

**A Decade with a Solution
Looking for a Problem.**

Or....thank you VPX!!!!!!

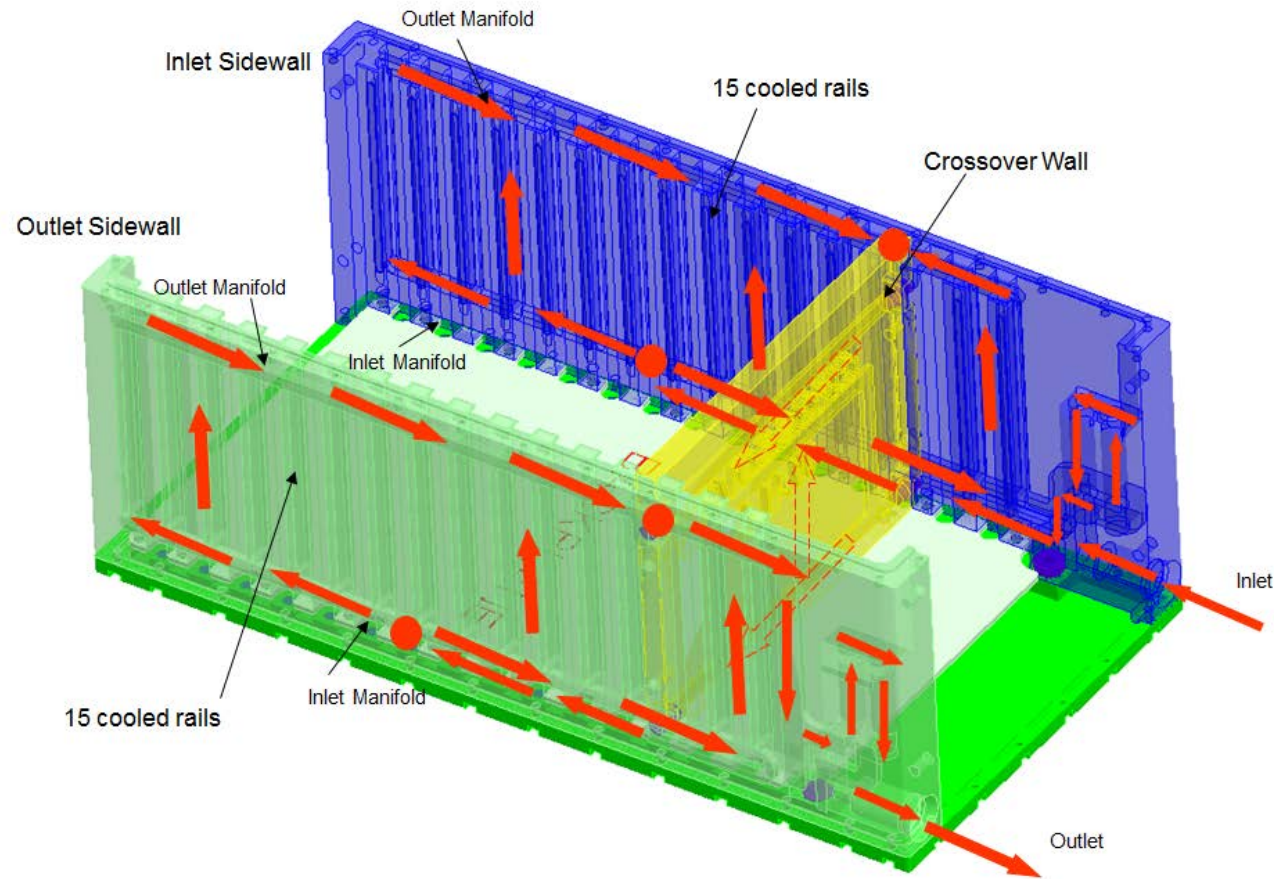


Embedded Tech Trends 2017

ENGINEERING YOUR SUCCESS.

Cold plates in an ATR format

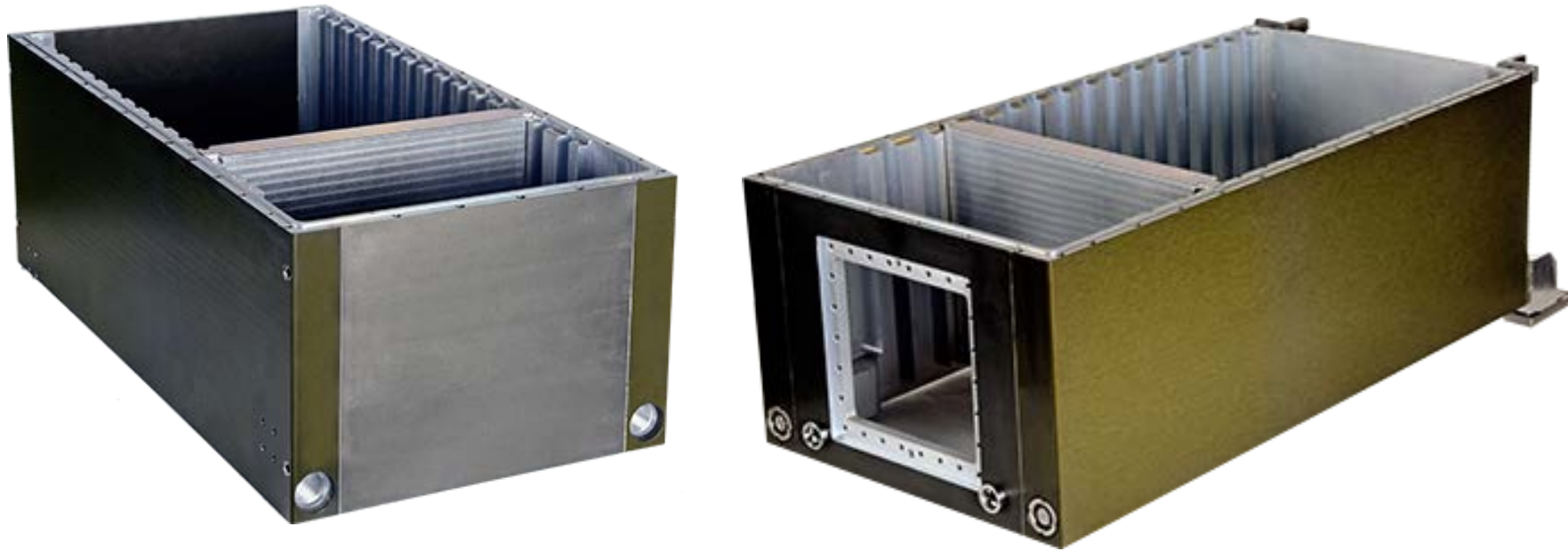
A liquid flow through chassis, the core building block



Liquid flow through schematic

LFT enclosure baseline (since 2005)

- One ATR format 1.0" pitch side walls (cold plates)
- Single liquid loop
- Supports a VPX backplane
- Cross over cold wall supports power supply cooling.
- Blind mate ARINC 600 I/O option



Liquid cooled system enclosures



“Large UAS”



“Fixed Wing Airborne”



FCS



Global Hawk & U2



“Rotary”



Integrated chassis

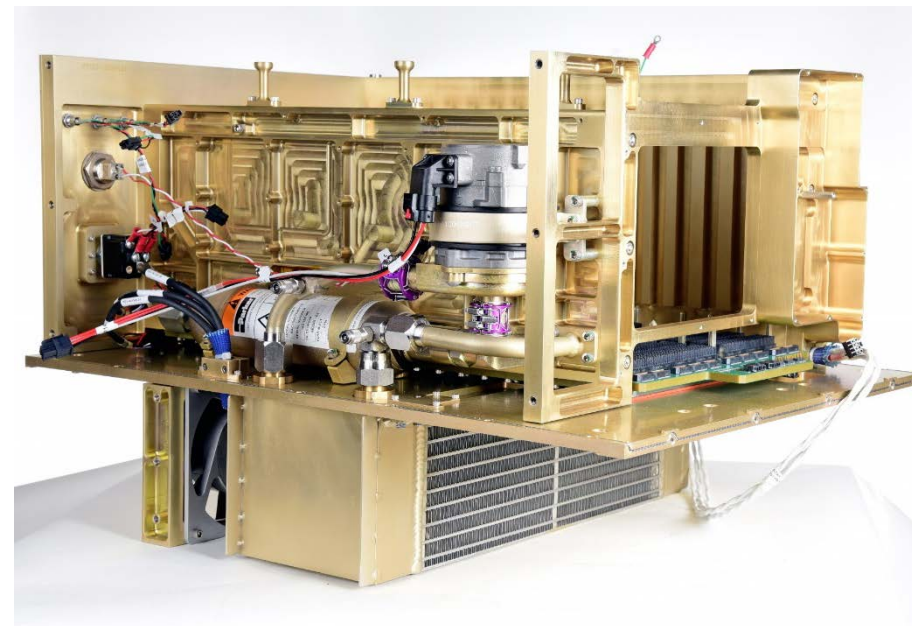
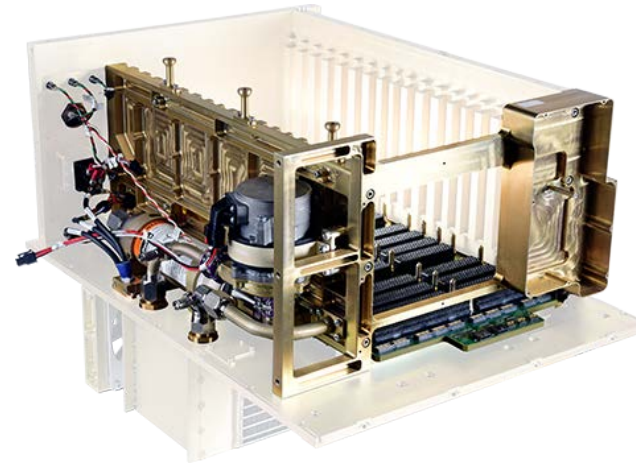
- 8U, 19" rack mount.
- All structural elements machined to reduce weight
- Rear I/O panel supports up to twelve MIL-DTL-38999 Series 3
- Backplane to I/O panel supported by high performance rigid flex circuits.
- Cooling air circulation direction options; front to rear or rear to front.



Integrated chassis

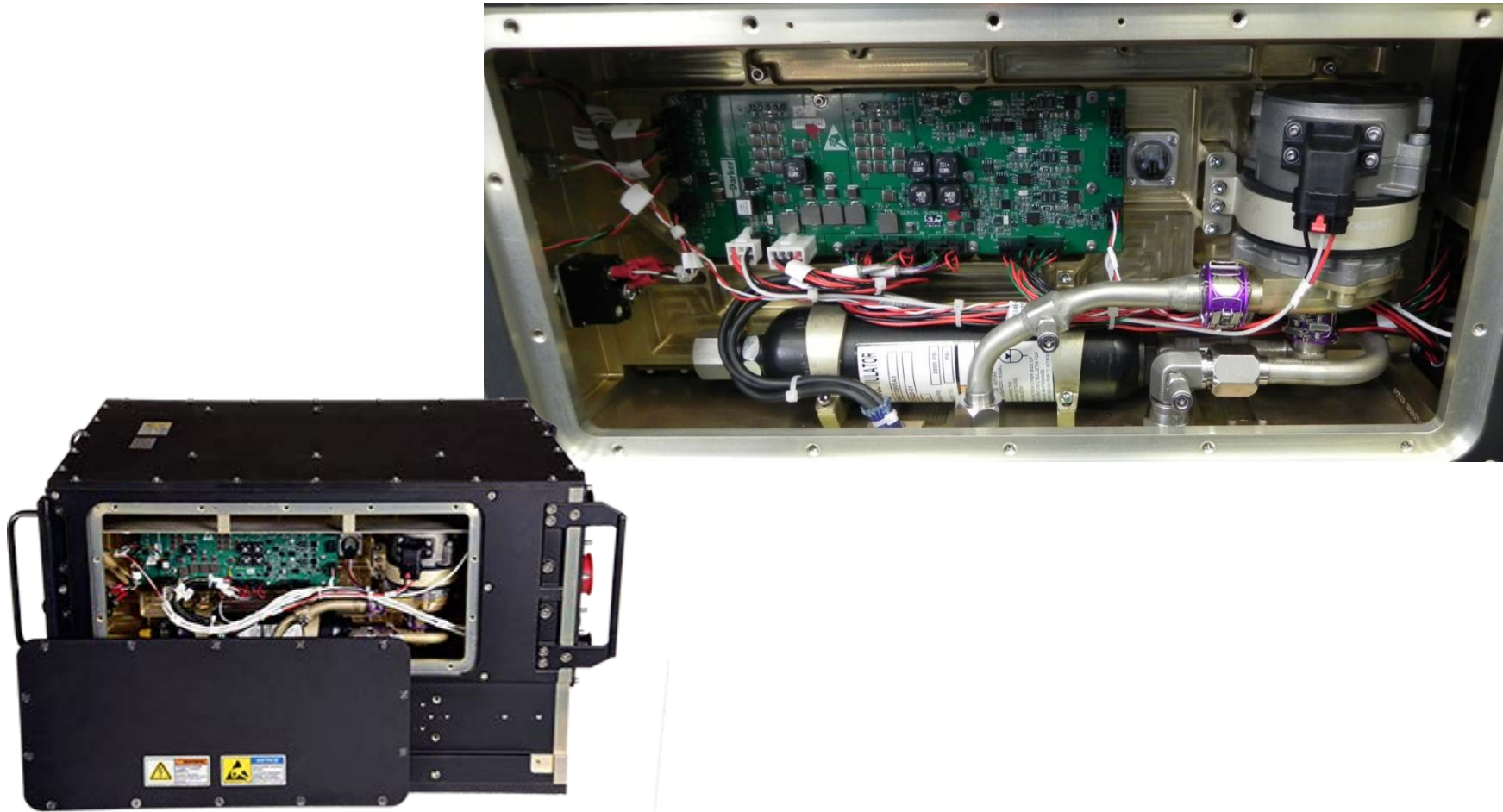
No external fluid loop

- Top load one ATR for 6U conduction cooled cards
- Closed liquid loop
- Liquid flow through side walls (cold plates)
- Integrated heat exchanger in the lower section
- Fluid management comprises:
 - Smart pump
 - Controller
 - Accumulator
- 3,000 watt power supply option with dissipation a factor of audible fan noise.....
- VPX backplane



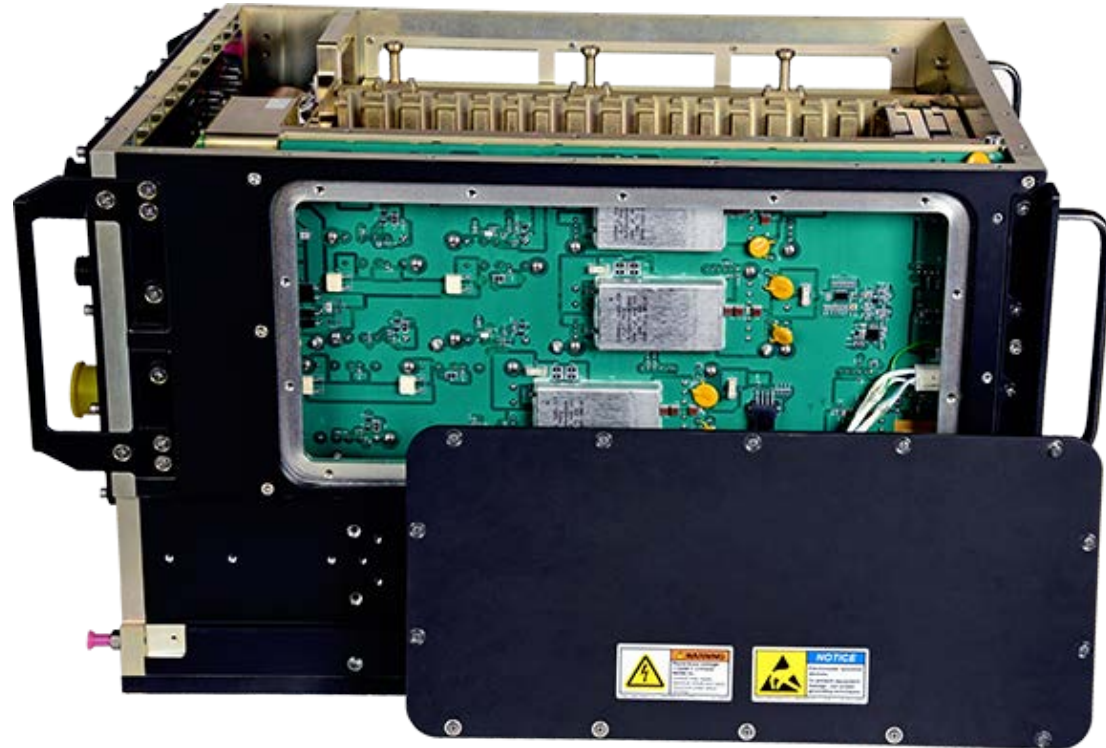
Integrated chassis

Smart pump/accumulator & controller



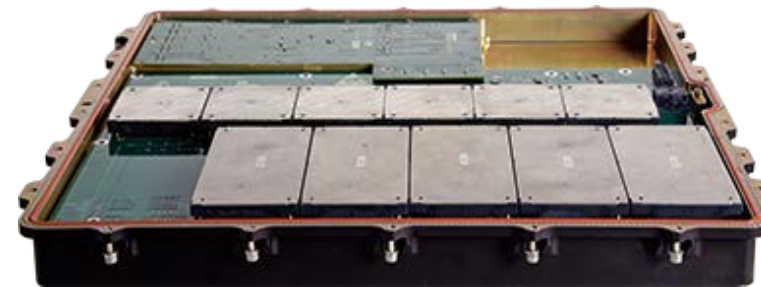
Power supply solutions

- I²C power & temperature monitoring.
- 3,000 watt power supply comprises two PCB assemblies.
- Significant heat generating components mounted adjacent to the cold plate side wall.
- Multiple input voltages supported.
- Full EMI/RFI protection.



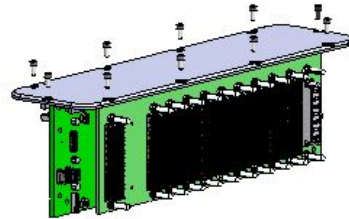
Power supply solutions

- Lower section doghouse supports 3,600 watt power supply solution.
- Blind mates to chassis buss-bars.
- EMI/RFI protection to MIL-STD-704.
- Input Power: 115/200 VAC 3-phase 400 Hz.

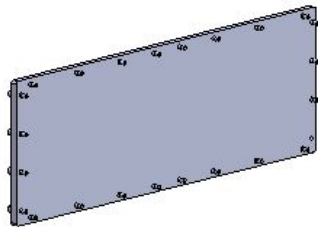


Liquid Flow Through custom solution – 3U VPX (or VME or cPCI)

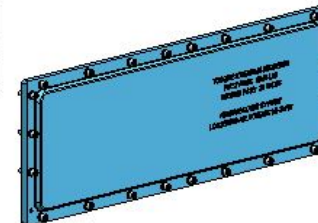
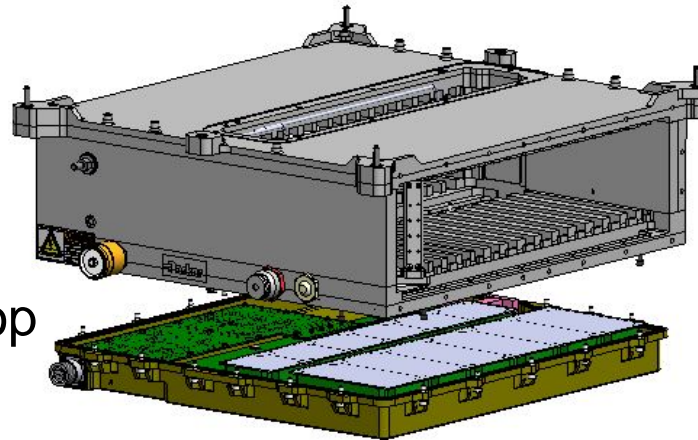
Power system combination of input power filtering and conditioning in the base plus plug-in DC-DC modules.



Back to back backplanes

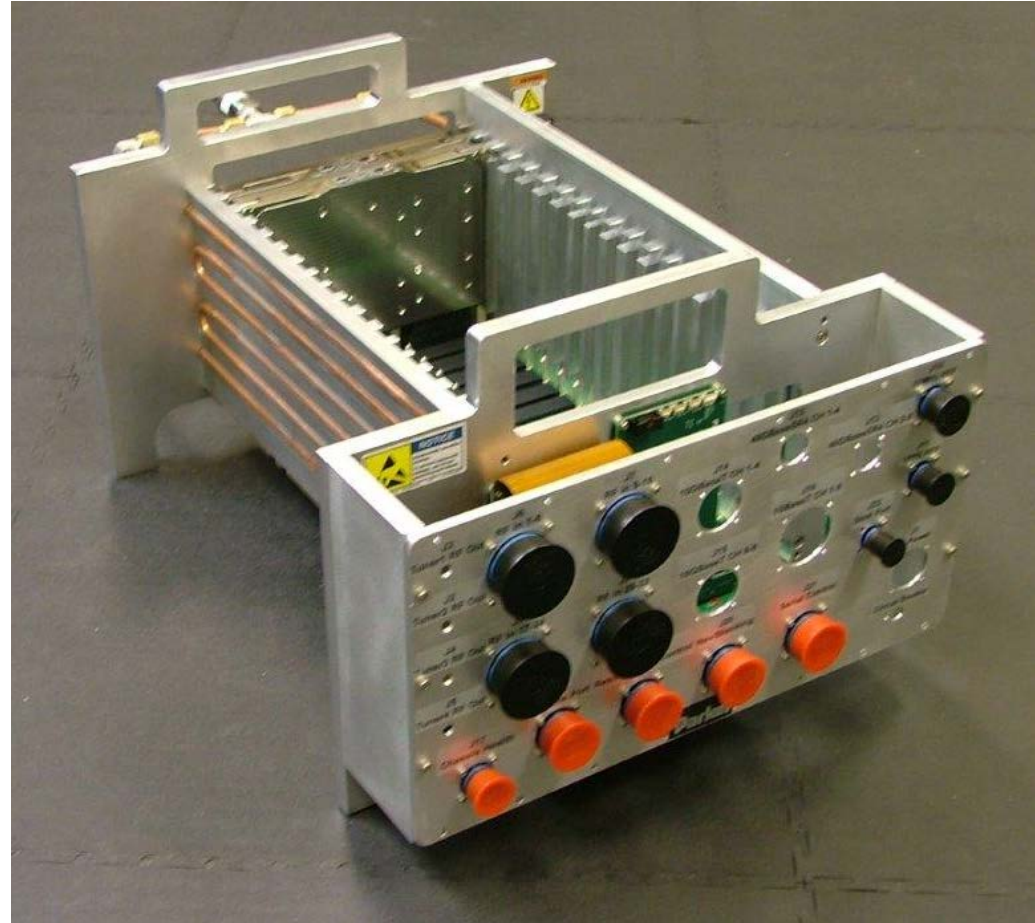


Single liquid loop



Liquid cooled open frame VPX development chassis

- Liquid flow through side walls
- Fluid quick disconnects to external HX
- IEEE1101 backplane mounting VME, cPCI or VPX
- 15 one inch pitch slots
- Machined I/O panel for MIL Circ. 38999s
- DC power to backplane from external source





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