



BSI Standards Publication

# Road vehicles — Ergonomic aspects of transport information and control systems — Introduction to integrating safety critical and time critical warning signals

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# TECHNICAL REPORT

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## **Road vehicles — Ergonomic aspects of transport information and control systems — Introduction to integrating safety critical and time critical warning signals**

*Véhicules routiers — Aspects ergonomiques des systèmes  
d'information et de contrôle du transport — Introduction à l'intégration  
des signaux d'avertissement critiques en termes de sécurité et de  
temps*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TR 12204 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 13, *Ergonomics applicable to road vehicles*.

## Introduction

This Technical Report supplements the information provided in ISO/TR 16352 “MMI of warning systems in vehicles” and specifically addresses the topic of warning signal integration in automobiles.

This Technical Report contains a mixture of general guidance information where technical consensus supports such guidance, as well as discussion of those areas where further research is required to support technical consensus. It should be noted, however, that the general guidance contained in this Technical Report is informative, rather than normative, in nature.

The HMI of warning interfaces for stand-alone active safety systems is not standardized. Recently, “Guidelines on establishing requirements for higher-priority warning signals” is being developed by the UNECE/WP29/ITS Informal Group. There are, however, many different interfaces used on production vehicles. The integration of multiple stand-alone warning systems requires consideration of basic properties of the interface such as modality, timing, and redundancy. This can lead to complex trade-offs for the system designer. It may well be that over time the industry and/or governmental regulators will converge on common specifications for warning interfaces for stand-alone warning systems.

It should also be noted that a key underlying assumption for the purposes of this Technical Report is that each of the stand-alone warning system signals to be integrated has been previously validated in terms of effectiveness and acceptability. Therefore, any changes to a particular warning signal that may be suggested by evaluating the integration of multiple warning signals into a coherent HMI are intended to address an integration issue, only, and not to compensate for any deficiency that may be present in the design of one or more underlying stand-alone warning/systems.

Poorly integrated warning signals may not be noticed or could be misunderstood, confused, or ignored and could potentially impair system performance causing the driver to respond too slowly, inappropriately or not at all. Poor integration could limit the safety benefits of the warning system.

# Road vehicles — Ergonomic aspects of transport information and control systems — Introduction to integrating safety critical and time critical warning signals

## 1 Scope

This Technical Report provides general, informative guidance for the integration of safety critical and time critical warning signals (signals which, if ignored even briefly, could result in bodily harm to the occupant(s) of the vehicle and/or to other road users) into existing in-vehicle messages presented to a driver. Integration of non-critical signals are outside the scope of this Technical Report, except to confirm that they do not affect the driver's comprehension of safety and time critical signals.

This Technical Report provides:

1) possible approaches for determining if integration is necessary to mitigate the possibility that signals from one or more vehicle system may degrade the driver's comprehension of, or response to, safety critical warning signals from another system(s); and

2) a discussion of possible methods for assessing potential integration conflicts.

It does not provide prescriptive guidance in how to design an integrated warning HMI.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Not applicable.

## 3 Terms and definitions

### 3.1

#### **abstract visual signal**

simple figure such as circle or square that has no clear meaning

### 3.2

#### **active safety warning system**

system incorporating sensors to detect potential hazards that communicate a warning signal to the driver so that a hazard may be avoided by driver intervention