MFREU

MULTI-FUNCTION RF ELECTRONICS UNIT & ON-BOARD PROCESSOR

A complete SDR, processor and data storage unit built on Trident's VPX modules suitable for a wide range of mission applications. Built with an EMI/EMC hardened chassis, integrated power supplies and flexible I/O, it is modular and customizable; the ideal solution for modern space applications.

Highly Integrated

The MFREU combines Trident's xDRT modules with support modules for a complete unit-level solution. Based on our powerful, flexible multifunction processing architecture, programmability over all key RF/Processing features is available in a very small size, weight, and power footprint. SpaceVPX compatibility and customization provides modularity, scalability and simplifies integration into space payloads.

Balanced Reliability

TRL9 on several LEO programs, a proven Radiation Effects Mitigated architecture, coupled with radiation-tolerant components, redundancy and a robust mechanical design, provide a low C-SWaP, high reliability platform for operation in harsh orbital and interplanetary environments.

Several Standard Configurations With Customization Available

TRIDENT
LIGHTRIDGE SOLUTIONS

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High Performance MFREU and Processor

C-SWaP Optimized High Performance Solutions for Modern Space Programs
Hardware, Software and Firmware customization available

Multi-Function RF Unit and Storage

- Up to 8 TX & RX channels per card
- Up to 4 xDRT modules per PSU
- 12-to-14-Bit DAC/ADC Options
- Interleaved Operation to >6 GSps
- DC - 8 GHz+ without RF Converter
- Internal/External RF Converter Options
- Card Synchronization
- Internal or External Ref/Sample CLK
- Up to 4 TB Storage per slot
- Redundant or Single String
- Customization Available

On-Board Processor and Storage

- Up to 4 xDRTs modules per PSU
- FPGA/GPP expandable to GPUs
- 1/10/40 GigE interfaces
- DDR4 SDRAM, NAND, NOR
- Dynamic Reconfigurability
- Built-In-Test and HW Monitoring
- FW/SW Deployment Options
- Redundant or Single String
- Up to 4 TB Storage per slot
- Customization Available

Typical Specifications

– Mission Areas	SAR/GMTI Radar, EO/IR Imaging, Tactical ISR, On-Board Edge Processing, Custom RF
– Trident Modules	SQDRT (Virtex5), UDRT (Xilinx MPSoC), RDRT (Xilinx RFSoC) and VDRT (Xilinx Versal AI)
– Compatability	OpenVPX and SpaceVPX compatibility for 3rd party SBCs, GPUs, and GPPs
– Card Positions	Scalable; 3 to 7 slots typical; high-speed backplane inter-module connectivity
– SWaP	11" x 12" (baseplate) x 6" Typical, < 15 kg, 50 to 200W+ with low power modes
– Power Supply	+28 VDC MIL-STD-704 and MIL-STD-461E Filtered. Primary and redundant options
– Temperature	-20' C to + 55' C Operation (at baseplate) configuration dependent
– Reliability	TID: 100 kRad unit level (TYP), No DSEL for LET <= 37 MeV-cm^2/mg

Interfaces

– High speed data	SERDES, 1/10/40 GigE, Copper & Fiber
– Control & low speed data	GigE/UDP, SpaceWire, CAN bus, Custom
– General Purpose I/O	RS-422, LVDS, LVTTL, Custom
– Discrete Enables	PSU Select/Enable, Module Select/Enable
– RF	50 ohm single ended, high-density
– Reference & Sample Clocks	Internal or External
– Synchronization	1 PPS
– Backplane Interface	SpaceVPX/OpenVPX per VITA 78/65
– Power	Isolated, Filtered MIL-DTL 38999

Multifunction Reconfigurability

- Multiple FPGA/Processor boot load options
- Primary/Redundant NOR Flash
- Dynamically Reconfigurable
- On-orbit re-programmability

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Because we are constantly improving our products, these specifications are subject to change without notice.