

A PI-Certified Competency and Training Center

EMC Awareness for Industrial Automation Systems

Section 511 “Compliance with Standards” of the 18th Edition of the **IET Requirements for Electrical Installations (BS7671)** states the following – “*The designer of the fixed installation shall verify that the installed equipment, where relevant, is designed and manufactured in accordance with the Electromagnetic Compatibility Regulations 2016 and, upon request, the responsible person for the fixed installation shall provide the required documentation as specified by the Electromagnetic Compatibility Regulations*”.

EMC and Industrial Automation

The fact that the installed equipment is designed and manufactured in accordance with the EMC Regulations does not guarantee that the Fixed Installation will be EMC compliant. It assumes that all equipment has been installed in line with the manufacturers installation guidelines. This is very often not the case and can often be proven to be the cause of intermittent outages.

This course is particularly targeted to those people / organisations that are involved in industrial automation and who need to conform to the **IEE Wiring Regulations (BS 7671)**. This one-day training course covers a topic that continues to bring many misconceptions and challenges for both experienced technicians and engineers alike. This course, which includes practical exercises and demonstrations, aims to provide key players with the knowledge to make informed decisions during the design, installation and commissioning phases and ensure reliability of associated industrial networks and control systems.

Who should attend this course?

This course is aimed at people with a conventional low frequency (50/60Hz) electrical background who are involved in the design, installation, commissioning or support of the following aspects of industrial automation systems:-

- Control Panels.
- Cable layout / Cable runs.
- Variable Speed Drives.
- PLC Communication Networks such as PROFIBUS and PROFINET.

What is covered in the course?

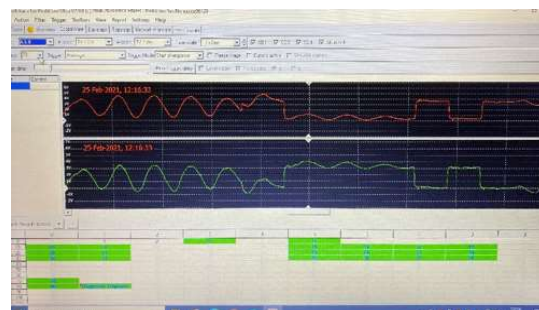
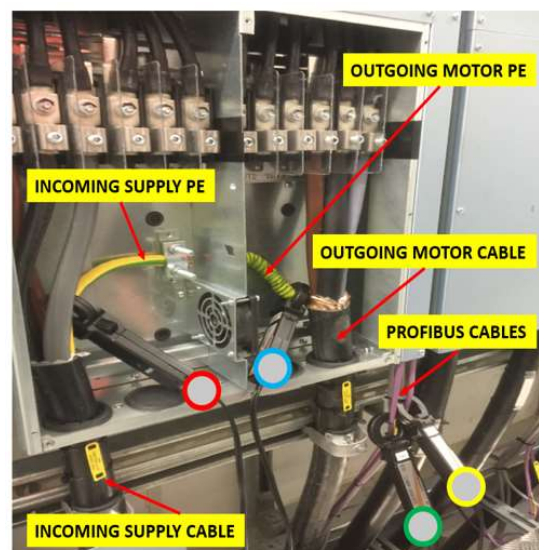
FUNDAMENTALS:

- Impedance – Resistance / Inductance / Capacitance.
- Frequency / Wavelength.

- Resonance.
- Differential Mode v Common Mode currents.
- Methods of Coupling.

EMC AND RELEVANT STANDARDS:

- BS 7671 (Sections 444 and 511).
- BS 6701, BS 61000-5-2, BS 50310 and BS 50174-2.



DRIVE-RELATED INTERFERENCE ON PROFIBUS

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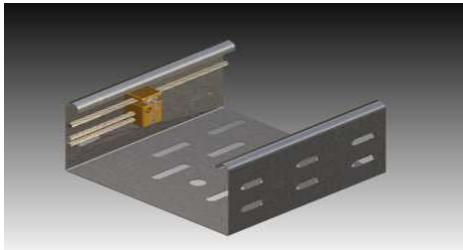
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LOW VOLTAGE DISTRIBUTION SYSTEMS & EMC

- TN-C, TN-S and others
- EMC considerations

EQUIPOTENTIAL BONDING TECHNIQUES:

- Bonding Straps v wires.
- Parallel Earth Conductors – wire / cable tray / conduit / armoured cable
- CBN / MESH-BN.
- Pragmatic improvements of existing bonding systems.



EMC TESTING AND EQUIPMENT:

- Oscilloscopes.
- Spectrum Analysers.
- Clamps and Probes.



CABLE SEGREGATION AND SHIELDING:

- Cable Segregation.
- Shielding Theory.
- Shielding Connection Techniques.
- EMC Glands.



ENCLOSURE (PANEL) DESIGN CONSIDERATIONS:

- Panel Layout (zoning).
- Internal Bonding.
- The use and purpose of a reference plane
- Potential issues associated with apertures.
- CE compliance of panels and devices inside them.



VARIABLE SPEED DRIVES:

- Basis of operation.
- Supply cabling / filtering / harmonics / Shielding / / Bearing Protection / Cable rating.
- Motor cabling / emissions / shielding.
- Common Problems.

INSTALLATION & OPERATIONAL QUALIFICATION:

- What to check and how to check it.
- IQ / OQ Documentation.



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Feedback from people that have attended this course



Dates and locations of our scheduled courses can be found on the training page of our web site -

https://controlspecialists.co.uk/support/industrial-network-support/training_courses/

For further information or to discuss the possibility of running this course at your premises for between 6 and 12 people, please contact:



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Other Courses by Control Specialists Ltd:

Control Specialists are accredited to deliver the following PI-certified training courses:-

- Certified PROFIBUS Installer
- Certified PROFIBUS Engineer
- Certified PROFIBUS System Designer

- Certified PROFINET Installer
- Certified PROFINET Engineer

Non-certified Courses

- PROFIBUS Commissioning & Maintenance
- PROFINET Commissioning & Maintenance
- CANOpen Commissioning & Maintenance.
- ASi Commissioning & Maintenance.
- PID Loop Optimisation