

# TOPAS

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## Traffic Open Products and Specifications

### **TOPAS 2511A**

#### *Performance Specification for Nearside Signal and Demand Unit*

<b>Revision</b>	<b>Date</b>	<b>Scope</b>	<b>Authorised by</b>
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# TOPAS 2511A

## PERFORMANCE SPECIFICATION FOR NEARSIDE SIGNAL AND DEMAND UNIT

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### Corrigendum 9/12/24

Amendment to 15-38% range for dim at Clause 2.39 (previously 15-25%)

Clarification of requirements for evidence for optical testing – note at Clause 2.39

Updated references for legislation in Section 3 and clause 2.4

Updated Appendix Z – no content change

# 1 INTRODUCTION

- 1.1 This TOPAS specification covers the requirements for Nearside Signals and Demand Units for use with signal controlled pedestrian, cycle and equestrian crossings on All-purpose roads.
- 1.2 TOPAS specifications are explicitly purchasing specifications and compliance with them is not mandatory. However Local and other Purchasing Authorities may typically require that equipment purchased complies with TOPAS specifications and is TOPAS registered.
- 1.3 Manufactures may register products as being compliant with this specification, using the process defined in TOPAS 0600.
- 1.4 TOPAS Registration requires manufactures submit a Technical File to an appropriate Technical Assessor to aid compliance verification. The content requirement for the Technical File is defined in Appendix Z of this specification.
- 1.5 Guidance to potential users of this Product is given in Appendix A.

## ***Implementation***

- 1.6 This specification implements requirements as originally defined in HA specification TR2511A. Product Approvals to TR2511A may be used to Register Products to this specification as defined in TOPAS 0600.
- 1.7 This specification will be immediately implemented from the date of issue for all new TOPAS Registrations.

## ***Glossary of Terms***

- 1.8 A comprehensive glossary of terms and abbreviations may be found in the Institute of Highway Engineers guidance note "Traffic Control and Information systems".
- 1.9 TOPAS terms are defined in TOPAS 0600 and TOPAS 0601

## 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 EN 50556 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.
- 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.
- 2.11 A means of inserting a demand shall be provided. This shall fit into an area of between 225mm<sup>2</sup> and 360mm<sup>2</sup>, 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 1x10<sup>6</sup> 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 TOPAS 2509 and TOPAS 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, excepting 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  $\pm 60^\circ$  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 15-38% of full light intensity. When the intensity and remain compliant with the requirements for optical performance.

NOTE : Optical test reports included in the technical file shall include the measured values of on-axis bright light output; the voltage applied to achieve bright; the measured values of on-axis dimmed light output; the voltage applied to achieve this dimming; the calculated dimming ratio.

### **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.

Colour	1		2		3		4	
	x	y	x	y	x	y	x	y
Red	0.660	0.320	0.680	0.320	0.710	0.290	0.690	0.290
Green	0.009	0.720	0.284	0.520	<b>0.209</b>	0.400	0.028	0.400

Table 2.1

Chromaticity Limits for Red and Green Colours

Horizontal \ Vertical	0°	±10°	± 20°	±35°
	+10°	13	12	8
0°	16	13	10	6
-10°	13	12	8	5
-20°	9	8.5	5	4
-30°	6	5	4	3
-40°	3.5	3.5	3	3

Table 2.2

Minimum values of luminous intensity (cd) - Red and Green Pedestrian Figures

Horizontal \ Vertical	0°	±10°	± 15°	±35°
	+10°	13	12	8
0°	16	13	10	6
-10°	13	12	8	5
-20°	9	8.5	5	4
-30°	6	5	4	3

Table 2.3

Minimum values of luminous intensity (cd) - Red and Green Toucan Combinations



Vertical \ Horizontal	0°	±10°	±15°
	+10°	13	12
0°	16	13	10
-10°	13	12	8
-20°	9	8.5	5
-30°	6	5	4
-40°	3.5	3.5	3

Table 2.4

Minimum values of luminous intensity (cd) - Red and Green Equestrian Figures

## 3 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.

BS 7671	Requirements for Electrical Installations
BS EN 12368	Signal Heads
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
BS 50556	Road Traffic Signal Systems

### Specifications

3.4 TOPAS Limited Specifications are available from [www.topasgroup.org.uk](http://www.topasgroup.org.uk)

### Other Publications

TSRGD	The Traffic Signs Regulations and General Directions
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## **APPENDIX A - INFORMATIVE GUIDE**

### **General**

A1 This Appendix is an informative guide to Systems Integrators and Highways Authorities who wish to purchase / hire 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 TOPAS Specification and associated Appendices (if applicable) against which it has been Registered;
- iii) The electrical supply requirements of the Product.

## APPENDIX Z TECHNICAL FILE CONTENT

This appendix defines the necessary content for a Technical File (a collection of relevant documents) which must be reviewed by an appropriate Technical Assessor as part of the TOPAS Registration process (See TOPAS 0600).

The 'ticked' items are required to be present in a Technical File used to support TOPAS Registration against TOPAS 2511A. **Please read the description criteria carefully.**

<i>Ref</i>	<i>Item</i>	<i>Description</i>	<i>Required</i>
1	Overview document	A summary document outlining the product, specifying which TOPAS and other relevant specification(s) the product has been designed to comply with, together with a detailed table of contents for the Technical File.  Where external certificates or documents are referred to these shall be included either:  (a) within this overview document; or  (b) supplied separately as part of this Technical File.	✓
2	QA accreditation certificate(s)	A copy of the Quality Management Registration Certificates for the organisation applying for TOPAS Product Registration.	✓
3	Details of all required standards and regulations including CE/CA requirements that apply to the Product	A list of all standards to be complied with.  Including explicit CE/CA declarations of performance/conformity for those standards, including all certificates, shall be included in this Technical File.	✓
4	A functional design description of the product	Title, document number, version and date of the overall System Design Document for the Product.	✓
5	Product part numbers	A list of top-level assembly part numbers and their issue states including all firmware / software part numbers and issues.	✓
6	Statement of Compliance	A clause-by-clause statement of compliance against TOPAS 2511A confirming compliance or non-compliance and referencing supporting evidence.  (An example template can be found on the TOPAS website)	✓

7	Functional test procedures and results	A list of all functional test schedules and test result documents (by document number and issue) that substantiate the Statement of Compliance.	✓
8	BS EN 50293 EMC test procedures and results	(a) Title, document number, version and date of the EMC test performance requirement document. Copies of the results of EMC testing undertaken by an appropriately qualified independent approved test house <u>must</u> be included in the Technical File.	✓
9	Optical test procedures and results required by this specification	For all products which have any defined optical performance requirements (a) Title, document number, version and date of the optical test performance requirement document. Copies of the results of optical testing undertaken by an appropriately qualified independent approved test house <u>must</u> be included in the Technical File.	✓
10	Environmental test results	(a) A list of relevant Environmental tests performance requirements defined in TOPAS 2130. Copies of the results of the Environmental testing undertaken by an appropriately qualified independent approved test house <u>must</u> be included in the Technical File.	✓
11	Radio Equipment Regulations test results	For all products which include any transmitting and/or receiving radio equipment (a) A copy of the RER Declaration Of Conformity (b) Reference to the RER Technical Documentation for the product (by title, document number and version). (c) Copies of the results of radio testing, undertaken by an appropriately qualified independent approved test house <u>must</u> be included in the Technical File. The test results should be those identified in the RER Technical Documentation and should cover any specific IR2030 requirements for the type of radio used. A copy of the Type Examination Certificate for radio equipment not covered by a Designated EN standard.	N/A
12	Primary Safety Test procedure and results	For Traffic signal Control equipment only: (a) The title, document number, version and date of the Primary Safety Test schedule. (b) A copy of the test results must be included as part of the Technical File.	N/A

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13	Failure Mode Analysis	For Traffic signal Control equipment only Title, document number, version and date of the product failure mode analysis requirements and results.	N/A
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