TiVo Grand Prize Winner!

I would like to thank everyone who completed Finger Lakes Engineering's 2005 Client Survey and Contest feedback!

Your replies talked about many common product development goals, technical areas where you expect FLE – as your design partner – to excel in, and general feedback such as how everyone would like to receive project updates and the best ways to transfer proprietary information between FLE and our clients.

Finger Lakes Engineering is developing a series of reference designs, expanding our website, and working on a plan to bring several internal R&D programs into FLE branded products throughout 2006 and 2007. The products will include simple reference designs and developer kits, Xilinx FPGA based IP cores, and a series of "daughter-card" style PCB designs that can be directly included in products to expand connectivity and processing capabilities.

I expect it to be a year of many new developments for Finger Lakes Engineering and I wish all of our clients to have a successful 2006 as well.

A random drawing was held on 1/30/06 to determine our Grand Prize winner of the TiVo system. The drawing selection was made by a "proprietary method" that combined a random number from an FLE staff member and a random letter selected by my mother-in-law.

Congratulations to Ed Bremer of Hand Held Products.
Ed won the random selection and is FLE's TiVo winner.

Thanks again for your support and all   Sincerely,
of the replies to FLE's 2005 Survey!   Steve Spano

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Processors, FPGAs, and Saving $$$ Part #2

By Steve Spano, President and Principal Consultant

In Part 1, we started to talk about the traditional design path of developing an embedded processing system using a Microprocessor. In this installment, we are going to spend some time discussing the basic operations of a processor so we can begin to compare it against a higher-performing, lower cost, FPGA solution.

What Does My Processor Do?

A Microprocessor is essentially a "general solution" to a "specific problem". You could select a microprocessor that would work equally well in a toaster, a cell-phone, and a desktop computer. So what should you base your decision on? Cost? Power? Performance? Size? What if you could optimize all four of these at once?

Let's consider a simple product that has two ports – IN and OUT and you want to move one piece of data from the IN port and place it in the OUT port. Let's take this example a little further and say you want to transfer 1000 pieces of data between the IN and the OUT port and you want to modify the data by performing some basic operation such as addition.

The example implies that your processor has to perform at least one read operation (to get the data from the input port), one math operation, one write operation (to put the data in the output port), increment another counter (are we at 1000 yet?), compare the new counter value against our target of 1000, and then make a decision (a branch) to see if we have to repeat the process or exit the process if we are all done with our 1000 operations. This is a total of at least 6 steps to make our product work. If we want to do these 6 steps once an hour; we probably have a low performance requirement and it may be suitable for any generic $1 processor.

What if we want to do the 6 steps every second, or every millionth of second (uS)? It can start to get tricky to move this amount of data within 1 uS. What does this mean for your product?

If you are using a microprocessor, then you could be incurring additional cost, wasted power, and a lot of external circuits to make the processor operate in your product. This is because a processor is a "generic" solution to your "specific" problem of moving 1000 pieces of data within one microsecond. The processor may have the capability to do this, but it probably also can run a toaster or a hair-dryer as well.

At the end of the day, your company needs to sell a product for as much as possible while paying as little as possible for the content within the product. In some cases, a traditional microprocessor solution isn't the best way to maximize your company's profitability. Traditional processors can require high amounts of power (due to their high clock speeds) and lots of supporting components including various memory devices, power regulators, and PCB area.

How Can I Reduce Complexity and Cost?

There are several options to reduce complexity and cost. For example, your company could reduce features and performance levels. This usually reduces sales and profits. A more profitable idea is to develop a "specific solution" to your "specific problem".

Through the proper use of FPGA technology, it is possible to combine the flexibility of a microprocessor with the power of custom logic circuits to achieve your product goals. Proper design of an FPGA device, using these techniques, can easily result in reduce power consumption (reduced clock speed), higher performance levels, and less support components and PCB area. This can allow your product to perform better, use less power, and cost less to manufacture.

**POINTS TO REMEMBER: GENERIC SOLUTIONS → GENERIC RESULTS
SPECIFIC SOLUTIONS → SPECIFIC RESULTS**

FLE Can Help Your Company Achieve SPECIFIC Results by Leveraging OUR FPGA Expertise

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Finger Lakes Engineering: Vision, Mission, Values

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Vision: To be the first choice engineering service provider for the most innovative companies in the world, to provide an ethical and flexible work environment for our staff, and to continually invest in our community.

Mission: To develop relationships with companies who use electronics technology and help them achieve a superior marketplace advantage by providing complete hardware design services from concept through production on a fixed cost quote.

Values:
- o Treating each client as if they are our most important customer
- o Open and timely communications with our clients and employees
- o Maintaining the confidentiality and security of client information
- o Treating our employees with fairness, respect, and accountability
- o Continued business growth through reinvestment of profits

Each copy of inPhase will feature articles such as FLE business news, client profiles, technical articles, and new innovations.

Stay tuned for Part#3 of the series "Processors, FPGAs, and Saving $$$" and more FLE news.