AS 4962—2005

Australian Standard™

Electronic toll collection—Transaction specification for Australian interoperability on the DSRC link

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AUSTROADS
Australian Automobile Association
Commonwealth Department of Transport and Regional Services
Federal Chamber of Automotive Industries
ITS Australia
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Roads and Traffic Authority of NSW
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PREFACE

This Standard was prepared by the Standards Australia Committee IT-023, Transport Information and Control Systems, and Subcommittee IT-023-05, Electronic Tolling and Traffic Management. It supersedes AS 4962(Int)—2001.

The objective of this Standard is to provide an agreed scheme of interoperability for toll operators, EFC system integrators and equipment suppliers. The interoperability only relates to the sequences between vehicle and roadside.

Electronic fee collection (EFC) is a telematics service offered by road operators or concessionaires as a service to their customers. In order to provide for a seamless service across the concession areas, an agreed scheme of interoperability is required. A seamlessly interoperable service requires harmonization of technical interfaces (e.g. the short range radio link between in-vehicle equipment and roadside stations), common definitions of operational data (e.g. tariff class definitions), and contractual arrangements (e.g. covering clearing among operators).

Australian operators have decided to offer EFC services based on the 5.8 GHz microwave dedicated short-range communication (DSRC) link according to CEN Standards. It was quickly recognized that the Standards provide for a toolbox of functions required to define individual EFC applications according to local needs. The Standards provide for a well defined common technical interface but do not by themselves provide for interoperability on higher levels, i.e. describe the data to exchange on the link or the sequence of communication steps to perform.

From the first installations it became evident that without agreed Standards relating to communication on higher levels, every new EFC installation would probably use a new, or at least slightly modified, EFC transaction variant. Such modifications could result from the local needs of operators or from preferred solutions of the equipment supplier. Users would not be able to enjoy interoperable service.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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1 SCOPE

This Standard specifies a framework for interoperable electronic fee collection (EFC) based on dedicated short-range communication (DSRC). Specification of the technical details of the radio communication is simply done by reference to the applicable CEN Standards. In addition, data to be used in interoperable Australian EFC transactions are specified. Depending on the on-board equipment type, these data may be transferred by different EFC transaction sequences. Two transaction sequences are defined in this document, both supporting central account payment. More transaction sequences might be recognized in the future should the need arise (e.g. in order to support payment based on values carried inside the on-board equipment).

The framework specified herein relies on the following philosophy:

(a) All equipment used will support the same radio link functionality, without variants.

(b) Roadside equipment has to support all recognized transaction sequences specified in Appendix A and B (in order to be able to perform transactions with every type of on-board equipment).

(c) On-board equipment has to support only one of the recognized transaction sequences.

The above rules apply to the domain of interoperability only. For local usage, operators or other DSRC system users are free to make use of other data and transaction sequences, as long as they comply with the DSRC Standards. The DSRC Standards already provide for the selection/switching mechanism required to negotiate the applications between roadside and on-board equipment.

The framework thus allows both for full interoperability through tightly specified recognized EFC transactions and for flexibility for future expansions and local needs through the negotiation mechanism inherent in the DSRC Standards. Additional Transactions may be added in the future by introducing a Recognized Type C transaction.

This Standard defines the protocol stack for communication between roadside equipment and on-board equipment using DSRC to perform EFC.

It specifies:

(i) The complete DSRC communication stack (OSI Layers 1, 2, and 7).

(ii) The supported EFC transaction types.

(iii) The EFC transaction data including security elements.

Tests and requirements regarding compliance of equipment with this specification, such as type approval procedures, lie outside the scope of this document.

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