

OMNEX & WINA

On February 11, 2004, the Wireless Industrial Networking Alliance (WINA) held its inaugural General Assembly at the ISA's conference facility in Research Triangle Park, Raleigh NC. Attending from OMNEX were Åke Severinson and Randy Klassen (both active as

by Randy Klassen
(excerpts taken from WINA charter documents)



In a very practical way, WINA will focus on the customer and help identify, characterize and recommend effective wireless technologies that meet the criteria of the



speaker and chairman respectively, at the ISA's Wireless Technical Conference on Security the previous day).

Newly formed from a coalition of participants representing industry organizations, technology suppliers, software developers, system integrators and others interested in the advancement of wireless solutions for industry, WINA's goal is to supply industrial end users with better access to clear, unbiased technical information on comprehensive wireless solutions.

end user. This will be done through the development of information materials, the support of Web-based education and participation in demonstration projects driven by industry partnerships. Along with helping to create effective solutions, WINA also plans to promote effective standards, regulations and practices. In doing so, WINA will serve as an information clearing house for its members and will work with analysts, journalists and organizations to quantify and articulate the advantages of wireless technologies.

Enthusiastic support for the formation of WINA comes from the Industrial Technologies Program in the US Department of Energy (DOE). "WINA is exploring key issues and barriers to

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Of Note:

- April 1, Kevin Towers & Randy Klassen to speak at Ecol Electric Technology Seminar, The Radisson, Burnaby, BC
- April 5-6, Randy Klassen to speak at Graybar Technology Showcase, Westin Waltham-Boston, Boston, MA
- April 20, Brian Cunningham to speak at Graybar Technology Showcase, The Solutions Center, Raleigh/Durham, NC
- May 12, Åke Severinson to speak at Graybar Technology Showcase, Belridge Graybar Office, St. Louis, MO
- May 20, Brian Cunningham to speak at Graybar Technology Showcase, Gwinnett Civic Center, Atlanta, GA
- June 6-10, Randy Klassen & Åke Severinson to speak at ISA Wireless Technical Conference /WINA (Sensors Expo) Presentation, Cobo Conference & Exhibition Center, Detroit, MI

Frequency Hopping & Unwanted Intruders

by Randy Klassen & Åke Severinson

All types of data transfer offer the opportunity for both data interception and injection. In wired systems, it usually takes some direct physical connection to gain access, with tampering being possible anywhere along the transmission wires. Radio systems, on the other hand, take the potential for data interception or injection out of the realm of actual physical contact and force tampering to occur in the radio frequency (RF) realm. Further to this, various radio systems and technologies set up different types of "road blocks" that must be overcome by the wireless intruder.

CONVENTIONAL SINGLE CHANNEL VHF/UHF RADIO

A single channel radio (where a listener finds the specific radio frequency and listens to the message being sent) has an added element of security over a wire because message is usually encoded and the listener can only make sense of it when he/she has the appropriate receiver. A person without the appropriate equipment to decode the message is thus forced to find the frequency used and acquire knowledge of the protocol before he/she can decode the signal. Likewise, injection of data into the signal can only happen if the code is 'broken'. This differentiates radio signals from wired communications that are typically not encoded. Take, for example, standard industrial signals such as ON/OFF status and 4-20mA current. These signals are encoded when passed through a radio, but not usually encoded when passed by wire.

FREQUENCY-HOPPING SPREAD SPECTRUM RADIO

To further inhibit unwanted intrusions, the military developed Frequency Hopping (FH) radios that add an additional set of barriers for a would-be intruder to overcome.

This technology has been available to commercial radio manufacturers since 1987 and the following list highlights a few of its detection avoidance features:

- ◆ Like the single channel VHF/UHF radios, each packet is encoded, thereby forcing the intruder to gain knowledge of the protocol, ID and decoding.
- ◆ Unlike single channel radio, the FH data is continually hopped across a wide range of frequencies in a pseudo random sequence. To listen to the data, the intruder must know (or establish) the hopping sequence and follow along as the bits and pieces of the message "jump around." As an example, the OMNEX HopLink system uses 252 different pseudo random hopping sequences.
- ◆ Data transmissions are tightly timed to make sure both ends of the system are on the same frequency at the same time. To make an FH system efficient, the time required to hop from one frequency to another must be made very short. The relevance of this from the intruder's point of view is that he/she cannot make use of "generic" radios normally designed to switch slowly to keep the cost of the equipment low. For all intents and purposes, the intruder needs to have an OMNEX radio set to stand much of a chance of intercepting an OMNEX HopLink transmission.

In conclusion, with an OMNEX HopLink system, the intruder needs to: a) be technically competent; b) have detailed knowledge of the inner workings of both the hardware (frequencies, bandwidths, hop and synchronization sequences and tim-



Although nothing is really safe against a determined intruder, Frequency Hopping is your best protection

ing) and software (data packet construction, time tracking, synchronization strategy, etc.) in the HopLink equipment; and c) be very tenacious. And though the case can be made that nothing is really safe against a determined intruder, in the case of a Frequency Hopping HopLink, military-type equipment and experience are needed to "break into" this type of radio system.



*Due to the hectic schedule of our President, Åke Severinson, we are unable to provide "Understanding Radio Communications" at this time. Please accept our apologies and look for another installment in the next edition of **Off the Wire**. In the meantime, we hope you enjoy this whitepaper. This and otherwhite papers may be found on our website at:*

http://www.omnexcontrols.com/downloads/download_whitepapers.aspx

April 2004

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Calendar of Events & Tradeshows

- March 30 - April 1
Electronica USA, Embedded Systems Conference
Moscone Convention Center
San Francisco, CA
See our products at the Phoenix Contact Booth # 5768
- April 9
OMNEX closed for Good Friday
- April 19-24
Hannover Fair
Deutsche Messe AG
Hannover, Germany
See our products at the Phoenix Contact Booth
- April 27-28
ISA Automation West
Long Beach Convention Center
Long Beach, CA
See our products at the Phoenix Contact Booth

May 2004

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23/30	24/31	25	26	27	28	29

- May 3-6
Offshore Technology Conference
Reliant Center
Houston, TX
See our products at the Phoenix Contact Booth # 5975
- May 4-7
Water/Wastewater NJWEA Conference & Exhibition
Tropicana Casino
Atlantic City, NJ
See our products at the Phoenix Contact Booth
- May 11-13
Automated Manufacturing Expo
Palmetto Exposition Center
Greenville, SC
See our products at the Phoenix Contact Booth # 221
- May 18-20
Waste Expo
Dallas Convention Center
Dallas, TX
Visit us at Booth # 8736

June 2004

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

- May 19-20
RSSI/AREMA
Opryland Hotel
Nashville, TN
See our products at the Phoenix Contact Booth
- May 24, 2004
OMNEX closed for Victoria Day
- June 8-10
Sensors Expo
Cobo Exhibition/Conference Center
Detroit, MI
See our products at the Phoenix Contact Booth # 527
- June 20-24
SUPERCOMM
McCormick Place
Chicago, IL
See our products at the Phoenix Contact Booth # 10807

Application Notes -

by Randy Klassen

Partner Phoenix Contact Answers the call for Class I, Div 1 Transmitter

For years OMNEX distributors of the industrial wireless I/O products hounded us for an explosion proof, flameproof, Class I Div 1 (CID1) transmitter. We never delivered it. Lots of excuses can be made, but the bottom line is: we never came up with a solution.

Now, the good news. Our partner, Phoenix Contact, answered our distributors' call a little quicker, and through a deal with Adalet they've teamed up to put together a CID1, Groups B,C,D UL/cUL, NEMA4X, IP66 transmitter package! Let's get excited! Cast from the finest corrosion resistant aluminum alloy and trimmed in a snappy safety blue polyester powder coating, this

formidable little conduit killer weighs in at a hefty 7.4lbs of industrial might. Go get em'!!

Yes, our beloved AC and DC CID2 "pipe" transmitters will likely continue their reign as industry's best answer to wireless I/O for outdoor level, pressure, temperature, flow and alarm, but with their new CID1 brother onboard, the RAD-ISM-900-UD series of wireless I/O products now packs an even bigger punch as THE wireless I/O solution throughout the ENTIRE refinery, chemical plant, mill and processing facility. This outstanding product is going where no OMNEX radio has gone before, and with the channel strength of Phoenix Contact, and the proven enclosure tech-



This outstanding product is going where no OMNEX radio has gone before, and with the channel strength of Phoenix Contact, and the proven enclosure technology of Adalet, we already know we've got a real winner!

nology of Adalet, we already know we've got a real winner! Without a doubt, this CID1 radio solution will save end users tens of thousands of dollars per monitoring/control device link as they reliably eliminate unnecessary cable installation costs in hazardous Div. 1 areas.

We on the industrial products team at OMNEX would like to extend a big "thanks" to Davis Mathews of Phoenix Contact for taking the initiative to drive this product innovation through. Good job. Good solution.

OMNEX and the Wireless Industrial Networking Alliance (WINA) cont'd

industry adoption, then formulating strategic approaches to address them," says Gideon Varga, a technology manager at DOE. "WINA is moving forward, and we expect these efforts to significantly expand industrial use over the next several years."

How is OMNEX getting involved? We're pleased to say that Åke has been participating in WINA since the embryonic stages of this global organization. He now sits on the Board of Directors and leads the RF Interference and Coexistence subcommittee. Randy has also joined the WINA gang and is currently participating in the writing of an industry wide Wireless Case Study book in conjunction with the marketing subcommittee. To date, OMNEX's participation and input

have been well received. OMNEX is an established wireless manufacturer with a global perspective, and our track record of success and reliability has put us in a position to lead. As a direct result our growing participation with other industry leaders, be prepared to hear about cooperative technological and marketing undertakings from time to time.

For more information about WINA, please visit the WINA website at www.wina.org

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Vancouver: Home of OMNEX and One of Top Three Places To Live

by Karin Micheelsen



Beautiful Vancouver, Canada (specifically the suburb called Port Coquitlam) is home to OMNEX and many of its employees. It is here where we design and manufacture the numerous products we ship globally for end-users or to be installed in the products and service offerings of our many OEMs and partners.

The modern city of Vancouver has a relatively short history as a developed centre, however for 9000 years, the area was inhabited by over 20 different native tribes including the Tsawwassen and Musqueam. In the 18th century, European explorers, notably the Spanish and British, discovered and charted the south west coast of British Columbia. Land disputes ensued and the area was eventually claimed by Captain George Vancouver for the British in 1792.

Looking up what is now called the Fraser River (named for Simon Fraser), Vancouver determined the river was too shallow for any real purpose and decided to abandon the area the very day he had claimed it!

The area was left in relative obscurity until 1827 when the Hudson's Bay Company established a fur-trading post in nearby Fort Langley. An influx of up to 25,000 new settlers into neighbouring New Westminster occurred in 1858 when gold deposits were discovered. New Westminster became the capital of this new Crown Colony in British Columbia and remained so until 1868 when Victoria was established as the current capital. By 1862, industry was flourishing and by 1884, the Canadian National Railway had established the terminus of its transcontinental rail-

road in what is now downtown Vancouver.

1886 marked the year the city was officially named Vancouver, however it promptly burned to the ground later that year. Always the dynamic city, Vancouver was quickly rebuilt.

Today, the metro Vancouver area boasts a population of approximately 2 million and is regularly ranked as one of the top cities in which to live (in 2004 Vancouver is ranked in 3rd place in terms of quality of life). Nestled at the foot of the Rockies on the Pacific coast, Vancouver's natural setting makes it one of the most beautiful cities in the world. Always a popular tourist destination, the city especially looks forward to welcoming the world as the Host City of the 2010 Winter Olympics.

New Product Spotlight - ORIGA Family

by Len Dueckman

The number of products and product variations in the ORIGA radio control family continues to grow as customers in the global marketplace accelerate product line development with ongoing requests for distinctive features and characteristics - something OMNEX is happy to offer.

ORIGA - where does the name

come from? "The original concept and graphic was based on the star pattern of the constellation Auriga - the shepherd of the sky," says Randy Klassen, OMNEX Sales and Marketing Director. "Since the controller "shepherds" mobile equipment, we took the "O" from OMNEX and replaced the "Au" in Auriga to get ORIGA. The pronunciation essentially stays the same." The secret is now out.

What makes the ORIGA family unique? The original objective laid out in the late 90s was to develop a second generation spread spectrum radio control system offering as good as or better performance than a wired umbilical remote, with no added cost penalty. The technology developed delivers on these objectives in the following fashion. First, the ORIGA family offers the same range and performance as the first generation radio systems - recognized in North America as providing the best performance and reliability in the industry - with 10 times the battery life. The T100 and T300 typically offer battery life exceeding 150 and 500 hours respectively. Second, the receiver family is designed to be price competitive with the simplest applications while retaining the ability to expand to fulfill the most demanding and complex machine control applications. The flexibility of the ORIGA receiver family is accomplished by using several interoperable units which can be enhanced with additional plug in modules for driving most types of hydraulic and electric actuators as well as serial protocols such as CanBus. Reliability and error reporting has also been addressed to minimize service and maintenance issues.

Another feature of the ORIGA family is the care that's gone into the packaging and design of the trans-



The ORIGA Family of products - Receivers and Transmitters

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Off the Wire

Trusted by Industry, Trusted by Operators



Important Contact Information

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New Product Spotlight - ORIGA Family cont'd

mitters. Compact, comfortable and enjoyable to use, the electronics compartment of each transmitter is also sealed and completely waterproof. The cases are made of a high strength/ high tech plastic capable of withstanding high shock levels over a wide temperature range. One user reports that a five-ton forklift drove over his T100 transmitter and it escaped fully intact with nothing more than a scratched surface. Though we don't recommend it, ORIGA transmitters won't break if you step on them.

Available in both 900 MHz and 2.4 GHz bands, the OMNEX line of ORIGA products is poised to show the world what wireless technology can do for equipment operability, efficiency and safety.

ORIGA T100



ORIGA T110



OMNEX's two most popular and recognizable ORIGA Products, known to some as "the Blue Wonder"

Industrial Wireless Mobile Control, I/O & SCADA Solutions

Eliminate the Expense of Cable and Conduit