Features

- Designed for data capture from Pentek Quartz® RFSoC products' 100 Gigabit Ethernet ports
- Single QSFP28 port with MPO transceiver
- Real-time record rates up to 12.5 GB/s (100 Gigabits/s)
- Front-panel removable solid state storage up to 122 TB
- Dual Intel Xeon® Gold processors with up to 4 TB of DDR4 SDRAM
- 4U 19-inch industrial grade server chassis
- Supports up to four independent UDP streams
- SystemFlow software GUI with Signal Viewer analysis tool
- C-callable API for integration

General Information

The Talon RTR 2757 is a turnkey system for recording 100 Gigabit Ethernet UDP streams from Pentek's Quartz® RFSoC products. Pentek's Quartz products provide 100 Gigabit Ethernet interfaces to stream data from up to eight high-speed A/D converters. The RTR 2757 is designed to capture digitized data from four of these streams in real time at the full 100 Gigabit per second rate. With up to 122 TB of removable solid state storage, the RTR 2757 provides hours of multi-channel wideband signal recording.

Pentek's Quartz RFSoC products provide two 100 Gigabit Ethernet interfaces via MPO optical connections. The Quartz FPGA IP routes four A/D channels to each optical interface. The RTR 2757 provides a single 100 Gigabit Ethernet interface, allowing the user to capture digitized signals from up to four RFSoC A/Ds.

The RTR 2757 provides an interface that matches the Quartz Ethernet UDP protocol and can accept up to four independent UDP data streams. This allows users to stream four A/D channels independently over 100 Gigabit Ethernet and capture them as independent files on the recorder. The recorder captures only the payload, providing data files similar to other Talon recorders. This allows the suite of SystemFlow software tools to be used for signal analysis prior to, during, and after a recording session.
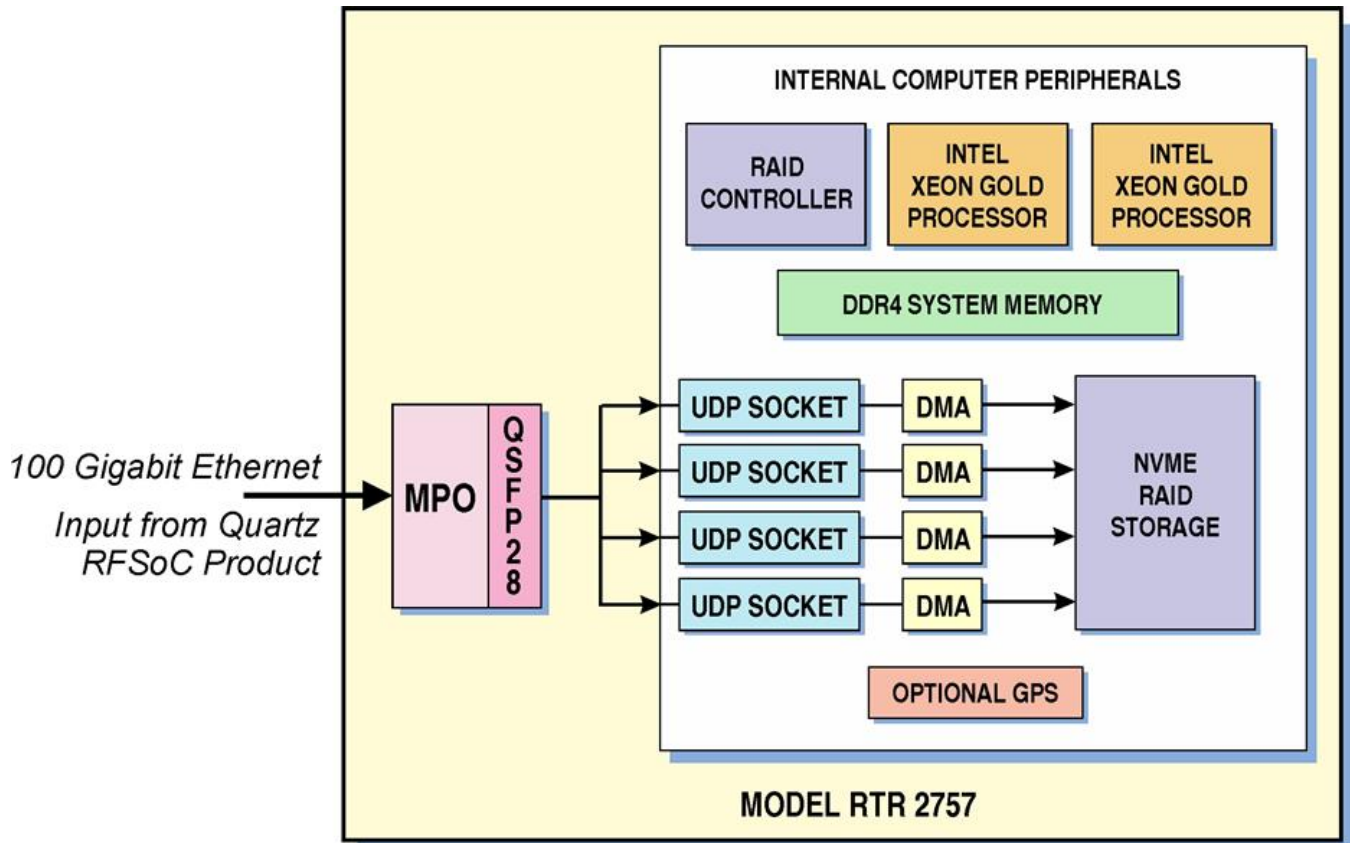
Rugged and Flexible Architecture

The RTR 2757 comes in an industrial grade 19-inch 4U rackmountable chassis. It uses high-performance NVMe (Non-Volatile Memory Express) U.2 drives in a RAID 0 configuration to provide extremely high-speed real-time recording. Drives are front-panel removable via eight individual drive trays. The independent operating system drive is also removable via the front panel. ➤

Multiple RTR 2757 systems can be combined to provide a scalable high-channel-count system. SystemFlow software provides the ability to control multiple systems from a single user interface. This architecture provides scalable storage as channel counts increase.

The RTR 2757 includes options for GPS time and position stamping, IRIG-B time stamping, and high-speed offload interfaces such as 10, 40, or 100 Gigabit Ethernet. The system is built using a dual Intel Xeon server-class motherboard, includes two Xeon Gold processors, and includes up to 4 TB of DDR4 RAM. The standard configuration includes USB 3.0 ports, Gigabit Ethernet for network communication, and a VGA port for display.
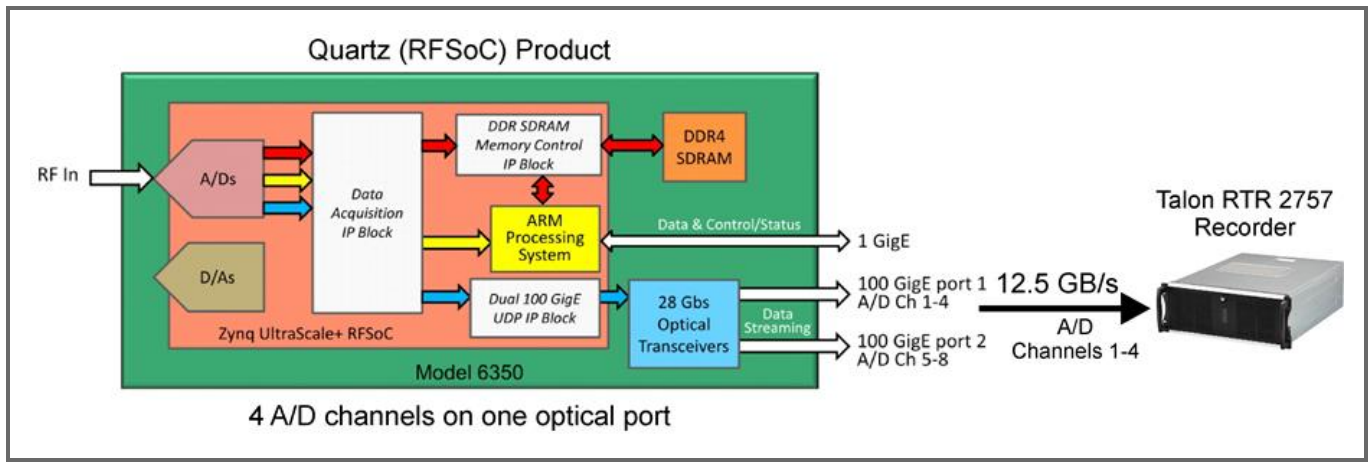
2757 Block Diagram

The Talon RTR 2757's single 100 Gigabit Ethernet port can receive up to four UDP streams (four independent UDP socket IDs). Each stream is sent to disk via a dedicated DMA channel. Each UDP stream is written to its own file in the standard Pentek .dat format on the NTFS file system.
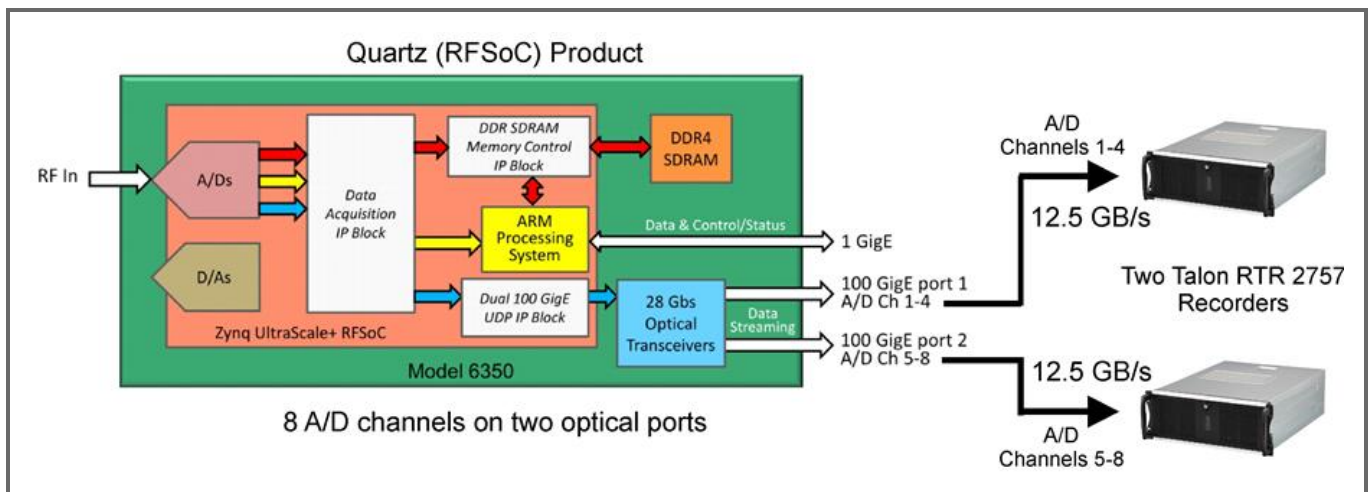
The RTR 2757 provides channelized file recording of the UDP payload. The payload can include VITA49 packet headers if they are enabled on the Quartz RFSoC product.

Capturing Data from Quartz (RFSoC) Products

The RTR 2757 works with any 100GigE-enabled Quartz product. Each example below shows a complete recording solution using the Quartz Model 6350 Small Form Factor rugged version and Talon RTR 2757 recorders.

- One 100 Gigabit Ethernet port has a maximum 12.5 GB/s streaming rate.
- One Model 2757 can capture real-time UDP streams at 12.5 GB/s using one QSFP28 optical port.

- Two 100 Gigabit Ethernet ports have a maximum 25 GB/s streaming rate.
- Two Model 2757 recorders can capture real-time UDP streams at 25 GB/s using two QSFP28 optical ports.

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 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 2757 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)
```
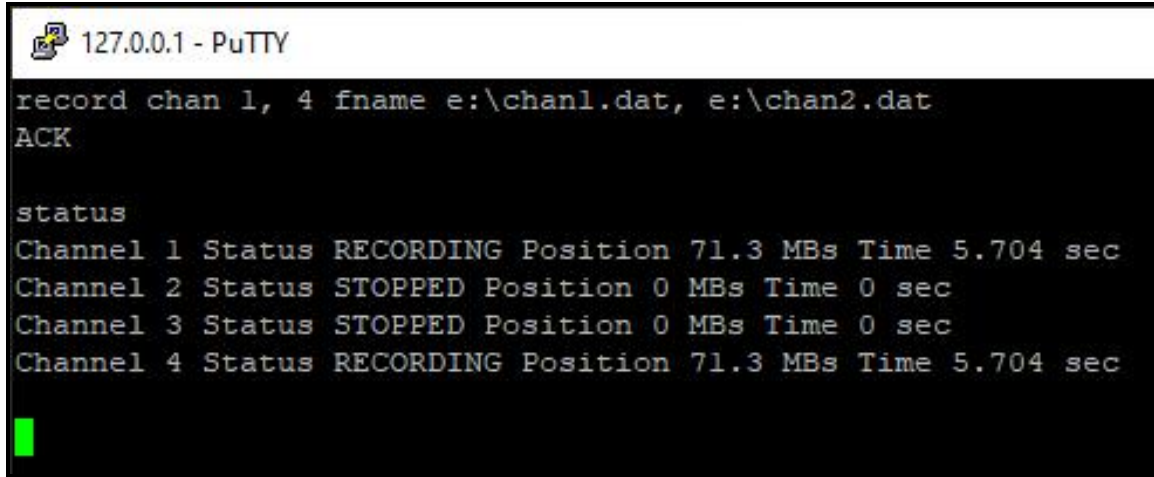
SystemFlow Telnet

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.

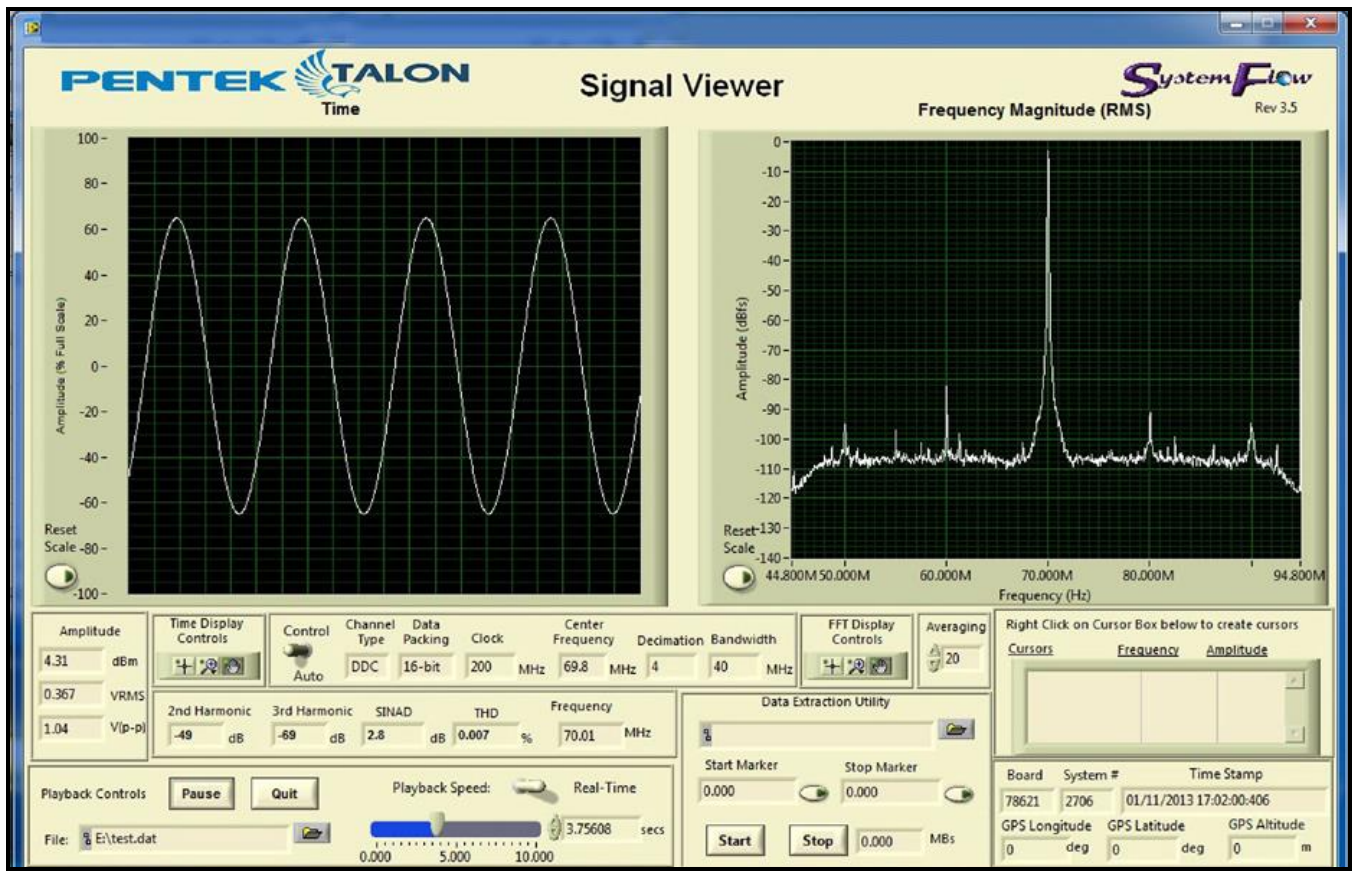Below is an example of use of the "record" command:

```
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

PC Workstation

Operating System: Windows
Processor: Intel Xeon Gold processor
SDRAM: Up to 4TB of DDR4 SDRAM
RAID
  Drive Type: Front-panel removable NVMe U.2 solid-state drives (SSDs)
  Storage: Up to 122 TB
  Supported RAID Levels: 0, 5

Ethernet Interface

Quantity: 1 port
Connector Type: QSFP28 port with MPO transceiver

Physical and Environmental

Dimensions: 16.93" W x 22.19" D x 6.93" H; (430 x 563.7 x 176 mm)
Weight: 51 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.

Storage Options	
Option -430	30.7 TB NVMe SSD storage capacity
Option -460	61.4 TB NVMe SSD storage capacity
Option -485	122.8 TB NVMe SSD storage capacity
General Options	
Option -261	GPS time and position stamping
Option -264	IRIG-B time stamping
Option -267	Dual 10 GbE offload
Option -268	Dual 40 GbE offload
Option -269	100 GbE offload
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:

> Pentek, Inc.
> One Park Way
> Upper Saddle River, NJ 07458 USA
> Tel: +1 (201) 818-5900
> Email: sales@pentek.com

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