Model 2590	8-Channel, 1/2 ATR, 250 MS/s RF/IF	Talon RTX Extreme Recorder	Small Form Factor

Features

TALON RTX EXTREME RECORDER

- Rugged 1/2 ATR MIL-spec chassis for harsh mechanical and thermal environments
- Environmentally sealed
- Internally conduction-cooled
- Fully sealed for RF emissions with EMI power line filter
- MIL-STD circular connectors
- Compact and lightweight: 18 lb (8 kg)
- QuickPac® drive packs allow quick removal of all data storage via the front panel
- Ideal for UAVs, military vehicles, aircraft pods and outdoor environments
- RF/IF recording with eight phase coherent 250 MHz 16-bit A/Ds
- Sustained real-time record rates up to 4 GB/s
- 12 to 28 VDC power supply
- Optional GPS receiver for precise time and position stamping
- SystemFlow GUI, SystemFlow API, and Signal Viewer analysis tools
- Optional telnet remote connection to recorder

General Information

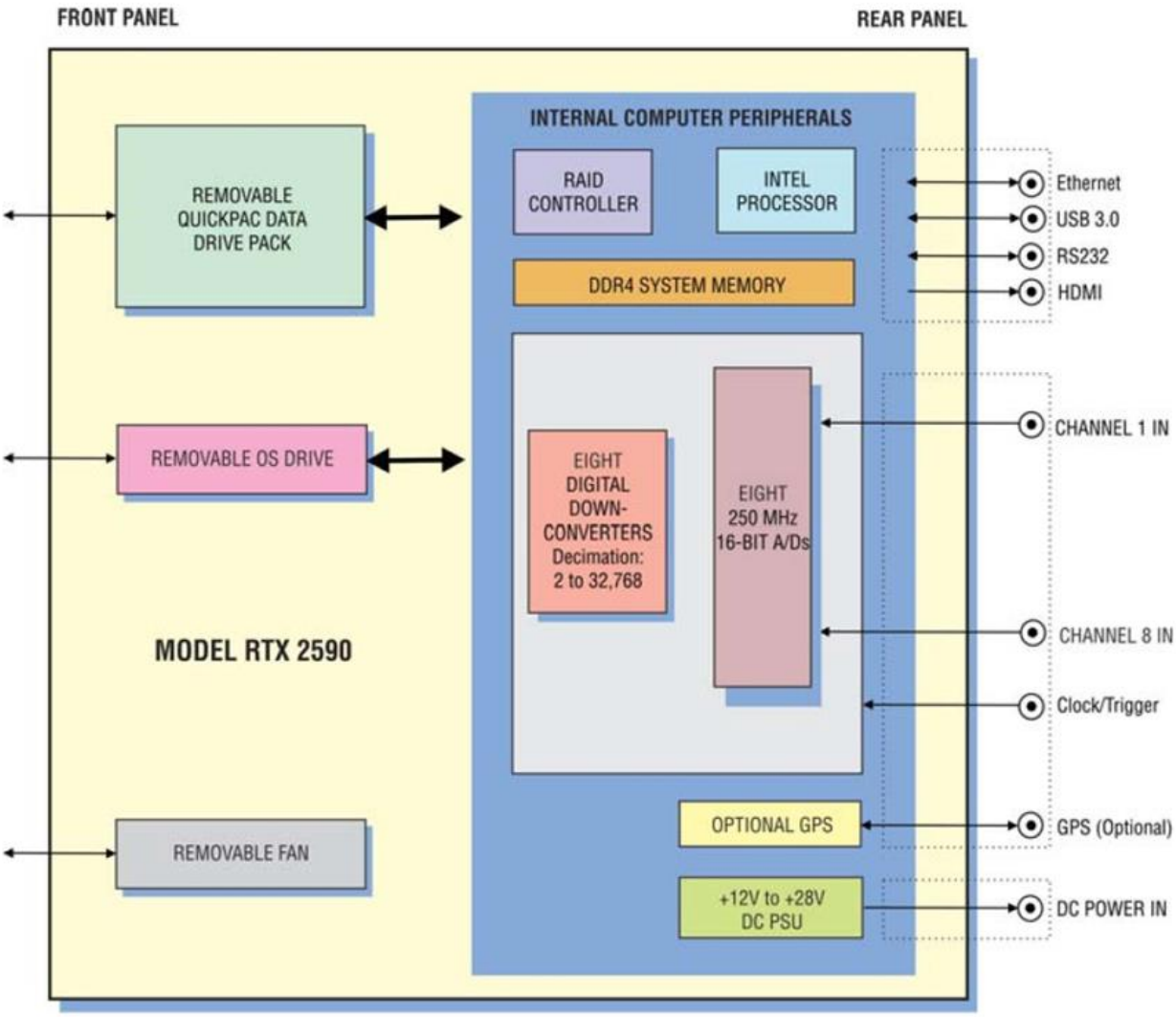
Pentek's Talon RTX Small Form Factor (SFF) recorders provide the performance of large rackmount recorders in the smallest footprint available in Pentek's Talon Recording System product line. Packaged in an extremely rugged 1/2 ATR form factor, these recorders provide high-performance processing, high speed data storage and large solid state storage capacity.

Optimized for SWaP (size, weight, and power), Talon RTX SFF recorders are packaged in a 1/2 ATR footprint, measuring 7.688" H x 4.880" W x 14.125" D and weighing only 22 pounds (10 kg). These recorders are capable of sustained real-time recording speeds up to 4 GB/s and can hold up to 61 TB of SSD storage.

Power consumption has been greatly reduced in this package. A standard system will draw approximately 110 Watt full operation.

The Model RTX 2590 provides eight phase-coherent channels of 250 MHz 16-bit A/Ds, allowing users the ability to capture up to 100 MHz of RF/IF signal bandwidth per channel with excellent dynamic range. It can sample RF/IF signals up to 700 MHz and provides digital downconverters with selectable decimation of 2 to 32,768.

2590 Block Diagram



Extremely Rugged Design

Designed to operate in the toughest environments, the recorder chassis keeps all electronics sealed from the outside environment and removes heat by conducting to forced-air cooling channels. Designed to operate from –40° to +60° C, these recorders can operate in most thermal environments, making them ideal for UAVs, aircraft pods, tight equipment bays, military vehicles and most outdoor environments.

The sealed ½ ATR chassis uses MIL-STD circular connectors for I/O to control RF emissions while protecting the recorder's electronics from humidity, water, dust, sand and salt fog. In addition to meeting MIL-STD 461 specifications for radiated RF emissions, conducted emission military specifications are met by design with a built-in conducted emissions filter.

Designed to handle high levels of shock and vibration, this extremely rugged chassis supports Pentek's extensive line of I/O front-ends, providing multichannel, wide bandwidth RF recording and a variety of digital interface recording options. An optional GPS receiver provides precise time stamping of recordings and can track and record the GPS position of the system during operation.

QuickPac Drive Packs

The Pentek QuickPac drive packs add a valuable convenience to the RTX SFF 1/2 ATR recorder by providing the ability to quickly remove all data storage from the recorder via the front panel. With up to 61 TB of solid-state data storage capacity, QuickPac drive packs can be easily removed from the recorder by loosening a set of captive thumb screws. A separate operating system drive can be removed as well, allowing users to extract all non-volatile memory from the system in just a few seconds.

QuickPac drive packs include a high insertion cycle connector to provide an extremely durable data storage drive for Talon recorders. Spare QuickPac drive packs can replace full ones in seconds to minimize mission downtime. QuickPac drive packs filled with mission data can be taken to the lab where data can be retrieved, post-processed and archived with a Talon offload system.

QuickPac Compatible

Sealed Chassis with Cooling Design

The Talon RTX SFF chassis seals the internal electronics from the outside environment by providing an inner plenum that is designed to extract heat from the internal electronics via conduction. The plenum is supplemented by a removable fan that is used to pull air from the front of the chassis and exhaust it through the rear. Only the fan is exposed to the outside environment, assuring the electronics are protected in the sealed chassis. The removable fan pulls air from the front of the chassis across heat sinks that are welded to the inner plenum of the chassis.

The welded heat sinks are attached directly to all heat-generating electronics within the sealed chassis, providing a conduction-cooled path to the inner plenum. This assures optimal cooling while maintaining a sealed design. The inner plenum can be replaced to provide other cooling options, such as liquid or conduction cooling.

Rear Panel I/O

The Talon RTX SFF rear panel I/O provides circular connectors for power and computer I/O. Bulkhead mounted SMA connectors for RF signals, GPS, clocks and triggers are sealed with gaskets for moisture and RF emissions protection. Optical I/O is provided via an optional rear panel connection.

SystemFlow Overview

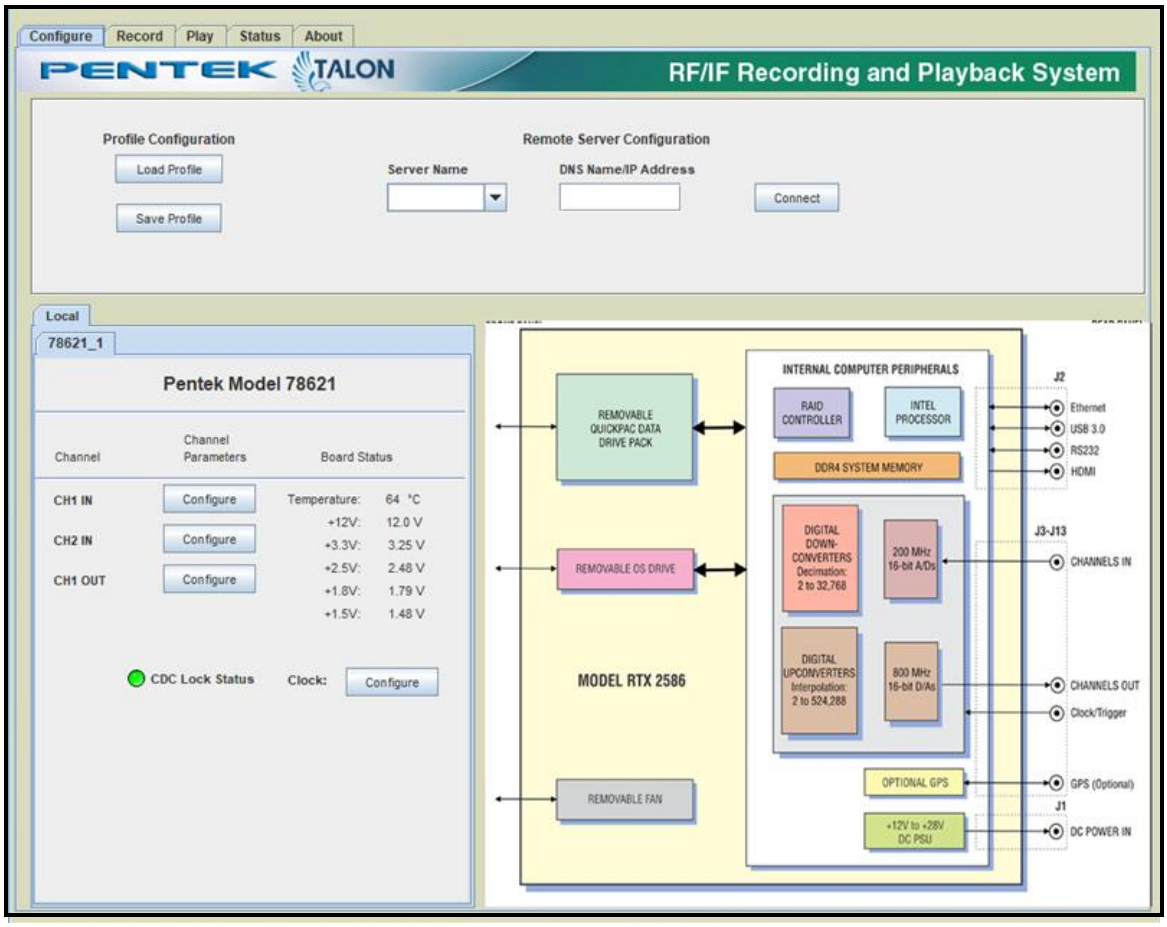
All Talon recorders include the Pentek SystemFlow® recording software. SystemFlow software provides three ways for users to configure and control a Talon recorder:

- The SystemFlow GUI provides an easy out-of-the-box experience which allows the operator to open the box and begin recording with a point and click user interface.
- 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 and all allow for easy access to recorded files.

SystemFlow GUI

The SystemFlow 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 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 RTX 2590 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.

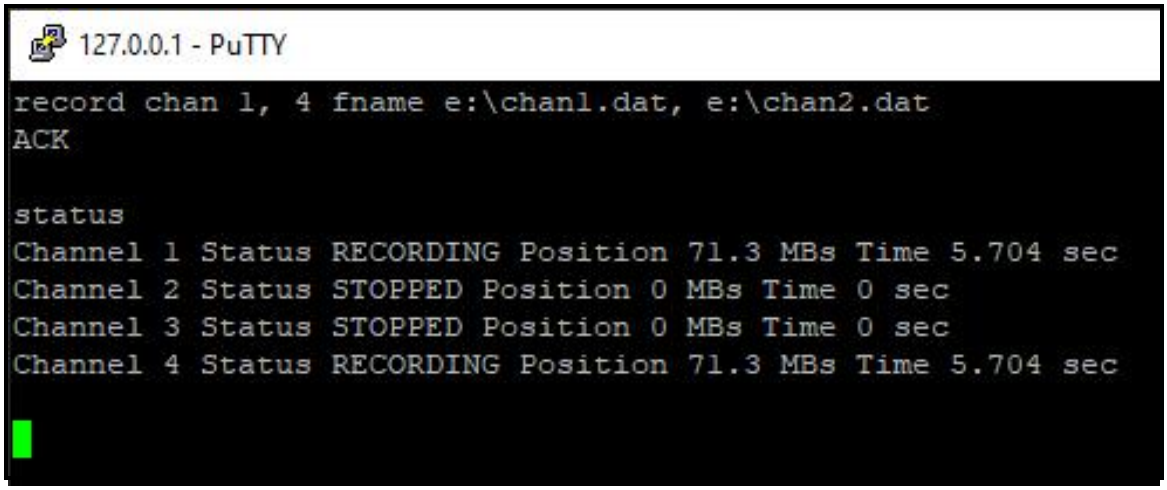
```
728         }
729         //transfer until end of disk
730         else if (transferType == TRANSFER_END_OF_DISK)
731         {
732             recordParams->transferTime    = 0;                    // must set to 0
733             recordParams->transferLength  = 0;                    // must set 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)
```

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.

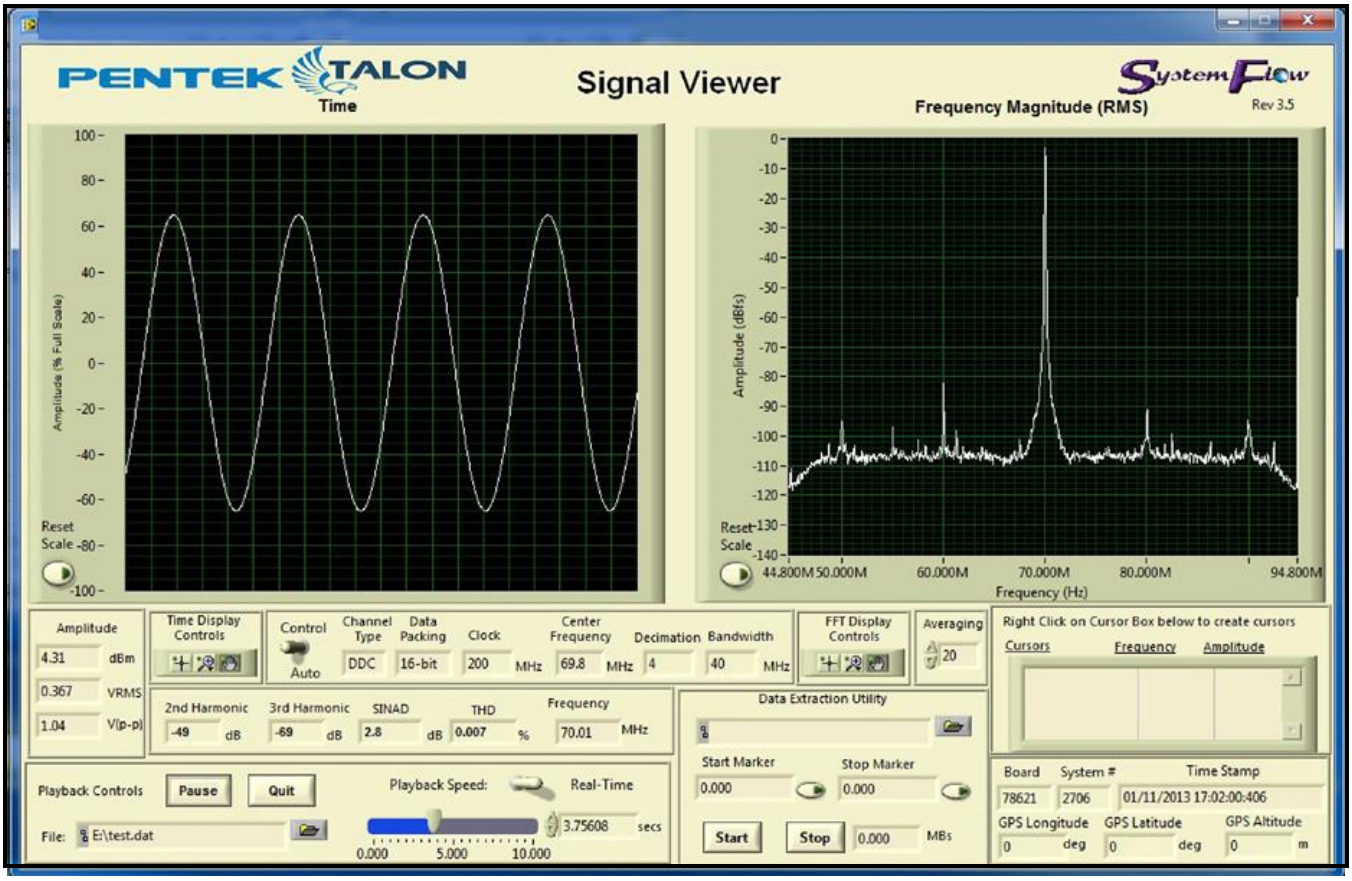
Below is an example of use of the "record" command:



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

Physical Characteristics

Dimensions: 7.688" H x 4.880" W x 14.125" D (195 mm H x 124 mm W x 359 mm D
Weight: 18 lb (8 kg)
Storage: One removable QuickPac drive pack with up to 61 TB total storage
RAID Levels: 0, 5 and 6 available
One removable Operating System SSD (M.2 form factor - 250 GB standard)

Front Panel I/O

One removable QuickPac drive pack (Thumbscrew removable)
One removable Operating System SSD (Thumbscrew removable)
One removable System Fan (Thumbscrew removable)

Rear Panel I/O

Chassis power connector: Glenair 805-005-07M12-2PA
Mating cable power connector: Glenair 805-002-16M12-2SA

Computer I/O

Chassis Computer I/O Connector: Glenair 805-003-07M19-85SA
Signals, 1 each: HDMI, USB 3.0, Ethernet (RJ 45), RS232 (optional)
Mating cable computer I/O Connector: Glenair 802-002-16M19-85PA
RF: 11x SMA (female SMA bulkhead-mounted with gaskets)

Cooling

Conduction-cooled to inner air channel
Removable fan inserted in air channel to pull air across sealed heat sinks
Optional direct conduction cooling and other methods available

Power

+12 to +28 VDC (+24 VDC nominal) 110 Watts power consumption typical, 140 Watts maximum

Analog Signal Inputs

Number of Inputs: Eight
Connectors: Female bulkhead SMA connectors
Input Type: Transformer-coupled (DC-coupled option available)
Transformer Type: Coil Craft WBC4-6TLB
Type: Texas Instruments ADS5485
Sampling Rate (fs): 10 MHz to 250 MHz
Resolution: 16 bits
SNR: 75 dBFS Typ. @ 70 MHz
SFDR: 87 dBc Typ. @ 70 MHz
Full-scale Input: +2 dBm into 50 ohms
3 dB passband: 300 kHz to 700 MHz
Anti-Aliasing Filters: External, user supplied

Digital Downconverters

Decimation: 2 to 32,768
IF Center Frequency Tuning: DC to fs, 32 bits
LO SFDR: >120 db
DDC Usable Bandwidth: 0.8*fs/D

Clock Sources

Source: Selectable from onboard programmable VCXO, or external clock
External Clock Connector: Female bulkhead SMA connector
External Clock Signal Requirement: Sine wave 0 dBm to 10 dBm full scale

External Trigger

External Trigger Connector: Female bulkhead SMA
External Trigger Signal Requirement: TTL

Processor and Memory

Processor: Intel Core i7, 7700K, 7th Generation, Quad Core, 4.2 GHz
DRAM: 8 GB DDR 4, optional 16 to 32 GB

Environmental

Operating Temp: –40° to +60° C
Storage Temp: –65° to +85° C
Operating Altitude: 60,000 feet maximum
Relative Humidity: 5 to 95%, condensing
Vibration: Designed to MIL-STD-810 Method 514.5
Shock: Designed to MIL-STD-810 Method 516.5
EMI/EMC: Designed to MIL-STD-461 - CE101, CE102, CS101, RE101, RE102, RS101

Ordering Information

Click here for more information.

Storage Options:	
Option -410	3.84 TB SSD
Option -415	7.68 TB SSD
Option -420	15.36 TB SSD
Option -430	30.72 TB SSD
Option -460	61 TB SSD
RAID Configuration:	
Standard	RAID Level 0
Option -285	RAID Level 5
Option -286	RAID Level 6
Additional Options:	
Option -261	GPS Time and Position Stamping
Standard	8 GB DDR Memory
Option -309	16 GB DDR Memory
Option -310	32 GB DDR Memory
Contact Pentek for compatible Option combinations. Storage and General Options may change, contact Pentek for latest information.	

Accessory Products

Power Cable	
Part Number:	2186-102
Length:	3 feet
MIL-STD Connector:	Glenair 805-002-16M12-2SA
Leads:	Two 14-gauge wires, unterminated

Power Connector	
Part Number:	2186-103
MIL-STD Connector:	Glenair 805-002-16M12-2SA

Power Connector Backshell	
Part Number:	2186-104
Backshell:	Glenair 370MS038M1006-6

Computer I/O Breakout Cable	
Part Number:	2186-202
Length:	3 feet
MIL-STD Connector:	Glenair 802-002-16M19-85PA
Breakout connectors (1 each):	HDMI female, USB 3.0 female, RJ45 female, RS232 female (optional), power button, reset button

Computer I/O Connector	
Part Number:	2186-203
MIL-STD Connector:	Glenair 802-002-16M19-85PA

Computer I/O Connector Backshell	
Part Number:	2186-204
Backshell:	Glenair 370MS038M1410-8

1/2 ATR Tray	
Part Number:	8380-258
Dimensions	15" L x 5.01" W x 1.223" H
Material:	.063 6061-T6 aluminum
Finish:	Chem Film per MIL-DTL-5541F, Type 1, Class 3

Spare QuickPac Drive Pack	
Part Number:	8336
Capacities:	Option 615: 7.6 TB
	Option 620: 15.3 TB
	Option 625: 30.7 TB

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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