

Processors for Measurements

From the Editor's Bench

Shlomo Engelberg

Dream On!

I am an engineer, and like many engineers, I am quite conservative. Though I love learning about new technology, I do not like to migrate from the familiar to the new – even if the new may be better. For a long time, I had my doubts about people who dreamed of making revolutionary changes, but now I know better. Without dreamers, little progress would ever be made.

When the United States was formed, the founding fathers (at the end of the Declaration of Independence, <http://www.constitution.org/usdeclar.htm>) stated that, “We mutually pledge to each other our lives, our fortunes and our sacred honor.” They dreamed of independence, and they were willing to pledge all that they held dear to make the United States into an independent country.

Many years ago I moved to Israel. In Israel, Hebrew is one of the official languages and is the first language of several million people. Hebrew is a language that was in some sense “dormant” for many years. It was just about nobody’s first language; over the last century plus, it has been revitalized.

Eliezer Ben Yehuda, one of the world’s great dreamers, was one of the people who helped revitalize Hebrew. Ben Yehuda dreamed of making Hebrew into the first language of a people, and he was willing to do whatever was necessary to revive the Hebrew language. He and his family were ostracized by their neighbors because of his views and actions. Ben Yehuda had a dream, and he worked hard and sacrificed much to make his dream come true.

At the magazine, our dream is to consistently produce a first rate publication with articles that are interesting, informative, and well written. If you want to be part of that dream, please feel free to contact me (at shlomoe@jct.ac.il) with your ideas for articles, columns, tutorials, and other features that you think will improve the magazine.

This issue of the magazine is the product of many people’s dreams. There are two articles. The first is Part 4 in the series on protecting your inventions with limited resources, and the second considers estimating sinusoids in the presence of noise. We have two tutorials: one covers rechargeable batteries and their management, and the other deals with the transition to multi-core processors. We have our regular assortment of columns and a column by Vint Cerf, the Chief Internet Evangelist for Google. I thank all of our authors, our dreamers, for helping make this magazine what it is. Enjoy!

Shlomo

President's Perspectives

Kim Fowler

The Challenge of Measurement Science, Part 2

In my last column, I addressed the challenge and importance of measurement and instrumentation. I listed several factors that I thought played into the general ignorance of our field of study:

- New technologies, such as the internet, gaming, and the smart grid, can be more exciting than measurement science to the latest generation of students, academics, and practitioners.
- The science of measurement has been thoroughly investigated over the past two hundred years, which might breed complacency and potentially contempt.
- No series of failures or catastrophes have occurred that can be attributed to issues within measurement science.

In November, I had the pleasure of attending several different I&M meetings: the i-ONE Awards and laboratory tours in Taiwan at the Instrumentation Technology Research Center and “The Future of Instrumentation Workshop” at Oak Ridge National Laboratories (ORNL). During these meetings, I asked participants what they thought were the reasons for the general ignorance of measurement and instrumentation. Here are some of their thoughts, in no particular order:

- Workplaces had forced “cylinders of expertise” or “stove-piped disciplines.” These cylinders or stove-pipes tended to isolate people and reduce communication.
- Vendors of sensors and instrumentation and process controls have been effective in reducing the concern over the issues of measurement and removing the need to understand them. In essence, they have persuaded buyers to relax - “Don’t worry. I’ll take care of you (i.e. your instrumentation needs).”
- Crossing disciplines requires a disinvestment of personal ownership in specifics for the good of the whole. This is a necessary component to “bringing down the stove-pipes.”
- Much of what we do and communicate is digital in format. Industry and the general populous have forgotten that the world is analog and that we measure analog quantities – but often convert them to digital format.
- Human commerce is transactions-based. Most measurements and instruments for industry and research want smooth, continuous operations that tend toward steady-state operation.
- A general impression exists that instrumentation is expensive.

So where do we go from here? The workshop at Oak Ridge National Laboratories was called the “Future of Instrumentation Workshop.” Discussion at the workshop led the participants to begin drafting a roadmap for the future of instrumentation. I would like to see input to this evolving roadmap expanded to include all of you and our colleagues. Please go to the <http://www.ieee-ims.org/main/> and look under the “About IMS” tab to find the roadmap blog and give your input.

Kim

A photo collage accompanies this column.

Article Summaries

Estimating the Parameters of Sinusoids and Decaying Sinusoids in Noise

Elias Aboutanios
(Summary)

In this article, the author examines the problem of estimating the frequency and decay factor of sinusoids in noise. In particular, the discussion focuses on frequency-domain (i.e. DFT-based) estimators that take advantage of the efficient FFT algorithm. The general signal model is presented, and then the author discusses the estimation of the frequency of an un-damped sinusoid before moving onto the estimation of the frequency and decay factor of a damped complex exponential. Some brief remarks are also made regarding the multi-component and real sinusoid cases.

This summary includes text from the article.

Choosing Your Patent Counsel and Determining an Appropriate Patent Filing and Prosecution Strategy, Part 4 in a Series on Protecting Your Inventions with Limited Resources

Reuven K. Mouallem
(Summary)

In Part 4 (the final installment) of the series, the author discusses the final stage of the priority year of the PPA in which one needs to consider selecting a patent practitioner, choosing how many and in which jurisdictions to file a non-provisional patent application, budgeting and timing of patent prosecution costs, evaluating the significance of office actions from the patent offices, and working with your patent counsel to incorporate strategic considerations related to litigation defensibility and assertability.

This summary includes text from the article.

Rechargeable Batteries and Their Management: Tutorial 30

Nihal Kularatna
(Summary)

This tutorial is an overview of the development of rechargeable batteries, battery management techniques and standards related to smart battery systems, and safety of battery powered systems.

Estimated worldwide sales for rechargeable batteries was around US \$36 billion in 2008, and this is expected to grow towards US \$51 billion by 2013. Some significant areas for new battery chemistry research include zinc-based chemistries. To complement these developments, many semiconductor manufacturers continue to introduce new integrated circuit families for battery management.

This summary includes text from the article.

Multicore Programming for Measurement: A Tutorial: Tutorial 31

Lee Barford

(Summary)

Analysis of measured data, and sometimes the generation of excitation signals, can be computationally intensive. The performance of such measurement software is likely to benefit from the use of multicore. The purpose of this tutorial is to introduce the issues that arise when writing multicore software, to show some of the easier ways to write such software, and to illustrate the methods using some simple measurement processing examples.

This summary includes text from the article.

Columns

Instrumentation Notes

Zbigniew Watral and Andrzej Michalski

Practical Validation of a Flow Meter Design Environment

(Summary)

This paper concentrates on some aspects of designing an electromagnetic flow meter for an artificial channel with a rectangular cross-section – a situation often encountered in wastewater treatment plants or irrigation systems. The main design problem is to ensure the uniformity of the magnetic flux distribution across the measurement zone by the careful design of the excitation coil. The authors attempted to create an optimal coil and used a new algorithm to compare the results achieved by the Flow Meter Design Tool with the results achieved by other commercially available software (i.e. Opera 3D) and by a real, prototype coil.

This summary contains text from the column.

By the Numbers

Stephen A. Dyer and Justin S. Dyer

Distortion: Total Harmonic Distortion in an Asymmetrically Clipped Sinewave

(Summary)

The example of harmonic distortion and its related mathematical principles presented by the authors relates to a request from an engineer from industry. Each of the units in a product line for which the engineer had responsibility within his company incorporates a class-D power amplifier to provide audio output to a small, internal speaker, and customers routinely adjust the audio volume such that the amplifiers are driven into clipping. The engineer wanted a quick means of determining, at the bench, the approximate percentage total harmonic distortion produced by the amplifier under a particular set of conditions.

This summary contains text from the column.

Recalibration

Vinton G. Cerf

Broadband Transparency and the Measurement Lab

(Summary)

The heart of Internet design is sometimes called the “end-to-end” principle that gives users the freedom to invent new applications. But because the Internet offers only “best efforts” service, it can sometimes fail to deliver performance that is needed for some applications (such as interactive collaboration or high speed video transfers). Transparency embraces both the idea of end-to-end interaction under user control and also visibility as to the nature of the service rendered by the ISPs in the path between users. To address the challenge of obtaining quality service data, a consortium of organizations in the private sector has organized the Measurement Lab (M-Lab) project. It is a purpose-built, active measurement platform that includes standards for connectivity and interaction, control of server-side congestion or CPU oversubscription, and access to a wide range of new tools for data collection and analysis.

This summary contains text from the column.

My Favorite Experiment

John Witzel

Experiments with a Cat-5 Cable

(Summary)

This column describes some data discovered when the author was downloading files to a home PC and had kinked the Cat-5 cable. Although a simple experiment, it drives home the idea of data flow limitations as a result of impedance changes and reflections within transmission cables. It is also a testament to the power of those invisible error correction routines that make most transmission line errors transparent to the user.

This summary contains text from the column.

Departments

New Products

Robert Goldberg

Handheld Cable and Antenna Analyzer Reduces Antenna Station Installation Time

Rohde & Schwarz launches the R&S ZVH, a portable cable and antenna analyzer especially designed to facilitate the installation of antenna stations. In the field, all acceptance tests are performed quickly and easily with this analyzer. Convenient wizards help users effortlessly measure antenna cables, filters and amplifiers. Documentation is made easy with simple tools for generating test reports. Using the R&S ZVH, installation teams can set up substantially more antenna stations than would be possible in the same amount of time using other commercially available Test & Measurement (T&M) equipment.

Two frequency ranges, from 100 kHz to 3.6 GHz or 8 GHz, are provided to help network operators, infrastructure manufacturers, and their service providers install and maintain mobile radio antennas with a minimum of effort and time.

Rohde & Schwarz claims to be the only manufacturer to offer a cable and antenna analyzer with wizards that guide users through procedures in individual, well described steps. Even users who have no experience with T&M equipment can, for example, check cable faults using the distance-to-fault (DTF) measurement or measure antenna matching and isolation.

The RF characteristics of the R&S ZVH make it one of the best analyzers in its class. The cable and antenna analyzer boasts a dynamic range of 100 dB, easily fulfilling manufacturer's guidelines of > 90 dB required for repeater measurements. The cost-effective handheld analyzer replaces conventional test setups consisting of a signal generator and a spectrum analyzer.

The handy, 3 kg light R&S ZVH (194 mm × 300 mm × 69 mm) is easy to use. Key functions such as the wizard are just a keystroke away. Thanks to the upright format, all operating elements are at the operator's fingertips, even when wearing work gloves, and without having to set down the instrument. Since the R&S ZVH analyzers conform to protection class IP51 and feature splash-proof, dust-protected connectors, they are reliable tools even under adverse ambient conditions.

Using external power sensors, the R&S ZVH can also operate as a power meter. When used with a directional power sensor, the analyzer can simultaneously measure antenna matching and transmitter output power up to 300 W.

For more information, please visit www.rohde-schwarz.com.

New Software Automates In-Circuit Test Coverage Reports

Agilent Technologies, Inc. introduced a fast and easy-to-use test coverage prediction tool: the N1194A Agilent Test Coverage Consultant (ATCC). The ATCC software performs two

significant tasks. First, it measures the test coverage of a product after the tests have been developed. Second, it quickly predicts the test coverage of a product based only on the CAD layout files. These two capabilities allow engineers to estimate test coverage early in the product life cycle, when only the CAD layout file is available. ATCC software also can work as a test strategy analysis tool by assisting the test manager in optimizing the manufacturing test coverage using a portfolio of available test platforms.

The Agilent Test Coverage Consultant, when used during the prototyping phase, helps test engineers estimate how well their product can be tested during mass production. Engineers will now have the time they need to adjust the test strategy to ensure the best coverage is achieved and that the best quality products are produced.

More information on the Agilent Test Coverage Consultant can be found at www.agilent.com/find/atcc.

High-Performance Analog and Digital Servo Inclinometer Series

Meggitt Sensing Systems has announced the North American market introduction of the Sensorex SX41100 series, a high-performance servo inclinometer family featuring analog and digital outputs and a maximum linearity error of less than $\pm 0.02\%$ FS. The series is designed to provide high-precision angular measurements within extreme testing environments.

The highly robust Sensorex SX41100 series is designed to provide an output signal proportional to the angle being measured over a range of $\pm 1^\circ$ to $\pm 70^\circ$. The series is also part of the company's best-selling Rugged Enhanced Digital Sensor (REDS) family, incorporating Meggitt's own proprietary Sensorex digital hybrid compensation circuit design (HCN module), resulting in high-performance inclinometers with $\pm 5V$ analog, 4-20 mA or RS232 and RS485 ASCII digital outputs and built-in active digital temperature compensation, reliably operating over a temperature range of -40° to $+85^\circ C$. Incorporation of an inertial mass with servo feedback, optical position pick-up and friction free mounting allow the Sensorex SX41100 series to provide high accuracy with excellent long term stability and high reliability. Because the inertial mechanism is immersed in oil, units have high shock and vibration resistance with a good damping factor. Units also operate from a 9-30V unipolar power supply and feature IP65 environmental sealing. Digital versions are delivered with software and digital data transmitted in ASCII format, allowing for direct communication with a standard PC, along with user-selectable parameters of data acquisition and display.

For detailed technical specifications, drawings or additional information about the Sensorex SX41100 series or other products offered by Meggitt Sensing Systems, visit www.meggittsensing.com.

New Family of Signal Generators

The **Aeroflex S-Series** RF signal generator family has been designed from the ground up to meet the expectations of today's engineers for instant answers at the touch of a screen. Buttons, rotary controls, and deeply nested software menus have all been removed. The first in the series is the Aeroflex SGA analog RF signal generator. It is compact and lightweight with low phase noise, high accuracy and fast settling time. The SGA is a high specification analog RF signal generator

that is a reliable and repeatable signal source solution for general-purpose, aerospace and military test applications in laboratory, factory, and field environments. The intuitive LCD touch-screen interface allows modulated or swept RF signals to be set up using fewer keystrokes than required by traditional soft key models, thus saving the engineer's time and reducing the risk of error.

A modular format, featuring the new Aerolock™ locking mechanism, allows additional RF instruments such as a second signal generator and combiner to be mechanically coupled externally by the user.

The Aeroflex SGA is currently available in two models: the SGA 3, which has an operating frequency range of 100 kHz – 3 GHz, and the SGA 6 covering 100 kHz – 6 GHz. The SGA is the first instrument in the new Aeroflex S-Series which is planned to include digital signal generators for wireless-specific measurements, including LTE, LTE-A and IEEE 802.11ac standards, and a range of signal analyzers.

Portability is a key feature of the new instruments. The SGA is half rack width and 4U high, and it weighs less than 17 lbs (8 kg) – less than half the weight of its predecessor.

A typical single sideband (SSB) phase noise specification of -135 dBc/Hz at 20 kHz offset from a 1 GHz carrier means that the SGA signal generator can easily measure receiver selectivity beyond 80 dB. Fast frequency settling times of 1 ms in conventional frequency selection mode, or 100 μs in list mode, make the SGA particularly suited for frequency hopping and semiconductor test applications and ensure maximum throughput in a production environment. Maximum RF output power is +13 dBm with a resolution of 0.01 dB, and a high power option is available to extend the maximum calibrated RF level to +20 dBm.

A digital sweep of carrier frequency, RF level, and modulation source is included, with single, continuous, or externally triggered modes as well as a list mode sweep facility.

For more information, contact your local Aeroflex sales office by calling or visiting Aeroflex Sales at (800) 835-2352 or info-test@aeroflex.com.

High Bandwidth Probes

The two new Tetris™ probes from **Pico Technology** offer high bandwidth in a compact and lightweight housing and are ideal for testing densely-packed high-speed circuits. With their active circuitry, these probes deliver a significant performance improvement over passive probes.

While the input capacitance of a passive probe loads the signal source even at frequencies below 1 MHz thus causing distortion, the Tetris probes maintain high input impedance into the GHz range. This enables the accurate display of pulses with subnanosecond rise times. The Tetris probes are compatible with all standard high-bandwidth oscilloscopes with 50-ohm BNC inputs, such as the Pico-Scope 6000 Series.

The Tetris 1000 has a probe bandwidth of 1 GHz, while the Tetris 1500 is rated at 1.5 GHz. Other specifications are: 1 meg-ohm input impedance in parallel with 0.9 pF; measuring range +/-8 V; attenuation 10:1 +/-5%; cable length 1.3 m; weight (probe only) 96 g.

The probe heads have a T-shaped cross-section that allows them to be stacked side by side closely enough to probe adjacent pins of a 0.1 inch IC package. The probes are supplied with a comprehensive accessory pack consisting of: low-inductance ground blade, assorted ground leads, L-In adapter, Z-Ground, 2 adhesive copper pads, two pico hooks, replacement solid and sprung tips, 0.8 mm socket adapter, and colored cable markers. A universal mains power supply is also included.

More information on Pico Technology can be found at www.picotech.com.

Smart Camera Provides 16 Times the Resolution of 640 x 480 Cameras

PPT VISION announces high-resolution M-390 Smart Cameras that deliver greater accuracy for high-precision machine vision applications. The M-390 cameras can be used as part of PPT VISION's IMPACT® M-Series Embedded Vision System, a single system with four independently operating cameras running distinct inspection, guidance or identification programs. The IMPACT M-Series System's unique design allows operators to mix and match camera resolutions for all points of inspection providing the flexibility to deploy cameras that are specifically suited to each of the separate inspection requirements. With increased resolution, 16 times the resolution of VGA (640 x 480) vision cameras, the IMPACT M-390 Smart Cameras provide ideal solutions for inspections that require more precision.

The IMPACT M-Series Embedded Vision System can be used with up to four M-390 Smart Cameras. Increasing the vision system's performance capabilities, the addition of four independent smart cameras allows the M-Series system to excel at differentiating parts, locating defects, and precisely gauging features on four sides of a part. Equipped with an optional right angle view, the compact M-390 Smart Camera features increased mounting possibilities in space-constrained locations.

The recently released M-Series Embedded Vision System allows users to perform up to four unique inspections utilizing a single vision processor. This eliminates the need to purchase costly separate inspection/guidance programs and reduces setup and networking time. Utilizing PPT VISION's universal IMPACT software, the M40 Processor works with the Micro-soft® Windows® XP operating system to transmit data and images, networking directly to databases, SCADA systems and other business system software.

For more information, please visit www.pptvision.com.

Data Acquisition Modules Offer Open-Collector Outputs and Optically Isolated Inputs for Distributed Control

Sealevel Systems, Inc. announces two additions to the SeaI/O family of modular I/O – the SeaI/O-530 and SeaI/O-540 digital I/O modules. Offering a powerful selection of open-collector outputs and optically isolated inputs, the modules are designed to interface to a variety of real-

world I/O. Ordering options allow control from a host device via wireless, Ethernet (Modbus/TCP), RS-485 (Modbus), USB, or RS-232.

The SeaI/O-540's 32 open-collector outputs are well-suited to controlling common industrial peripherals, and each output circuit includes a flyback diode for protection when interfacing highly inductive loads such as dc motors. The SeaI/O-530 combines 16 optically isolated inputs with 16 open collector outputs. The non-polarized inputs can monitor 5-30 Vdc and provide optical isolation to protect the host computer and other sensitive equipment from voltage transients and ground loops that are common in industrial environments. For connecting I/O, removable terminal blocks are standard on both modules, enabling fast, versatile field wiring. Both SeaI/O modules are housed in a rugged, metal enclosure and are also available in board only versions, which allow easy integration into OEM systems. The modules feature a standard operating temperature range of -25°C to 85°C, and an extended temperature range of -40°C to +85°C is available. Both the SeaI/O-530 and SeaI/O-540 are powered from your 9-30 Vdc source, and you can select from a variety of Sealevel power supply options.

For more information, visit www.sealevel.com.

New Datalogger

The Swiss technology company **MSR Electronics GmbH** has introduced an autonomous logger with an LCD display into its universal range of mini dataloggers for daily use. The handy MSR255 simultaneously measures and saves up to five different measurement parameters. The voltage signals from four additional analog channels can also be recorded.

The measuring tasks undertaken by the user define the way in which the MSR255 is configured. There is a choice of temperature, humidity, air pressure and light sensors (which can be fitted as required either internally within the case or externally on a cable) together with a sensor for monitoring acceleration/movement in all three coordinate axes. The 3-axis acceleration sensor with fast peak function allows the peak value to be recorded once a second while making measurements of up to 1600 values per second per axis. The voltage signal from four further analog channels or sensors (0 to 3V, 12-bit resolution) can be measured in addition, e.g. conductivity, flow, viscosity and a wide range of other sensors for physical and chemical parameters. The analog inputs are equipped with an alarm output, multiple output switching power supply and an input for starting and stopping data recording. The internal memory capacity of the MSR255 is over 2 million measurement parameters. Thanks to its higher capacity lithium polymer battery (2300 mAh), the unit is ideal for making long-term measurements. A permanent power supply can also be connected via a 6V socket. Data can be transferred to any PC or laptop using the software and USB cable supplied.

The MSR255 has two operating keys. The easy-to-read 4-row backlit LCD display has four individually configurable views. Up to four display values can be defined for each of the views, and users may select from all of the measurement channels, battery status, configurable limits and alarm values. The display also has an energy-saving mode.

Depending upon its configuration, the device in its anodized aluminum case weighs approximately 222 g and will also be available in a sealed version in accordance with IP67. The

dimensions are 78 x 62 x 38 mm. Included with the unit is a snapper for easily fastening of the logger to a top-hat rail (TS 35).

Find more information at www.msr.ch.

Flash Differential Scanning Calorimeter

METTLER TOLEDO introduces a revolutionary instrument that expands the boundaries of thermal analysis—the Flash Differential Scanning Calorimeter (FDSC). The Flash DSC 1 has extremely high cooling (-4,000 °C/sec) and heating (40,000 °C/sec) rates which allow scientists to study crystallization and reorganization processes of materials that were not possible until now. It also offers a wide temperature range from -95 °C to 450 °C in one measurement, along with an ergonomic design that simply and safely facilitates daily work.

For years, conventional DSC instruments have struggled to answer many questions pertaining to the behavior of materials while being rapidly cooled in modern high-speed production processes. The Flash DSC 1 opens the door to the wider experimental parameters required to investigate the meta-stable and time-dependent transitions of materials. Very fast cooling and heating rates allow researchers to generate material under real process conditions (on cooling) and then measure those material properties (on heating) to gain a never before seen perspective.

Additional information about METTLER TOLEDO can be found at www.mt.com.

High Accuracy, High Temperature Oxygen Sensor

In response to industry demands for a high-accuracy, wide operating temperature oxygen (O₂) sensor, **Heraeus Sensor Technology** has developed O₂ sensing technology that provides several advantages over the current state of the art. The measurement principle of the Heraeus Dynamic Oxygen Sensor is based upon the pumping of oxygen ions from the measurement medium through a heated ZrO₂ layer into a small chamber. The number of oxygen ions pumped into the chamber to reach a defined Nernst Voltage corresponds to the concentration of oxygen in the measurement medium. Key advantages include: A 0.5% to 100% O₂ measurement range; No reference atmosphere is required; Single-point calibration; No consumable materials are required; High temperature stability; High maximum operating temperature (750°C); and No susceptibility to poisoning by high CO₂ levels.

The Heraeus Dynamic Oxygen Sensor technology is designed to be a customizable, application-specific sensor. The sensor may be used in any high-volume application requiring a stable, easily-calibrated O₂ sensor.

This technology offers the possibility of many sensor configurations, ranging from a discrete element to a fully pack-aged sensor system with signal processing electronics.

For additional information, please contact Bob Gliniecki, Heraeus Sensor Technology USA; Phone: +1 732 940-4400 ext 13; email: robert.gliniecki@heraeus.com.

Piezo Mechanisms Catalog

Physik Instrumente (PI) L.P. has released a new catalog on Piezo Mechanisms. The 400 page catalog presents PI's complete spectrum of piezomechanic components and motion systems, from simple, direct actuators to long-travel ceramic linear motors and complex multi-axis flexure guided nanopositioning stages. A separate section lists the latest digital control electronics.

The catalog also includes a tutorial that treats piezo design for positioning applications. The Piezo Mechanisms catalog can be downloaded at: http://www.piezo.ws/pdf/Piezo_Mechanism_Cat10.pdf.

Catalog Features Panel and Board Mount LED Indicators

Wilbrecht LEDCO, Inc. announces that its updated product catalog is now available. The new 24 page color catalog features their complete LEDCO product line of high quality LED, neon and incandescent indicator lights.

The catalog is an easy-to-use reference for sourcing industry standard and custom indicator lights for panel and printed circuit board mounting. Products included are panel mount LED, neon, and incandescent indicators for front and rear mounting, as well as right angle and vertical LED bars for board mounting. Each product page contains product photos, dimensioned drawings, application notes, LED specifications and an easy "How to Order" part description.

Wilbrecht LEDCO can adapt an indicator light to meet a customer's specific requirements. The front and rear mount panel indicator lights can be supplied with custom defined lead lengths, special bicolor/tricolor LEDs and connectors. Other popular options include IP66 sealing, XL-ETFE insulated wire and custom part marking. The board-mount right angle LEDs are available as industry standard single units or customized bars with color sequencing and spacing set to the customer's specifications. Vertical LED bars are available with custom spacing and assembly height and can be retrofitted to existing board layouts.

To download a PDF version of the catalog, please visit http://www.wilbrecht.com/html/_1_main.htm.

Society News

Kristen Donnell

Chapter Revitalization – Lessons from the Oregon Chapter

The Instrumentation and Measurement (I&M) Society is proud of its many active chapters. 2010 welcomed a number of new chapters to the Society, as well as a multitude of chapter events. Previous issues of the I&M Magazine have highlighted some of these events. 2011 has started strong, with many chapter events taking place around the world, including Distinguished Lecturer visits to the New Zealand and Oregon chapters.

This article outlines the chapter revitalization process. Chapter revitalization can be an undertaking of an already-active chapter that wishes to grow its membership and visibility within its region, or, it may be a push to save a chapter, as was the case of the Oregon Chapter in late 2010. The Oregon Chapter is a joint chapter with the Controls System Society (CSS) and it had not been active for a period of time. As such, it was on the verge of losing chapter status. The Oregon chapter followed these steps to successful chapter revitalization.

Start by identifying all members in your region. If you want more members and your chapter is not already a joint one, determine if there are other chapters (or membership representation from another society) in the area with which your chapter might join. Possible contacts for assistance at this stage of the revitalization are the I&M Chapter Chair Liaison, Kristen Donnell (kmdgfd@mst.edu), or your local IEEE section officials. Next, plan an event. As you do this, remember that the primary purpose of your event is to bring the membership together to foster networking and chapter enthusiasm.

For example, the Oregon Chapter organized a meeting at Oregon Health and Science University (OHSU), one of the local universities, at the Center for Health and Healing on the campus. The meeting concluded with a technical tour of the Portland Aerial Tram facility. A tram engineer led the tour and answered questions about mechanical, power, electrical, communications, operational, and safety aspects of the Portland Aerial Tram. A free round-trip ride (the first time for many local members) completed the tour.

The revitalization meeting is a great time to bring in an IEEE representative from your local Section or the Society. These individuals will be familiar with chapter support programs, distinguished lecturer programs, and educational support. They can help answer questions about the application process for these programs.

During the Oregon revitalization meeting, a number of important “book-keeping” actions were completed. First, officer elections were held for 2011. This is a critical step in the revitalization process. To maintain “Active Status,” a chapter must meet a number of requirements including maintaining a minimum of ten members, reporting the officers (at a minimum, the Chapter Chair) to the administrative Section, and reporting all meetings (including a minimum of two technical meetings annually) to IEEE Headquarters and the local Section using form L-31. This information is available in the IEEE Chapter Chairs’ Reference Guide (http://www.ieee.org/about/volunteers/tab/creating_a_chapter.html).

Once chapter leadership has been established, it is important to agree on a meeting schedule. Now that you have some interest in your chapter, give the membership a regular, reliable meeting schedule. For the Oregon Chapter, a bimonthly meeting schedule was adopted. This step leads to perhaps the most difficult of all: organizing and planning the future meetings! Planning and organizing chapter meetings is not as daunting a task as it may seem. Even for smaller chapters, interested members will want to see the chapter succeed and grow. Build on their enthusiasm by enlisting their help with planning future meetings. For example, the Oregon Chapter planned the 2011 January and March chapter meetings. January’s meeting featured a technical speaker from OHSU. Plans for the March meeting included contacting a local industry, Tektronix, and a possible tour of the Tektronix Instrumentation Museum.

The ultimate goal of the chapter revitalization process is to bring forth enthusiastic Chapter leaders who are determined to see the Chapter and its support of the membership continue to

grow. The process followed by the Oregon Chapter showcases a successful revitalization. We give many thanks to Roger Ellingson, the 2011 Oregon Chapter Chair, and Dr. Fu Li, a Senior Member of the IEEE and a Professor at Portland State University, for their outstanding efforts and support of this successful revitalization.

A photo collage accompanies this column.