



LICENCE

Title:

Licensee:

Date:

Conditions of use  (Click here for full conditions of Licence)

WEB SEARCH

 Check if current

 Find similar documents

 StandardsWatch (Info and Login)

 Visit our website



Australian Standard™

Laser-based speed detection devices

Part 2: Operational procedures

This Australian Standard was prepared by Committee CS-098, Laser Speed Detection. It was approved on behalf of the Council of Standards Australia on 11 July 2003 and published on 12 August 2003.

The following are represented on Committee CS-098:

Australian Automobile Association
Australian Chamber of Commerce and Industry
CSIRO Division of Telecommunications and Industrial Physics
Institution of Engineers Australia
National Standards Commission
New South Wales Police Service
Queensland Police Service
South Australia Police
Tasmania Police
Victoria Police
Western Australia Police

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Australia web site at www.standards.com.au and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Global Standard*, has a full listing of revisions and amendments published each month.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.com.au, or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

This Standard was issued in draft form for comment as DR 02500.

Australian Standard™

Laser-based speed detection devices

Part 2: Operational procedures

First published as AS 4691.2—2003.

COPYRIGHT

© Standards Australia International

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia International Ltd
GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 3661 0

PREFACE

This Standard was prepared by Standards Australia Committee CS-098, Laser Speed Detection, following a request by a supplier of these devices for a performance specification and operating procedures for laser-based speed detection devices. The request has resulted in the preparation of a two part series of Standards. Part 1 covers definitions and device requirements predominantly for assistance to manufacturers and this Part (Part 2) covers operational procedures for users of these devices.

This Standard does not purport to be an exhaustive set of requirements for the metrological aspects of speed measurements by laser. The establishment of such requirements falls within the area of responsibility of the National Standards Commission (NSC) rather than Standards Australia.

This Standard has been prepared to take into account the state of the art of laser-based speed detection in Australia at the time of publication.

This Standard is not intended to inhibit further advances in laser-based speed detection technology. The Committee will consider amending the Standard to include suitable requirements for new types of equipment as they become available.

The term 'normative' has been used in this Standard to define the application of the appendix to which it applies. A 'normative' appendix is an integral part of a Standard.

CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE.....	4
1.2 OBJECTIVE.....	4
1.3 REFERENCED DOCUMENT.....	4
1.4 DEFINITIONS.....	4
SECTION 2 OPERATIONAL PROCEDURES	
2.1 OPERATOR.....	5
2.2 EQUIPMENT CERTIFICATION.....	5
2.3 OPERATIONAL CHECKS.....	6
2.4 SITE SELECTION.....	6
2.5 FIELD TESTING.....	7
2.6 TARGET IDENTIFICATION.....	7
APPENDICES	
A OPERATOR TRAINING.....	9
B TRAINING OF PERSONNEL TO EVALUATE CAPTURED IMAGES.....	11

STANDARDS AUSTRALIA
—————
Australian Standard
Laser-based speed detection devices
—————
Part 2: Operational procedures
—————

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies operational procedures for laser-based devices which are used to measure the speed of targets for law enforcement or scientific measurement using the lidar principle. This Standard includes devices linked to an image capture system.

1.2 OBJECTIVE

The objective of this Standard is to provide users of laser-based speed detection devices with requirements and recommendations covering the operation of these devices and the training of operators in order to ensure uniformity of practice.

1.3 REFERENCED DOCUMENT

The following document is referred to in this Standard:

AS
4691 Laser-based speed detection devices
4691.1 Part 1: Definitions and device requirements

1.4 DEFINITIONS

For the purpose of this Standard the definitions in AS 4691.1 apply.

SECTION 2 OPERATIONAL PROCEDURES

2.1 OPERATOR

For the purpose of law enforcement, the operator of the laser-based speed detection device shall be trained in accordance with Appendix A and authorized in the use of these devices to measure the speed of objects.

Records of persons authorized to use laser-based devices to measure the speed of objects shall be maintained.

The authorization of an operator shall lapse if the operator has not used a laser-based speed detection device for more than 12 months. Such an operator may be reauthorized following an adequate period of retraining.

NOTES:

- 1 The authorizing body is the body with the responsibility for enforcing laws relating to target speed at the location where the laser-based device is to be used.
- 2 Lidar measurements taken by persons other than authorized operators may not be considered to be valid unless such persons are under training and are being directly supervised by an authorized operator.

Operators using these devices for other purposes should seek similar training.

2.2 EQUIPMENT CERTIFICATION

2.2.1 Testing authority

Each testing authority shall be an organization or company recognized as being competent to carry out electronic testing in accordance with this Standard.

NOTE: Selection of a testing authority that holds National Association of Testing Authorities (NATA) accreditation and can provide assurance that testing equipment has current calibrations traceable to standards of physical measurement in accordance with the National Measurement Act is recommended.

2.2.2 Frequency of testing

The laser-based device shall not be used unless it has been tested and certified by a testing authority as meeting the requirements set out in Clause 2.2.3 and been sealed by the testing authority within the past 12 months.

2.2.3 Testing procedure

The testing procedure shall ascertain that—

- (a) the optical output power of the device is within the specification provided by the manufacturer of the device;
- (b) the device is correctly calibrated in accordance with the manufacturer's instructions;
- (c) speed measurements with an accuracy of +2, -3 km/h or +1, -2 kn, as appropriate, are determinable using the simulator method in AS 4691.1; and
- (d) range measurements with an accuracy of +0.3, -0.4 m or +1, -2 ft for both the short range and long range tests are determinable using either the simulator or physical method in AS 4691.1.

2.2.4 Sealing

The testing authority shall seal the laser-based device only if the device satisfied the testing carried out in Clause 2.2.3.

The seals shall be applied in such a manner as to effectively prevent interference with the speed computing circuitry of the device without breaking the seal. The testing authority shall keep records of all devices sealed, including—

- (a) identification of each device;
- (b) the date on which the tests were conducted; and
- (c) the manner in which the device was sealed.

2.2.5 Certification

The testing authority shall issue a certificate only if the device has—

- (a) satisfied the test requirements of Clause 2.2.3; and
- (b) been sealed as prescribed in Clause 2.2.4.

2.3 OPERATIONAL CHECKS

Before the device is taken out to a measurement site, the following parameters shall be checked:

(a) *Physical check*

The device shall be inspected and not used until any physical damage which may affect its operation has been assessed. All seals shall be intact and the certification shall be current.

(b) *Internal circuit*

The operator shall monitor the device as it performs its internal circuit test (see AS 4691.1) and interpret the result in accordance with the manufacturer's instructions.

(c) *Display*

The operator shall conduct a display test and ensure all segments and features of the display are working before using the device.

(d) *Sight alignment*

The operator shall perform a sight alignment check to verify the vertical and horizontal alignment of the sight with the laser.

NOTE: This may be achieved through use of—

- (i) a special test feature, if one is fitted, which employs an audible tone which changes pitch when the aiming point of the sighting device is panned across a specific narrow target in both horizontal and vertical planes; or
- (ii) changes between the audible tones specified in AS 4691.1 when the device is panned across a specific narrow target in both horizontal and vertical planes.

(e) *Range check*

A range measurement taken to a suitable target over a known distance clear of obstructions shall be within the required accuracy as stated in AS 4691.1.

2.4 SITE SELECTION

2.4.1 General

When selecting a site for the use of a laser-based device in the stationary mode, the factors listed in Clauses 2.4.2 and 2.4.3 shall be taken into account.

2.4.2 Detection area

The operator shall take into account the detection area and the fact that the speed of any moving object within the detection area could be being measured at any given time.

NOTE: The detection area varies with different makes of laser-based devices.

2.4.3 Traffic density

The operator shall take into account the traffic density at the site at the time of measurement to ensure that targets can be clearly identified.

2.4.4 Alignment

For speed measurements, the operator should ensure that the beam of the laser-based device is as close as practical to being directly in line with the direction of travel of the target to minimize the cosine angle effect.

NOTE: The operator should be aware of the fact that, if the laser beam is not aligned with the direction of travel of the target, the speed measured by the device can be less than the true speed of the target. This is referred to as the 'cosine angle effect' because the measured speed is equal to the true speed multiplied by the cosine of the angle between the beam and the direction of travel of the target and hence cannot be higher than the true speed.

2.5 FIELD TESTING

2.5.1 General

The accuracy of the laser-based speed detection device shall be tested in accordance with the manufacturer's instructions at the commencement and end of operation.

2.5.2 Required accuracy

When tested, the required speed accuracy as set out in Clause 2.2.3(c) or range accuracy as set out in Clause 2.2.3(d) shall be met.

If the accuracy of the device is not within the required accuracy, then—

- (a) the device shall not be used until it has been rendered capable of producing the required accuracy, recertified and resealed in accordance with Clause 2.2; and
- (b) all readings taken since the device was last tested in accordance with Clause 2.5.1 shall be deemed to be invalid.

2.6 TARGET IDENTIFICATION

2.6.1 General

A valid speed measurement shall only be taken when the target vehicle is clearly identifiable by direct observation or by means of an image capture system.

2.6.2 Manual operation

Identification of the target within the laser beam shall be achieved by employing the following factors:

- (a) *Visual observation*

The operator shall visually monitor the object under investigation for sufficient time to identify it as the target. If the operator has any doubt that the speed measured by the device is not that of the object under investigation, that speed measurement shall be considered invalid. Mirrors shall not be used to observe the object under investigation.

(b) *Audio tracking*

The operator shall monitor the audible tones of the laser device to identify when the target is in aim and when a valid speed measurement has been taken (see indicator requirements in AS 4691.1).

2.6.3 Automatic operation

Identification of the target within the laser beam shall be achieved by employing the following factors:

(a) *Speed preselection*

NOTE: Where the device is fitted with the facility for speed preselection, the facility should be used to discriminate between a target travelling at, or above, the preselected speed and surrounding traffic moving slower than the preselected speed.

(b) *Evaluation of captured images*

For the purpose of law enforcement, captured images produced by a laser-based speed detection device linked to an image capture system shall be evaluated by a person trained in accordance with Appendix B and authorized to undertake this task. The evaluator need not be present at the time the image was captured.

The authorization of an evaluator shall lapse if the evaluator has not undertaken this task for more than 12 months.

NOTE: Such an evaluator may be reauthorized following an adequate period of retraining.

APPENDIX A
OPERATOR TRAINING
(Normative)

A1 SCOPE

This Appendix specifies the elements to be included in the training program for laser-based speed detection device operators. It is recognized that the proper use of laser-based devices relies on the skill and training of the operator.

A2 THEORY

A2.1 General

The theory elements set out in Paragraphs A2.2 to A2.4 shall be included in the program, which shall be delivered by a qualified instructor.

NOTE: The qualified instructor should have both operational and instructional knowledge specific to laser-based speed detection devices.

A2.2 Laser (lidar) principles

The basic principles of laser-based speed detection shall be explained and their application to the device which the operator will be using shall be pointed out. This shall include the following points:

- (a) The principles of laser pulse emission and collection of the reflected energy as applicable to speed detection.
- (b) Effective range and width of the detection area.
- (c) Cosine angle effect.
- (d) Causes of interference.
- (e) Factors affecting target identification.
- (f) Differences between speed and distance modes.
- (g) Limitations of laser-based speed detection, e.g. sweep effect, panning.
- (h) Effects of relative size, shape, finish and distance of targets.
- (i) Laser safety.
- (j) Relevant legislation and Australian Standards.

A2.3 Set-up and field test procedures

The procedures to be followed when setting up the device and the method of testing the accuracy of the device shall be explained. The maximum allowable period between accuracy tests (see Clause 2.5.1) and the procedure to be followed if the device fails the test shall be set out.

A2.4 Site selection

The factors involved in the selection of a site at which to operate the laser-based device shall be explained (see Clause 2.4).

A3 PRACTICAL TRAINING

Practical training in the operation of laser-based devices shall be carried out at typical sites under the supervision of a qualified instructor.

A4 EXAMINATION

At the completion of the training program, candidates shall complete a written examination on the theory elements of laser-based speed detection device operation and satisfy an examiner by practical demonstration that they have achieved an acceptable level of proficiency in the use of laser-based speed detection equipment.

A5 ACCREDITATION

Accreditation shall only be granted to those candidates who achieve satisfactory results in both the written examination and practical assessment.

A6 REACCREDITATION

The accreditation of an operator shall lapse if the operator has not used a laser-based speed detection device for more than 12 months. Such an operator may be reaccredited following an adequate period of retraining.

A7 FURTHER TRAINING

When a new type of laser-based speed detection device is introduced into operation, each operator who will be using it shall be trained to use the new device.

APPENDIX B
TRAINING OF PERSONNEL TO EVALUATE CAPTURED IMAGES
(Normative)

B1 SCOPE

This Appendix specifies the elements to be included in the training program for personnel involved in the identification of targets from images produced by laser-based speed detection devices linked to an image capture system.

B2 VERIFICATION

The evaluator shall be trained to correctly execute the following procedures:

- (a) Verify details on the data block against the operator's statement. These details typically include:
 - (i) Location of site.
 - (ii) Date.
 - (iii) Time of day.
 - (iv) Speed of target.
 - (v) Range to target.
 - (vi) Direction of travel.
 - (vii) Speed limit.
 - (viii) Equipment identification.
- (b) Understand and initiate the appropriate actions in response to any operator notes which may include reference to anomalous speeds being recorded.
- (c) Examine the images captured for each session and, for each image, check the following points:
 - (i) Image number.
 - (ii) Whether or not there is more than one vehicle in the image. If more than one vehicle is in the image, apply the prescribed procedure for target identification or reject the image, according to the guidelines being used.
 - (iii) Direction of travel of the target.
 - (iv) Registration number or other identifier of target.
 - (v) Whether the description of the target according to registration records matches the vehicle in the image.
- (d) Reject those images where there is a possibility of an incorrect speed having been recorded or where the target cannot be clearly identified.

B3 EXAMINATION

At the completion of the training program, candidates shall complete a written examination on the theory of captured image evaluation and satisfy an examiner that they have achieved an acceptable level of proficiency in evaluating captured images through a practical demonstration.

B4 ACCREDITATION

Accreditation shall only be granted to those candidates who achieve satisfactory results in both the written examination and practical assessment.

B5 REACCREDITATION

The accreditation of an operator shall lapse if the operator has not evaluated captured images for more than 12 months. Such an operator may be reaccredited following an adequate period of retraining.

B6 FURTHER TRAINING

When a new type of laser-based speed detection device is introduced into operation, each evaluator shall be trained in the appropriate evaluation techniques for use with the new system.

Standards Australia

Standards Australia is an independent company, limited by guarantee, which prepares and publishes most of the voluntary technical and commercial standards used in Australia. These standards are developed through an open process of consultation and consensus, in which all interested parties are invited to participate. Through a Memorandum of Understanding with the Commonwealth government, Standards Australia is recognized as Australia's peak national standards body.

Australian Standards

Australian Standards are prepared by committees of experts from industry, governments, consumers and other relevant sectors. The requirements or recommendations contained in published Standards are a consensus of the views of representative interests and also take account of comments received from other sources. They reflect the latest scientific and industry experience. Australian Standards are kept under continuous review after publication and are updated regularly to take account of changing technology.

International Involvement

Standards Australia is responsible for ensuring that the Australian viewpoint is considered in the formulation of international Standards and that the latest international experience is incorporated in national Standards. This role is vital in assisting local industry to compete in international markets. Standards Australia represents Australia at both ISO (The International Organization for Standardization) and the International Electrotechnical Commission (IEC).

Electronic Standards

All Australian Standards are available in electronic editions, either downloaded individually from our Web site, or via on-line and CD ROM subscription services. For more information phone 1300 65 46 46 or visit us at

www.standards.com.au



GPO Box 5420 Sydney NSW 2001

Administration Phone (02) 8206 6000 Fax (02) 8206 6001 Email mail@standards.com.au

Customer Service Phone 1300 65 46 46 Fax 1300 65 49 49 Email sales@standards.com.au

Internet www.standards.com.au