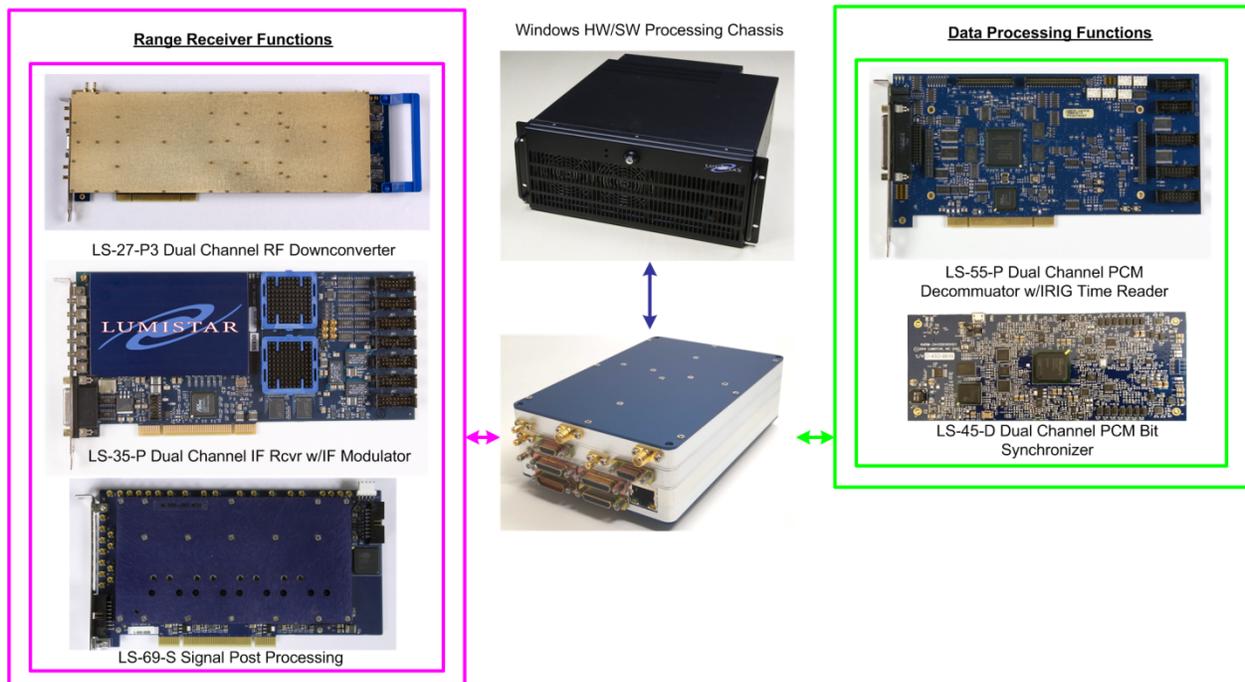




The LS-28-DRSM is a very compact, modular, multi-band, multi-mode, multifunction telemetry processing network appliance like none other. Based on eighteen years of telemetry processing experience, the design incorporates Lumistar’s experience in RF receiver design and couples it with our data processing technologies into an ultra-compact device that weighs less than two pounds.

The LS-28-DRSM design basis is our familiar existing PC product lines. Our existing product families can be separated into three basic categories each containing a group of hardware and associated processing software. These categories include: Data Processing controlled via the Lumistar Data Processing System (LDPS) software, RF Range Receiving functions controlled via the Lumistar Range Receiver System (LRRS) software, and PCM Simulation hardware controlled via the LS7xDynaSim software application. The LS-28-DRSM design targets all of the capabilities of the LRRS hardware and software application as well as the hardware functions of the LDPS application. The figure below illustrates the products that are integrated in the LS-28-DRSM product design.



As with all new product introductions, users considering these newer technologies have a number of different concerns. These include concerns about how the new product performance compares to older generations, what will the supporting application software provide in terms of features as well as features that will no longer be provided, how will the user GUI interface be implemented and how easy will it be to understand, as well as the overall “environment” of product support. Lumistar is fortunate

to have a large installed base of users that utilize our present products and software. We clearly understand these concerns. This paper will assist in addressing some of these concerns and questions.

Hardware functional performance:

As stated, the hardware design of the LS-28-DRSM carries forward the design technologies and techniques of the previous Lumistar receiver, decommutators and bits synchronizer generations while incorporating newer technologies and added functionality. In terms of performance, the design represents a combination of analog and digital techniques to allow for support of older transmission techniques while supporting the addition of more modern enhancements such as Low Density Parity Coding (LDPC), Space Time Codes (STC) and adaptive equalization. Data rate support exceeds our previous generation of products while the number of reception bands has again doubled over our standard Tri-band RF PCI products. All of the demodulation methods previously supported with growth capabilities for future needs.

The new design contains many attractive additions. The LS-28-DRSM design is controlled and accessed completely via serial means, primarily via a high-speed 1Gbps Ethernet interface. This allows complete remote access. No commercial or open-source operating systems for maximum security and the unit is fully “field” upgradeable in terms of internal control software and license upgrades. If desired, the unit can optionally be delivered with internal FLASH recording memory. If recording memory is prohibited, the unit will be delivered with no internal recording memory installed.

Software Interface:

The application software environment for the LS-28-DRSM contains three main pieces: the primary Windows operating application supplied with each LS-28-DRSM delivery (LS28App), integration into the existing Lumistar Data Processing System application (LDPS), and an extension to the LS28App referred to as LS28Pro.

The selection of the software needed by the customer is entirely based on operational requirements. If the need is to simply provide receiving and low level data processing and streaming functions in a virtual “stand-alone” mode, the LS28App will supply all of the necessary functionality. The application can be configured to talk directly from a host computing platform directly to the device forgoing the necessity of any external network components. The LS28App application allows the user to program, store and recall, all receiving functionality as well as setup on-board decommutation assets. If streaming is desired, this process is also controlled for up to two live data streams. If received data requires decryption, the receiver provides simultaneous RS422 and TTL clock and data outputs that can be connected to decryption equipment. The unit also provides a clock and data input from the decryption equipment which allows for decommutation and streaming of decoded data. The figure below illustrates an ultra-portable configuration using our optional desktop power and cooling fixture.

LS28App Processing Platform

LS-28-DRSM w/Desktop Power/Cooling Enclosure

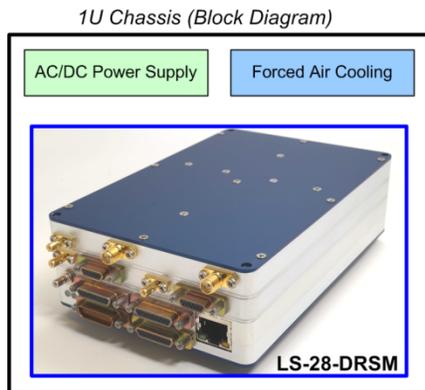


1Gbps Ethernet

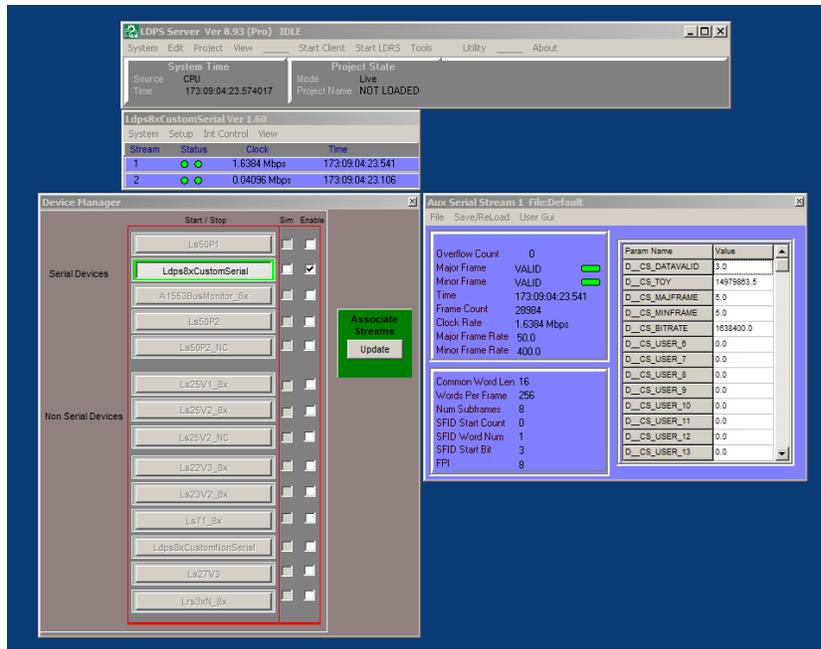


If requirements include the need for data display and analysis in addition to the receiving functions, then the number of options increases. The figure below shows an approach utilizing a 1U integrated chassis solution. In this configuration, the host processing platform contains both the LS28App and the LDPS application software. Besides the LS-28-DRSM, no additional processing equipment is included inside the integrated chassis.

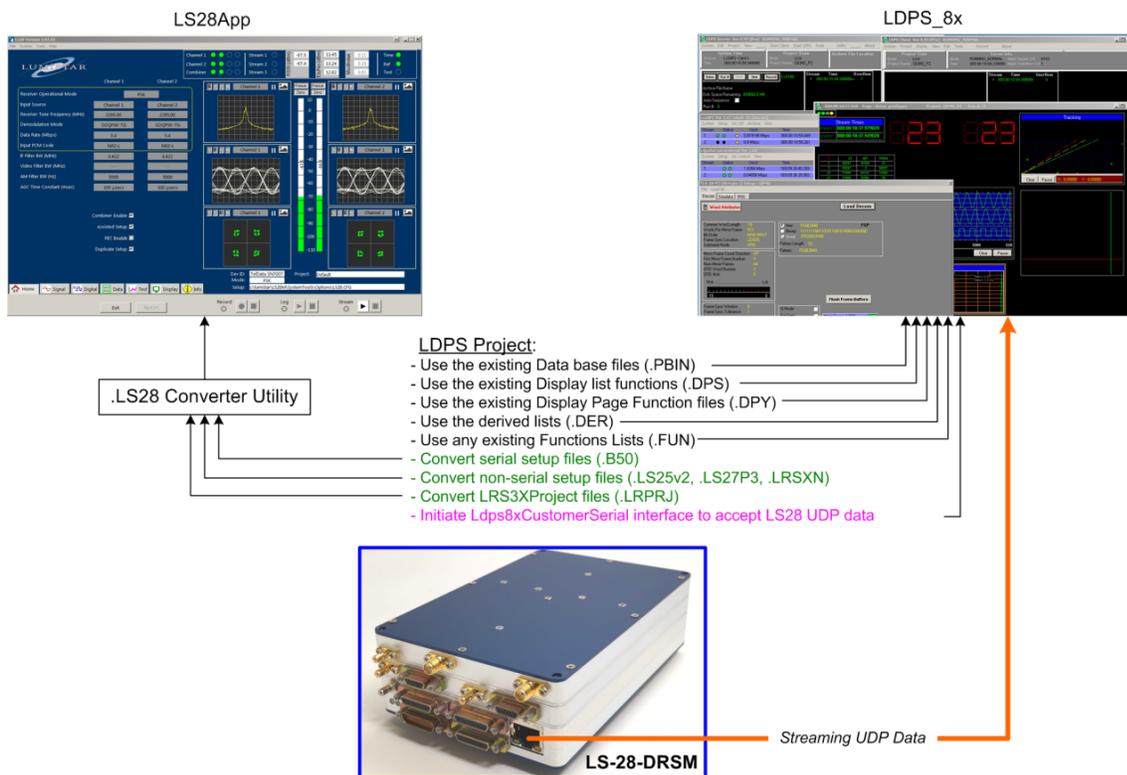
LDPS and LS28App Processing Platform



In this configuration, data streaming from the LS-28-DRSM will be processed and applied to all server and client functionalities of the LDPS application through an existing LDPS managed device referred to as “Ldps8xCustomSerial”. This device has been a part of the release version of LDPS for many years and now will have a key integration role in terms of the LS-28-DRSM. An example of this is shown in the figure that follows. Once selected, this interface allows the user to apply all data that is being decommutated on the LS-28-DRSM directly to existing data bases and display suites that may exist from previous operations. The integration removes a great deal of the risk associated with redevelopment of data bases and display screens and adds a level of “comfort and familiarity” in the data display and processing functionality when considering an experienced user base.



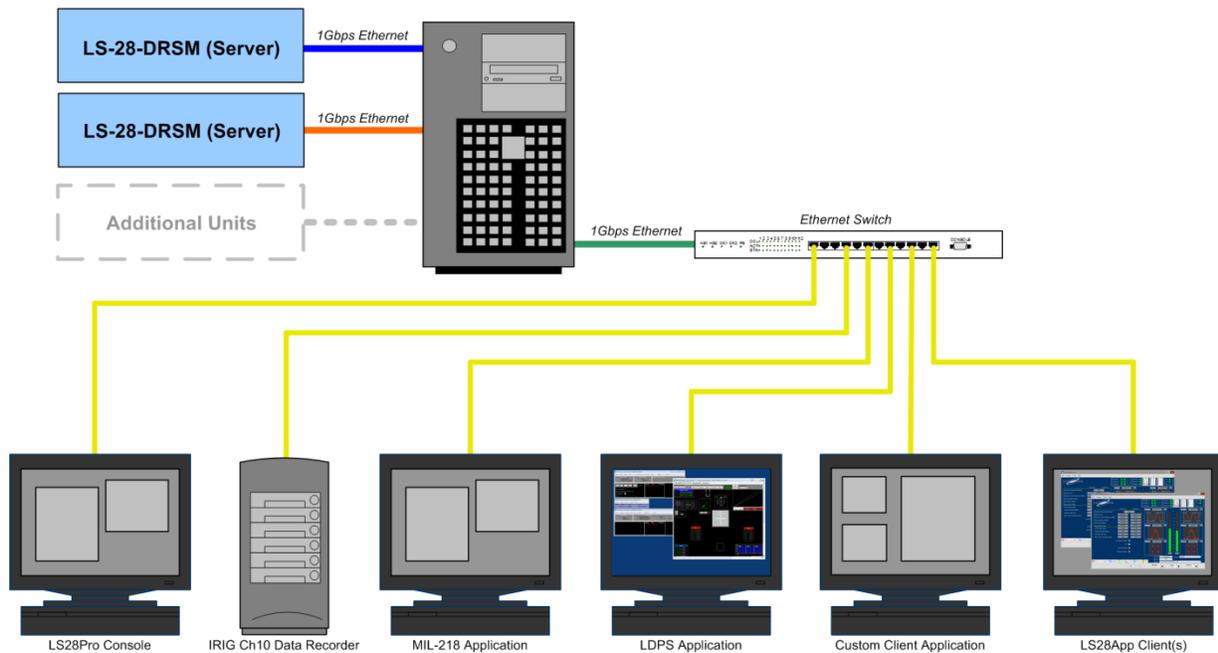
Furthermore, to more fully integrate these two suites together, Lumistar is developing a translator that will allow the user to take existing LDPS project files (.PRJ) and translate them into direct setups that can be loaded directly to the LS-28-DRSM. The figure below shows the functions that are in an existing LDPS project file and those few items that would need to be translated into configuration data for the new LS-28-DRSM.



More complex scenarios include the need to control multiple LS-28-DRSMs, have specific data sent to multiple locations, the addition of VLAN capacities for WLAN applications, and the translation of live streaming data into various other formats. For these types of functions Lumistar is developing the LS28Pro application. This application acts as a sort of “Director” to allow the following types of functions while maintaining the IP v4 security and operational compatibility:

- 1.) Distribution of data, controls and status based on administratively assigned privileges
- 2.) Support of multiple devices and multiple network connections
- 3.) Conversion of live streaming data to various formats (Ch10, RCC-218, Custom, etc.)
- 4.) Storage of live streaming data
- 5.) Utilitarian conversion tools to convert data and setup files
- 6.) Provisions for WLAN security needs

LS28Pro Running on a Windows PC



The LS28Pro application will scale with various needs. This includes needs where a single terminal is being used to control, status, display and store data in a specific format from a single terminal to widely distributed processing scenarios. The LS28Pro application can be run on the same platform as other LDPS and LS28App application software or on a separate processing platform as indicated in the drawing above.

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