Performance Specification for Nearside Signal and Demand Unit
TR 2511 A

PERFORMANCE SPECIFICATION FOR NEARSIDE SIGNAL AND DEMAND UNIT

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1 INTRODUCTION

1.1 This specification covers the essential requirements for Nearside Signals and Demand Units for use with signal controlled pedestrian, cycle and equestrian crossings on All-purpose roads.

1.2 This specification supersedes TR 2181C from the date of issue and the approval process described therein.

1.3 As a statutory requirement, equipment manufactured according to this specification must be approved before its use is permitted on the public highway.

1.4 Statutory Approval (Approval) shall be in accordance with the requirements for Self-Certification set out in TRG 0600.

1.5 Within this specification, “The Product” shall mean all components necessary to provide a complete operational system meeting the requirements of this specification and the Common Requirements defined in TRG 0600.

1.6 Guidance to potential users of this Product is given in Appendix A.

Implementation

1.7 This specification will be immediately implemented from the date of issue for all new approvals.

1.8 Equipment Approvals for this product issued under the previous procedures defined in TRG 0500 will remain valid and no retrospective action will be required providing the build state of that equipment remains unmodified.

Glossary of Terms

1.9 A comprehensive glossary of terms is given in Highways Agency document TA 84 Code of Practice for Traffic Control and Information Systems for All-Purpose Roads.
2 FUNCTIONAL REQUIREMENTS

General

2.1 This specification defines the requirements for the Puffin, Toucan and Equestrian Nearside Signal and Demand Unit.

2.2 The product allows pedestrians, cyclists and equestrians to register a demand to cross the carriageway, indicate the demand has been registered, and the appropriate period to cross by displaying internally illuminated red and green signals.

2.3 The Product shall function in accordance with this specification when connected to an Approved Traffic Signal controller.

Performance

2.4 The requirements of signal intensity for safety of BS 7987 shall be complied with. For signals this is class AF1.

2.5 The Product shall comply with the requirements of BS EN 60825-1.

2.6 The light visible from the Product shall be at full brightness when the input voltage is greater than 75% of the nominal supply voltage.

2.7 The light visible from the Product shall be dimmed (see 2.39) when the input voltage is between 50% and 75% of the nominal supply voltage.

2.8 For signals which are required to be “OFF” e.g. Green, shall be considered “OFF” if the voltage on the output of the controller is less than 20% of the full rated output voltage.

Physical Requirements

2.9 For Zebra, Pelican and Puffin Pedestrian Crossings, the dimensions and layout of the front of the Product shall be in accordance with The Zebra, Pelican and Puffin Pedestrian Crossings Regulations and General Directions 1997.

2.10 For Toucan and Equestrian crossings, the dimensions and layout of the front of the Product shall be in accordance with The Traffic Signs Regulations and Directions 2002.

2.11 A means of inserting a demand shall be provided. This shall fit into an area of between 225mm² and 360mm², and be circular, square or rectangular in shape.

2.12 The device in 2.11 shall have an in service life of a minimum of 1x10⁶ operations.

2.13 It shall be a design requirement for the device in 2.11, to minimise the risk of jamming by any cause, including foreign objects, moisture or the effects of corrosion.

2.14 An internally illuminated “call accepted” indicator shall be red and shall be provided around, within or adjacent to the device in 2.11. The call accepted indicator shall be visible to pedestrians, cyclists and equestrians to show that the demand has been registered. The optical performance of this indicator is detailed in 2.40.

Construction

2.15 The face of the Product shall be impact-resistant in accordance with BS-EN 50102.
2.16 Means shall be provided for securely fixing the housing to the signal pole. Access to the fixing shall only be available from inside the housing.

2.17 Means shall be provided to permit access to the housing to facilitate the installation and termination of electrical cables and for maintenance purposes.

2.18 Access to the interior of the housing shall be secured by a T key or by other means as agreed with the purchaser.

2.19 The colour of the Product shall be in accordance with the regulations.

2.20 There shall be space available within the base of the Product to incorporate both an audible and tactile device (to TR 2509 and TR 2508 respectively).

2.21 The product shall be designed such that when correctly fitted, it can be sealed to prevent the ingress of moisture.

2.22 All exposed parts shall be easily replaceable if damaged.

2.23 All internal components shall be capable of being replaced without the need for specialist tools.

2.24 All external corners and edges of the housing, in excess of 40 mm, excluding lower edges, shall be rounded to at least 4 mm radius and all other external edges shall have a radius of at least 1.5 mm.

2.25 The Product’s housing located within the signal head, shall be tested to BS EN 60529 IP55.

2.26 The Product manufactured to this specification shall be designed to have a minimum in-service life of 15 years with suitable maintenance.

**Electrical Requirements**

2.27 The Product shall operate on a voltage no greater than the Extra Low Voltage as defined in BS7671.

2.28 No voltage in excess of Extra Low Voltage supply shall be permitted in the Product.

2.29 All wiring, termination, earthing and labelling shall be in accordance with BS 7671.

**Optical Performance Requirements**

2.30 The Product shall meet the specified limits for the following:

i) Luminous Intensity (Refer to 2.31);

ii) Luminance Uniformity (refer to 2.34);

iii) Chromaticity (refer to 2.37);

iv) Sun Phantom Ratio (refer to 2.38).

**Luminous Intensity Values**

2.31 The minimum luminous intensity distribution of the light output from the red and green signals shall be in accordance with the appropriate table.

i) Pedestrian signals Table 2.2;

ii) Toucan signals Table 2.3;

iii) Equestrian signals Table 2.4.

2.32 The on-axis luminous intensity value shall not exceed 50 cd.

2.33 The luminous intensity beyond ±60° from the reference axis in the horizontal plane shall be less than 3cd for pictogram figures.
Luminance Uniformity

2.34 Each Product shall present a uniform appearance, free from excessively bright spots or sectors over the whole area of the signal face when viewed from any angle within the appropriate Product luminous intensity table.

2.35 The light intensity between each point specified within the appropriate Product luminous intensity table and Table 2.1. Chromaticity limits for red and green colours shall be continuous and vary smoothly with each change of angle.

2.36 The red and green pictogram signal combination shall have a luminance uniformity of 4:1 or better. Luminance measurements shall be taken within a 3 mm diameter circular area, on axis, to within 1 mm of the edges of the entire area of the figure. The ratio of the highest to the lowest reading obtained shall be used to calculate uniformity.

Chromaticity

2.37 The chromaticity of the figures shall be within the limits specified in table Table 2.1 when measured on axis at full intensity and when dimmed (refer to 2.39).

Sun Phantom

2.38 Phantom intensity when measured on axis under simulated solar illumination of 40,000 Lux at 10° above the axis shall be greater than 3:1.

Dimming Facility

2.39 The Product shall be capable of being dimmed to within the range of 15-25% of full light intensity. When the intensity and remain compliant with the requirements for optical performance.

Call Accepted Indicator

2.40 The internally illuminated “call accepted” indicator as described in 2.14 shall have a minimum intensity of 1cd on axis and shall be visible over the distribution range specified in each Product type luminous intensity table when on.
### Table 2.1
Chromaticity Limits for Red and Green Colours

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<thead>
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<th>Colour</th>
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<th>3</th>
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<tr>
<td></td>
<td>x</td>
<td>y</td>
<td>x</td>
<td>y</td>
</tr>
<tr>
<td>Red</td>
<td>0.660</td>
<td>0.320</td>
<td>0.680</td>
<td>0.320</td>
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<tr>
<td>Green</td>
<td>0.009</td>
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### Table 2.2
Minimum values of luminous intensity (cd) - Red and Green Pedestrian Figures

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<td>12</td>
<td>8</td>
<td>5</td>
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### Table 2.3
Minimum values of luminous intensity (cd) - Red and Green Toucan Combinations
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</table>

Table 2.4
Minimum values of luminous intensity (cd) - Red and Green Equestrian Figures
3 NORMATIVE REFERENCES

General

3.1 Where undated references are listed, the latest edition of the publication applies.

Working Drawings

3.2 Working Drawings are available from:

Department for Transport
Great Minster House
76 Marsham Street
LONDON
SW1P 4DR

- Bicycle Drawing No: S24.
- Green Man Drawing No: P4002 3 of 3
- Horse and Mount Drawing No: S8
- Red Man Drawing No: P4002 2 of 3

British Standards

3.3 British Standards are published by the British Standards Institution, London.

Contact: +44 (0) 1344 404 429
BS 7671 Requirements for Electrical Installations
BS EN 12368 Traffic Signals
BS EN 50102 Degrees of protection provided by enclosures for electrical equipment against mechanical impacts (IP code).
BS EN 50293 Electromagnetic Compatibility Road Traffic Signal Systems Product Standard
BS EN 60825–1 Safety of Laser Products

Specifications

3.4 Specifications are published by the Highways Agency.

Contact: +44 (0) 117 372 8300
Email: tss_plans_registry@highways.gsi.gov.uk
WEB address: www.tssplansregistery.org

TR 2130 Environmental Tests for Motorway Communications Equipment and Portable and Permanent Traffic Control Equipment
TR 2508 Performance Specification for Tactile equipment
TR 2509  Performance Specification for Audible Unit for use at Pedestrian Crossings
TR 2523  Traffic Signal Equipment Interface Specification
TRG 0600 Self-Certification and Approval of Equipments for the Control of Vehicular and Pedestrian Traffic on Roads

Other Publications

TSRGD  The Traffic Signs Regulations and General Directions
ZPPRGD  The Zebra, Pelican and Puffin Pedestrian Crossings Regulations and General Directions.
4  HISTORY

TR 2181    Issue C    July 2001
TR 2511    Issue A    July 2005

Approval of this document for publication is given by the undersigned

Traffic Signals and Road Lighting Safety
Zone 2/17E
Temple Quay House
2 The Square
Temple Quay
Bristol
BS1 6HA

Mike Smith
Team Manager
Traffic Signals and Road Lighting Safety
APPENDIX A INFORMATIVE GUIDE

General

A1 This Appendix is an informative guide to Systems Integrators and Highways Authorities who wish to purchase / hirer and use Nearside units for use at Pedestrian, Toucan or equestrian Crossings, that has been declared conformant to this specification. Prospective purchasers/hirers should ensure that the procurement contract address the following issues.

A2 The Procurement Contract should ensure that the enclosure housing the Product’s electronic circuitry is constructed of materials that will withstand the rigours of the environment in which it is intended to operate.

Connections

A3 The Procurement Contract should ensure that all connections to the Product are such, that the unit can be easily removed from its installed position by an authorised maintenance staff.

Marking and Labelling

A4 The Procurement Contract should ensure that all connections have be clearly identified and that the Product displays a label showing the Following:

i) The unique product identity number and serial number;

ii) The HA Specification and associated Appendix against which it has been declared compliant;

iii) The electrical supply requirements of the Product.