Model RTX 2596	Serial FPDP 1/2 ATR	Talon RTX Extreme Recorder	Small Form Factor

Features

- **Rugged** 1/2 ATR MIL-spec chassis for harsh mechanical and thermal environments
- **Environmentally sealed**, 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
- Can offload data from QuickPac drive packs via an optional **data offload system**, allowing the Talon recorder to remain deployed in the field
- Ideal for UAVs, military vehicles, aircraft pods, and outdoor environments
- Four-channel Serial FPDP record/playback
- 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
- Single-mode and multi-mode fiber interfaces available
- 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. Housed 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.
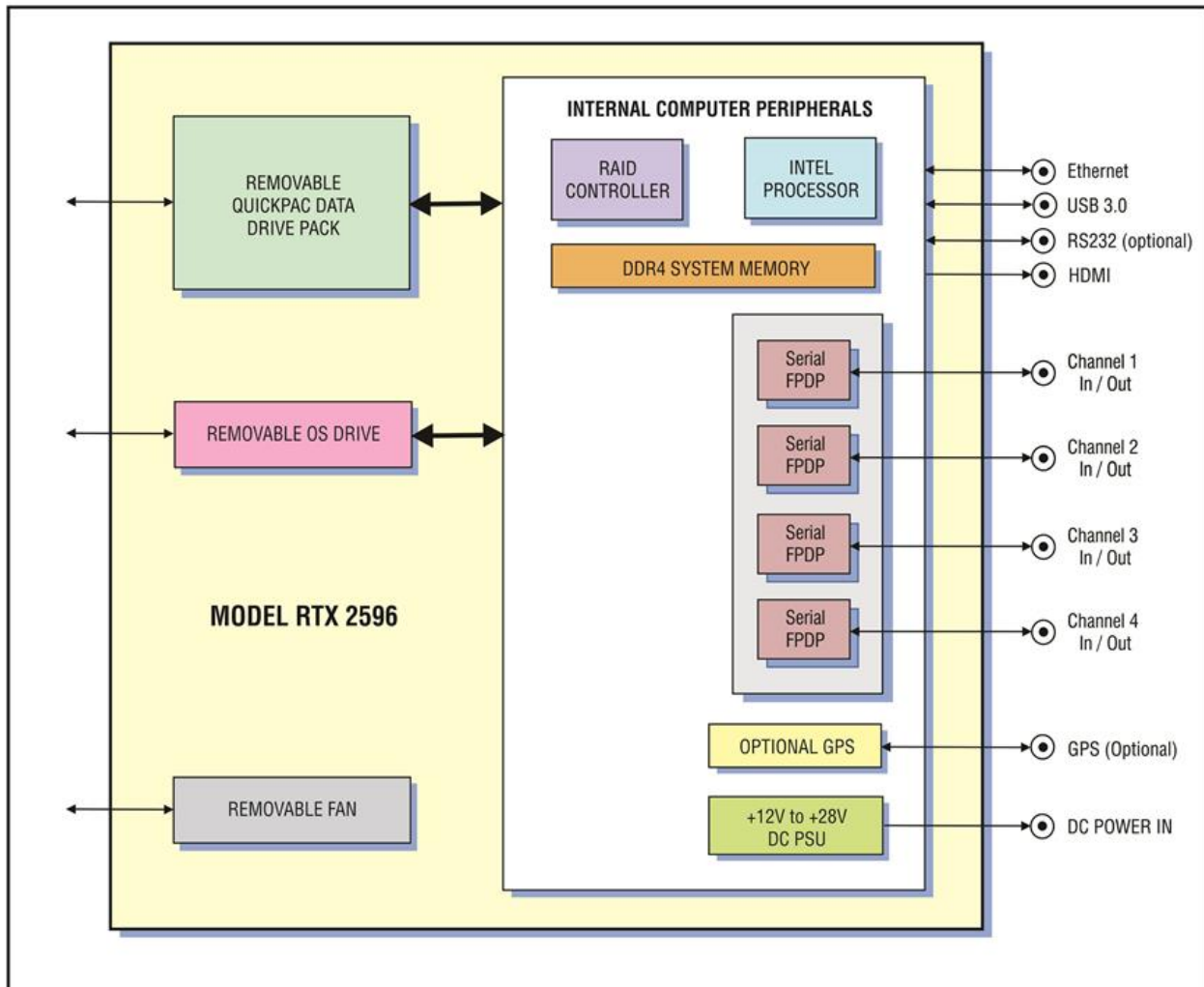
Optimized for SWaP (size, weight and power), Talon RTX SFF recorders are packaged in a 1/2 ATR chassis, measuring 7.688" H x 4.880" W x 14.125" D and weighing only 18 pounds (8 kg). These recorders are capable of sustained real-time recording speeds up to 4 GB/s and can hold up to 61 TB of SSD storage. Power consumption has been greatly reduced in this package. A standard system will draw approximately 125 W at full operation.

The Talon RTX 2596 is a small form factor, rugged recorder that is capable of recording and playing back four serial FPDP data streams. The recorder is ideal for capturing any type of streaming source, including live transfers from sensors or data from other computers, and is fully compatible with the VITA 17.1 specification.

RTX 2596 Block Diagram

FRONT PANEL

REAR PANEL

INTERNAL COMPUTER PERIPHERALS

RAID CONTROLLER

INTEL PROCESSOR

DDR4 SYSTEM MEMORY

REMOVABLE QUICKPAC DATA DRIVE PACK

REMOVABLE OS DRIVE

MODEL RTX 2596

REMOVABLE FAN

Serial FPDP

Serial FPDP

Serial FPDP

Serial FPDP

OPTIONAL GPS

+12V to +28V DC PSU

Ethernet

USB 3.0

RS232 (optional)

HDMI

Channel 1 In / Out

Channel 2 In / Out

Channel 3 In / Out

Channel 4 In / Out

GPS (Optional)

DC POWER IN

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 +55° 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.
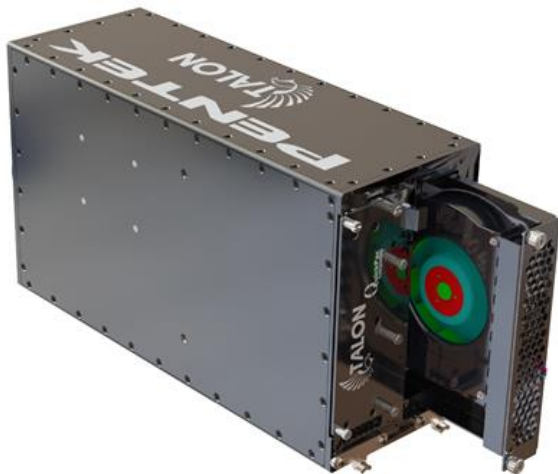
Sealed Chassis with Cooling Design

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.

Data Offload System

The Talon Model 2580 is a data offload system for Talon RTX SFF (Small Form Factor) 1/2 ATR recorders. This is an optional product that is ordered separately.

The Talon RTX SFF recorder's QuickPac drive pack can be quickly removed from the recorder's front panel by loosening six thumb screws and then inserted in the slot on the 2580 front panel. Data stored on the removable Talon QuickPac drive pack can be accessed and off-loaded for analysis, allowing the Talon recorder to remain deployed in the field.

A monitor, keyboard, and mouse can be attached to the 2580, and data can be analyzed or offloaded via removable SATA drives, DVD, Ethernet and USB ports. For more details, refer to the 2580 datasheet.

Talon Model 2580
Offload System

Talon RTX
SFF Recorder

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.
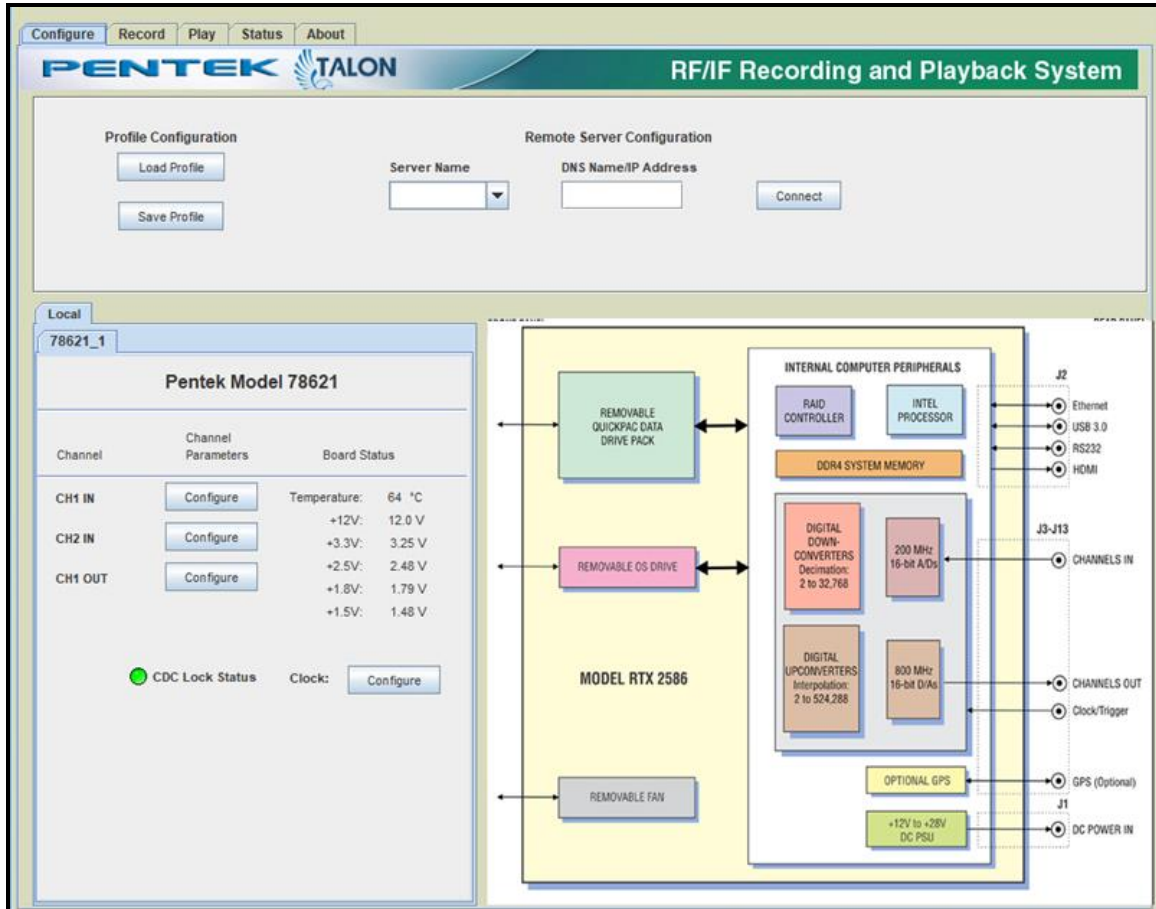
SystemFlow API

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 2596 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)
```
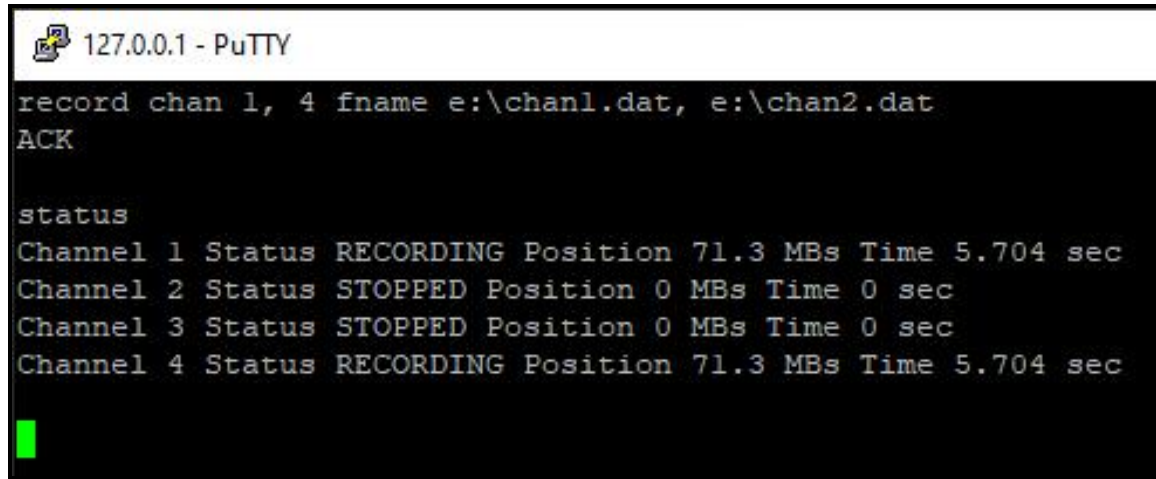
SystemFlow Telnet

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:

```
127.0.0.1 - PuTTY
record chan 1, 4 fname e:\chan1.dat, e:\chan2.dat
ACK

status
Channel 1 Status RECORDING Position 71.3 MBs Time 5.704 sec
Channel 2 Status STOPPED Position 0 MBs Time 0 sec
Channel 3 Status STOPPED Position 0 MBs Time 0 sec
Channel 4 Status RECORDING Position 71.3 MBs Time 5.704 sec
```

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.
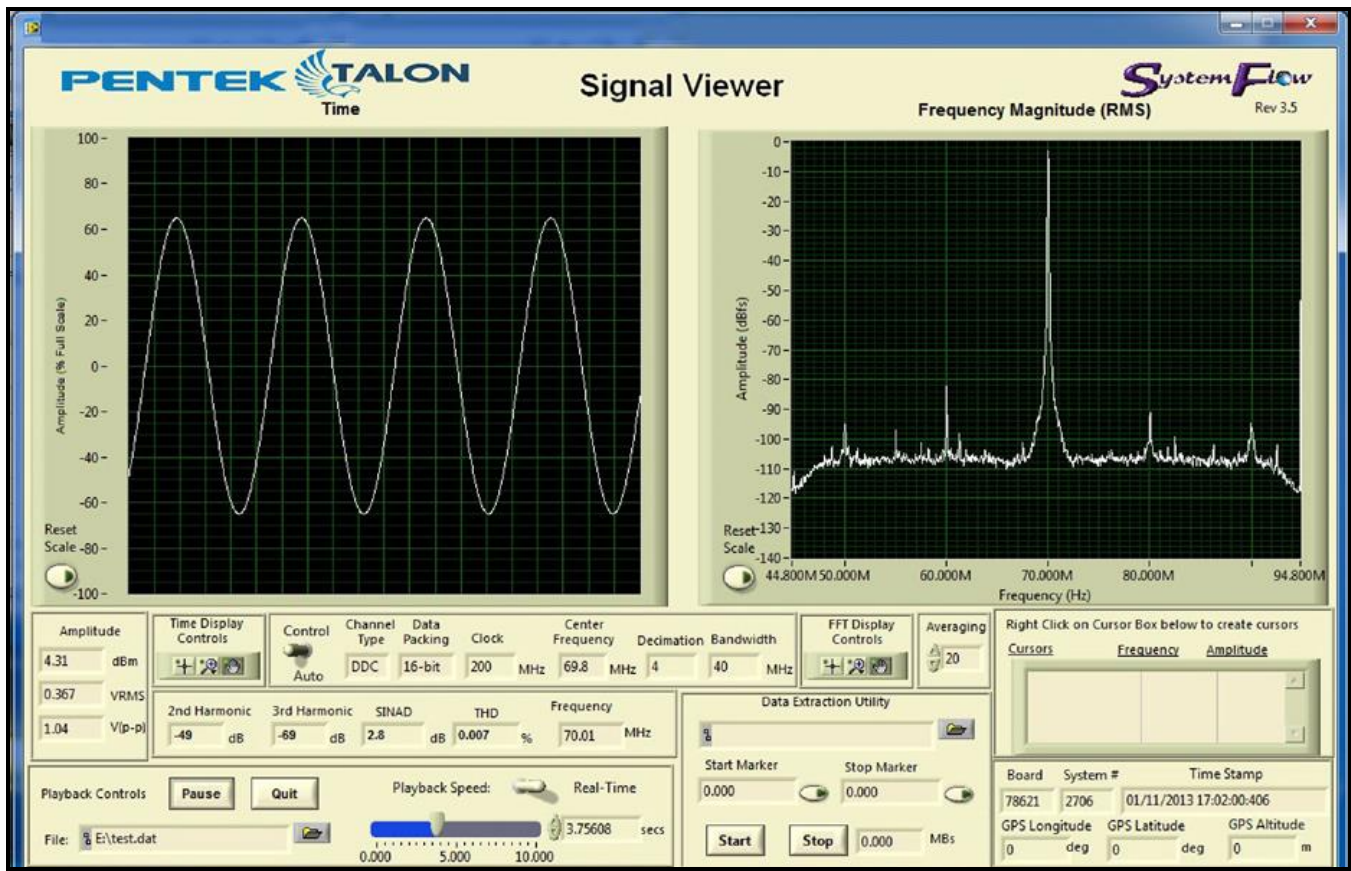
Specifications

Physical Characteristics

Dimension: 7.688" H x 4.880" W x 14.125" D (231 mm H x 124 mm W x 359 mm D

Weight: 18 lb (8 kg)

Storage: One removable QuickPac® 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 Operating System SSD
One removable QuickPac (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

SFPDP I/O

Chassis Connector: Glenair 183-001ME08-11-1PN

Type: One SuperNine MT ferrule

Signals: 4 SFPDP channels on 8 fibers

Mating Cable Connector: Glenair 183-001MEG6-11-1SN

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) 125 Watts power consumption typical, 170 W maximum

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 +55° C (-20° C start-up)

Storage Temp: −65° to +85° C

Altitude: 60,000 feet

Relative Humidity: 5 to 95%, condensing

Vibration: MIL-STD-810 Method 514.5

Shock: MIL-STD-810 Method 516.5

EMI/EMC: MIL-STD-461 - CE101, CE102, CS101, RE101, RE102, RS101

Sand and Dust: MIL-STD-810 Method 510

Ordering Information

Click here for more information.

Model	Description
Talon RTX 2596	Serial FPDP Extreme 1/2 ATR Recorder

Storage Options	
Option -410	3.84 TB SSD storage capacity
Option -415	7.68 TB SSD storage capacity
Option -420	15.36 TB SSD storage capacity
Option -430	30.72 TB SSD storage capacity
Option -460	61 TB SSD storage capacity
RAID Configurations	
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 system memory
Option -309	16 GB DDR system memory
Option -310	32 GB system memory
Storage and general options may change. Contact your Pentek representative for the latest information and valid option combinations.	

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), LVDS 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

Model 2580	Data Offload System for Talon RTX SFF Recording Systems
Option -267	Dual 10 GigE Offload
Option -268	40 GigE Offload
Option -269	100 GigE Offload
Option -309	16 GB System Memory
Option -310	32 GB System Memory
Option -311	64 GB System Memory

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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