

# Talon RTR 2757

## 100 Gigabit Ethernet rugged rackmount recorder

Captures data from  
Quartz® RFSoc products'  
100 Gigabit Ethernet ports

- Real-time record rates up to 25 GB/s (200 Gigabits/s)
- Front-panel removable solid state storage up to 244 TB
- Records up to 8 A/D channels
- SystemFlow software GUI with Signal Viewer analysis tool



**The Talon RTR 2757 is a turnkey system for recording up to two 100 Gigabit Ethernet UDP streams from Mercury's Direct RF and Quartz® RFSoc products.** With up to 244 TB of removable solid state storage, the 2757 provides hours of multi-channel wideband signal recording.

Mercury'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 100 Gigabit Ethernet interfaces, allowing the user to capture digitized signals from up to eight RFSoc A/Ds.

The RTR 2757 provides an interface that matches the Quartz Ethernet UDP protocol and can accept up to eight independent UDP data streams. This allows users to stream all eight A/D channels independently over 100 Gigabit Ethernet and capture them as independent files on the recorder. The standard RTR 2757 captures only the payload, providing data files similar to other Talon recorders. The payload typically consists of raw I/Q data or VITA-49 packetized data, depending on the setup of the digitizer module, independent of the recorder. This allows the suite of [SystemFlow software](#) tools to be used for signal analysis prior to, during, and after a recording session.

**FEATURES**

- Designed for data capture from Mercury **Direct RF** and **Quartz® RFSoc** products' 100 Gigabit Ethernet ports
- Up to two QSFP28 ports with MPO transceivers.
- Real-time record rates up to 25 GB/s (200 Gigabits/s)
- Front-panel removable solid state storage up to 244 TB
- Intel Xeon® processors with up to 4 TB of DDR4 SDRAM
- 4U 19-inch industrial grade server chassis
- Supports up to eight independent UDP streams
- SystemFlow software GUI with Signal Viewer analysis tool
- C-callable API for integration

**RUGGED AND FLEXIBLE ARCHITECTURE**

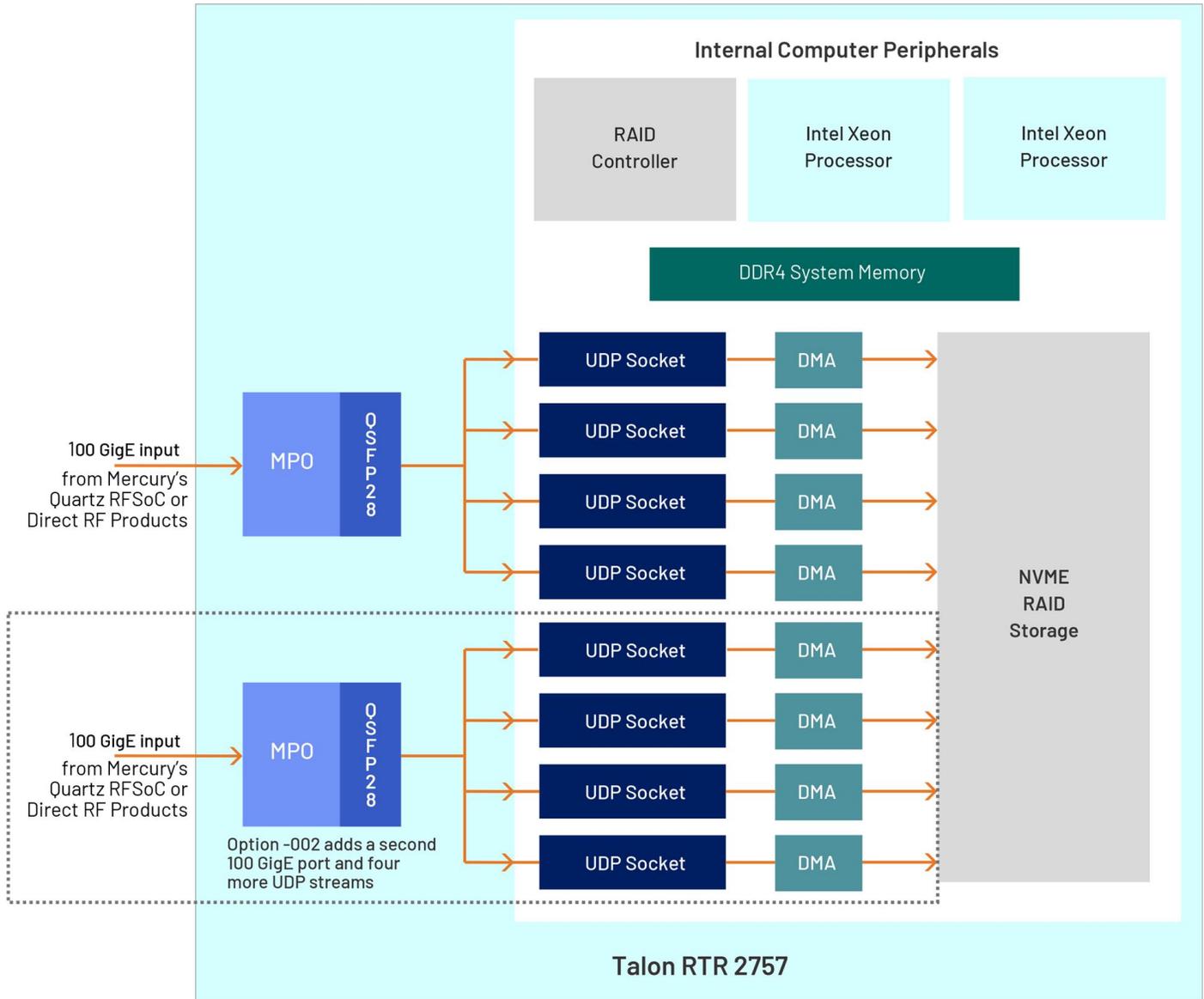
The RTR 2757 comes in an industrial-grade 19-inch 4U rack-mountable chassis. It uses high-performance NVME U.2 drives in a RAID 0 configuration to provide extremely high-speed real-time recording. Drives are front-panel removable via eight individual drive trays. The independent operating system drive is also removable via the front panel. Multiple 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 is built using an Intel Xeon server-class motherboard, includes Xeon processors, and includes up to 4 TB of DDR4 RAM. The standard configuration includes USB 3.0 ports, Gigabit Ethernet for network communication, and an HDMI port for display.

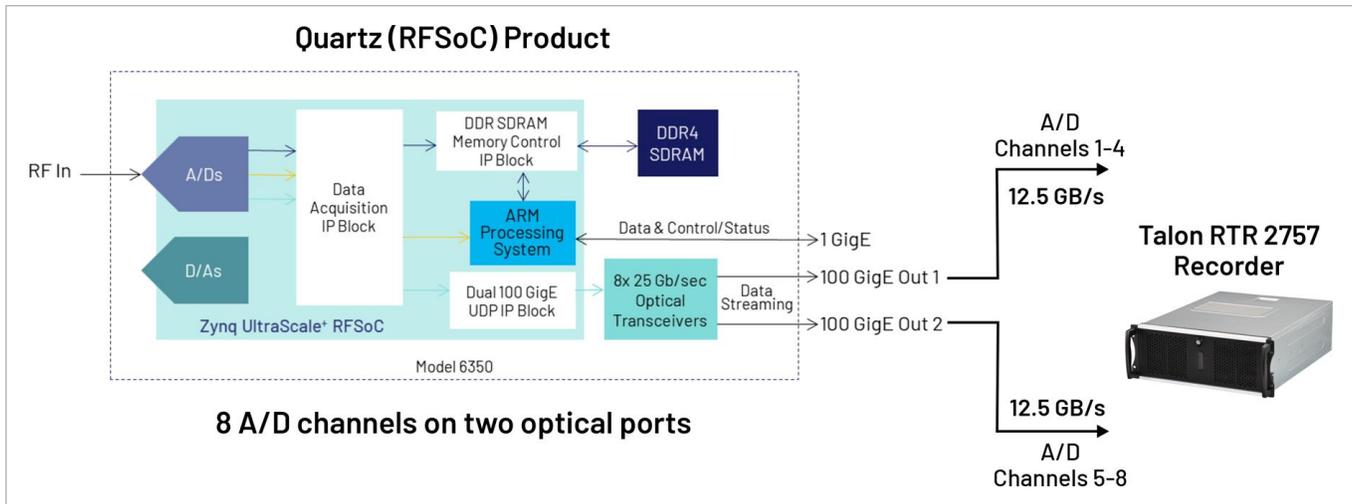
The RTR 2757 can be configured with either a single or two 100 Gigabit Ethernet optical ports. Each port can handle up to 4 UDP streams that are typically driven by A/D channels. Each channel/stream is written to disk as an individual file to the NTFS file system. This provides separation of A/D channels on a file by file basis, making it easy for the user to access channelized data.

The RTR 2757 provides channelized file recording of the UDP payload. The payload can include VITA49 packet headers if they are enabled on the Mercury Direct RF or Quartz RFSoc product.

2757 BLOCK DIAGRAM



CAPTURING DATA FROM MERCURY'S DIRECT RF AND QUARTZ (RFSOC) PRODUCTS



- Two 100 Gigabit Ethernet ports have a maximum 25 GB/s streaming rate.
- One 2757 recorder can capture real-time UDP streams at 25 GB/s using two QSFP28 optical ports. Option -002 doubles this capacity as shown in the block diagram on the previous page.

## SYSTEMFLOW SOFTWARE

All Talon recorders include the Mercury SystemFlow<sup>®</sup> 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.
- 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. Additional high-level libraries, like Python, are available upon request.

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.

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.

## SYSTEMFLOW SIMULATOR

To learn more about SystemFlow software, contact Mercury at [techsales@mercy.com](mailto:techsales@mercy.com). 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
- Allows engineers to write and test their application (built using the SystemFlow API) before receiving the recorder hardware
- Demonstrates SystemFlow signal and file viewer tool
- 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

## 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. In addition to C, support is also provided for high level languages such as Python and C#. Below is an example of controlling recording via the SystemFlow API.

```

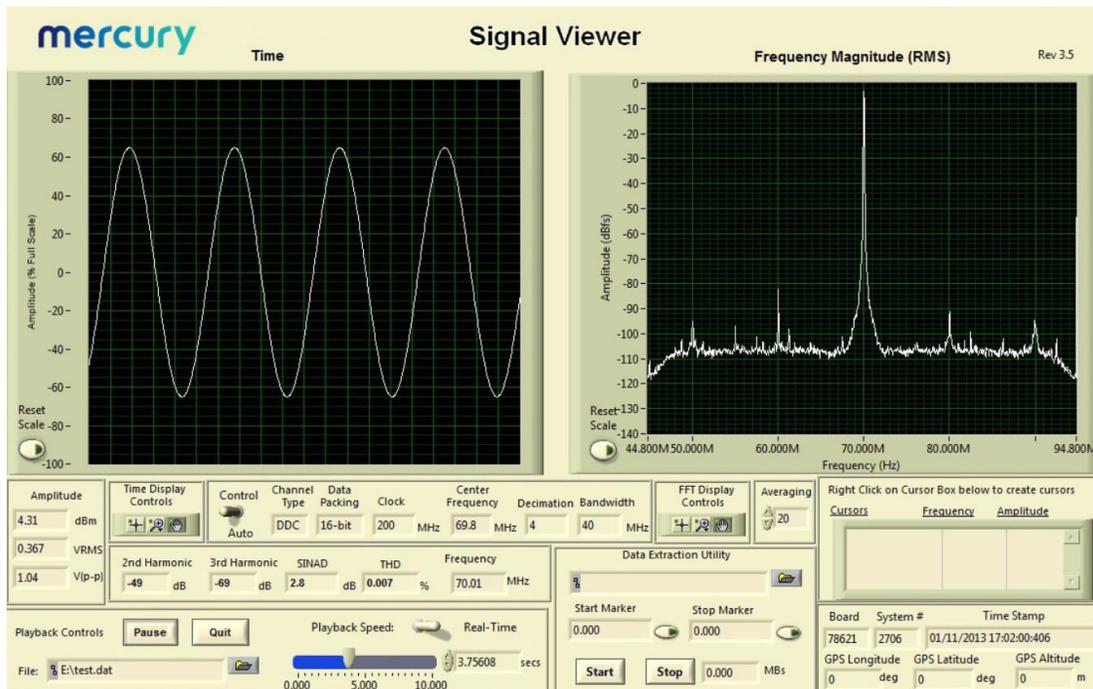
728     }
729     //transfer until end of disk
730     else if (transferType == TRANSFER_END_OF_DISK)
731     {
732         recordParams->transferTime = 0;           // must set to 0
733         recordParams->transferLength = 0;        // must set to 0
734     }
735
736     //////////////////////////////////////////////////////////////////// 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)

```

**SIGNAL VIEWER**

The SystemFlow Signal Viewer includes a spectrogram, 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: Dual Intel Xeon Processors

SDRAM: Up to 4 TB DDR4 SDRAM (64 GB DDR standard)

RAID

- Drive Type: Front-panel removable NVMe U.2 solid-state drives (SSDs)
- Storage: 15.3 to 244 TB
- Supported RAID Levels: 0

**Ethernet Interface**

Quantity: Up to 2 ports (1 port standard)

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**

**General Options**

|             |                   |
|-------------|-------------------|
| Option -002 | Two optical ports |
|-------------|-------------------|

**Storage Options**

|             |                   |
|-------------|-------------------|
| Option -430 | 30.7 TB SSD RAID  |
| Option -460 | 61.4 TB SSD RAID  |
| Option -485 | 122.8 TB SSD RAID |
| Option -490 | 243.3 TB SSD RAID |

Contact Mercury for compatible option combinations. Storage and general options may change, so contact Mercury for the latest information.

**QUARTZ RFSOC PRODUCTS**

Model RTR 2757 supports Mercury's Quartz RFSoc products.

**Quartz Options**

**VPX 3U**

|            |  |
|------------|--|
| Model 5550 | 8-Channel A/D and D/A Zynq UltraScale+ RFSoc Processor - SOSA Aligned 3U VPX       |
| Model 5553 | 8-Channel A/D and D/A Zynq UltraScale+ RFSoc Gen 3 Processor - SOSA Aligned 3U VPX |
| Model 5950 | 8-Channel A/D and D/A Zynq UltraScale+ RFSoc Processor - 3U VPX                    |
| Model 5953 | 8-Channel A/D and D/A Zynq UltraScale+ RFSoc Gen 3 Processor - 3U VPX              |

**Small Form Factor**

|             |  |
|-------------|--|
| Model 6350  | 8-Channel A/D and D/A Zynq UltraScale+ RFSoc Processor - SFF                 |
| Model 6350S | 8-Channel A/D and D/A Zynq UltraScale+ RFSoc Processor - SFF Subsystem       |
| Model 6353  | 8-Channel A/D and D/A Zynq UltraScale+ RFSoc Gen 3 Processor - SFF           |
| Model 6353S | 8-Channel A/D and D/A Zynq UltraScale+ RFSoc Gen 3 Processor - SFF Subsystem |

**PCIe**

|            |   |
|------------|---|
| Model 7050 | 8-Channel A/D and D/A Zynq UltraScale+ RFSoc Processor - PCIe       |
| Model 7053 | 8-Channel A/D and D/A Zynq UltraScale+ RFSoc Gen 3 Processor - PCIe |

**DIRECT RF PRODUCTS**

Model 2757 supports Mercury's Direct RF products.



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