

TOPAS

Traffic Open Products and Specifications

TOPAS 2520A

Performance Specification for Uni-directional Logic Equipment

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TOPAS 2520A

PERFORMANCE SPECIFICATION FOR UNI- DIRECTIONAL LOGIC EQUIPMENT

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1 INTRODUCTION

- 1.1 This TOPAS specification covers the requirements for Uni-directional Logic Equipment used in traffic control applications to detect vehicles travelling in a specified direction.
- 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 Guidance to potential users of this Product is given in Appendix A.
- 1.6 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 TOPAS 0600.
- 1.7 This specification implements requirements as originally defined in HA specification TR 2520A. Product Approvals to TR2520A may be used to register products to this specification as defined in TOPAS 0600
- 1.8 This specification will be immediately implemented from the date of issue for all new TOPAS Registrations

Glossary of Terms

- 1.9 A comprehensive glossary of terms is given in Highways Agency document TA84 Code of Practice for Traffic Control and Information Systems for public highways.

Implementation

- 1.7 This specification implements requirements as originally defined in HA specification TR 2520A. Product Approvals to TR2520A may be used to register products to this specification as defined in TOPAS 0600

2 FUNCTIONAL REQUIREMENTS

General

- 2.1 This specification defines the requirements of a Product to detect vehicles travelling in a specified direction.
- 2.2 The Product shall be designed not to detect vehicles travelling in the opposite direction to the direction specified.
- 2.3 The Product shall be used in conjunction with vehicle detectors complying with TOPAS 2512. The detector loops shall be capable of detecting all types of vehicles and shall conform to the requirements of TOPAS 2512.
- 2.8 When a vehicle is travelling in the specified direction as defined in 2.6 the Uni-directional logic shall output a signal when a vehicle detection signal is received from the A detector (upstream) and maintain this output signal until the vehicle leaves the detection zone of the A detector.
- 2.9 When a vehicle is travelling in the opposite direction to that defined in 2.11 the Uni-directional logic shall not output a signal under the following detector output conditions:
- i) Output U only.
 - ii) Output U only, followed by U and A, followed by A only.

Performance

Logic Processing

- 2.4 The logic processing shall perform to the requirements of clauses 2.5 to 2.9 of this specification.
- 2.5 The Product shall be designed so that each channel of Uni-directional logic has two inputs, each fed with the output from an associated vehicle detection equipment, referred to as A and U.
- 2.6 Detection Equipment A shall be located so as to detect vehicles travelling in the normal direction of traffic flow for its lane of the carriageway.
- 2.7 Detection Equipment U shall be located so as to detect before detection equipment A, vehicles travelling in the opposite direction to that specified in 2.6

Interface

- 2.10 The interface between the Product and an associated Signals Controller shall be in accordance with TOPAS 2523.
- 2.11 An indicator showing the output status of the product. The indicator is to be a high brightness red Light Emitting Diode (LED) (capable of being seen in bright sunlight) located in a position, which is readily visible during inspection and maintenance.

Electrical

- 2.12 All wiring, termination, earthing and labelling shall be in accordance with BS 7671
- 2.13 The U/D Logic shall be protected from damage due to reverse polarity connection.

Power Supplies

- 2.14 The Product shall be powered from one of the following supplies:

Extra Low Voltage AC

- 2.15 The Product shall operate as required by this specification when the extra low voltage varies between +13% and -10% of its nominal voltage of 24V AC and over the range + 2% of its nominal frequency.

Extra Low Voltage DC

- 2.16 The Product shall operate as required by this specification when the nominal 24V DC supply voltage varies over the range $\pm 20\%$ of its nominal value.
- 2.17 When installed, all external and easily accessible metal parts of modules utilising voltages above an extra low voltage supply shall be bonded together and connected in accordance with BS 7987.
- 2.18 The product shall be powered in accordance with BS 7987.

Construction

- 2.19 The general design, construction and assembly of the vehicle detector shall be based on sound proven engineering principles.
- 2.20 The Product enclosure shall be manufactured from suitable material to provide mechanical protection of the electronic or mechanical equipment in the intended environment. See TR 2130.
- 2.21 The front panel of rack mounted vehicle detectors shall be fitted with a means to assist easy removal and replacement of units.
- 2.22 U/D Logic used with traffic signal controllers shall preferably be mounted in the controller cabinet. Where this is not possible, remote housings may be used.

- 2.23 Remote housings shall provide a degree of protection rating IP 55 to BS EN 60529.

- 2.24 The U/D Logic shall have an design life of 15 years.

Failure Modes

- 2.25 An interruption of the power supply to the Product shall, after an interval not exceeding 5 seconds, automatically produce a vehicle detection signal (indicating the presence of a vehicle) from the Product for so long as the interruption persists. The Product shall regain its specified operation within 5 seconds of the restoration of the power supply

3 REFERENCES

References

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

British Standards

3.2 British Standards are published by The British Standards Institution, London

BS 7671	Requirements for Electrical Installations
BS 7987:2001	Road Traffic Signal Systems
BS EN 50293	Electromagnetic Compatibility Road Traffic Signal Systems Product Standard
BS EN 60529	Degrees of Protection Provided by Enclosures (IP Code)

Specifications

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

MCE 0108	Siting of inductive loops for Vehicle Detecting Equipments at Permanent Road Traffic Signal Installations
TR 2130	Environmental Tests for Motorway Communications Equipment and Portable and Permanent Traffic Control Equipment
TOPAS 2512	Inductive Loop Vehicle Detection Equipment
TOPAS 2523	Traffic Control Systems Interfacing Specification
TOPAS 0600	Self-Certification and Approval of Equipment for the Control of Vehicular and Pedestrian Traffic on Roads

Other Publications

3.4 Other publications can be obtained from the Stationary Office.

TSRGD	Traffic Signs Regulations and General Directions
MCHW	Volume 1 Specification for Highways Works
Directive 89/336/EEC	EMC Regulations 1992, (Statutory Instrument 1992 No 2372)

APPENDIX A INFORMATIVE GUIDE

General

- A1 This Annex is an informative guide to Highways Authorities who wish to use the product for use with permanent Traffic Signal Controllers.

Marking and Labelling

- A2 The Purchase Contract should call for the Product is to be fitted with a label displaying the Following:
- i) The unique Product Identity and serial number;
 - ii) The Technical Requirements Specification against which it has been declared compliant;
 - iii) The electrical supply requirements of the equipment.

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 2520A.

Ref	Item	Description	Required
1	Technical File overview document.	<p>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.</p> <p>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.</p>	✓
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 CE markings that apply to the product.	A list of all directives complied with and how achieved. Typically this would be references to explicit 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 2520A 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	A reference to Optical tests performance requirements. Copies of the results of Optical testing undertaken by an appropriately qualified independent approved test house must be included in the Technical File Pack.	N/A
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 Agency test results	A reference to Radio Agency tests performance requirements. Copies of the results of Radio Agency testing undertaken by an appropriately qualified independent approved test house must be included in the Technical File Pack.	N/A
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