

# PEARL

## SPACECRAFT PLATFORM



SDL's Pearl spacecraft platform delivers the performance, reliability, and mission flexibility needed for demanding small satellite missions. The Pearl platform architecture draws from common sets of components to build 3U, 6U, 12U, and custom sizes with variations in mission capability, parts quality, and radiation tolerance. This flexibility enables our professional staff to develop systems specific to each mission while drawing on a common design to maintain reliability and costs.

SDL's state-of-the-art testing facilities, experienced staff, and high-performance systems provide assured performance and mission success. Mission support can be provided through the entire mission life cycle, from concept to end-of-life disposal.

### FEATURES:

- Parts quality can be scaled to the needs of the mission
- Options available for type 1 encryption
- Supports a range of radiation requirements
- Traceability from the requirements to design to test and verification
- Comprehensive verification and validation of mission requirements with hardware-in-the-loop testing
- Flexible, customizable, and adaptable
- Full mission life cycle engineering support
- Facilities onsite to support all program phases



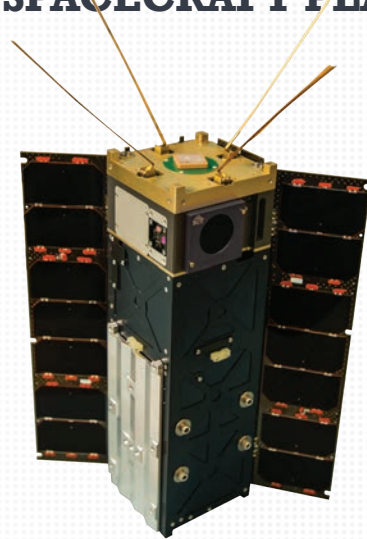
**Space Dynamics**  
LABORATORY  
Utah State University Research Foundation



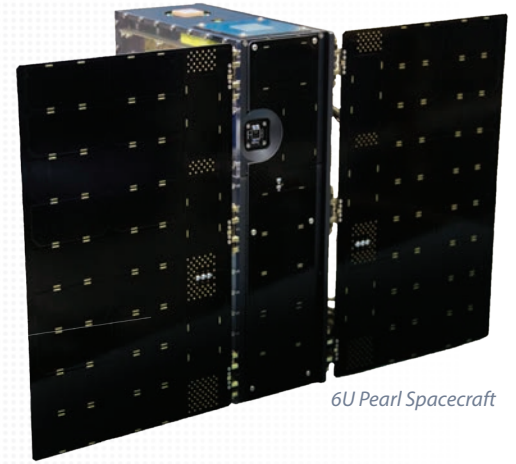
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## SPACECRAFT PLATFORM

3U Pearl Spacecraft



6U Pearl Spacecraft



SPECIFICATIONS	3U	6U, 12U, CUSTOM
<b>PAYLOAD ACCOMMODATION</b>		
<b>VOLUME</b>	Up to 1.7U	Up to 4U, 8U, & custom
<b>ORBIT AVERAGE/PEAK POWER</b>	15 W OAP (orbit dependent) – higher power available for low duty cycle events/35 W peak	30 W OAP (orbit dependent) – higher power available for low duty cycle events/75 W peak
<b>POWER SWITCHES</b>	One 5 V, two 12 V	One 5 V, four 12 V
<b>COMMUNICATION PORTS</b>	SpaceWire, PCI, RS-422, & other payload interfaces available	Support for up to 3 payloads, FPGA configurable: SpaceWire, UART, synchronous serial
<b>PAYLOAD DATA STORAGE</b>	Up to 64 GB on-board flash storage	16 GB radiation tolerant, EDAC protected
<b>HEATER CIRCUITS</b>	0	Up to 3
<b>TEMPERATURE SENSORS</b>	Up to 8	Up to 9
<b>PAYLOAD DEPLOYMENT CIRCUITS</b>	Up to 4	Up to 3, redundant drivers— 6 total
<b>BUS</b>		
<b>PROCESSOR</b>	2 or 4 core LEON-III fault & radiation-tolerant, single board computer, 25 to 266 MHz	
<b>RAM</b>	256 MB on-board memory	
<b>OPERATING SYSTEM</b>	VxWorks, RTEMS, or Linux OS	
<b>POSITION ACCURACY</b>	<0.021° (3-sigma)	
<b>POSITION KNOWLEDGE</b>	<0.021° (3-sigma)	
<b>ORBITS SUPPORTED</b>	LEO	LEO, GEO, and beyond. Fully radiation tolerant options available
<b>DOWNLINK CAPABILITIES</b>	Up to 3.5 Mbps, with AES 256 encryption	Up to 40 Mbps, with AES 256 or TSAB encryption
<b>FREQUENCIES SUPPORTED</b>	UHF, unified S-band, SGLS, X- & K-band options	



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