Performance Specification for Unidirectional Logic Equipment
TR 2520 A

PERFORMANCE SPECIFICATION FOR UNI-DIRECTIONAL LOGIC EQUIPMENT

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1 INTRODUCTION

1.1 This specification covers the essential requirements for Uni-directional Logic Equipment used in traffic control applications to detect vehicles travelling in a specified direction.

1.2 This specification supersedes specification MCE 0161B and the previous 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 a Product approved to this specification 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 TA84 Code of Practice for Traffic Control and Information Systems for public highways.
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 TR 2512. The detector loops shall be capable of detecting all types of vehicles and shall conform to the requirements of TR 2512.

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

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.

Interface

2.10 The interface between the Product and an associated Signals Controller shall be in accordance with TR 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 ± 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 a 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 NORMATIVE REFERENCES

References

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

British Standards

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

Contact: +44 (0) 1344 404 429
WEB: http://www.bsonline.bsi-global.com

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 The Highways Agency publishes National Approval Specifications.

Contact: +44 (0) 117 372 8270
WEB: http://www.tssplansregistry.org/homepage.htm

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
TR 2512 Inductive Loop Vehicle Detection Equipment
TR 2523 Traffic Control Systems Interfacing Specification
TRG 0600 Self-Certification and Approval of Equipments for the Control of Vehicular and Pedestrian Traffic on Roads

Other Publications

3.4 Other publications can be obtained from the Stationary Office.

Contact: +44 (0) 20 7242 6393
WEB: http://www.tso.co.uk

TSR&GD Traffic Signs Regulations and General Directions
MCHW          Volume 1 Specification for Highways Works
4 HISTORY

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Approval of this document for publication is given by the undersigned

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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.