

EMC – Avoiding the nightmare**4th December 2018****Hosted by The Bradfield Centre**

The Radio Technology Group is championed by Mark Beach, **University of Bristol**, Brian Collins, **BSC Associates**, Diego Giancola, **PA Consulting Group** and Peter Topham, **Qualcomm Technologies International**

Venue: The Bradfield Centre, 184 Cambridge Science Park, Cambridge, CB4 0GA

Reliable radio communication devices are essential in today's world. It is vital that multiple systems can operate without mutual interference, and this is the aim of design for Electromagnetic Compatibility (EMC). Good EMC engineering begins with the design concept and should not be a matter of applying fixes to a complete device that failed to meet specification because of spurious emissions, internal crosstalk, or susceptibility to interference from another device. EMC is designed in, not tested out.

DRAFT AGENDA**10:30** Registration and networking with refreshments**11:00** Welcome from CW / host**11:10** Sponsor welcome**11:20** **Introduction to Radio Technology SIG and scene setting****Brian Collins, BSC Associates****Morning sessions chaired by SIG Champion Brian Collins, BSC Associates****11:30** **EMC issues of wireless products****Roger Ray, Technical Director, RN Electronics**

Emissions from wireless devices, are generally understood by wireless designers. ETSI and FCC specifications define the limits for harmonics, in and out of band spurious, and adjacent channel. However, transmit test modes often don't allow full configuration or use of product (Ethernet/USB/Serial ports etc. may not be fully functioning) therefore EN 301 489-x series of standards come into play (class B radiated emissions etc.) to cover generic/other emissions. Also conducted port emissions both power and telecom need to be measured if applicable. Other considerations are: Multiple transmitters in the same product, and installing an OEM module. Together with EU tests that are generally defined in standards, and FCC/ISED tests that refer to ANSI standards or KDB's.

11:55 Q&A**12:05** **Why are there so few Harmonised EMC Standards?****Steve Hayes, Technical Director, Element Materials Technology**

There have been very few Harmonised EMC standards issued in recent months. This is due to a fundamental issue identified by the European Commission that is yet resolved that covers the assessment of the product during testing. This presentation will highlight the issues and provide a clear path to approving products against the appropriate directive without the use of harmonised standards.

12:30 Q&A**12:40** **Lunch and networking with demos****Session chaired by SIG Champion Peter Topham, Qualcomm Technologies International****13:40** **EMC Simulation of Automotive Ethernet****Dr Tamara Monti, Solution Consultant, Dassault Systèmes /Simulia**

Rapidly escalating levels of data rates are projected to grow even further in the future, fuelled by trends like the upcoming introduction of connected and autonomous vehicles. This talk will present simulations of EMC related aspects of the automotive Ethernet: the effect of the PCB layout on the emission from an automotive Ethernet channel, crosstalk from the automotive Ethernet channel to other cables inside one harness, and susceptibility of the channel based on the BCI testing method.

14:05 Q&A**14:15** **Refreshments and networking**

Session chaired by SIG Champion, Peter Topham, Qualcomm Technologies International

14:45 RF shielding – A practical demonstration

Mark Tyndall, Senior EMC Engineer, Eurofins York

This demonstration looks at the radio-frequency shielding provided by a typical metallic enclosure and explores how it can be degraded by poor design or unconsidered changes.

15:10 Q&A

Session chaired by SIG Champion Brian Collins, BSC Associates

15:20 Panel / discussion session

15:55 Closing remarks

16:00 Event close

With the permission of the speakers, presentations will be loaded to the CW website within two weeks of the event

Profile of organisers

Cambridge Wireless (CW)

CW is the leading international community for companies involved in the research, development and application of wireless and mobile, internet, semiconductor and software technologies. With over 400 members from major network operators and device manufacturers to innovative start-ups and universities, CW stimulates debate and collaboration, harnesses and shares knowledge, and helps to build connections between academia and industry. CW's 19 Special Interest Groups (SIGs) provide its members with a dynamic forum where they can network with their peers, track the latest technology trends and business developments and position their organisations in key market sectors. CW also organises major conferences and start-up competitions along with other high-quality industry networking events and dinners. With headquarters at the heart of Cambridge, UK, CW partners with other international industry clusters and organisations to extend its reach and remain at the forefront of global developments and business opportunities. www.cambridgewireless.co.uk

Profile of host

The Bradfield Centre and Central Working

The Bradfield Centre is a collaborative entrepreneurial community of technology start-ups and scale-ups at the heart of the Cambridge Science Park. The new Centre is expected to become the gateway and focal point for Cambridge's ever-expanding technology cluster. The Centre is the largest of Central Working's global network of rapidly expanding membership-based communities. www.bradfieldcentre.com

Profile of SIG Champions

Mark Beach, University of Bristol (Communication Systems & Networks Research Group)

Mark Beach received his PhD for research addressing the application of Smart Antenna techniques to GPS from the University of Bristol in 1989, where he subsequently joined as a member of academic staff. He was promoted to Senior Lecturer in 1996, Reader in 1998 and Professor in 2003. He was Head of the Department of Electrical & Electronic Engineering from 2006 to 2010, and then spearheaded Bristol's hosting of the EPSRC Centre for Doctoral Training (CDT) in Communications. He currently manages the delivery of the CDT in Communications, leads research in the field of enabling technologies for the delivery of 5G and beyond wireless connectivity, as well as his role as the School Research Impact Director. Mark's current research activities are delivered through the Communication Systems and Networks Group, forming a key component within Bristol's Smart Internet Lab. He has over 25 years of physical layer wireless research embracing the application of Spread Spectrum technology for cellular systems, adaptive or smart antenna for capacity and range extension in wireless networks, MIMO aided connectivity for through-put enhancement, Millimetre Wave technologies as well as flexible RF technologies for SDR modems underpins his current research portfolio.

Brian Collins, BSC Associates

Brian has designed antennas for applications including radio and TV broadcasting, base stations, handsets and consumer products, and has operated his own consultancy firm for the last 12 years. He has published more than 70 papers on antenna topics and contributed chapters to several recent textbooks. He operates a small consultancy company, chairs the Antenna Interface Standards Group and is an Honorary Visiting Professor in the School of Electronic Engineering and Computer Science at Queen Mary, University of London.

Diego Giancola, PA Consulting Group

Diego has spent his career in radio systems R&D and modem design in the wireless communication sector, from 2G to the latest 4G evolutions. His research interests lie in multi-antenna systems and novel signal processing and architectures for radio signals. He currently co-runs PA's signal processing team and leads the research activities in LTE evolution and 5G landscaping. Diego has a first degree in telecommunication engineering and a doctorate in electronics and communication engineering from Politecnico di Milano.

Peter Topham, Qualcomm Technologies International

Peter has more than 30 years' experience of RF and high-speed circuit design, taking chips into production ranging from FM Band II through cellular, Bluetooth and on to UWB at 10GHz. He has been with Qualcomm for 7 years, specialising in low-power RF design for portable and wearable products.

Profile of speakers

Steve Hayes, Technical Director, Element Materials Technology

Steve Hayes CEng, MIET - Steve is Technical Director with Element Materials Technology focusing on EMC and radio related topics, having served as General Manager for many years, responsible for running Element's EMC/wireless labs in the UK. Steve now supports the operational business through technical leadership in both the UK and US where Element has the majority of its test labs, in addition to running its advisory services (ESQ) offering providing support and guidance on compliance issues to Element customers. Steve is the current chair of the EMC Test Labs Association (EMCTLA) and past chair of the EU Association of Notified Bodies (EUANB) in addition to being an active member of the UK mirror committees of IEC/CISPR and convenor of CISPR/B/WG1, responsible for the content of CISPR 11/EN55011 covering Industrial, Scientific and Medical Equipment.

Dr Tamara Monti, Solution Consultant, Dassault Systemes/Simulia

Dr Tamara Monti earned her PhD degree in Electromagnetics from the Polytechnic University of Marche, Italy with a thesis about Near-Field Scanning Microwave Microscopy. She then joined the University of Nottingham for a 3-year post-doctoral appointment in the Microwave Processing Engineering group. She currently has 10 top 10% SNIP journal publications and she presented results to several international conferences. Tamara has been visiting scholar to Temple University, Trieste Synchrotron, University of Maryland and Oak Ridge National Laboratories. She joined CST UK in August 2017 and now she is Solution Consultant for Dassault Systemes.

Roger Ray, Technical Director, RN Electronics Ltd.

Roger has over 40 years' experience in the electronics industry including his role as Group Chief of Marconi Mobile Radio. Roger formed RN Electronics in 1986 as an RF design and consultancy business, mainly for wireless products. Through the 1990's he developed the business providing EMC testing to complement the wireless design and regulatory testing. RN Electronics has grown steadily since then to become one of the leading independent UKAS accredited test laboratories for EMC and Radio testing. Roger now splits his time between his interest in microwave amateur radio and supporting the business expansion in to providing testing services for the latest wireless technologies.

Mark Tyndall, Senior EMC Engineer, Eurofins York

To follow