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### Upcoming Events

- Feb 28, 2012 .....February Members meeting.  
"Linkageless Burner controls, high lighting various models and styles, the benefits thereof" by Roy Voorberg' of Carremm controls"
- March 20, 2012 .....Annual ISA Hamilton Expo at Botanical Gardens, 650 Plains Road, Burlington, Ontario
- May 25, 2012 .....Annual ISA Hamilton Section Golf Tournament

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## 1. Message from our new District VP



Dear ISA Members,

On January 1, I started serving your district (D13) in the position of District Vice-President - DVP.

I first joined ISA back in 1997, and in 2007, in response to my wish to contribute to the local section, and by invitation of our D13 past DVP and past Montreal Section President, Diana Bouchard, I assumed the position of Director on the board of the ISA Montreal Section. In 2010, following a suggestion made by the late Marc Sider, also until recently a member of the Section Board, I was elected President of my local section, a responsibility that I will continue to fulfill until next June, when the gavel will be passed to the next President.

During my mandates as Director and President of the ISA Montreal Section, I had the opportunity to learn about the purpose, importance, and responsibilities of an ISA Section, and from my participation in DLCs, SLMs, FLM, committees, and ISA DVP training, I had the chance to learn more about the Society's way of functioning, its present situation, and most of all, the impending challenges and my involvement as DVP in the process of addressing them, a heavy responsibility that I humbly accept.

We have already a few projects to put in place, our first one being our upcoming joint DLC. Together with District 5, we are organizing it to take place on the first weekend of May in Sarnia ON. Our Society President, Bob Lindeman, has already revealed his plans to attend our DLC and to give the opening presentation. Another participant from the international ISA organization is also on the program: William Stange will speak to us about "Process Flow For Standards Approval." As you may see, we are investing in high-quality presentations for this event, and we expect an impressive presence of D13 members.

As DVP, I have also made a commitment to link our members to the larger ISA organization, and from now on, I would like to make myself available for Sections whenever needed.

Let me express to you the pleasure that I feel in being honored by the assignment of representing you in the larger ISA organization, and I thank you, the district members, for the trust and the mandate that have been given to me to work for District 13.

Welcome to our mandate, and thank you for being part of ISA. Your participation makes us stronger.

Antonio Alves  
District Vice-President  
ISA District 13 (Eastern Canada)

## 2. Nov 29 Member Event Plant Tour report: Oakville Southwest Wastewater Plant

On Nov 29, 2011 the Region of Halton gave us a tour of the **Oakville South West Wastewater Plant** located on Lakeshore Drive in Oakville, Ontario. The plant has recently completed a major upgrade, and plant supervisor Mike Di Iorio, along with operators Alvin Kiers and Chris Boutilie, was pleased to show us the newly upgraded facility. Despite the rainy weather we had a turnout of 23 attendees, including several students from McMaster University's B.Tech program.

The tour began in the plant's main meeting room with light dinner courtesy of ISA Hamilton. While we were eating, Mike gave us an oral history of the plant while showing us photos from the recent construction of the plant's new civil works and treatment equipment. This was followed by us breaking into three groups so Mike, Alvin and Chris could give us individualized walking tours of the plant. The tour ended up being 2.5 hours long instead of the original one hour timeslot – as our guides eagerly took us through all the various process control and instrumentation aspects of the plant. A big than you to Mike, Chris and Alvin for organizing a very successful tour for us!



Photo of Plant tour: Oakville South West WWTP

## 3. Member spotlight: ISA District 13

Michael Bovenkamp and Graham Nasby participated in a District Spotlight Q&A with *ISA Insights*. Nasby is the vice president of ISA Hamilton Section located in Hamilton, Ontario, Canada. Bovenkamp is the 2011 ISA District 13 vice president.

**Insights:** Can you tell readers about District 13 and how it fits into ISA's membership structure?

**Bovenkamp:** In ISA's membership structure, members are encouraged to belong to a local section in their geographical

area. Sections are then assigned to one of ISA's 14 districts and regions.

ISA District 13 comprises the Eastern half of Canada. The provinces New Brunswick, Newfoundland & Labrador, Nova Scotia, Ontario, Prince Edward Island, and Quebec are part of District 13. We have a total of five active sections, one formative section, and several student sections. Our active sections are Hamilton, Montreal, Saguenay - Lac St. Jean, Sarnia, and Toronto. Section programs are provided in either French or English, depending on the preferences of the local members.

**Nasby:** Over the years, I have been a section member and attended meetings of the Hamilton, Sarnia, and Toronto sections. The sections have been unique and similar to each other. The common thread between the sections is the willingness of section members to encourage mentorship, leadership, and camaraderie.

**Insights:** What sorts of industries are found in your district?

**Nasby:** We are fortunate to have a wide variety of industries in our district. However, despite the differences in the various industries and types of processes, there is the commonality of the automation body of knowledge. Our instrumentation, automated control, monitoring and process safety skills, and experience tie our members together.

**Bovenkamp:** Our diversity of industries is our strength. The members of our various sections value the knowledge sharing that their ISA membership makes possible.

**Insights:** You recently had your District Leadership Conference (DLC). What do you do at the DLCs?

**Bovenkamp:** The District Leadership Conference (DLC) is one of the foundations of the leadership development program ISA makes available to its volunteer leaders and members. Once per year, most ISA districts will hold a DLC for their members who are interested in developing their leadership skills and learning more about our Society. In District 13, we rotate the DLC location between each of our sections, and we typically schedule it for early May. Our 2011 DLC was hosted by our ISA Toronto Section. Over two days, we held leadership development workshops, brought people together for a social event, and conducted a District Council Meeting. During the District Council Meeting, each section makes a presentation to the District regarding their previous year's activities.

**Nasby:** The DLC is a unique ISA feature that I wish other organizations would consider. As a new ISA Hamilton Section Leader, the DLC was a great opportunity to learn about ISA Section activities and operations. I learned about how ISA sections are structured to present member meetings, events, and local exhibitions for their members. For our District 13 DLCs, the workshops are facilitated by ISA members just like me, so I got a chance to learn from my colleagues. The workshops also

give the speakers a great opportunity to practice their presentation and public-speaking skills. Best of all, the DLCs give us an opportunity to meet fellow automation professionals from our district.

**Insights:** What sorts of events and programming do District 13 sections organize for their members?

**Bovenkamp:** Each of our sections hosts regular membership meetings that consist of a mixture of technical seminars, plant tours, hands-on workshops, and networking events. Section leaders also collaborate with high-school, college and university leadership to help students get excited about automation and offer ISA's support for young people who are considering careers in automation. Our sections have a strong mix of section exhibitions, training programs, technical programs, and special events.

**Nasby:** The golf tournaments organized by our sections are popular. For example, my home section, ISA Hamilton Section, hosts an annual golf tournament that routinely attracts over 140 golfers every year. Our other sections who organize golf tournaments report similar results.

Plant tours are also very popular. Throughout District 13, we have discovered technical people love to see the equipment and processes shown during section plant tours. For our members who are end users, it also gives them an opportunity to "show off" their facilities to fellow automation professionals.

**Insights:** In your district, what is the secret for having a good local Section Exhibition?

**Bovenkamp:** I would say, first and foremost, planning, followed by forming long-term relationships with vendors who exhibit every year. For our sections that host exhibitions, they typically have one or two strong leaders who lead a team of volunteers through planning and execution. The shows are typically one or two days in length and use the table-top format. Some exhibitions also have training or technical presentations adjacent to the exhibit hall. The section show size usually varies from 40 to 80 tables with a local vendor exhibitor focus. Vendors see our shows as a cost-effective and intimate venue to get to know their customers. Attendees support their employers through the technology knowledge exchange and are exposed to a friendly local atmosphere.

**Nasby:** In addition to planning, a successful exhibition must be announced well in advance and be effectively marketed. In the Hamilton Section, we have a dedicated volunteer who books the venue at least 18 months in advance. Table-top exhibitors are typically booked four to eight months ahead of time. We send out a save-the-date notice at least a year in advance and follow-up by using e-mail notifications, articles in local equipment news magazines, social media, and notices in our quarterly Section newsletter.

**Insights:** Can you tell us when you first became an ISA member?

**Nasby:** I have actually been an ISA member since 2004. At the time, I was in my final year of university, and someone had left a copy of a trade magazine in the engineering society's lounge. I can't recall what the magazine was about, but I do remember seeing an advertisement in it about ISA. The focus of the ad was ISA membership benefits and it included a small note at the bottom that said students could join for only \$10. A student membership for only \$10? I couldn't argue with that, so I took the bait and joined via the ISA website—I've been an ISA member ever since.

**Bovenkamp:** When I started my first full-time job after graduation, my colleagues encouraged me to attend ISA Section meetings and be involved in volunteer committee work. I quickly benefited from the quality technical presentations, society technical content, local exhibitions, networking opportunities, and section Committee work.

**Insights:** What do you see as the greatest benefits to ISA membership from the perspective of your district?

**Bovenkamp:** ISA membership has helped me support my employer, grow in my career, meet new and interesting people, and open doors to opportunities. ISA has also allowed me to get access to the vast collection of knowledge and experience from members and industry experts.

**Nasby:** I would say the networking and access to opportunities that compliment my day job are the greatest benefits of ISA membership. ISA has enabled me to get access to people, information, and contacts that I would never would have otherwise. Technology is something that comes and goes, but it is the people and relationships we form that enable us to move forward in our careers. The networking that comes with ISA membership is an incredible thing; the more you put into it, the more it gives back to you.

**Michael Bovenkamp, P.Eng., CAP** is the 2011 ISA District 13 vice president and a member of the ISA 2011 Executive Board. He has more than 11 years of experience as an automation professional in the steel-making industry for ArcelorMittal Dofasco in Hamilton, Ontario, Canada.

**Graham Nasby, P.Eng., PMP** is a licensed professional engineer who has worked in various industries, ranging from IT and software development to pharmaceuticals and semiconductor manufacturing. He currently designs automated control and monitoring systems for the municipal water/wastewater sector at Eramosa Engineering Inc. Graham is the VP and president-elect for the Hamilton Section and a contributing member of the ISA18 Alarm Management standards committee.

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## 4. ISA Hamilton Expo-March20, 2012

Make sure to save the date for the 2012 ISA Hamilton Expo. This year's expo will be held on Tuesday, March 20, 2012 and will feature a trade show, seminars and exhibits.

Keynote Address: "Improved Operational Performance utilizing FDT Technology (IEC62453/ISA103)".

Presented by David Riemer/Product Solutions Manager; Endress & Hauser.

Exhibition Opens at 10AM.

For more information about this event or to book your exhibit space, please contact our Expo Coordinator Alice Kelly at [expo@isahamilton.com](mailto:expo@isahamilton.com)

## 5. Making the Most of your ISA Membership: Industries & Sciences Technical Divisions

By Graham Nasby

*This article is part of a series of articles about taking advantage of the resources and opportunities that come with your ISA membership.*

In last issue's column we covered what ISA Technical Divisions are, and how they have been set up to serve the various technical interests of ISA members. Technical Divisions in the ISA are grouped into two distinct groups:

The first grouping is the "Industries and Sciences" department which hosts divisions focused on the needs of specific industries. The second grouping is the "Automation and Technology" department which hosts divisions based on individual technologies and technical aspects of automation. Today's article will provide an overview of the technical divisions in the "Industries and Sciences" department.

Listed in alphabetical order, the divisions in the Industries and Sciences Department are as follows:

- Aerospace Industries Division
- Building Automation Systems Technical Interest Group
- Chemical & Petroleum Division
- Construction & Design Division
- Education Division
- Food & Pharmaceutical Division
- Glass & Ceramics Technical Interest Group
- Mining & Metals Division
- Power Industry Division
- Pulp & Paper Division
- Textiles Technical Interest Group
- Water & Wastewater Division

The objective of **Aerospace Industries Division** is to coordinate and use the knowledge, expertise, and skills of its members in spreading and maintaining materials and process specifications for professionals who are involved with aspects of

instrumentation associated with ground testing, flight testing, and control of airplanes, missiles, and space Vehicles and their measurements.

The **Building Automation Systems Technical Interest Group (BASTIG)** focuses on using ISA's 66 years of automation knowledge and applies that to the building automation vertical. ISA openly acknowledges others have made significant contributions to the vertical application of automation within buildings, and that building automation does have different requirements. The purpose of this group is to be a home for building automation Professionals within the larger automation society, to allow us to gain a consensus within our vertical market, and to use that as a basis for making change within the industry. The BASTIG will start by marketing ourselves to peers as a source of certification and education.

The **Chemical and Petroleum Industries Division** (also known as ChemPID) aims to contribute to the professional involved in the processing of chemicals, petrochemicals, petroleum, and natural gas. From raw materials to products ChemPID strives to advance best practices in: Safety, Environmental, Production Efficiency, Operations, Process Control, and Automation.

The **Construction and Design Division (CONDES)** serves practitioners in all areas of automation, bringing together professionals involved in design, construction, and commissioning activities related to all types of facilities. CONDES supports development of applicable standards, recommended practices, and technical papers. Within the construction and design arenas, Division Members are involved in all facets of facility design and construction, building automation, safety and security, construction management, and commissioning of facilities and process systems.

The **Education Division (EDD)** promotes and advances educational initiatives including automation engineering, automation-related courses and programs, and activities related to the mission of the Society. The division functions as a resource and technical information exchange for students, faculty, education professionals, and others with an interest in education. Members will have the opportunity to share experiences and learn from their peers. The division works with other groups within ISA to recruit and retain student members.

The **Food and Pharmaceutical Industries Division** is the Division for sharing and understanding the latest technology for sensor, instrument, equipment, automation, computer-system, and software application for the Consumer Packaged Goods (CPG) and Pharmaceutical Supply Chains. The FPID represents a knowledge base of design, engineering, system, software, process automation, validation, quality, research, and scientific professionals. Share and enhance personal expertise for CPG product manufacturing and packaging, pharmaceutical R & D, clinical trials, and manufacturing of tablet formulations, parenterals and biotech products.

The **Glass and Ceramics Technical Interest Group** is focused on Instrumentation, systems and automation practitioners and

professionals interested in economically and environmentally sound practices for the manufacture of glass and ceramic products.

The **Mining and Metals** Division is for automation professionals who are concerned with economically and environmentally sound practices as related to the extraction of metal ores, coal, cement, sand, gravel, and other minerals-and the handling, separation, processing, fabrication, related processes, and research and development for the production of finished mineral or metal products. It also covers the Iron and Steel Making industry, Aluminum Processing and other light metals and the production and manufacturing of metals products.

The **Power Industry Division** (also known as POWID) is a recognized leader in developing and communicating the highest standards of information exchange, practices, environmental awareness and safety of information exchange among engineers, scientists, technicians, students/universities, and management involved in instrumentation and control relating to the production of electricity. POWID is host to the POWID symposium, which has been an annual event for over 50 years.

The **Pulp & Paper Industry Division** (PUPID) is dedicated to advancing the knowledge and skills of professionals in the pulp and paper and forest products industries including those employed in the manufacturing facilities as well as engineering & construction consultants. PUPID members main concerns are the measurement, control, and optimization of processes in the pulp & paper and forest products industries.

The **ISA Textiles Technical Interest Group** helps keep members up-to-date on all aspects of textile instrumentation and process control, from fiber to finished product, including acquisition and handling of raw materials, research and development, fabrication, and inspection. Through meetings and networking events, members have the chance to meet with their peers from around the world and exchange ideas on the latest developments in textile manufacturing technology.

The **Water and Wastewater Division** (WWID) is concerned with all aspects of instrumentation and automated control related to commercial and public systems associated with water and wastewater management. Membership provides the latest news and information relating to instrumentation and control systems in water and wastewater management, including water processing and distribution, as well as wastewater collection and treatment. WWID is invaluable to professionals interested in sanitary technology and engineering, and the operation and maintenance of wastewater facilities. The division hosts the annual ISA water/wastewater symposium, now in its 7th year.

#### NEXT ISSUE: ISA Divisions – Automation & Technology

*The author, Graham Nasby, is general symposium chair for the upcoming 2012 ISA Water/Wastewater and Automatic Controls Symposium taking place Aug 7-9, 2012 in Orlando Florida. For more information and to download/view the Call for Abstracts, visit the symposium website at [www.isawwsymposium.com](http://www.isawwsymposium.com)*

## 6. Basic Motion Control - Absolute Optical Encoders

**Question:** We require an accurate determination of shaft position for a PLC/ motor application that frequently stops and starts. Any suggestions?

**Answer:** A typical solution would be to install an absolute optical encoder.

### Okay...Why use an Absolute instead of an Incremental Optical Encoder?

Optical encoders are devices attached to motors capable of telling us the distance traveled and the speed of rotation. Absolute rotary encoders provide a shaft's actual position and speed. The less costly incremental encoder only informs the distance of movement relative to the motor's last position.

#### Absolute Encoders

Absolute encoders are typically found in applications where:

- Position data must be retained after a power loss,
- A device is inactive for long periods,
- A device moves at a slow rate (i.e. cranes, valves or gates).

If you recall, an incremental encoder is a pulse counter that needs to be 'homed' or referenced to a certain point. Lose the power and it has to be re-referenced.

#### Establishing Position after a Power Loss

Absolute encoders solve this 'homing' problem by directly providing a unique 'code' for each position. Since each code is different, every position can be identified no matter where the shaft starts and stops.

The traditional absolute optical encoder is a shafted mounted glass disc with concentric rings comprised of alternating transparent and opaque sections. The number of sections doubles with each ring providing a natural binary weighting. Pulses from each ring are routed to the appropriate bit location in a parallel data word. The number of rings will determine the size of the data word and therefore the rotational resolution. To increase the resolution - increase the number of rings.

For example:

1) A disc with eight rows (8 bits = 256 counts) is capable of resolving 360 degrees/ 256 counts/rotation = 1.4 degrees.

2) A disc with 12 rings (12 bits =4096) is capable of resolving 360 degrees /4096 counts/rotation = 0.087 degrees.

To count segments an infrared emitter is mounted on one side of each track and an infrared phototransistor (receiver) on the other.

The receiver outputs are passed to modules that isolate the fast changing segments (bits) from the slower PLC scan rate.

Problems occur with natural binary codes when transitions between opaque and transparent segments do not happen simultaneously for exact positions. Consider a hypothetical four-bit encoder; during changes between positions, all four bits will change state. The detectors will see spurious data. An observer will not be able to tell if this is the real position, or a transitional state between positions. If the output feeds into a sequential system then the system may store a false value. To avoid this problem reflected binary codes (such as Gray) are employed. Gray and its derivatives ensure that consecutive positions of the sequence will differ by only one bit. This limits the maximum position error to one LSB. Most PLC's have a Gray to binary conversion instruction allowing the encoded data to be used elsewhere in the program.

#### About the Author:

**Glen C. Taylor** is the owner of eWerks Inc. for over 25 years he has been involved in the design and manufacture of industrial electronics. His blog is online at [www.Thingsthatgoblink.com](http://www.Thingsthatgoblink.com). Glen holds a Master of Science degree (with distinction) in Electronic Product Development from the University of Bolton in the UK, a CID certification in circuit board design from IPC Designers Council, and is an authorized Microchip Design Partner. He is also a senior member of IEEE and ISA. His company's website is [www.ewerksinc.com](http://www.ewerksinc.com)

## 7. Member Meetings: Call for Speakers

As a service to its members, the ISA Hamilton section holds monthly membership meetings. The meetings consist of dinner and a speaker. The meetings generally start at 6:00pm, followed by a 45 minute seminar that begins at 6:30pm.

Meetings are open both members and non-members of the ISA. Pre-registration is required so that we know how many dinners to order. Please see our website for the meeting schedule.

We are currently seeking speakers for several of our upcoming membership meetings. Our focus is technical content. Note for Vendors: The goal of the member meeting presentations is to present technical topics of interest to our members – not to just be sales presentations. We do accept vendor presentations provided that they are geared towards general technical knowledge and not specific product lines. We have had many excellent vendor-provided presentations in the past, and we look forward to many more.

Please visit our website to see what meeting presentation slots are available. Feel free to contact us if you are interested in sharing your knowledge with your fellow automation professionals through our membership meetings program. We look forward to seeing you at our next meeting.

## 8. ISA Hamilton Section Contacts

For more information about ISA membership, the ISA Hamilton section or the upcoming section events, please do not hesitate to contact any one of us. (Email addresses are @isahamilton.com)

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*The ISA Hamilton Section is the local section of the International Society of Automation for the Hamilton, Burlington, Guelph and Golden-Horseshoe areas of Southern Ontario, Canada. ISA Hamilton Section holds regular meetings, sponsors a variety of educational endeavors, produces an annual exhibition, encourages an open exchange of career opportunities, and promotes the goals & objectives of ISA. More info: [www.isahamilton.com](http://www.isahamilton.com)*