Model 2628	8-Channel, 6 GHz RF	Talon RTR Rugged Recorder	Rackmount

Features

- Eight-channel phase-coherent RF recording
- Ideal for signal intelligence, phased-array radars, beamforming, and DF (Direction Finding) systems
- Records RF frequencies from 30 MHz to 6 GHz
- Captures 80 MHz of instantaneous bandwidth
- Eight-channel RF tuner can be set for phase-coherent operation or independent tuning
- Eight 250 MHz 16-bit A/Ds
- Eight DDCs with decimations to 65,536 for selectable bandwidths
- 3.2 GB/s real-time aggregate recording rate
- 4U 19-inch rugged rackmount PC server chassis
- Windows® workstation with high-performance Intel® processor
- Front panel removable SSD drives
- Up to 122 terabytes of storage to NTFS RAID disk array
- SystemFlow® GUI with signal viewer analysis tool
- Optional GPS time and position stamping

TALON RTR RUGGED RECORDER

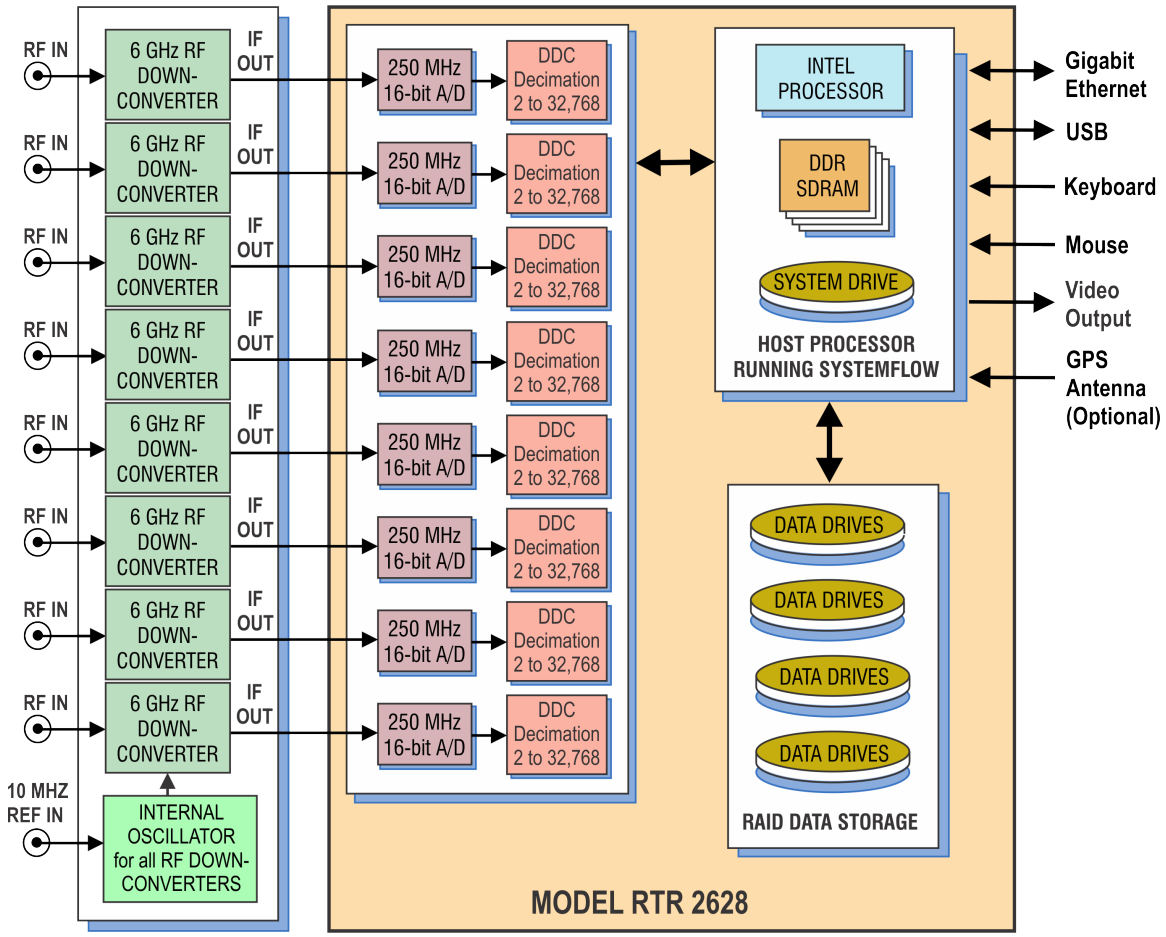
General Information

The Talon® RTR 2628 recorder provides eight channels of phase-coherent RF signal recording, ideal for phased-array antenna systems. It is tunable up to 6 GHz and provides up to 80 MHz of real-time capture bandwidth.

Each input channel includes a 250 MHz 16-bit A/D and an FPGA-based digital downconverter with programmable decimations from 2 to 65,536. RF signals up to 6 GHz in frequency can be sampled and streamed to disk in real-time at sustained aggregate recording rates up to 3.2 GB/sec in a 4U rackmount solution. 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.

Designed to operate under conditions of vibration and extended operating temperatures, the RTR 2628 is ideal for military, airborne and field applications that require a rugged system. The hot-swappable solid state storage drives provide the highest level of performance under harsh conditions and allow for quick removal of mission-critical data.

2628 Block Diagram



Rugged and Flexible Architecture

The RTR 2628 is configured in a 4U 19-inch 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 2628 includes as many as 32 hot-swappable SSDs to provide flexible storage capacities up to 122 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.

SystemFlow Software

All Talon recorders include the Pentek SystemFlow® recording software. SystemFlow software enables 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 GUI and API can be run from a remote connection over Gigabit Ethernet. Recorders can be set up to run autonomously by implementing scripts using the API interface.

Pentek's Talon RTX 1/2 ATR systems, which are typically deployed in unmanned aircraft, also include telnet support. If you are interested in the telnet feature for a non-RTX Talon recording system such as the RTR 2628, contact Pentek.

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

Click below to view a video about SystemFlow.

SystemFlow Simulator

To learn more about 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 a Talon recorder's SystemFlow software interface before you acquire a recorder or while you are waiting for delivery of a recorder.

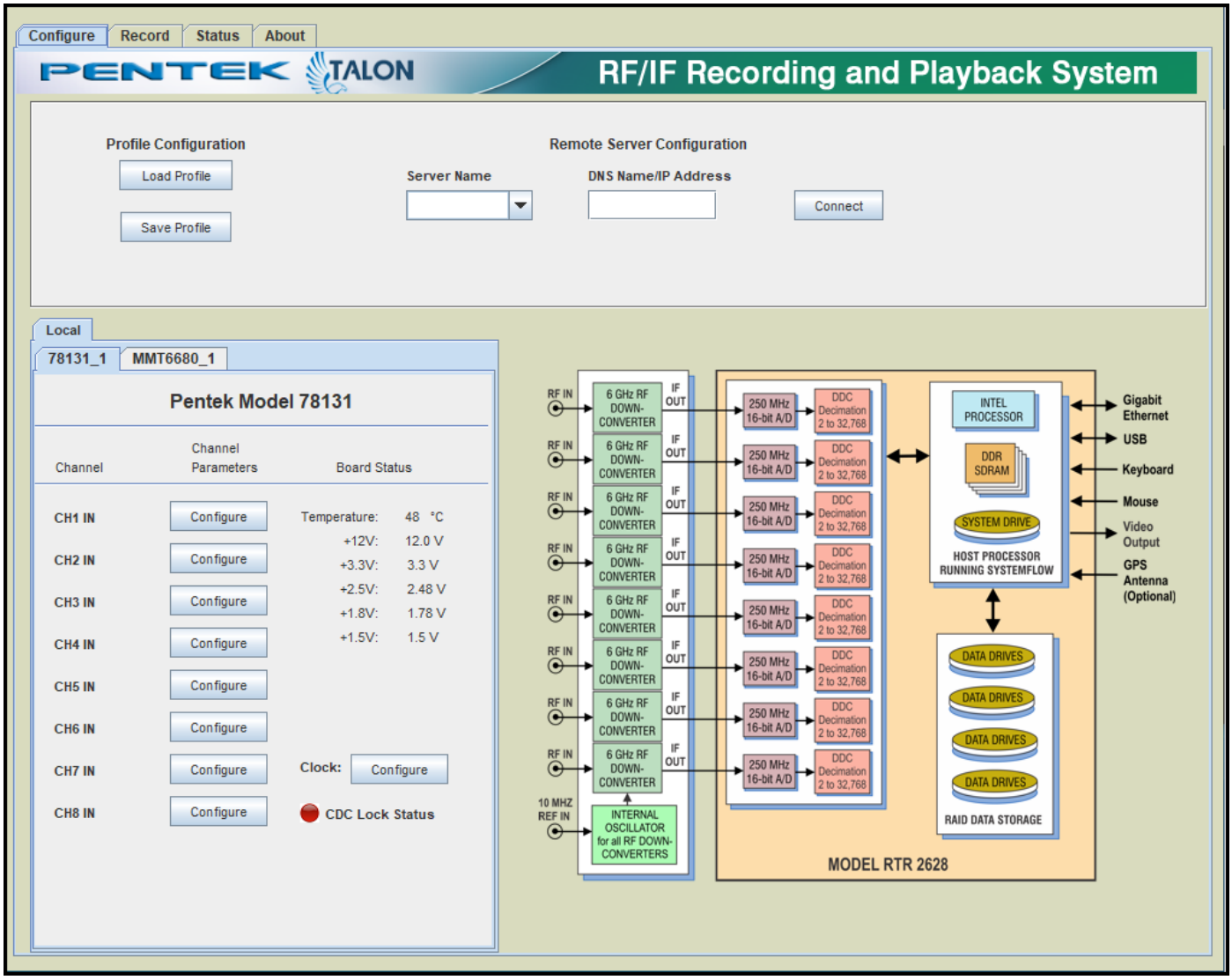
The Simulator can simulate the operating environment of all the different Talon recorder models. The Simulator also demonstrates the SystemFlow Signal Viewer by playing recorded signals to simulate the appearance of live signals being digitized and recorded by a Talon analog signal recorder.

Features

- Provides real-time recording system simulation
- Demonstrates SystemFlow signal and 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 a custom user interface

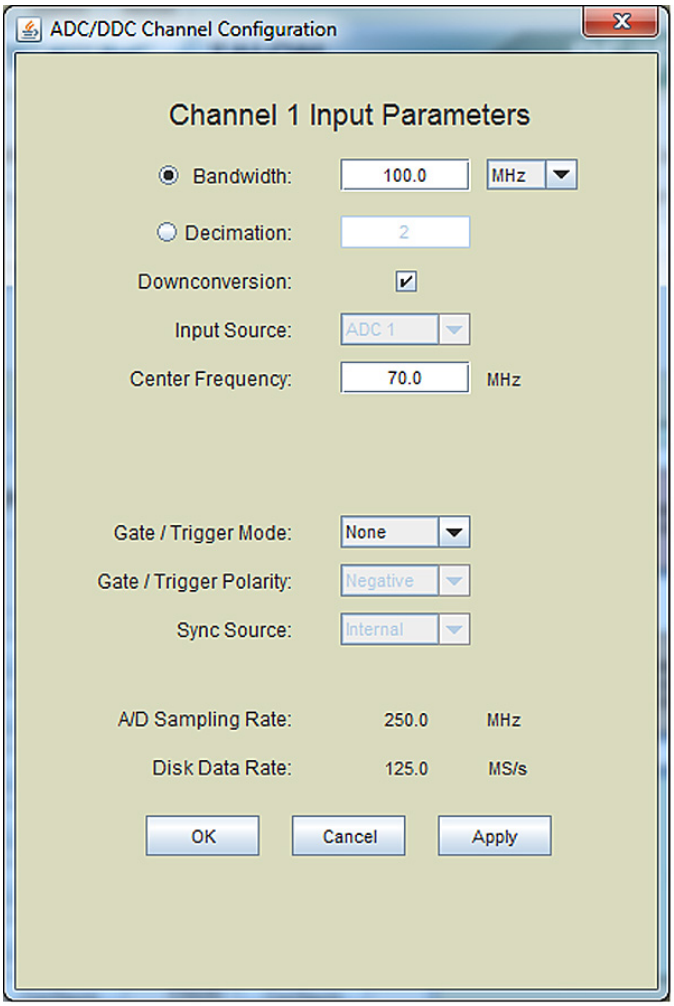
SystemFlow Recorder Interface

The RTR 2628 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, 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

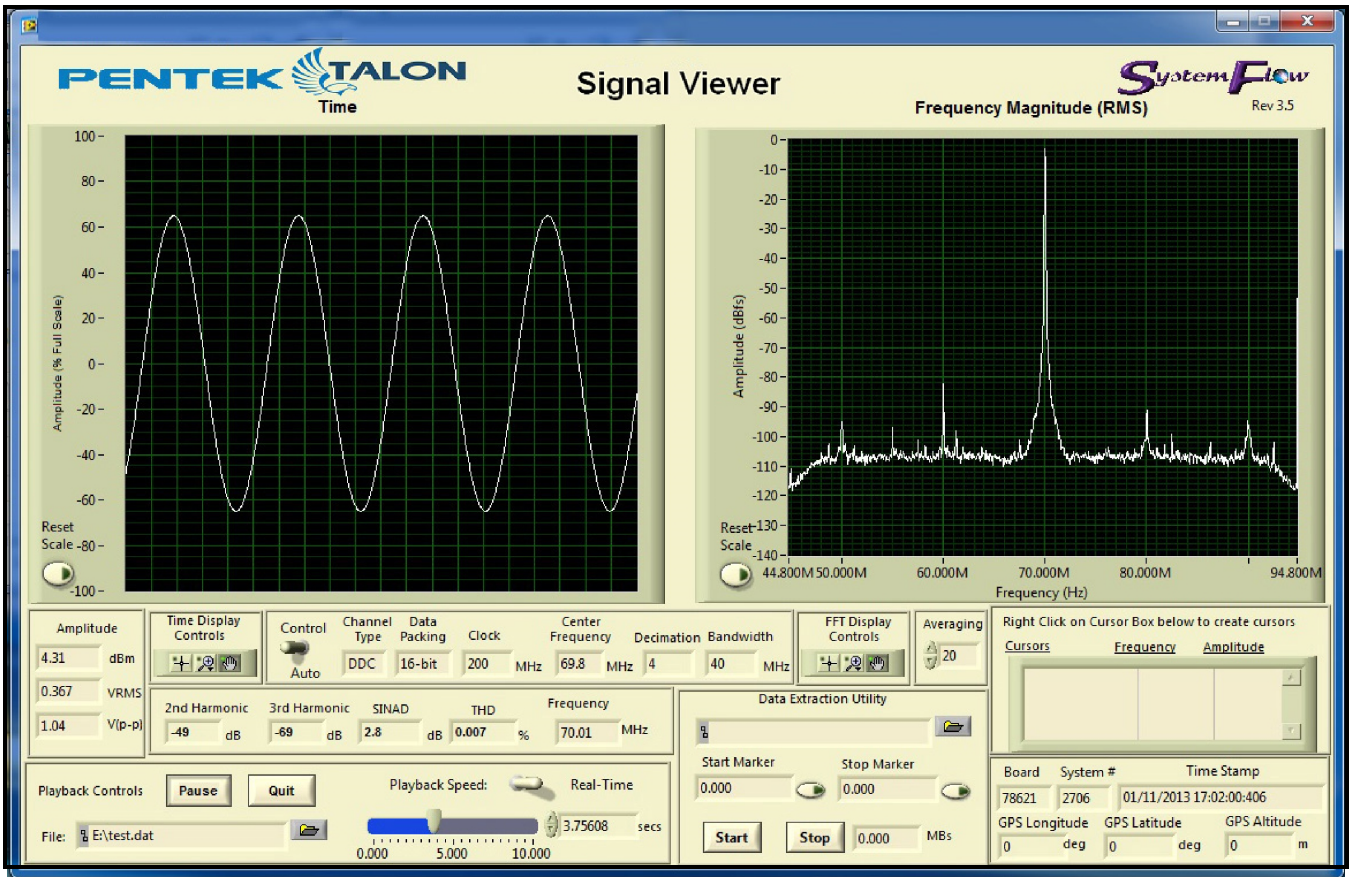
The RTR 2628 Configure screens provide a simple and intuitive means for setting up the system parameters. The ADC/DDC configuration screen, shown below, allows user entries for input source, center frequency, and decimation, as well as gate and trigger information. All parameters contain limit-checking and integrated help to provide an easier-to-use out-of-the-box experience.



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 2628 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, standalone 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)
```

Specifications

PC Workstation

Operating System: Windows
Processor: Intel Core i7 processor or better
SDRAM: (standard) 8 GB
Option -309: 16 GB
Option -310: 32 GB
Option -311: 64 GB
RAID
Storage: 15.3, 30.7, 61.4 or 122.8 TB
Drive Type: SATA III SSDs
Supported RAID Levels: (standard) 0
Option -285: RAID 5
Option -286: RAID 6

Analog Signal Inputs

Connector Type: Rear-panel female SMA connectors

RF Tuner

Frequency Range: 30 to 6000 MHz
Tuning Resolution: 1 kHz steps
Internal Frequency Accuracy: ±1.0 ppm (-20 to +60°C); options available
External Reference Input Frequency: 10 MHz
External Reference Input Level: 0 dBm ± 3 dBm
RF Input: 50Ω nominal
VSWR: 3:1 max, <2.01 typical at tuned frequency
Preselection:
20-90 MHz Low Pass Filter
90-250 MHz, 250-750 MHz Voltage Tuned Filters
750-1200 MHz, 1200-1700 MHz, 1700-2300 MHz Suboctave
2300-4000 MHz, 4000-6000 MHz Voltage Tuned Filters
Noise Figure:
13 dB typical, 16 dB maximum, (Independent Mode)
14 dB typical, 17 dB maximum, (Slave Mode)
Maximum RF Input without Damage: +15 dBm
In-Band input IP3: +3 dBm typical, -3 dBm minimum
Input Second-order Intercept Point: +30 dBm minimum, +36 dBm typical
IF Bandwidth: Nominal 80 MHz bandwidth standard (40 MHz optional)
RF to IF Gain : +60 dB nominal above RF input
Gain Control:
Manual: 60 dB range (minimum)
Automatic: ±3 dB of selected output level (0 to -30 dBm)
Image Rejection: 65 dB minimum (>80 dB typical)
IF Rejection: 65 dB minimum (80 dB typical)
LO Level at RF Input: -75 dBm maximum (-90 dBm typical)
Phase Noise at 6000 MHz
1 kHz Offset: -75 dBc/Hz typical
20 kHz Offset: -80 dBc/Hz maximum
100 kHz Offset: -100 dBc/Hz typical
1 MHz offset: -125 dBc/Hz typical
Receiver Tuning Speed: 300 µs typical 800 µs maximum, to within 1 kHz
Internally Generated Spurious: -100 dBm equivalent RF input typical

A/D Converters

Type: Texas Instruments ADS42LB69
Resolution: 16 bits
SNR: 73.2 dBFS
SFDR: 87 dBc (HD2 and HD3)
100 dBc (Non HD2 and HD3)

Digital Downconverters

Type: Pentek DDC IP Core
Decimation (D): User selectable 2 to 65536
DDC Usable Bandwidth: $0.8*f_S/D$, factory-supplied DDC coefficient tables

A/D Clock

Clock Sources: Selectable from onboard programmable VCXO or external clock

External Clock

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.

Ordering Information

Click here for more information.

RAID Options	
Standard	RAID 0 configuration
Option -285	RAID 5 configuration
Option -286	RAID 6 configuration
Channel Configuration	
Memory Options	
Standard	8 GB system memory
Option -309	16 GB system memory
Option -310	32 GB system memory
Option -311	64 GB DDR4 SDRAM

Bandwidth Options	
Standard	80 MHz maximum bandwidth
Option -040	40 MHz maximum bandwidth
Storage Options	
Option -415	7.6 TB SSD
Option -420	15.3 TB SSD storage capacity, 960 GB per channel
Option -430	30.7 TB SSD storage capacity, 1.92 TB per channel
Option -461	61.4 TB SSD storage capacity, 3.84 TB per channel
Option -485	122.8 TB SSD
General Options (append to all options)	
Option -261	GPS time and position stamping
Option -264	IRIG-B time stamping
Option -004	D-C coupled inputs
Contact Pentek for compatible option combinations. Storage and general options may change, so be sure to contact Pentek for the latest information.	

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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Lifetime Applications Support

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