

TOPAS

Traffic Open Products and Specifications

TOPAS 2542A

Performance Specification for Non-Contact Pedestrian Signal Demand Equipment

Revision	Date	Scope	Authorised by
A	25/2/21	Final	Board

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TOPAS 2542A

PERFORMANCE SPECIFICATION FOR NON CONTACT PEDESTRIAN SIGNAL DEMAND EQUIPMENT

CHANGE LOG

Specification first issue so no change log entries.

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1 INTRODUCTION

1.1 This performance specification covers the necessary requirements for equipment used in conjunction with traffic pedestrian equipment, to provide facilities which insert pedestrian demands, without the need to physically press the standard pedestrian demand push button.

Note. Throughout this specification the term 'pedestrian' refers to all types of non-vehicle users, including cyclists and equestrians.

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 Manufacturers may register products as being compliant with this specification, using the process defined in TOPAS 0600.

1.4 TOPAS registration requires manufacturers 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 Within this specification, "The Product" shall mean all components necessary to provide a complete operational unit meeting the requirements of this specification and the common requirements defined in TOPAS0600.

Implementation

1.6 This specification will be immediately implemented from the date of issue for all new TOPAS Registrations.

Glossary of Terms and Abbreviations

1.7 A comprehensive glossary of terms and abbreviations may be found in the Institute of Highway Engineers guidance note "Traffic Control and Information systems".

TOPAS Terms are defined in TOPAS 0600 and TOPAS 0601.

2 FUNCTIONAL REQUIREMENTS

General

2.1 The Products defined in this specification are used to provide a supplementary method of inserting a pedestrian demand at signalled crossings, specifically without the need for users to make physical contact with any part of the pedestrian demand or display unit.

2.2 For safety reasons Products are explicitly not permitted to provide any indication of right-of-way.

Note The right of way indication is controlled by a traffic signal controller compliant with TOPAS 2500.

2.3 For safety reasons Products are explicitly not permitted to issue any sounds which may be confused with the standard audible right-of-way indications provided by pedestrian demand or display units.

2.4 For safety reasons Products are explicitly not permitted to internally generate voltages in excess of ELV.

2.5 Products may be retrofitted to existing pedestrian demand or display units or incorporated into the units during manufacture.

2.6 Products shall not alter the appearance of pedestrian demand or display units, such that they are no longer compliant with the requirements of TSRGD.

Operation

2.7 Where the Product uses gestures (such as moving a hand near the Pedestrian demand or display unit) a demand shall be applied and removed, constrained by the following conditions:

- a) The Product must respond to objects creating a gesture with a presented surface area of 35 cm² or greater.
- b) A gesture must be detected when presented within 20mm to 200mm from the pedestrian unit.
- c) A gesture may be detected when presented within 0mm to 20 or 200mm to 300mm from the pedestrian unit.
- d) A gesture shall not be detected when presented further than 300mm from the pedestrian unit.
- e) The gesture has been present for 1 second. Gestures of less than 0.5 second duration are to be ignored.
- f) The demand shall be removed within 1 second of the gesture falling outside of the may detect range.

Note. The must and may detect zones are shown graphically in Appendix A

2.8 Where the Product uses a remote activation device (such as a mobile phone), a demand shall be inserted and cancelled, constrained by the following conditions:

- a) The demand has been actively requested by the user and has not been generated merely by the transmitter being in vicinity of the pedestrian unit.
- b) The must detect range between the transmitter and the pedestrian unit shall be 0m to 2.0m.
- c) The may detect range between the transmitter and the pedestrian unit shall be 2.0m to 4.0m

- d) Demands originating from remote activation devices at ranges of greater than 4.0m shall be ignored.
- e) The remote activation has been present for between 0.5 and 1 second.
- f) The demand shall be removed within 1 second of the remote activation being removed.

2.9 The Product shall not activate pedestrian demand inputs other than the one intended and shall not respond to extraneous transmissions, for example from passing vehicles.

Note: For the purposes of testing it can be assumed that pedestrian demand or display units are positioned no closer than 1.5m to each other.

Interfaces – Electrical

2.10 The Product shall be capable of being powered by standard 24V AC and 24V DC detector supplies provided by TOPAS 2500 compliant controllers, as defined in TOPAS 2523.

Note. DC supplies may be negative or positive with respect to earth.

2.11 Where 24V supplies are brought into any pedestrian demand or display unit, the cables and connectors used shall ensure that faulty wiring, caused for example by a poor or disconnected joint, does not expose the 24V supply, allowing it to potentially come into contact with any pedestrian signal connection within the unit.

Note. The use of female connectors for the power source are considered sufficient to meet this requirement.

2.12 No connection shall be made to any pedestrian indicator signal, including the red symbol, green symbol, demand accepted indicator, audible or tactile unit drives.

2.13 In the absence of power the product shall insert a permanent pedestrian demand via the demand insertion interface defined in sections 2.14 to 2.16.

Interfaces – Demand Insertion

2.14 The means to insert the demands shall be volt free and meet the requirements of TOPAS 2523 – Parallel Output Interface.

2.15 When inserted a demand shall exist for a minimum of 200 milliseconds.

2.16 Insertion of demands may be via an independent input to the controller or via a connection in parallel with the standard pushbutton within the pedestrian demand unit.

Note. The use of an independent input is preferred as it allows the controller to determine that the product is working via its normal DFM functionality, but this may require additional cabling and possibly controller configuration.

Fault monitoring and indication

2.17 The Product shall undertake internal fault monitoring and detect failures that would prevent it from operating correctly. Such failures include (but are not limited to):

- Software failures or lockups.
- Power supply failures.
- Sensor / intentional emitter failures.

2.18 In the event of any operational failure the product shall insert a permanent pedestrian demand via the demand insertion interface defined in sections 2.14 to 2.16.

2.19 A means to reset the Product and bring it back into operation shall be provided.

2.20 The Product may provide an indication of normal operation (such as a flashing LED). If provided this shall:

- g) Not be visible outside the pedestrian demand or display unit when its door is closed.
- h) Shall be 'daylight viewable' when the door of the pedestrian demand or display unit is fully open.

Construction

2.21 The Product construction shall be suitable for the on-street environment that will be experienced, including specific measures to mitigate against water damage due condensation or water leaking into the pedestrian demand or display unit enclosures.

Reliability

2.22 The Product shall have a design life of at least 10 years. Where optical or wireless emitters are used evidence of their expected life shall be included in the Technical File.

EMC and Environmental requirements

2.23 The Product shall be tested to and comply with the requirements of BS EN 50293 (Electromagnetic Compatibility Road Traffic Signal Systems).

2.24 Where the Product is an intentional radio transmitter it shall comply with Radio Equipment Directive and be tested to the requirements of IR2030 and the relevant additional tests defined in BS EN 301489-3.

2.25 Where the Product emits any form of coherent light (for example low power laser light) it shall be compliant with and tested to the applicable classes of IEC 60825. No emitters in excess of Class 1 shall be present in the product.

Note. Where the Product uses a laser device (including any optical lensing) which is unmodified by the product manufacturer and the device has evidence of testing and compliance with IEC 60825, further independent testing is not required.

2.26 The Product shall be designed not to be triggered erroneously by adverse weather conditions including, heavy rain falling snow and blowing leaves.

2.27 The Product shall be tested and meet the Environmental requirements of TOPAS 2130.

Documentation

2.28 Full installation, commissioning and maintenance instructions shall be published for the Product. These shall be identifiable by part number and issue state.

Labelling

2.29 In addition to mandatory markings (such as CE or equivalent) the Product shall also be clearly marked with:

- i) Its Product designation (such as the manufacturers part number) and a unique serial number.
- j) Its power supply requirements in terms of operating voltage range and power or current consumption.
- k) Where the Product emits any form of coherent light (for example low power laser light) it shall include the prescribed Class 1 Laser Product label.

3 REFERENCES

3.1 Where undated references and standards are listed, the latest issue of the publication applies.

British Standards

3.2 The British Standards Institution, London, publishes British Standards.

BS EN 50556	Road Traffic Signal Systems
BS EN 50293	Electromagnetic Compatibility Road Traffic Signal Systems Product Standard
BS EN 12675	Traffic Signal Controllers – functional safety requirements

Specifications

3.3 TOPAS Limited specifications are available at www.topasgroup.org.uk

TOPAS 0600	TOPAS Registration Process
TOPAS 2523	Traffic Control Equipment Interfacing Specification
TOPAS 2130	Environmental Tests for Road Traffic Control Equipment

Other Publications

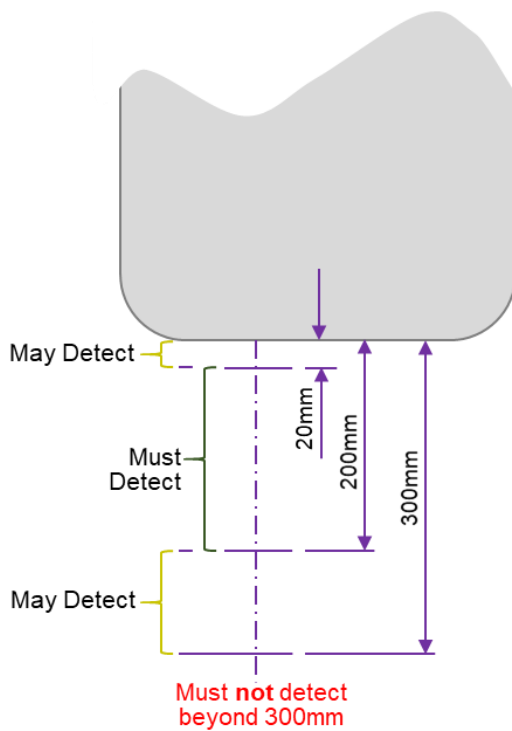
3.4 Other publications can be obtained from various sources including the Stationary Office:

TSRGD	Traffic Signs Regulations and General Directions
IR2030	UK Interface Requirements 2030 – Licence Exempt Short Range Devices
IEC 60825-1	Safety of laser products - Part 1: Equipment classification and requirements

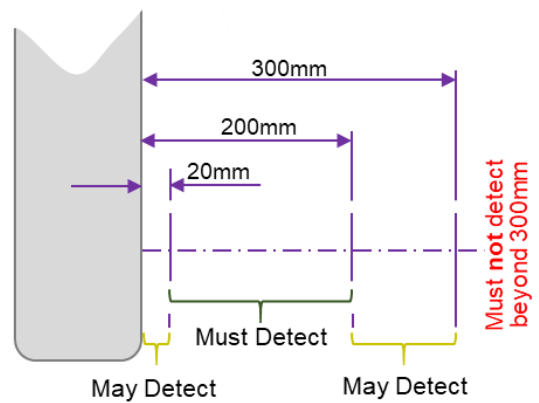
APPENDIX A – DETECTION ZONES

The must and may detection zones described in clause 2.7 are outlined below.

Example where gesture is to be detected is underneath the pedestrian unit.



Example where gesture is to be detected in front of the pedestrian unit.



APPENDIX Z -TECHNICAL FILE CONTENT

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

Only the 'ticked' items are required to be present in a Technical File Pack used to support TOPAS Registration against TOPAS 2542A.

Ref	Item	Description	Required
1	Technical File 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 Pack. Where copies of external certificates or documents are referred to these may be included within the Technical File overview document or supplied separately as part of the Technical File Pack.	✓
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 CA / CE markings that apply to the product.	A list of all directives complied with and how achieved. Typically this would be references to explicit CA / CE Technical Files and certificate's, copies of which would be included in the Technical File Pack.	✓
4	A functional design description of the product.	A reference to the overall System Design Documentation for the product (by document part number and issue).	✓
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 2542A confirming compliance and/or listing caveats or deviations.	✓

7	Test procedures and results	A reference to all test schedules and test result documents (by document part number and issue).	✓
8	EMC test results	A reference to EMC test performance requirements. Copies of the results of EMC testing undertaken by an appropriately qualified independent approved test house must be included in the Technical File Pack.	✓
9	Optical test results Note. Where the product uses a laser device which is unmodified by the product manufacturer and the device has evidence of testing and compliance with IEC 60825, the evidence should be included in the Technical File Pack. Further independent testing is not required	Where the Product emits any form of coherent light (for example low power laser light) copies of the results of Optical testing undertaken by an appropriately qualified independent approved test house, confirming class 1 laser safety, must be included in the Technical File Pack.	✓
10	Environmental test results	A reference to Environmental tests performance requirements. Copies of the results of the Environmental testing undertaken by an appropriately qualified independent approved test house must be included in the Technical File Pack.	✓
11	Radio Test results	Where the product is an intentional radio frequency emitter, copies of the results of Radio testing undertaken by an appropriately qualified independent approved test house must be included in the Technical File Pack. Reports should be those listed on the EU Declaration of Conformity & the Technical File or specific IR 2030 requirement.	✓
12	Primary Safety Test results	For Traffic Control equipment specifically a reference to the Primary Safety Test schedule and test results by part number and issue. A copy of the test results should be included as part of the Technical File Pack.	N/A
13	Failure Mode Analysis	A reference to the product failure mode analysis requirements and results by document part number and issue.	N/A