



Specification for Overlay Miniature Stop Light Level Crossing Systems

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1 Scope

The product requirements herein apply to Overlay MSL type of level crossing.

The Overlay MSL is designed to be a cost effective and safe level crossing system using red and green light indications. It may be installed at level crossing sites designated as User Worked Crossings, Bridleways and Footpaths.

The product is designed to provide protection to the right of way user by means of red and green lights plus an audible warning. The product has provision to interact with Power Operated Gate Opener equipment. It does not have the ability to interact with any other signalling systems.

The equipment is design to be independent of all other signalling infrastructure, therefore it is only suitable for simple configurations of railway.

This document specifies the product acceptance criteria for the Overlay Miniature Stop Light system for use at user worked, footpath and bridleway level crossings.

2 Normative references

The following referenced documents are indispensable for the application of this specification. For dated references, only the edition cited applies. For undated references, the latest edition of the reference (including any amendments) applies.

[1]	NR/L2/RSE/100/05 – Product introduction and change, Issue 1 3 rd December 2011
[2]	BS EN 50126:1999 Railway Applications – The Specification and Demonstration of Dependability – Reliability, Availability, Maintainability and Safety.
[3]	pr EN 50617 Part 2 Railways applications – Basic parameters of train detection systems – Axle counters
[4]	BS EN 50128: 2011 Railway Applications – Software for Railway Control and Protection Systems,
[5]	BS EN 50129: 2003 Railway Applications – Safety Related Electronics Systems for Signalling,
[6]	BS EN 50125-3 Railway Applications – Environmental conditions for Signalling and Telecommunications Equipment.
[7]	BS EN 50124-1:2001+A2:2005 Railway applications – Insulation coordination. Basic requirements. Clearances and creepage distances for all electrical and electronic equipment
[8]	BS EN 50121-1:2000 Railway Applications – Electromagnetic Compatibility – general emission and immunity of the signalling and telecommunications Apparatus.
[9]	BS EN 50121-4:2000 Railway Applications – Electromagnetic Compatibility – part 4 2000
[10]	93/68/EEC CE Conformity assessment procedures and markings July 1993
[11]	NR/L2/SIG/30027 Product Specification for Plug Couplers for Connection of Cables to Lineside Signalling Equipment
[12]	GE/RT8015 – Electromagnetic Compatibility between Railway Infrastructure and

	Trains, Issue 1 October 2002
[13]	Not used
[14]	GM/RT2466 – Railway Group Standard, Wheel Sets, Issue 3, November 2011
[15]	BS EN 12368(2006) – Traffic Control Equipment, Signal Heads
[16]	NR/L2/SIG/11201/Mod X02 - Level Crossing Common Design Requirements, Issue 2, June 2012
[17]	RT3170/9 Guide To Track Safety, Issue 9, June 2013
[18]	BS EN 50122-1:2011+A1 “Railway Applications – Fixed Installations – Electrical Safety, earthing and the return circuit: Part 1 Protective provision against electric shock”
[19]	BS EN 50122-2:2010 “Railway Applications – Fixed Installations – Electrical Safety earthing and the return circuit Part 2 Provisions against the effects of stray currents caused by d.c. traction systems”
[20]	BS EN 50122-3:2010 “Railway Applications – Fixed Installations – Electrical Safety, earthing and the return circuit: Part 3 Mutual Interaction of a.c. and d.c. traction systems”
[21]	NR/L2/SIG/11201 ModX39 – System Application Specification for Overlay Miniature Stop Light Level Crossings

3 Terms and definitions

Term	Definition
Another Train Coming	This is a feature of the warning given to the user that the warning has been extended due to the approach of another train before the warning being terminated for the previous train has left the level crossing area.
Bi-directional Control	This is a control provision to operate the level crossing system for trains that can approach the crossing in the “reverse” direction, whether they are signalled moves or not.
Common Safety Methods	European Union Commission Regulation 402/2013 “Common Safety Method for risk evaluation and assessment”
Dark Mode	This term means that lights within the user visual warning indications are extinguished and the audible warning is silenced due to a system failure or expiration of the level crossing approach timer. Where an “On Demand” facility is provided the operating buttons shall be extinguished.
Fixed Monitoring Point	This is a staffed facility used by the Network Rail maintenance function and is responsible for implementing actions to resolve failure of operational equipment.
Level Crossing Area	This is defined as the usable area between the entrance and exit of the level crossing gates including the crossing deck.

Term	Definition
Miniature Stop Lights	These are the conventional visual indication given to the user to indicate that a train is approaching. The two visual indications are Red (which indicates it is not safe to cross the railway) and Green (to signify that it is safe to cross the railway).
Minimum User Warning Time	This is defined as the time interval between strike-in of the train and arrival at the crossing, as achieved by a train travelling at the constant maximum line speed.
On Demand	This is a mode of operation that may be specified in order to minimise power consumption or environmental impact of the level crossing system. Under this mode, the User is required to interact with the level crossing system in order to restore the user indications. This interaction is required when, after a period of inactivity, the level crossing warning indications are suppressed and the user wishes to cross the railway. The indication that interaction is required is shown by illumination of the button that the user must press in order to restore the user indications. When interaction is not required, the button is not illuminated.
Operator	This is the person responsible for supervising the train movements within the area the level crossing resides. This definition includes the current post of Signaller.
Power Failure	The primary electrical power to the level crossing equipment has been lost.
Power Source	The input of power to the Level Crossing System. This may be derived from a Distribution Network Operator, a fixed installation from the railway infrastructure, or a renewable energy source.
Product Acceptance	The acceptance of the equipment for use on the infrastructure by Network Rail, specifically the granting of an Acceptance Certificate. The process is mandated and described in standard NR/L2/RSE/100/05 [1].
Strike-in	Position of the leading wheels at the front of the train when it is travelling towards the level crossing and initiates the warning time. Note that "Another Train Coming" feature is required and the Warning Time may not commence at the exact time of strike-in.
Strike-out	Position of the last wheels at the rear of the train when it is travelling away from the level crossing, at which time the level crossing stops the warning time.

Term	Definition
Safe to cross	Positive indication that, at the time it is given, the user has sufficient time to cross from the decision point at commencement to a position of safety at the end of crossing the railway. The indication is rescinded when the warning time starts, and is replaced with Not safe to cross indication. Safe to cross indication is restored when there are no trains approaching the level crossing, and all trains that initiated the Warning Time have struck out.
Train Detection Equipment	The devices used to detect the train at and between the Strike-in and Strike-out positions. The components include the train detection trackside equipment, and any evaluation processing equipment specifically used to determine where the train is in relation to level crossing controls.
User	The User is defined as the person (pedestrian, driver or rider) that is required to cross the railway at the level crossing. Users are deemed to be capable of understanding the warning (audible and visual) and any signage at the level crossing.
User Worked Crossing	A specific type of private railway crossing whereby the person crossing the line is responsible for using the protection provided in accordance with the instructions displayed at the crossing.
Warning Time	The time interval between the first warning indication to the user and the train arriving at the level crossing.

Table 1 – Terms

Abbreviation	Description
ARTMAX	Maximum Active Repair Time
ARTMEAN	Mean Active Repair Time
CE mark	<i>Conformité Européenne</i> (Mandatory Conformity marking)
FMEA	Failure Mode and Effects Analysis
LED	Light Emitting Diode
MSL	Miniature Stop Lights
PDF	Portable Document Format
SI	<i>Système International d'Unités</i> (International System of Units – Metric)

Table 2 – Abbreviations