

Strathnuey - The Xilinx Technologies Integrator

An entry level PCI card with DIME slot capability using Spartan-II FPGAs.

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The low profile PCI/USB card, Strathnuey, is the latest carrier card to be added to Nallatech's award winning DIME module product line. The Strathnuey pulls together, in a compact form factor, many of the exciting new technologies being produced by Xilinx for FPGAs. Support is included for the high speed SelectMAP interface (which forms the basis for partial reconfiguration), Chipscope ILA (giving built-in logic analyzer capability), Xilinx PCI LogiCORE development (for custom application development), and DSP IP core verification.

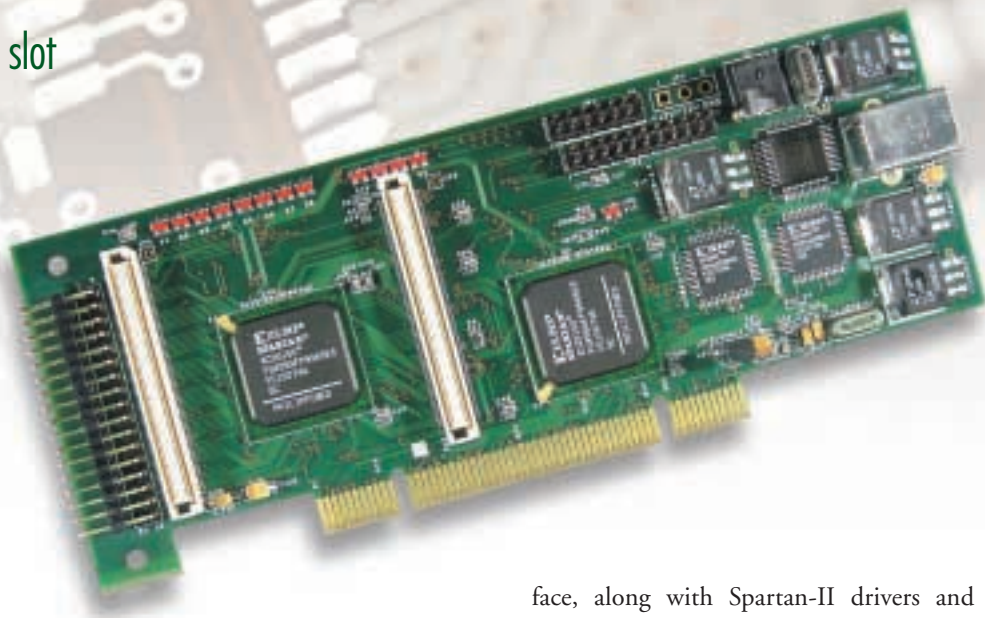
Using two of the latest Spartan-II devices the Strathnuey provides a versatile platform for application development. The Spartan-II family is used in diverse applications such as wireless digital communication systems, digital TV, high-speed DSL, cable modems, and medical imaging systems.

DIME - DSP and Image processing Modules for Enhanced FPGAs

The DIME module slot, illustrated in Figure 1, gives access to the wide range of DIME modules, which you can use to customize the card to your selected application.

DIME Select

To complement the Strathnuey, a new range of low profile modules, called DIME Select, are now available from Nallatech. These new modules enable you to cus-



tomize the Strathnuey for your application while maintaining the low cost and features of the DIME standard. DIME Select modules will include AD/DA conversion, Bluetooth, SDRAM, QDR ZBT, and Ethernet.

DIME Professional

If you require a higher level of performance and more processing power, the Virtex-based DIME Professional modules can also be mounted onto the Strathnuey. These DIME modules are all populated with the Virtex family and include a wide range of functions, such as video capture and display, high speed communications, data capture/generation, and complex DSP algorithms.

Whether you are using DIME Professional or DIME Select modules, the Strathnuey enables you to construct full custom FPGA-based systems using standard off the shelf products, guaranteeing risk reduction and a significant reduction in development costs and time to market.

Configuration Software

The Strathnuey kit comes complete with compiled designs for the PCI/USB inter-

face, along with Spartan-II drivers and application software, removing the need for required expertise in PCI or USB interfacing. The advanced system-level tools supplied are those from the established DIME range, which include plug and play capability and a standard interface which provides transparent migration to the more powerful and scalable DIME platforms such as the Ballynuey.

A key component of the tools is the integrated high speed configuration mechanism which allows the on board Spartan-II, or other attached FPGAs, to be configured directly over the PCI or USB buses, thus eliminating the need for dedicated download cabling and PROM programming. The configuration of the Spartan-II or Virtex-E FPGA (using the DIME slot) can be performed via the Xilinx SelectMap protocol, or alternatively via the JTAG chain, which allows access to the data and control registers, enabling partial reconfiguration. This feature naturally provides the mechanism to develop dynamically reconfigurable systems giving this card the capability of having multiple personalities.

The software tools run on all Windows platforms (95/98/NT/2000) and is one of the first FPGA-based system platforms to be supported under Linux.

Communication Interface

Communication and control of the Strathnuey is provided by two separate mechanisms. Using the universal PCI interface enables the card to be used inside standard PC systems for embedded applications. Alternatively, for standalone or remote applications, the card can use the USB interface allowing it to be connected directly to a laptop, for example.

IP Core Demonstration Platform

The flexibility and scalability of the Strathnuey make its range of applications wide and varied. In particular, the Strathnuey is an ideal demonstration environment for IP core suppliers to show their cores' capabilities working "live" with real hardware and data.

As an example, IP developers can easily send data to and from their cores via the straightforward infrastructure interfaces such that demonstration GUIs could be constructed to elegantly demonstrate any special features of their particular cores. Additionally, if required, a DIME module can provide the appropriate physical front end or back end interface to hook up the core with other systems for a complete demonstration system.

Integrated Silicon Systems (ISS), the leading multimedia IP core provider, selected DIME to demonstrate the capabilities of its applications-specific virtual components (ASVCs). "Performance and flexibility were key selection criteria when ISS went looking for a suitable hardware platform to demonstrate its multimedia and communications IP cores working in Xilinx Virtex technology," commented Stephen Farson, Engineering Manager, ISS. "Nallatech's DIME solution excelled in these areas."

Educational Lab Experiments

The Strathnuey provides an excellent educational platform for Electronic Engineering courses, with the ability to go far beyond education in FPGA technology to complete system design. The simplicity of the software interface to the uncommitted secondary Spartan-II FPGA allows

very elaborate Computer Based Training (CBT) courses to be based around the Strathnuey. These can be developed to educate the student in many areas and the integration of technologies such as the Xilinx Chipscope ILA allows the student to have a full debug workbench on his PC without the expense of additional test equipment.

The addition of DIME Select Modules will ensure that lecturers can educate their students in many areas including:

- FPGA technology.
- DSP theory.
- Communications theory.
- ADC/DAC principles including aliasing.
- Control theory.
- Hardware and software partitioning.

The new development system is the result of a close collaboration between Nallatech and the reconfigurable logic group led by Patrick Lysaght at the University of Strathclyde. The group has a 70-seat laboratory for teaching undergraduates digital design and has been using Xilinx FPGAs since 1989.

PCI Development Platform

The Strathnuey can also be used to prove your own PCI interface designs when you are using the Xilinx 32-bit PCI LogiCORE or an in house PCI core. Support for 3.3V and 5V PCI is incorporated with auto detection circuitry to select the appropriate bit streams from the flash-based XCV1800 PROMs. These PROMs can easily be reconfigured with the user-specific bit stream.

Conclusion

The Strathnuey gives you a complete platform that links the exciting new technologies from Xilinx. In addition, the Strathnuey provides an ideal entry-level DIME-based system development platform, which can also be used as a stepping stone to the high performance Ballynuey DIME Professional products.

For more information on the Strathnuey or other DIME products, contact Nallatech at www.nallatech.com.

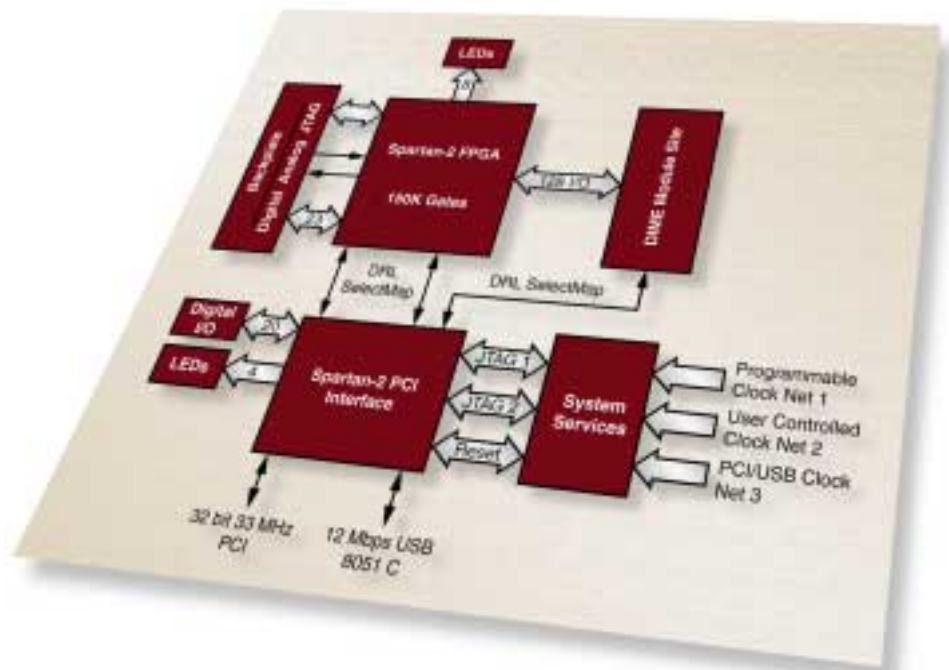


Figure 1 - Strathnuey block diagram