

# EMCUK 2009 Training Sessions

**Tuesday 13th October 2009**

**Registration is from 08.30 for either Day.**

## **Electronic Fundamentals for Good EMC**

Presenters:

**Keith Armstrong**

Cherry Clough Consultants

&

**Tim Williams**

Elmac Services

- 09.10 - 10.30    **Shielding**  
Theory; Effect of apertures and seams; The slot-in-a-box model; Conductive gaskets; Conductive coatings; Using the shield as ground; Cable layout and large enclosures
- 10.30 - 11.10    **Coffee and Visit to Exhibition Stands**
- 11.10 - 12.30    **EMC Techniques for PCB Layout**  
Saving time and money; Segregation; Interface analysis, filtering, and suppression OV and power planes; Power supply decoupling; Transmission line techniques; Layer stacking; Some useful references
- 12.30 - 14.00    **Lunch and Visit to Exhibitions Stands**
- 14.00 - 15.20    **EMC in Circuit Design and in the selection of Active Components**  
Digital design for EMC; Analogue (not RF) design for EMC; Switch-mode design for EMC; Communication design for EMC; Optoisolator design for EMC; Checking device EMC characteristics; Some useful references
- 15.20 - 16.00    **Tea and visit to Exhibition Stands**
- 16.00 - 17.20    **Filtering and Cabling**  
Filter configuration; Components: capacitors and ferrites; I/O and mains filtering; Mode of propagation; Unscreened cables: using twisted pair; Screened cables - screen operation, transfer impedance & the effect of the connector; Transducer and communications interfaces

### **Who should attend:**

Design engineers of electronic products in all sectors (consumer, medical, industrial, military, transport, telecom) who have to meet high frequency EMC compliance requirements

### **Benefits:**

Delegates will hear from two of the most respected lecturers in the business. After attending this course, delegates will be able to review their designs with confidence in all aspects – mechanical drawings, PCB layouts and circuit schematics – for adherence to principles of minimum disturbance emissions and maximum interference immunity

**Wednesday 14th October 2009**

## **Basics of Emissions and Immunity Testing**

Presenter:

**Keith Armstrong**

Cherry Clough Consultants

### **Synopsis**

There are certain issues common to all emissions and immunity tests, that the test standards may not make very clear. If they are not understood, significant differences between test laboratories can result.

This morning's session describes these issues, and is intended for those new to commercial EMC testing.

- 09.10 - 10.30    **Making Emissions Measurements**
- 10.30 - 11.10    **Coffee and Visit to Exhibition Stands**
- 11.10 - 12.30    **Making Immunity Measurements**
- 12.30 - 14.00    **Lunch and Visit to Exhibitions Stands**

## **Immunity requirements related to design choices**

Presenter:

**Tim Williams**

Elmac Services

### **Synopsis:**

Immunity test requirements are standardized for many products, either under the EMC Directive or through product specifications, and even without standardized requirements, good EMC immunity is the hallmark of a well-designed product. Since immunity can only be verified through testing, a test plan should be drawn up at the start of each design; but how do circuit, PCB and mechanical design choices relate to this test plan?

This afternoon's session is aimed at electronic product design and development engineers, who need to be able to implement a design in the knowledge that, when it comes to the immunity tests, they have anticipated and allowed for the electromagnetic stresses that their product will undergo.

- 14.00 - 15.20    **RF Immunity**  
Immunity of analogue circuits, cable coupling at low frequencies; high-Z and low-Z common mode filtering; required common mode rejection; effect of circuit and cable resonances; radiated coupling to structures; layout, circuit bandwidth, shielding if necessary; RF immunity of digital circuits.
- 15.20 - 16.00    **Tea and visit to Exhibition Stands**
- 16.00 - 17.20    **Transient and LF Immunity**  
Immunity of digital circuits; ESD effects on edge-triggered signals; layout, filtering and decoupling; enclosure design to control ESD strikes; ESD protection of interfaces; integration with RF filtering; capacitive filtering for EFT/B; effectiveness of the ground reference for EFT/B; HF filtering of power supplies; surge protection of power supply and interfaces, integration with RF filtering; LF immunity: AC supplies - dips, interrupts, inrush current; DC supplies: same, plus overvoltage and reverse polarity protection.

*We reserve the right to make changes as required.*

# EMCUK Training Sessions 2009

13<sup>th</sup> & 14<sup>th</sup> October 2009

## Booking Form

Please complete your details on page 3 and tick below which Day/s you wish to attend.  
Note: These pages may be completed electronically or you can print & complete by hand.

Return completed pages 2 & 3 to Nutwood UK Ltd, at the address on page 3, or by fax to: 01208 850871 or by email: [registration@emcuk.co.uk](mailto:registration@emcuk.co.uk)

All fees include Lunch, Training Proceedings printed in colour, coffee and tea breaks. You will be issued with an attendance certificate. Entrance to the exhibition is Free, as is all Parking.

### Training Sessions/Fees

Tuesday 13th October - **Training Session Day 1**. Electronic Design Fundamentals.

Wednesday 14th October - **Training Session Day 2**. Basics of Emissions & Immunity Testing and Immunity requirements related to design choices.

#### Fees (per person)

	Cost	Total inc. VAT
One Day	£135.00	<b>£155.25</b>
Two Day	£240.00	<b>£276.00</b>

***The prices in red italics include VAT at 15% and are the total prices due.***

#### Cancellation Policy

All requests for cancellation refunds must be made in writing prior to the 30th September 2009.

No cancellations can be accepted after this date. A service fee of £25 plus VAT will apply per cancellation. Substitutions are permitted. The organisers reserve the right to change the programme and speakers at any time.

An EMC Academy Event



EMC Training for **Industry** by **Industry**

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Payment is required in Pounds Sterling in advance of the Conference and can be made by cheque made payable to Nutwood UK Ltd, Company Purchase Order or by credit card - **MasterCard or Visa only accepted.** A VAT invoice will be sent by return. ***Please use the prices shown overleaf in red italics.***

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