EMC Testing of Railway Applications

In Accordance with BS EN50121

Introduction

With the increasing introduction of high powered electronic equipment, together with complex micro controllers and a multitude of other electronic devices being installed on trains and other rail vehicles, Electro Magnetic Compatibility within the rail environment has become a critical issue in every aspect of the design and implementation of train and rail-associated apparatus. This has subsequently led to the mandatory requirement that all new railway applications, including stock (e.g. a single commercial railway unit), traction stock (e.g. electric and diesel locomotives etc), hauled stock (e.g. independent passenger coaches and freight wagons), main-line vehicles (e.g. high speed trains, freight trains etc designed to operate between cities) and urban vehicles (e.g. underground train sets, trams, LRVs etc.), must be tested for, amongst other things, compliance to the European and British Standard, (BS) EN 50121.

The directive EN 50121 addresses the three main aspects of the railway system that EMC concerns; the effect of the railway system on the surrounding environment; the effect of the railway system on signalling and communications equipment; and the ability of railway equipment and related apparatus to remain unaffected by the inherently severe environment within which it is intended to operate. It is further stated that the infrastructure controller and the train/rolling stock operator must take all reasonable measures to ensure that their actions and equipment do not compromise reliability due to EMI, under normal operating procedures.

To ensure that these issues are satisfied, and to help alleviate the concern of Health and Safety in an increasingly hazardous environment, it is now imperative that any newly introduced rail vehicle and associated equipment is tested to ensure that both the electromagnetic emissions and the level of immunity to external EMI are within the specified limits. This EMC testing now forms a compulsory part of the assessment undertaken by the small number of Vehicle Acceptance Bodies, within the UK, that approve all applicable equipment suitable for use on the nation's extensive rail network.

Rail Related EMC Services

EMC Solutions' services include the pre-compliance testing of the electromagnetic compatibility of Rolling Stock (Train and complete vehicle), and electromagnetic compatibility of Rolling Stock (Apparatus), EN50121-3-1 and EN50121-3-2 respectively, encompassed by the overall product specification of EN 50121, to the standards required by VABs to authorise the vehicle or equipment's suitability for use on the railway. These specifications can be suitably interpreted and adapted by our fully qualified engineers to enable their application to any relevant item of rail-associated equipment.

Tests Required to Satisfy EN 50121

The individual tests that form constituent parts of EN 50121, conducted by EMC Solutions to ensure compliance to the aforementioned standard, usually include the following elements, (dependant on the type of vehicle or rail-enabled system under test);

SPECIFICATIONS:	EN55011 Class B	Radiated Emissions
(If appropriate)	EN61000 - 4 - 6 Level 4	Conducted Immunity
	EN61000 - 4 - 4 Level 4	Immunity to Fast Transient Bursts
	EN61000 - 4 - 2 Level 4	Immunity to Electrostatic Discharge
	EN61000 - 4 - 3	Immunity to Radiated Fields

EMC Solutions Ltd
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Advice and Consultancy Service

Since the comprehensive implementation of EN 50121 in April 2000, EMC Solutions have worked with a number of different companies and clients, including VABs, vehicle manufacturers, and plant hire companies, etc. to test and approve a wide range of vehicles, which has subsequently provided us with a wealth of experience in this specialised field. EMC testing has been undertaken on vehicles such as; road/rail conversions; lighting rigs; JCB's; Unimogs; inspection vehicles; and other various brands and types of specialised vehicle. EMC Solutions is therefore able to offer a comprehensive and thorough service regardless of equipment size and type.

Having over 40 years of experience in the EMC industry, in a wide range of fields and applications, enables us to provide solutions to any EMC-related problems that may arise following testing, ensuring that all apparatus can ultimately be modified or adjusted to comply with EN 50121, and therefore satisfy the EMC components of the VAB's, or appropriate body's, assessment of the equipment's suitability for use on the railway.

Our Flexibility to Client's Needs

EMC Solutions' engineers are available to test both in-house at our suitably equipped facilities in the West Midlands, or, taking advantage of our wide range of portable test equipment, on-site at a customer's desired location.
We are conveniently located near Birmingham International Train Station and Birmingham Airport, and are serviced by several major motorways. With equipment, facilities, accreditations and proven results in Commercial, Military and International EMC testing, EMC Solutions provide a personalised service suitably tailored to each client's individual needs, to a level which is unrivalled within the industry.

On-Site Testing

Testing at EMC Solutions

On-Site Testing

In addition to the standard range of filters & power supplies, and testing, EMC Solutions Ltd specialize in the design and manufacture of filters to suit your specific requirements.
Due to continuous development EMC Solutions Ltd reserve the right to amend any information contained within this datasheet without prior notice.

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