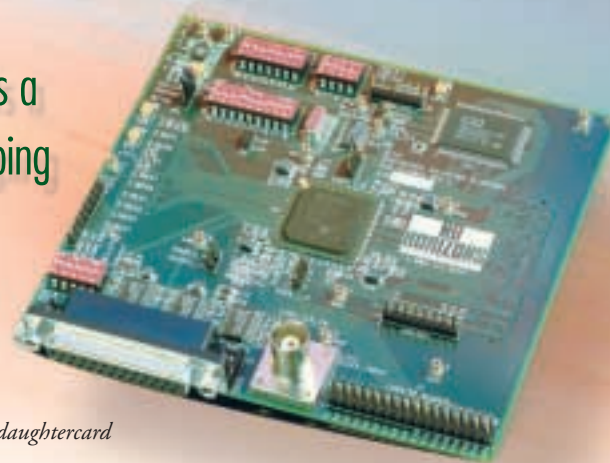# Multiprotocol Modular Engineering Solutions Platform Offers Design Flexibility and Faster Time to Market

The Nu Horizons Engineering Solutions Platform presents a cost-effective alternative to single-board tools for developing high-end data communication and server applications.

Virtex-II daughtercard

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Today's one-sided trend toward shorter system development cycles and increasingly complex designs are driving the need for more timely system validation. Although designers recognize this weighted ratio, and are turning more and more to Xilinx FPGAs for their designs, they have also recognized a need for development boards that are up to the challenge.

Nu Horizons Electronics Corp. understands this short-cycle/high-complexity design ratio and has introduced a line of hardware development platform tools that facilitate system verification within an integrated environment. The Nu Horizons Engineering Solutions Platforms are based on a modular design concept that allows the re-use of expansion cards with other interface expansion cards to create a unique development evaluation environment.

Modular Design Solution

The Engineering Solutions Platform solution consists of up to three boards in a modular environment. With this modularity, you may combine a number of different expansion cards for multiple solutions, or you can build a total solution in a modular environment. The days of purchasing a development board for a single application are gone.

Engineering Support Platform motherboard

Motherboard

The primary function of the Engineering Solutions Platform motherboard is to provide a high-speed backplane for board-to-board data transfers. This backplane is called the Horizon Bus. With the high-density board-to-board connectors, you can evaluate the functions of two expansion cards, which allows emulation of a total solution. The Horizon Bus has an aggregate bandwidth of 26 Gbps, and is highly suited for developing solutions for the telecommunications and data network markets.

The main board, or motherboard (Figure 1), has the following features:

- Xilinx XCR3128XL -10PQ VQ100 CoolRunner™ CPLD
- High-density board-to-board connectors for two expansion cards
- Dual seven-segment LCD display
- RS-232 level shifter for UART core instantiation
- JTAG configuration headers
- Two 44-pin PLCC sockets for Xilinx configuration PROMs
- Fifty test points
- Power management
- Reset controller
- Status LEDs.

Virtex-II Expansion Card

The Xilinx Virtex™-II expansion card (Figure 2) is a cost-effective development board with a broad suite of features. Available now is the XC2V1000 FG456 one-million-gate Virtex-II device with the following features as implemented on the Engineering Solutions Platform daughtercard:

- 16 channels of LVDS interface
  - User-configurable as eight transmit and eight receive or 16 transmit channels
- Multiprotocol serial clock/data transceivers with auto cable termination
  - Certified TBR-1, TBR-2, NET-1, and NET-2 compliant.
- 16 megabits of synchronous NBT SRAM
  - Flow through and pipelined
- Programmable clock from 1 MHz to 200 MHz
- 6 user clock inputs
- High speed 133-bit at 200 MHz backplane
- DCI (digitally controlled impedance).

Design Platform for High-End Applications

Targeted at high-end data communications applications, the Virtex-II daughtercard is applicable to many scenarios, including SPI-3 to CSIX bus interface or offering transparency within high-end networking solutions. The 16 channels of high-performance LVDS (low voltage differential signaling) provide the capability to prototype high-speed differential interfaces such as the SPI-3 and SPI-4 bus technologies. The Receive port includes parallel termination; the Transmit side does not require this feature.

The multiprotocol clock/data transceivers with auto cable termination can support multiple protocols such as two channels of

V.35 HDLC (high-level data link control). Coupled with the HDLC core from Xilinx, you can turn your Virtex-II FPGA into a powerful network engine. The multiprotocol clock/data transceivers also support X.21, V.11, RS-232, RS-449, and RS-53W\ serial interfaces.
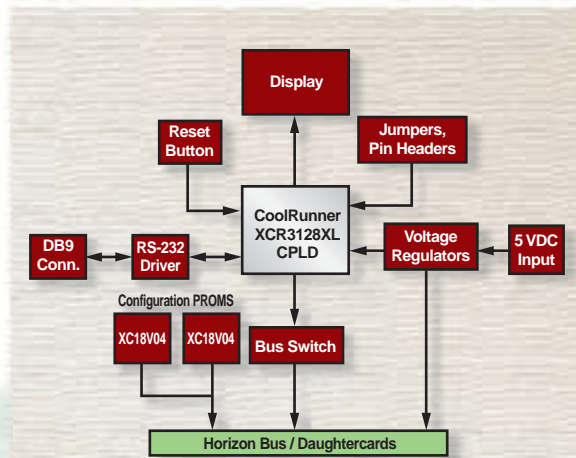

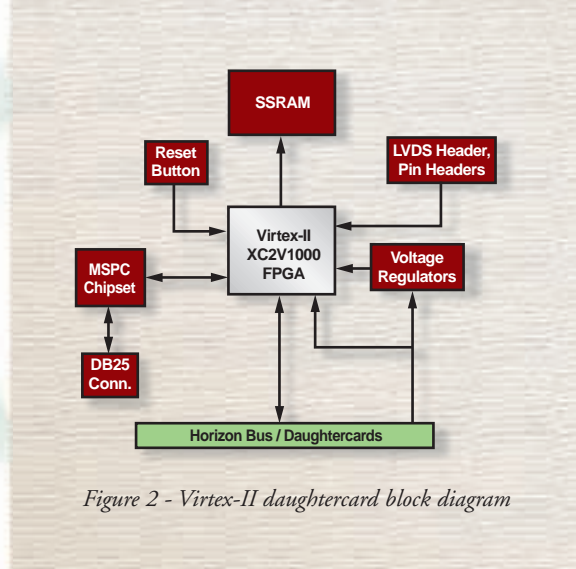*Figure 1 - ESP motherboard block diagram*

Figure 2 - Virtex-II daughtercard block diagram

NBT (no bus turnaround) RAM offers a standard packaging for high-speed SSRAM devices. The Virtex-II daughtercard has 16 MB of NBT SSRAM from GSI Technology, which allows for zero-wait, read-write bus utilization. This GSI SSRAM is programmable as FT (flow through) or pipelined, operating as a pipelined synchronous device. This means that in addition to the rising-edge triggered registers that capture input signals, the device incorporates a rising-edge triggered output register.

The daughtercard also incorporates an ICS525-02 user-configurable clock chip from Integrated Circuit Systems Inc. The ICS525-02 is the most flexible way to generate a wide range of highly accurate clock output from a standard crystal or clock oscillator. You can easily program the ICS525-02 to output a frequency from 1 MHz to 200 MHz by setting a bank of switches located on the board. You may also supply a LVDS clock, as well as four other single-ended user supplied clocks, for a total of six usable clock inputs.

With the Horizon Bus backplane, the Virtex-II daughtercard becomes a very powerful development platform offering up to 26 Gbps throughput and allowing the instantiation of a multitude of bus architectures, such as CSIX for telecommunications.

Nu Horizons Electronics Corp. is in the process of developing new daughtercards for the Engineering Solutions Platform. Future cards include an HTML server/white appliance controller and a high-speed AFE (analog front end) with an Ethernet interface.

Conclusion

The Engineering Solutions Platform from Nu Horizons Electronics Corp. is a modular Virtex-II development environment that provides designers with the hardware necessary to develop, prototype, verify, and test their designs before they are finalized. Intended to accelerate the design cycle timeline, the Engineering Solutions Platform is a modular solution that enhances and simplifies system design and validation processes. Its modularity makes it highly functional over many design cycles, thus providing a cost-effective alternative to single-board tools for developing high-end data communication and server applications. The Engineering Solutions Platform motherboard with the Virtex-II daughtercard sells for $999 and is available for immediate shipment. For more information, please log onto *www.nuhorizons.com*.