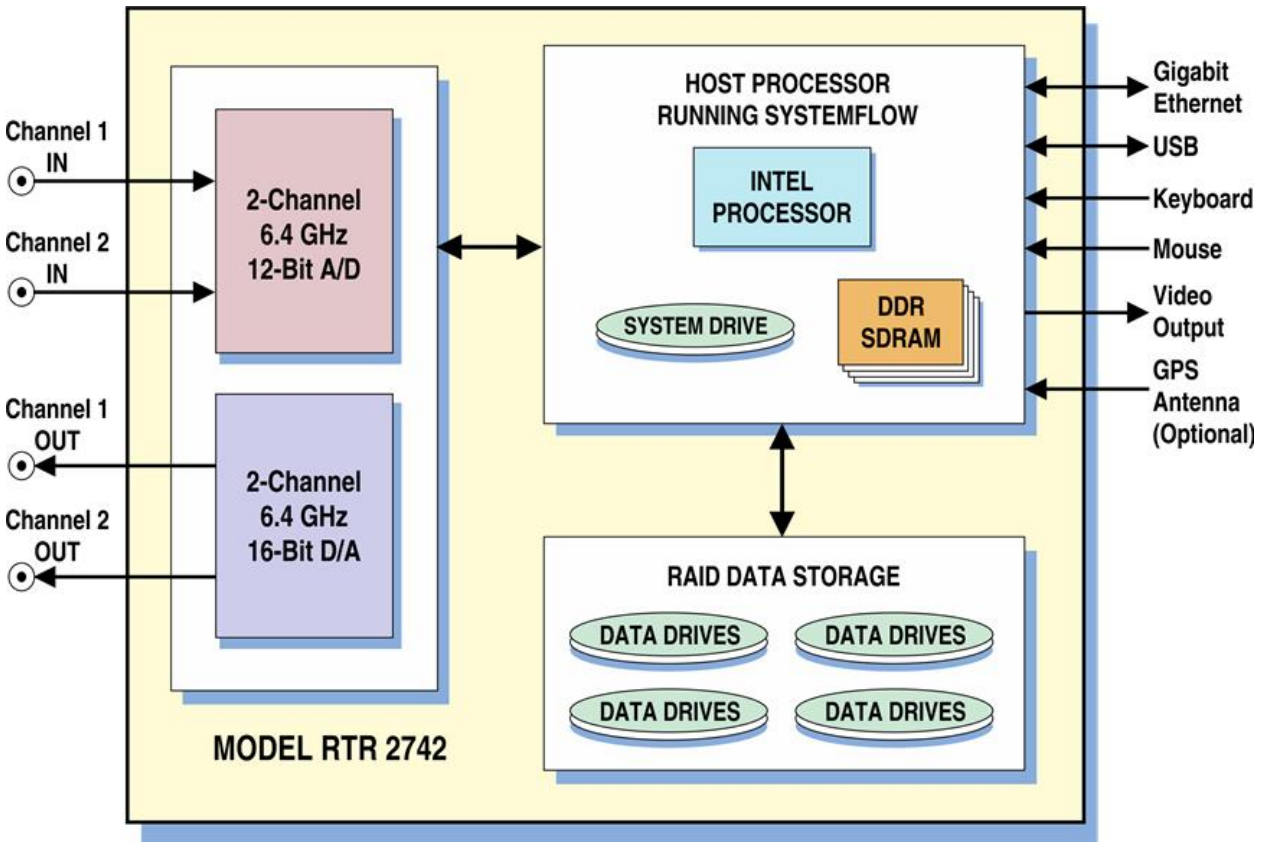
Rugged and Flexible Architecture

Because SSDs operate reliably under conditions of vibration and shock, the RTR 2742 performs well in ground, shipborne and airborne environments. The hot-swappable SSDs provide storage capacity of up to 122 TB. The drives can be easily removed or exchanged during or after a mission to retrieve recorded data.

The RTR 2742 is configured in a 4U 19-inch 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.

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

2742 Block Diagram



Operational Modes

The RTR 2742 uses JESD204B A/D and D/A converters that are limited to a set of operational modes. These modes are defined below:

Record Modes

Single-Channel Mode (dual-edged sampling)	Dual-Channel Mode (single-edged sampling)
8-bit packed real, fs = 1600 - 6000 MHz	8-bit packed real, fs = 800 - 3000 MHz
16-bit packed real, fs = 1600 - 3000 MHz	16-bit packed real, fs = 800 - 1500 MHz
	16-bit packed complex DDC, fs = 800 - 3000 MHz (dec = 4)
	16-bit packed complex DDC, fs = 800 - 3200 MHz (dec = 8 or 16)

Playback Modes

Single-Channel Mode (single-edged sampling)	Dual-Channel Mode (single-edged sampling)
8-bit packed real, fs = 1600 - 3200 MHz	16-bit packed real, fs = 400 - 1250 MHz
16-bit packed real, fs = 400 - 1600 MHz	16-bit packed real, fs = 800 - 2500 MHz (int = 2)
16-bit packed real, fs = 800 - 3200 MHz (int = 2)	16-bit packed real, fs = 1600 - 3200 MHz (int = 4)
16-bit packed real, fs = 1600 - 3200 MHz & 5240 - 6400 MHz (int = 4)	16-bit packed complex DUC, fs = 1200 - 3200 MHz (int = 6)
16-bit packed complex DUC, fs = 800 - 1600 MHz (int = 2)	16-bit packed complex DUC, fs = 1600 - 3200 MHz (int = 8)
16-bit packed complex DUC, fs = 1600 - 3200 MHz (int = 4)	16-bit packed complex DUC, fs = 2000 - 3200 MHz & 5240 - 5750 MHz (int = 10)
16-bit packed complex DUC, fs = 1200 - 3200 MHz (int = 6)	16-bit packed complex DUC, fs = 2400 - 3200 MHz & 5240 - 6400 MHz (int = 12)
16-bit packed complex DUC, fs = 1600 - 3200 MHz & 5240 - 6400 MHz (int = 8)	16-bit packed complex DUC, fs = 3200 MHz & 5240 - 6400 MHz (int = 16)
16-bit packed complex DUC, fs = 2000 - 3200 MHz & 5240 - 6400 MHz (int = 10)	16-bit packed complex DUC, fs = 5240 - 6400 MHz (int = 18)
16-bit packed complex DUC, fs = 2400 - 3200 MHz & 5240 - 6400 MHz (int = 12)	16-bit packed complex DUC, fs = 5240 - 6400 MHz (int = 24)
16-bit packed complex DUC, fs = 3200 MHz & 5240 - 6400 MHz (int = 16)	
16-bit packed complex DUC, fs = 5240 - 6400 MHz (int = 18)	
16-bit packed complex DUC, fs = 5240 - 6400 MHz (int = 24)	

SystemFlow Software

All Talon recorders include the Pentek SystemFlow® recording software. SystemFlow software provides three ways for users to configure and control a Talon recorder:

- The SystemFlow GUI provides a point-and-click user interface. 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.
- The SystemFlow API provides a set of C-callable libraries that allow engineers to develop their own user interface to configure and control their Talon recorder.
- The SystemFlow Telnet interface provides a simple set of commands to configure and control the recorder. This eliminates the need for any software development and is most suitable for unmanned operation.

SystemFlow software allows the recorder to be set up to run autonomously by implementing scripts using the API or telnet interface. All three interfaces can be run from a remote connection over Gigabit Ethernet.

A simple header that holds the recording parameters is added to the beginning of the file. An optional GPS receiver allows the user to precisely timestamp files and optionally track the recorder's position throughout a mission. The system records all data to the native NTFS file system, allowing for quick and easy access to the data from any computer.

Click below to view a video about SystemFlow.

SystemFlow Simulator

To learn more about the SystemFlow Software, you can download and install the free SystemFlow Simulator to your desktop or laptop PC. The SystemFlow Simulator allows you to learn how to use the Talon recording system's SystemFlow software interface before you acquire a recorder or while you are waiting for delivery of a Talon recording system.

The Simulator can simulate the operating environment of all the different Talon recorder models. The Simulator also demonstrates the SystemFlow Signal Viewer by playing recorded signals to simulate the appearance of live signals being digitized and recorded by a Pentek analog signal recorder.

Features

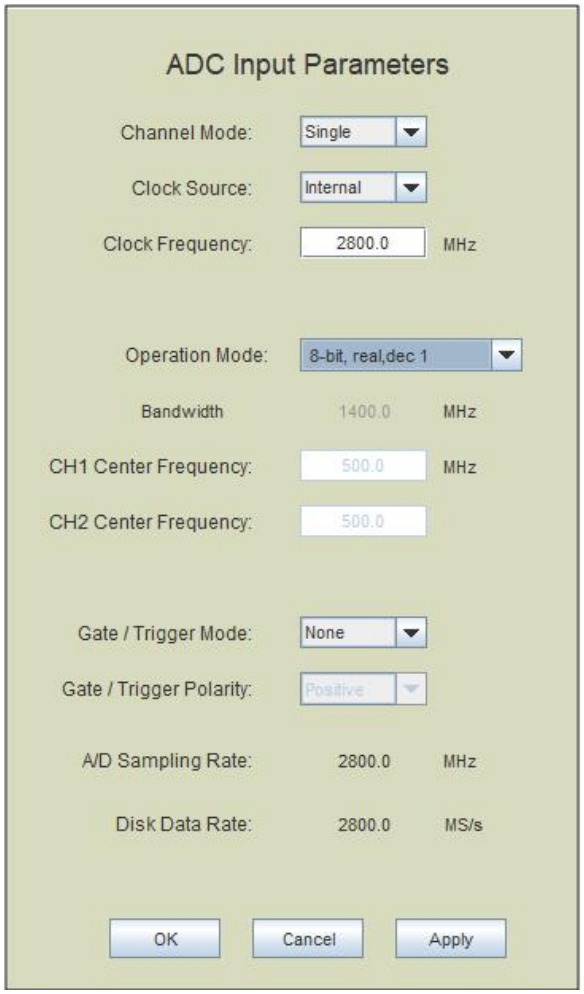
- Provides real-time recording system simulation
- Demonstrates SystemFlow signal & file viewer tools
- Capable of simulating all Talon analog and digital recording systems
- Full Talon SystemFlow GUI
- Simulator can be used to develop Talon system profiles for use in the final system
- Can be used with the SystemFlow API to develop and test custom user interface

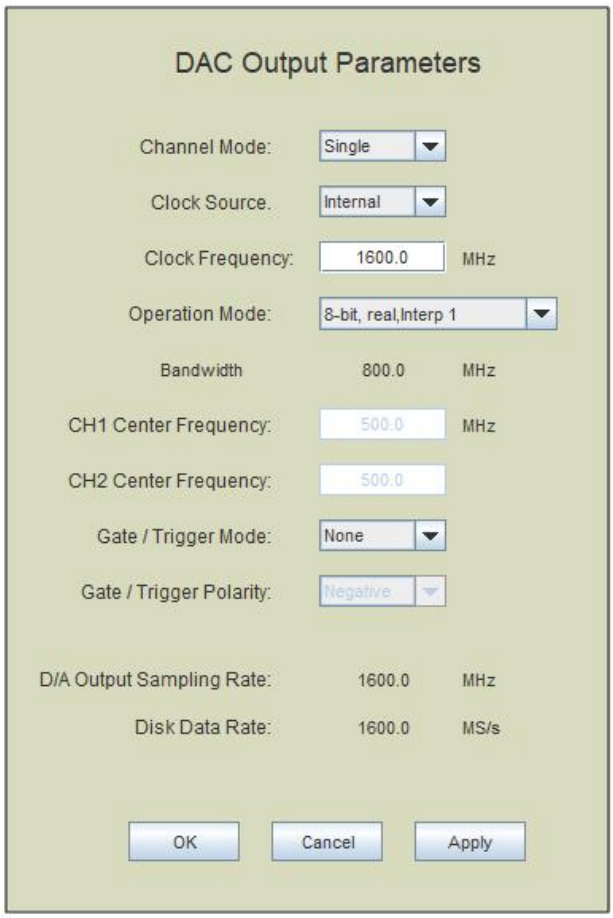
SystemFlow Recorder Interface

The RTR 2742 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.

Setting System Parameters

The RTR 2742 configuration GUI provides a simple and intuitive means for setting up the system parameters such as channel mode, clock frequency, downconversion, and gate/trigger mode. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience. Details about each field on the configuration screens are provided in the RTR 2742 user manual.

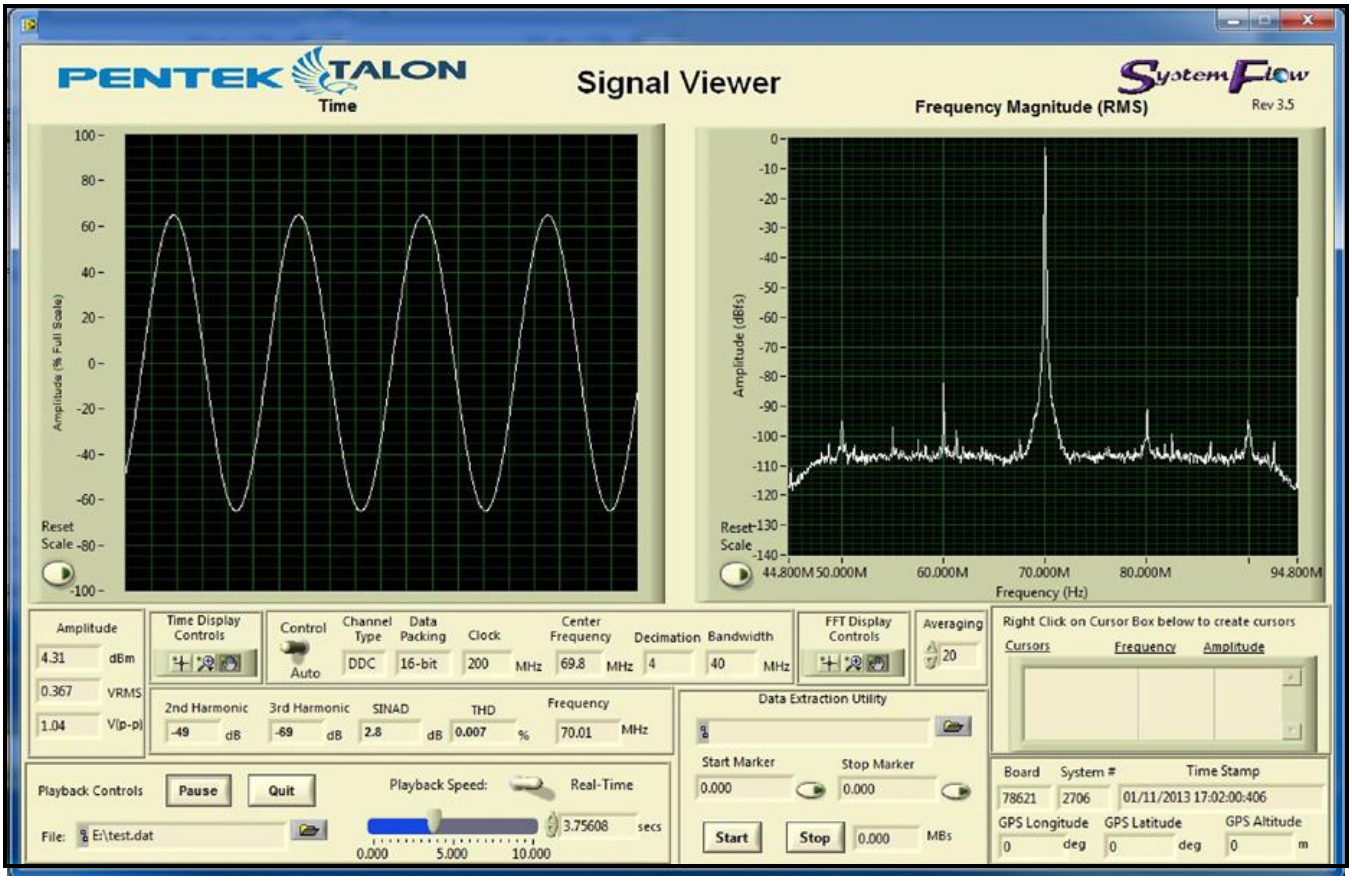




Signal Viewer

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.



SystemFlow API

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

High-level C-language function calls and the supporting device drivers allow users to incorporate the RTR 2742 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.

Below is an example of controlling recording via the SystemFlow API.

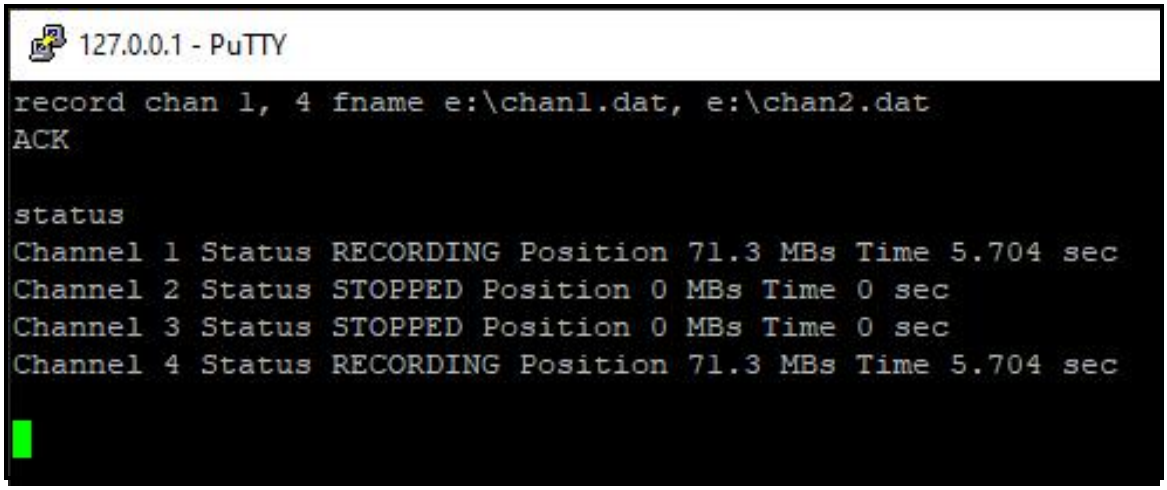
```
728         }
729         //transfer until end of disk
730         else if (transferType == TRANSFER_END_OF_DISK)
731         {
732             recordParams->transferTime    = 0;                    // must set to 0
733             recordParams->transferLength  = 0;                    // must set to 0
734         }
735
736         ////////////////////// Start the record //////////////////////
737         SetConsoleTextAttribute (hConsole, FOREGROUND_GREEN | FOREGROUND_INTENSITY );
738         printf("\nCase 6: RTS_Record\n");
739         SetConsoleTextAttribute (hConsole, wOldColorAttrs);
740
741         //trigger immediately
742         if(recordParams->trigger == RTS_TRIGGER_IMMEDIATELY)
743         {
744             //send record command
745             if ((error = RTS_Record(++msgNum,
746                                     serverInfo,
747                                     recordParams,
748                                     recordChanId,
749                                     fileName[0])) != RTS_SUCCESS)
750             {
751                 printf("Record Error # 0x%lx.\n", error);
752                 exitHandler(error);
753                 goto freeMem;
754             }
755
756             Sleep(500);
757         }
758
759         //wait for SW trigger
760         else if(recordParams->trigger == RTS_WAIT_FOR_SW_TRIGGER)
761         {
762             //send record command which set up record and start DMA
763             if ((error = RTS_Record(++msgNum,
764                                     serverInfo,
765                                     recordParams,
766                                     recordChanId,
767                                     fileName[0])) != RTS_SUCCESS)
```

SystemFlow Telnet

The Talon telnet facility is an optional feature that can be requested when ordering one of Pentek's Talon recording systems. The Talon telnet facility allows you to control a Talon recorder from a remote computer. You also can use the Talon recorder's SystemFlow Signal Viewer to remotely monitor real−time data.

Pentek's *Telnet Facility for Talon Recording Systems User's Guide* provides instructions for setting up telnet access and describes all the supported commands.

Below is an example of use of the "record" command:



Specifications

PC Workstation (standard configuration)

Operating System: Windows
Processor: Intel Core i7 processor
SDRAM: 8 GB
RAID
Storage: 7.6, 15.3, 30.7, 61, or 122.8 TB
Drive Type: SATA III SSDs
Supported RAID Levels: 0, 5, and 6

Analog Signal Inputs

Connectors: Two rear panel SSMC connectors, In 1 & In 2
Input Type: Single-ended, non-inverting
Full Scale Input: 1 dBm into 50 ohms
Coupling: Transformer-coupled

A/D Converters

Type: Texas Instruments ADC12DJ3200
Sampling Rate: Up to 6 GHz
Resolution: 12 bits
Anti-Aliasing Filters: External, user-supplied

Analog Signal Outputs

Connectors: Two rear panel SSMC connectors: OUT 1 & OUT 2
Output Type: Single-ended, non-inverting
Full Scale Output: +5 dBm
Coupling: Transformer-coupled
Analog Output Transformer Bandwidth: 1.28 MHz

D/A Converters

Type: Texas Instruments DAC38RF82
Sampling Rate: Up to 6 GHz
Resolution: 16 bits

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

4U Long Chassis: 19" W x 26" 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.

Specifications are subject to change without notice.

Ordering Information

Click here for more information.

RAID Options	
Option -285	RAID 5 configuration
Option -286	RAID 6 configuration
Memory Options	
Option -309	16 GB system memory
Option -311	64 GB DDR4 SDRAM
Storage Options	
Option -415	7.6 TB SSD
Option -420	15.3 TB SSD
Option -430	30.7 TB SSD
Option -460	61 TB SSD
Option -485	122.8 TB SSD
Other Options	
Option -261	GPS time and position stamping
Option -264	IRIG-B time stamping
Option -267	Dual 10 GbE offload
Option -268	40 GbE offload
Option -625	Removable OS drive enclosure
Option -680	28V DC power supply

Pricing and Availability

To learn more about our products or to discuss your specific application please contact your local representative or Pentek directly:

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