

## **39<sup>th</sup> IICIT Symposium Papers, May 12-13, 2008 at the Holiday Inn Select in Naperville, Illinois**

**May 12 1 pm - Welcome and opening remarks** – Dale Reed, Symposium Chair

**Molex, facilitating change** – Symposium kickoff by Brian Krause of Molex.

### *Legacy Learning Tutorials*

**High Definition Signals (and Beyond) though Cable and Connector** by Steve Lampen

Abstract: High definition signals have been around in the professional video and broadcast worlds for well over a decade. Now they're entering SuperHD (1080p/60) and the consumer world is right behind with HDMI. This presentation talks about these professional cable and connector systems and the consumer versions, how they are similar and how they are different. Included will be suggestions on testing connectors for both professional and consumer applications.

**Connector plating 101** – by Dale Reed

Abstract: Things we already know and may have forgotten on plating metals. In a broad overview, the speaker covers gold over nickel, nickel solderability, solder pre-tinning, alloy reflow, and some of the various methods of plating (sputtering, electrolytic, electroless, and immersion).

**Signal Characterization 301 in Interconnects** by Ron Hranac – Ron has taken a break from his CATV editorials to join us at the Symposium to speak on connector-specific standards in SCTE's standards "stable". Always highly grounded in arguments steeped with technology, Ron will delight us with his views on high potential testing, BERT, eye pattern, QAM, and other signal characterizations.

**Fiber optic testing in multimode and singlemode** by Doug Parker - Doug has a rich portfolio of optical form factors, cross sectional views, technology graphics, dos and don'ts, best practices, and just good information on optical connectivity and testing.

**International Wire and Cable Symposium, a briefing** by John T Barteld,  
CEO/Director [jbarteld@iwcs.org](mailto:jbarteld@iwcs.org)

Topic: International Wire and Cable Symposium, Inc is a non-profit organization whose mission is to provide a forum for the exchange of information among suppliers, manufacturers and users on advancements in materials, processes and products for transmission systems of voice, data, video signal and electrical current.

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**May 13, 8 AM - Ron Bishop keynote address** for the 39<sup>th</sup> IICIT Symposium. In this presentation, Ron discusses the annual Connector Supplier Survey and his view of the value and the ratings of that process as a mechanism for compliance to ISO9000-2000 as well as a mechanism for connector buyers to evaluate their supplier base.

### *Innovation & Excellence - Optical track, Steve Lampen, Chair*

#### **Connectors with Embedded Media Converters - a case study in the industrial segment.**

By Duane Teachout, Stratos Optical Product Line Technical Manager, Emerson Connectivity Solutions.

Abstract – We all know and understand within series adaptors and between series adaptors. Enter the world of between media adaptors (going from copper to optical) in the connector itself. Duane, always an entertaining speaker, discusses the lifting of the optical transceiver from the pcb and building it into the connector itself for a special industrial application.

#### **New Passive Optical Attenuators to Provide Network Protection, Power Level Control and Fixed Attenuation**

By NM Masum Choudhury, Yuriy Belenkiy, Barbara Grzegorzewska, Victor Chen, Timothy S. Hanrahan, Thomas J. Coughlin, and Tom R. Marrapode – all of *Molex Inc.*, *Fiber Optics Division* plus Ariela Donval, Moshe Oron, and Regina Shvartzer of *Kilolambda Technologies*.

Abstract: Today's complex high power fiber optic networks require increased protection against damage due to power spikes. This paper takes on the need and resulting development of a dynamic attenuator that uses optical physics at the nanostructure level. Test results confirm that the devices work equally well under extreme environmental conditions following Telcordia (GR-1209-CORE) schedule.

#### **3D Verification of the endface geometry of fiber optic connectors**

By Eric Lindmark contact [JAZinser@promet.net](mailto:JAZinser@promet.net)

Abstract: Typical optical link budgets are influenced by alignment and geometry perfectness, as measured by insertion loss and reflection loss. This paper explains the importance of verifying the 3D endface geometry of polished fiber optic connectors to ensure excellent fiber optic connector intermateability and optimum system performance inclusive of curvature, apex offset, and fiber height. Basic principals of true phase-shifting Michelson interferometry and its application to connector endface verification are illustrated and discussed.

#### **Expanded Beam Connectivity Matures**

By Dale Mullen, Product Line Manager, Emerson Connectivity Solutions, Stratos Optical  
Abstract -

#### **Ruggedized POF Connector for Industrial Applications**

By Paul Mulligan, CEO, FiberFin and Chairman, POFTO Standards Committee

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Abstract – In this paper, Paul gives us an update on the industrial, automotive, and consumer electronics optical applications that are now being done in plastic technology, with an emphasis on termination tools.

### **The classic electrical connector – obsolete!**

By Avner Badihi

Abstract: Xloom Communications is an industry pioneer for high density, chip-scale optics for LAN, SAN and Grid Computing. Xloom produces chip-scale, high-speed optical interconnect solution for data center applications. Building the OE interface into the connector allows optical ports on data center cards for high bandwidth solutions.

### **RFID Enabled Connectors**

By Jon Scholtz, Product Line Technical Manager and Derek Dobin, Area Manager of Emerson Connectivity Solutions, Stratos Optical

Abstract - What about smart connectors? Like humans, they can be sort of smart or really “loaded” with brilliance. Come find out the dream and the reality of RFID enabled connectors. Demo/exhibit included.

## *Innovation & Excellence - Copper track, Greg Dalton, Chair*

**High Speed Data Rate Transfers Across Capacitive Interconnects** by Robert Malucci, Malucci Consulting

Abstract - Fully degraded interfaces can still provide acceptable performance for high data rate signal transfers due to capacitive coupling and wave propagation. The physics of this type of interface is used to describe the reliance on capacitive (as opposed to metallic) coupling and electronic tunneling. These results help define the physics and design requirements for capacitive coupling. A finite element model was used to simulate a full wave field analysis to evaluate high frequency performance. This paper provides a contrast between the requirements for high frequency signal transfer using capacitive coupling and traditional metallic contact.

**Electrical Conductivity of typical Automotive Engine Compartment Fluids and A Method for determining their Effects when Inadvertently Present in Electrical Connectors of Powertrain Control Modules** By Nosh K. Medora, S.M. P.E. Alexander Kusko, Sc.D., P.E of Exponent Failure Analysis Associates, Phoenix, AZ.

Abstract: This paper presents the electrical conductivity of eleven engine compartment fluids, and also graphically presents the conductivity of engine coolant for a range of concentrations. This paper also presents a technical procedure using PSpice computer simulation program to determine the leakage currents in a contaminated hypothetical connector

### **NP6: a challenging new high performance machinable copper alloy**

Jean-Pierre Tardent, head of Innovation at SWISSMETAL.

Abstract – This paper deals with a new patented alloy containing 9 % Ni, 6 % Sn, 84% Cu and 1% Pb. This alloy is examined for machining properties for manufacturing

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connector pins by screw machining, including a look at head aging treatment related to metal strength and corrosion resistance.

### **The Application of RoHS compliant matte tin, reflowed finishes and whiskering implications following further manipulation and product assembly.**

By Laurence Danter, former president of Weidmuller

Abstract – This paper discusses the typical material structure of RoHS compliant matte tin deposits on copper alloys, with emphasis on reel to reel continuous contact plating and the further effect of matte tin deposits regarding the resulting structural impact of bending, forming and assembly into insulators.

### **Recent Developments in the Design of Constant Force Electrical Contacts**

By John Meaders and Christopher Mattson

Abstract – The issues of maintaining sufficient contact normal force in the design of small scale electrical contacts is reviewed with particular attention to vibration with a discussion of deflection range and design domain optimization. Speculative conclusions are tested with Monte Carlo simulation.

### **Cable Assembly Design**

By Darrell Fernald, Cooper Interconnect

Abstract: The blend of wire, insulation, shielding, jacketing, connectors and connector termination necessary to design a viable cable assembly requires the engineer to have a basic understanding of all these elements as well as the basic requirements to be met. This paper will discuss selection of the various cable assembly elements and how to select them in order to meet system and environmental requirements. A design guide as a part of this paper will assist the engineer to specify the cable assembly in order for proper manufacture to be accomplished.

### **Self wiping contacts, a case study on how important it can be**

By Bill Spink, Engineering Manager, Trompeter and Dale Reed, VP Emerson Connectivity.

Abstract: Using the normal thru patchjack as an illustration, this paper talks to the importance of the self wiping feature set, the benefit, and how such a design can be accomplished in a non standard package of connectivity.

### **Paradigm Shift in Microwave Interconnect Packaging: SSBP-20 Coaxial Contacts for use in Standard Connector Housings**

By Bucky Clyatt – Manager, SSB Product Development, Southwest Microwave, Inc.

Abstract: This paper presents use of the multiport 38999-configured coax assemblies with comparison to today's single-line coaxial cables. Line-to-line isolation and other test results are included. The development process is reviewed along with application studies including coplanar launch and reliability per MIL-HDBK-217. Custom MIL-PRF-83513 configurations are presented. Benefits for digital applications are explained, that take advantage of the higher harmonics to achieve greater signal integrity in high noise ambients. This is a new approach to package I/O and cable design.....a paradigm shift in microwave interconnect technology!

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### **10 Connectors a Cable Guy Would Love You to Make** by Steve Lampen

Abstract: Always entertaining, we get a shopping list from Steve of what one industry expert says we need to be working on.

*End by 5 pm May 13, 2008.*