

**CURTISS  
WRIGHT** Controls  
Embedded Computing



The CHAMP-FX2 from Curtiss-Wright Controls Embedded Computing is a 6U VPX heterogeneous FPGA/microprocessor DSP compute engine designed for tough signal and image processing tasks in either benign or rugged deployed embedded environments. The CHAMP-FX2 combines the raw parallel computational power of two Xilinx Virtex-5 FPGAs with the floating-point computational power provided by the Altivec-enabled dual-core 8641D processor, all connected with a high-performance Serial RapidIO switched fabric to bring unprecedented computational densities to the VPX form factor.

Curtiss-Wright worked with customers to design the CHAMP-FX2 so that the bandwidth provided by the Virtex-5's off-board and inter-FPGA I/O links is carefully balanced with the bandwidths of multiple SRAM and SDRAM banks to ensure that there are no natural bottlenecks to the data flow. The onboard Serial RapidIO fabric ties the CHAMP-FX2 computing resources with other Serial RapidIO-enabled boards such as the CHAMP-AV6 and VPX3-185 to provide solutions for tough deployed embedded systems including radar, image processing, and signals intelligence.

– Curtiss-Wright Controls Embedded Computing

## More FPGAs power VPX DSP board

As FPGAs trounce the world of DSP designs, having more of them – with more I/O and more memory – is “more better.” Curtiss-Wright Controls Embedded Computing's CHAMP-FX2 – the latest incarnation of the company's venerable CHAMP DSP series – uses two Xilinx Virtex-5 LXT FPGAs to provide true heterogeneous processing. A “lowly” Freescale 8641D PowerPC processor handles general-purpose processing, as well as DSP algorithms in its own right. Collectively, these three nodes are mounted on a 6U VPX board that affords more I/O capabilities than Bill Gates has copies of Windows. Well, maybe not that many, but a lot.

Each FPGA node is swimming in memory: up to 1 GB DDR2 SDRAM (4.4 GBps peak) and up to 32 MB QDR-II+ SRAM (8.8 GBps peak). Additionally, nodes are interconnected in various ways: four-lane RocketIO LVDS; four-lane high-speed serial links to the backplane, XMC site, and one optionally to the front panel; and 18 pairs of discrete LVDS to the VPX-equipped backplane in case you want to roll your own. And the 8641D dual core is no slouch, either. It can run up to 1.33 GHz and has up to 1 GB of DDR2 SDRAM with ECC and 512 MB of flash plus 128 KB of NVRAM. There's Ethernet (two), serial (two), and an onboard Serial RapidIO switch spidering lines all over the board and out to the VPX backplane. There's more, but we're out of room. Check it out at the Curtiss-Wright website.

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