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# Bloomy Solutions

*A Technical Newsletter for PC-Based Measurement and Automation Users*

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Welcome to the first issue of *Bloomy Solutions*. This technical newsletter is filled with information on and examples of PC-based measurement and automation. PC-based measurement and automation combines

Visit [www.bloomy.com](http://www.bloomy.com) to learn how Bloomy Controls can help you meet your measurement and automation needs.

flexible, low-cost hardware and software with industry-standard computers and Internet technology to quickly and economically create high-performance, tightly integrated applications.

Since 1991, Bloomy Controls has delivered these benefits to customers through its software development, systems integration, and training services. *Bloomy Solutions* showcases some of these PC-based measurement and automation applications.

For more information on how Bloomy Controls can assist you with your measurement and automation needs, call Rob Michell at (860) 298-9925, e-mail [info@bloomy.com](mailto:info@bloomy.com), or visit our Web site at [www.bloomy.com](http://www.bloomy.com). ➔

## How to Choose a Consumer Off-the-shelf Computer for Your DAQ System

Consumer off-the-shelf (COTS) computers fill the bill nicely for most data acquisition (DAQ) applications. The advantages of using COTS computers for DAQ hosting boil down to low cost, ready availability, and ease of use. COTS computers are manufactured in staggering quantities, and these immense unit volumes drive manufacturing costs way down. Tremendous sales volumes, standardized open architecture, and large numbers of manufacturers make them effectively a commodity item. Indeed, some large corporations standardize on a given platform and buy units in bulk. Because COTS

computers are intended for use by *everyone*, including the computer-illiterate, these systems have become exceptionally easy to use as well.

Peter Blume, president of Bloomy Controls, Windsor, Conn., lists ten categories that DAQ users need to consider for their COTS computers.

**RAM:** New PCs have more memory than most DAQ applications require. If, however, your DAQ

hardware is streaming data directly to memory, you should do a calculation and make sure you have enough memory.

**CPUs:** As far as processors go, you're fine with any Intel Pentium processor or equivalent for most DAQ applications. If your application is extremely computation extensive, Blume suggests buying a computer with multiple processors. LabVIEW and some other DAQ applications are multithreaded and multiprocessor capable, so they can run much faster on a multiprocessor machine. All of the major manufacturers, such as Dell, Gateway, Compaq, Micron, etc., sell multiprocessor PCs.

**Hard drives:** The capacity of the hard drives shipping with today's mainstream computers far exceeds what a typical user's needs are. If you are a DAQ developer, in rare circumstances you may have to consider how large the files will be that you create.

**Removable media:** Many DAQ users still require floppy drives to transfer acquired data to another computer. A Zip drive is convenient for storing large data files, but you can also store DAQ application source code on Zip disks. An alternative is distributing applications on CD-ROMs. CD burners are becoming more affordable. There are critical applications where you have to somehow release your applications while keeping a master copy, and CDs are a good vehicle for doing this.

**Backplane buses:** "Get as many slots as you can for DAQ applications," Blume advises, "and don't buy a computer that has hardware in it that you don't need." For example, when you buy a COTS computer originally intended for the home-computer market, chances are it will come with a sound card, speakers, and maybe a game port. These are extras that you might use in the home, but they take up PCI or AT slots that you could better use for DAQ peripherals.

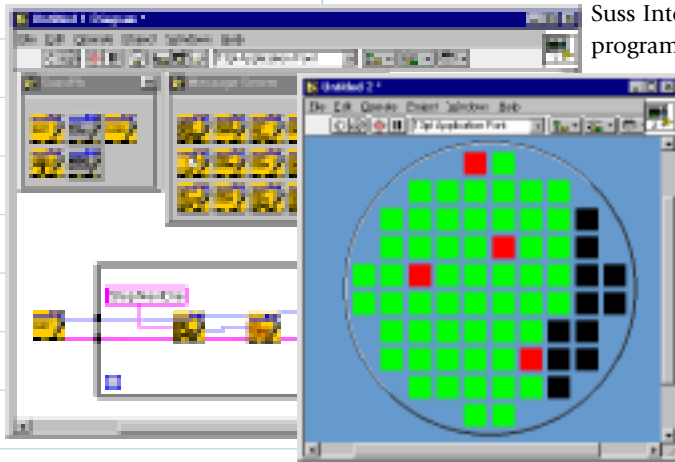
Continued on page 2

*Interested in learning how to incorporate image processing or Internet connectivity into your application? Turn to page 3.*



## LabVIEW Toolkit Automates Wafer Testing with Suss Probe Stations

Bloomy Controls has developed a LabVIEW interface that enables semiconductor test engineers to seamlessly incorporate National Instruments LabVIEW into Karl Suss manual, semiautomatic, and fully automatic probe stations to customize and automate wafer-level test applications. With the



Suss Interface Toolkit for LabVIEW, users can make wafer, microscope, and programmable probehead stage movements; make movements to the first die; and step through a wafer map with a click of a button. In addition, users now can create custom test interfaces and integrate any of 1,250 instruments, whose drivers are provided in LabVIEW, into their probe station.

The Suss Interface Toolkit for LabVIEW has the look and feel of a standard LabVIEW instrument driver with which LabVIEW developers are familiar. With the numerous instrument drivers available for LabVIEW, this toolkit brings a wide array of instruments and measurement tools to the semiconductor industry. In addition, the interface offers fast and easy integration that is a crucial part of the test system based on Karl Suss probe stations.

The Suss Interface Toolkit for LabVIEW is available now for \$1,995.

For information about Bloomy Controls software development, systems integration, and training services, contact the company at 839 Marshall Phelps Rd., Windsor, CT 06095. Call (860) 298-9925, fax (860) 298-9535, or e-mail [info@bloomy.com](mailto:info@bloomy.com). Readers also can access the company's Web site at [www.bloomy.com](http://www.bloomy.com). ↩

*To purchase the Suss Interface Toolkit for LabVIEW, call Bloomy Controls at (860) 298-9925 or e-mail [info@bloomy.com](mailto:info@bloomy.com)*

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## How to Choose a COTS Computer (Continued from page 1)

**Video:** Any PCIbus video adapter would be fine for your DAQ computer. You do, however, have to specify the monitor size. Display size is important because DAQ programs today are very graphical. It can be numeric data, it can be graphical data, it can be graphical representation of their processes.

**Form factor:** While desktop computers have been the mainstay of DAQ applications, many users are now opting for portability that comes with basing their DAQ systems on notebook computers. The only thing to keep in mind with notebooks, according to Blume, is that the CPUs aren't executing at their full speed because there is typically less power available in a notebook computer.

**Networking:** A 100BaseT Ethernet network card is standard today. "Nobody that we've dealt with lately is using anything but Ethernet," reports Blume. David Howard, product manager for Digital Dynamics, Scotts Valley, Calif., agrees: "Ethernet is pretty much the way it's moving because IT managers are still driving factory automation. A lot of PCs end up on factory floors because there is a need to get this data into accounting and costing systems right away. Ethernet is the choice because it connects a whole factory with the same data."

**Warranty and service:** Most vendors offer extended warranties. There are usually several different options, so it's worth looking into.

**Uninterruptible power sources:** You definitely want to include an uninterruptible power supply (UPS) in your system hardware specification. Usually when you are acquiring data, you are in an industrial atmosphere where there are many motors and other equipment that add noise to the incoming power lines. ↩

*Excerpt taken from "Buying a DAQ-System Computer Starts With Building a Spec List," by C.G. Masi in the November 99 R&D Magazine. Find the complete article, which includes a discussion of CompactPCI alternatives to COTS computers, at [www.bloomy.com](http://www.bloomy.com).*

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# Need Image Processing or Internet Connectivity Training?

## Vote for new training classes at [www.bloomy.com](http://www.bloomy.com)

Bloomy Controls offers training classes on the latest measurement and automation technologies. Our current course offering includes extensive LabVIEW, LabWindows/CVI, BridgeVIEW, ANSI C, and data acquisition training. Go to [www.bloomy.com](http://www.bloomy.com) to let us know which classes we should offer next.

- **LabVIEW Instrument Control** – A 2-day, hands-on course that covers topics including an introduction to different types of instruments, identification of instruments through computer, introduction to instrument drivers, and control of instrument settings through LabVIEW.
- **LabVIEW Machine Vision and Image Processing** – A 2-day course in which you will learn the basics of building a vision system including camera and video basics, image acquisition and analysis, and application strategies.
- **LabVIEW Internet** – A 1-day, hands-on workshop that explores the LabVIEW tools and techniques for Web publishing of data and user interface screens via the Internet or company Intranet. Other topics include data transfer via e-mail and FTP.
- **LabVIEW Database SQL** – A 1-day, hands-on workshop that explores the LabVIEW tools and techniques for direct interaction with local or remote databases, Microsoft Access, SQL Server, Oracle, and other ODBC-compliant databases. ➔

## Bloomy VI Corner – Interval Timer.vi

### Download this free LabVIEW VI from [www.bloomy.com](http://www.bloomy.com)

**Interval Timer.vi** is a virtual instrument (VI) that times events. Developed by Bloomy Controls engineer Keith Brainard, this VI can be used as a sub VI within a larger application to time a test or process or to control how often data is logged to file. Also, the VI can be frequently called in a looping structure to provide a live display of elapsed or remaining time. This is particularly useful if you have a lengthy application with few updates to the display screen, whereby displaying the remaining time allows the user to monitor an application's progress.

The block diagram consists of calls to Tick Count (mS), Delta Time.vi, and several comparison and algebraic functions. **Tick Count (mS)** is a LabVIEW primitive function found in the Time & Dialog palette that returns a 32-bit, unsigned integer, representing time in milliseconds. **Delta Time.vi** is another Bloomy Controls VI that is called as a sub VI to calculate the time elapsed between the Start Time and Current Time input values. Delta Time.vi is preferred over simple subtraction because it handles the condition when Tick Count (mS) values are supplied as inputs, and one or the other wraps from  $2^{32}-1$  to 0.

Interval Timer.vi is normally called as a sub VI from within a looping structure. The iteration terminal of a While or For loop is wired to the iteration input terminal of Interval Timer.vi. On iteration 0, Interval Timer.vi calls the Tick Count (mS) function to establish a base time which is stored in a shift register. Subsequent calls to the VI with an iteration greater than 0 read the latest tick count and subtract the base time to calculate Elapsed Time. Remaining Time is calculated as the interval minus the elapsed time. Once the interval expires, the Interval Elapsed? boolean output becomes true and the VI stores the current tick count as the next interval's starting time. Hence, the VI immediately begins timing the next interval without explicitly reinitializing.

Interval Timer.vi also has continuous run and pause modes. Continuous run mode updates the Elapsed Time output while inhibiting the interval from elapsing and reinitializing. It is invoked by passing -1 to the iteration input. Setting the Paused? boolean input to true extends the time interval indefinitely until Paused? becomes false.

A very important property of this VI is that it is reentrant. This ensures that all copies of this VI use a separate memory space. Multiple copies of the VI will run independently in the same program without overwriting each other's shift register data. ➔

Go to [www.bloomy.com](http://www.bloomy.com) to download these and more free VIs.

To receive a 10 percent discount on any training class offered by Bloomy Controls, be one of the first 10 people to go to [www.bloomy.com](http://www.bloomy.com) to vote for new training class offerings.

