Pentek Talon RTX SFF

Features

- Rugged 1/2 ATR MIL-spec chassis
- Designed 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 design - 22 lb (10 kg)
- Ideal for UAVs, military vehicles, aircraft pods and outdoor environments
- Capable of recording RF/IF frequencies to 2.8 GHz
- Ultra wideband recording with 3.6 GHz 12-bit A/D
- Selectable 1.8 GHz dual-channel mode
- 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 API, GUI and Signal Viewer analysis tools

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 30 TB of SSD storage.

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

The Model RTX 2589 uses a Texas Instruments ADC12D1800 12-bit, 3.6 GHz A/D converter to provide ultra-wide bandwidth recording of RF/IF signals. The A/D can be configured as a single channel 3.6 GHz A/D or two 1.8 GHz A/Ds. Selectable sample rates and data packing modes allow the user to capture large swaths of the RF spectrum in real-time at sustained record rates as high as 4 GB/s.

The ADC12D1800 has a full power input bandwidth of 1.75 GHz in single-channel mode and 2.8 GHz in dual-channel mode.

It is complemented with a digital downconverter that provides selectable decimations up to 512 to improve SNR while zooming in on signals throughout the RF spectrum.

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. ➤

A QuickPac removed from the Talon Recorder

A fan removed from the Talon Recorder

Rear Panel I/O
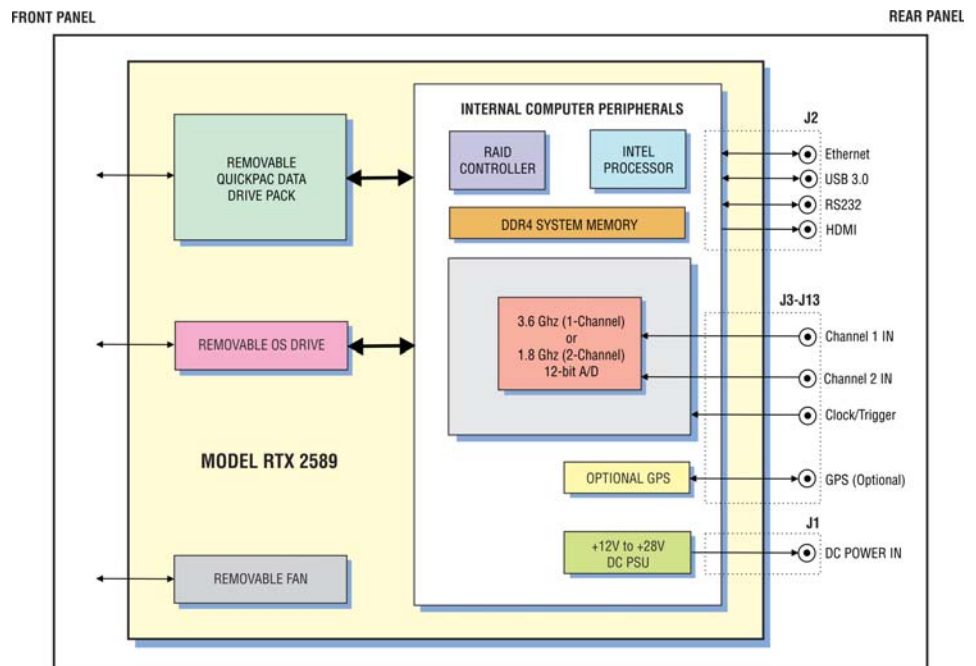
Using QuickPacs

The Pentek QuickPacs 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 30 TB of solid state data storage capacity, QuickPacs 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 the users to extract all non-volatile memory from the system in just a few seconds.

QuickPacs include a high insertion cycle connector to provide an extremely durable data storage drive for Talon Recorders.

Spare QuickPacs can replace full ones in seconds to minimize mission downtime. QuickPacs 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.

Rear Panel I/O

The Talon RTX SFF rear panel I/O provides MIL-STD 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. ➤


A QuickPac in the process of being removed from the front of a Talon Recorder

A fan in the process of being removed from the back of a Talon Recorder

SystemFlow Graphical User Software
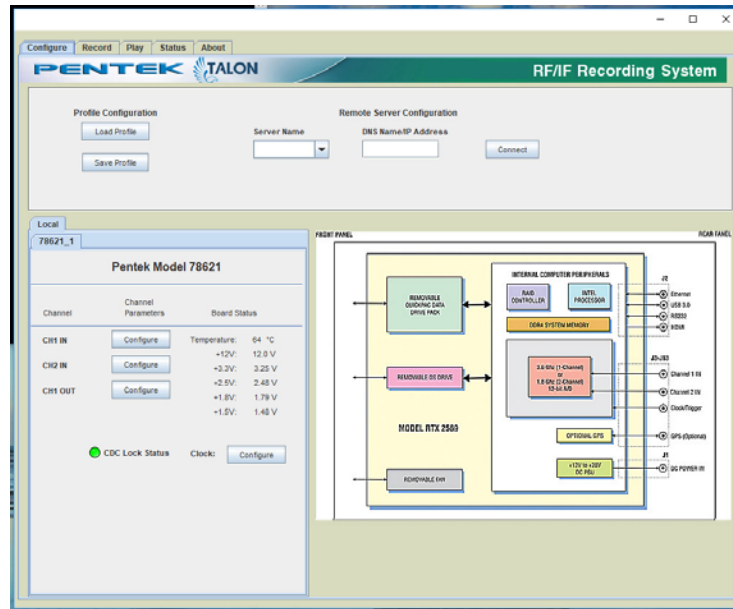
SystemFlow Main GUI

All Talon RTX SFF Recorders include the Pentek SystemFlow® recording software. SystemFlow features a Windows-based GUI (Graphical User Interface) that provides a simple means to configure and control the recorder.

SystemFlow includes signal viewing and analysis tools, that allow the user to monitor input signals prior to, during, and after a recording session. These tools include a virtual oscilloscope, a spectrum analyzer and spectrogram displays.
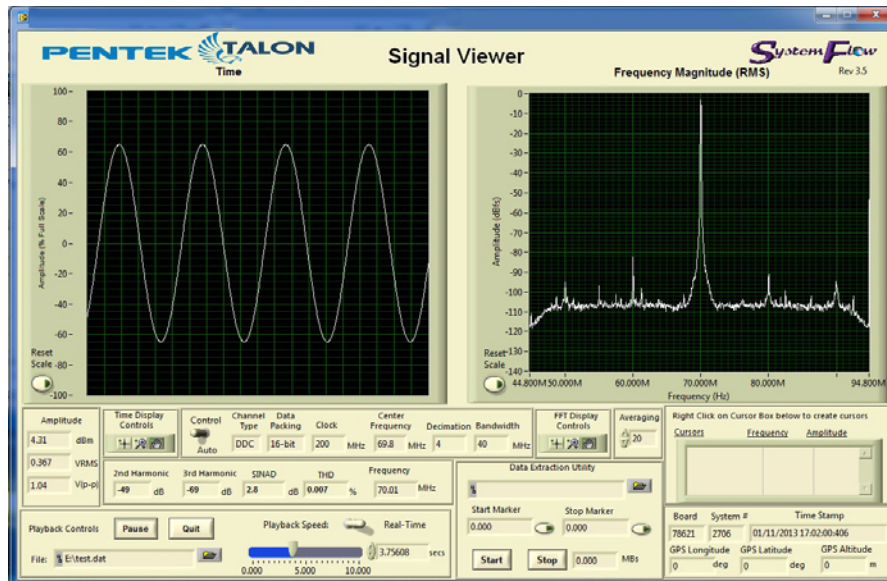
Signal Viewer

SystemFlow uses a client/server architecture to allow the real-time recording software to run on the Talon recorder independent of the control software that can run on an external computer.

System engineers can use the SystemFlow GUI to control the system remotely or develop a custom interface using the SystemFlow API (Application Programming Interface). Remote control takes place over gigabit Ethernet.

Recordings are kept simple to allow for extremely high bandwidth data storage, streaming only the raw data to disk. 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. ➤

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: 22 lb (10 kg)

Storage: One removable Quickpak
  with up to 30.72 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 (Thumbscrew removable)
  One removable Operating System SSD (Thumbscrew removable)
  One removable System Fan (Thumbscrew removable)

Rear Panel I/O
  Chassis power connector: Amphenol 2M805-002-16M12-2PA
  Mating cable power connector: Amphenol 2M805-002-16M12-2PA
  Chassis Computer I/O Connector: Amphenol 2M805-005-07M19-85SA
  Mating cable computer I/O Connector: Amphenol 2M805-002-16M19-85PA
  RF: 11x SMA (female SMA bulkhead mounted with gaskets)

Computer I/O
  Chassis Computer I/O Connector: Amphenol 2M805-005-07M19-85SA
  Signals, 1 each: HDMI, USB 3.0, Ethernet(RJ 45), RS232

Cooling
  Conduction-cooled to inner air channel
  Removable fan inserted in air channel to push 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
  Connectors: Female bulkhead SMA connectors
  Input Type: Transformer Coupled
  Full-scale Input: +2 dBm or +4 dBm into 50 ohms
  3 dB passbend: 4.5 MHz to 3.0 GHz
  Sampling Rate (fs):
    Single-channel mode: 500 MHz to 2.8 GHz
    Dual-channel mode: 150 MHz to 1.8 GHz
  Resolution: 12 bits
  Anti-Aliasing Filters: External, user supplied

A/D Converters
  Type: Texas Instruments ADC12D1800
  Sampling Rate (fs):
    Single-Channel Dual-edge sampling: 500 MHz to 3.6 GHz
    Dual-Channel, single-edge sampling: 150 MHz to 1.8 GHz

Resolution: 12 bits

SNR: Single-Channel: 55.8 dB Typ @ 125 MHz,
  50.4 dB Typ @ 1147 MHz
  Dual-Channel: 58.6 dB Typ @ 125 MHz,
  53.9 dB Typ @ 1147 MHz

SFDR: Single-Channel: 58.9 dBc Typ @ 125 MHz,
  56.7 dBc Typ @ 1147 MHz
  Dual-Channel: 73 dBc Typ @ 125 MHz,
  60.2 dBc Typ @ 1147 MHz

Anti-Aliasing Filters
  Type: External, user supplied

Digital Downconverter
  Decimation: 8, 16 to 512 in Single-Channel Mode, 4, 8 to 256 in Dual-Channel Mode
  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
  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 ➤

Options

Sample Clock Options

Option -910	User-Programmable Sample Clock
Option -911	1.5 / 3.0 GHz sample clock
Option -912	1.6 / 3.2 GHz sample clock
Option -913	1.2 / 2.4 GHz sample clock
Option -914	1.36 / 2.72 GHz sample clock
Option -915	1.8 / 3.6 GHz sample clock

Note Custom fixed-frequency sample clocks available upon request.

Option -910 User-Programmable Sample Clock

Dual-channel mode sample clock range:	150 MHz – 945 MHz
	970 MHz – 1134 MHz
	1213 MHz – 1417.5 MHz
Single-channel mode sample clock range:	500 MHz – 1890 MHz
	1940 MHz – 2268 MHz
	2426 MHz – 2835 MHz

Storage Options

Option -410	3.84 TB SSD Storage
Option -415	7.68 TB SSD Storage
Option -420	15.36 TB SSD Storage
Option -430	30.72 TB SSD Storage

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 DDR System Memory

Specifications are subject to change without notice