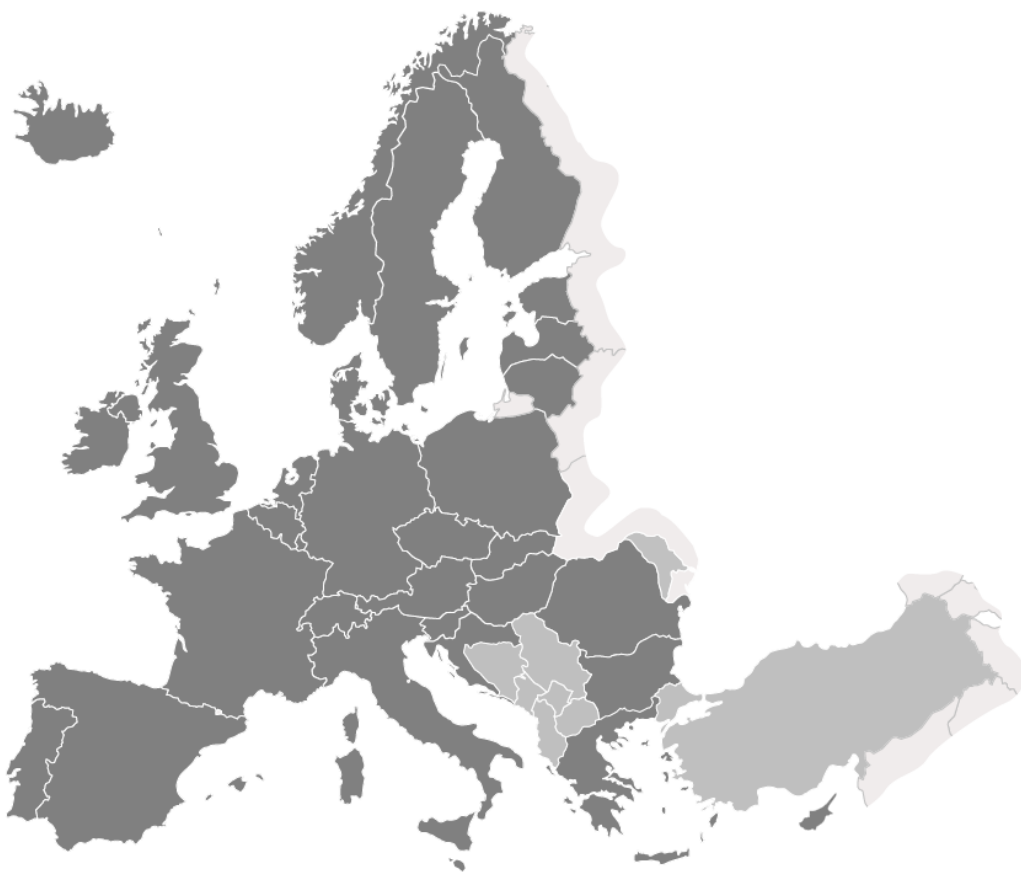


# WELMEC

European Cooperation in Legal Metrology

## **Taximeters common Application** Directive 2014/32/EU, Annexes I & IX



*For information:*

This guide is available to the Working Group Measuring Instruments for future reference on the Europa Website.

# WELMEC

European Cooperation in Legal Metrology

WELMEC is cooperation between the legal metrology authorities of the Member States of the European Union and EFTA.

This document is one of a number of Guides published by WELMEC to provide guidance to manufacturers of measuring instruments and to Notified Bodies responsible for conformity assessment of their products.

The Guides are purely advisory and do not themselves impose any restrictions or additional technical requirements beyond those contained in relevant EU Directives.

Alternative approaches may be acceptable, but the guidance provided in this document represents the considered view of WELMEC as to the best practice to be followed.

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## Foreword

This guide is intended to provide guidance to all those concerned with the application of annex I and annex IX Taximeters (MI-007) of Directive 2014/32/EU (MID), recast of directive 2004/22/EC.

This guide provides a record of the continuing work of WELMEC Working Group 12 (former WG 8 subgroup) taximeters in the area of the common application of the Directive itself, as a specific guide for taximeters. In addition this guide seeks to provide information, which is specific to individual Member States.

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# 1 Taximeter functionality

## 1.1 Changes of the fare in position “Stopped” (discount)

Applying a discount at the end of the trip is not allowed as the taximeter shall indicate the fare to be paid permanently during and at the end of the trip. The fare should not be changed in “Stopped” afterwards; only the subsequent addition of supplements is acceptable. From a technical point of view a discount might be managed via a negative supplement, however a supplement is a positive amount and is only for extra services.

## 1.2 Indication of distance travelled during the trip

The taximeter shall indicate the fare during the complete trip (Hired position). **The distance travelled may be indicated separately (for example a separate area in the display or a separate display) if no confusion is possible** and if all indications are accompanied by the unit of measurement and suitably identified, for example by the wordings “Fare” and “Distance” or equivalent wording. In some cases (if non-misleading) the numbers followed by the unit of measurement are sufficient. The distance shall be the secondary indication (physically smaller than Fare).

## 1.3 Modern graphical displays and additional functions

Modern graphical displays may be used for taximeter functionalities and additional functionalities and indications. This is only acceptable if a clearly separated part of the graphical display is reserved for the taximeter functionalities. The taximeter indications have to be shown permanently during a trip (in positions “Hired” and “Stopped”). Confusion for the customer must be prevented.

## 1.4 Power save mode

A power save mode (in For hire only) may be enabled by a secured setting for countries that allow this mode, provided the interface required in clause 4 of MI-007 stays operational and the totalizers need to be operational. The interface provides for example the signal for the “For Hire” indication (e.g. roof sign) or the data for a “board-computer”. The taximeter should leave this mode as soon as the vehicle starts moving to prevent fraudulent usage.

## 1.5 Distance measurement when driving backwards

An electronic taximeter receiving distance pulses is usually not able to distinguish between driving forwards or backwards. The calculated fare is therefore incremented by driving in both directions.

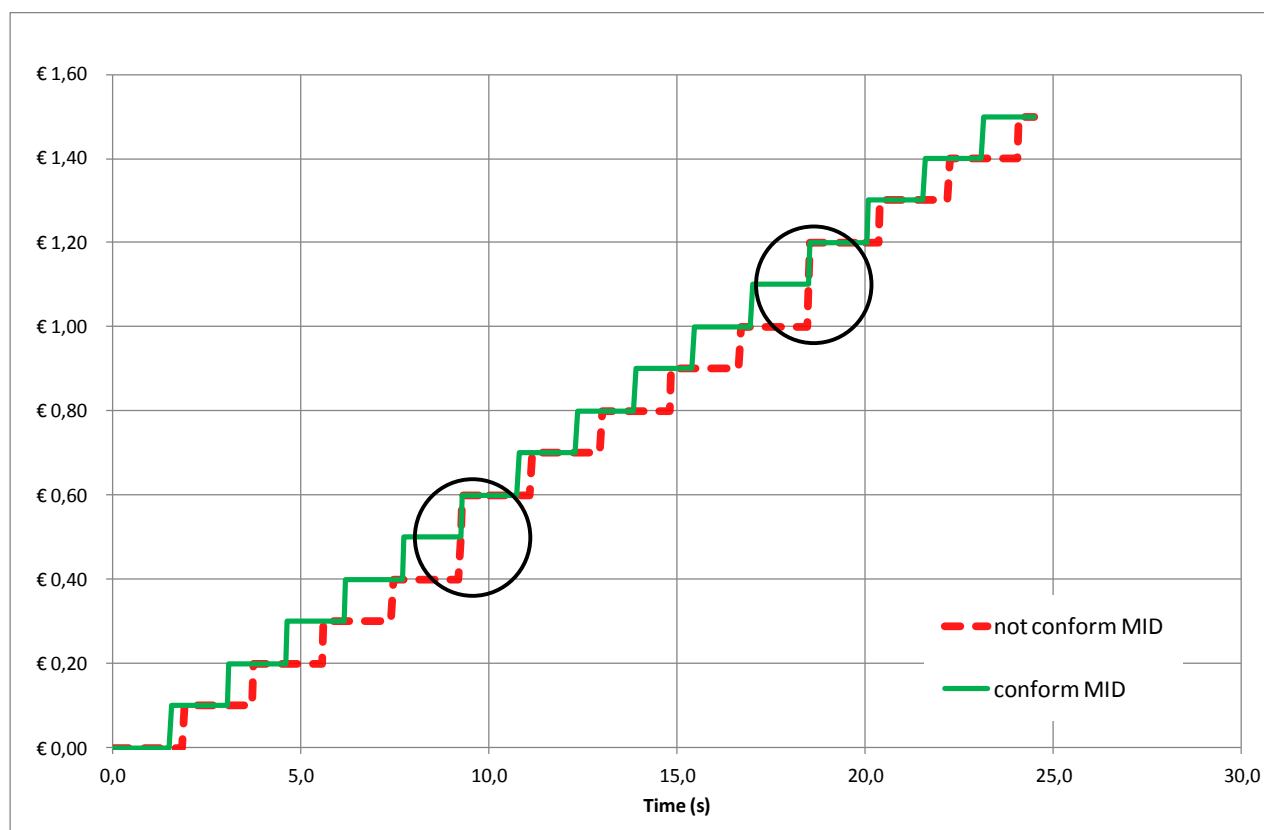
Driving backwards is part of the travelled distance.

## 1.6 Normal calculation mode D (double application of tariff)

Two algorithms for the fare calculation when using a double application of tariff are found which differ with regards to the increment of the indicated fare. In both cases

distance and time part of the fare are first calculated with higher resolution (e.g. 1 cent) than the fare increment (e.g. 10 cent). The two algorithms are:

- The indicated fare is incremented when the sum of distance and time parts reaches the increment (conform to MID definitions), illustrated by the continuous (green) line in Picture 1;
- The indicated fare is incremented when either the distance or the time part reaches the increment, the other part being stored for the next increment (not conform to MID, even if the error is always in favour for the customer), illustrated by the dotted (red) line in Picture 1.



Picture 1: Example of two calculation methods for double tariff with distance tariff € 2,43 / km, time tariff € 38,98 / h, fare increment € 0,10, speed 80 km/h.

## 1.7 Display of all tariff parameters

On demand, a taximeter shall display all tariff parameters. The tariff parameters include the criteria for automatic changes.

## 1.8 Real-time clock

Annex IX, 22 reads:

“The taximeter shall be equipped with a real-time clock ..... The requirements for the real-time clock are:

- The timekeeping shall have an accuracy of 0,02 %;
- The correction possibility of the clock shall be not more than 2 minutes per week .....

It is to be understood that the drift of the (real time) clock shall not be more than 2 minutes per week (0,02% of 10800 minutes is 2,016 minutes).

## 1.9 Totalisers

Acceptable solutions to show totaliser values on a display with limited number of digits:

- A. display only whole numbers of currency and distance;
- B. display part of totalisers on other available displays;
- C. shift the complete value of totaliser on the display [left -to-right and back].

The variable for a totaliser shall cover only positive numbers and have sufficient length (e.g. minimum 32 bits).

## 1.10 Remote operation

Remote operation of the taximeter is limited to a distance (remote) selection of a pre-defined tariff (on the taximeter) according to MID, Annex IX, point 14.1, as long as this remote selection (communication) fulfils the requirements of WELMEC 7.2.

## 1.11 Distance information and testing

Some taximeters are designed to receive the distance information via CAN-bus which is specified in the corresponding EU-type examination certificates or EU-design examination certificates. The distance signal generator and / or the CAN-bus itself and the corresponding possible manipulations are not under the scope of MID.

The latency of the distance data results in a delay of the indication of the monetary steps, depending on the velocity. A delay of up to 1 s for the distance data in the complete system until displaying on the taximeter is an acceptable value.

A CAN-bus converter is part of taximeter and needs to be certified.

If the conversion into (distance) pulses (for the output) is not included in the test connector, a separate device may perform this conversion.

The manufacturer shall supply special equipment for testing purposes for Notified Bodies, national verification officers, market surveillance authorities and inspection officers.

The manufacturer may alternatively supply a process which enables testing, for example special tariffs (distance only, time only and calculation tariff). In this case the test procedure shall be described in the operation manual (Annex I, clause 7.6).

## **1.12 Navigation satellites based distance signal**

The current state of the MID does not cover distance signal generators including those based on navigation satellites. Systems using this technology need to take into account that the distance signal is available continuously (e.g. navigation signals may be shielded by buildings or tunnels or be subject to manipulations) in relation to the maximum permissible error when installed.

## **1.13 Settings not in line with MID**

If a taximeter is equipped with settings not in line with MID (e.g. disable/enable totalisers or discount function), they shall be disabled and secured by the manufacturer. The manufacturer shall supply documentation for the verification about the settings and the correct values.

The manufacturer shall only place instruments on the market with settings that conform to MID.

## **1.14 Seals**

### Accessibility

All sealing locations, markings (CE, supplementary metrology and identification number of the notified body) and inscriptions of taximeters, even if the taximeter consists of several parts, shall be accessible (without the use of tools) for visual inspection.

### Design

The location of the sealing designed for applying a sticker shall be designed such that the (self-destructive) sticker cannot be removed without evidence of removal.



## 2 Content of (the annexes of) the certificate

The following basic information especially for the market surveillance and in service inspection is needed (based on WELMEC 8.3):

- Specifications such as range of values of the constant of the distance signal generator ( $k$ ), power supply, tariff ranges, resolutions, climatic, electromagnetic, mechanical environments etc,
- Interfaces, peripheral devices,
- Test connector if different from OIML R 21 (including conversion device if applicable),
- Description of sealing measures (including photo or drawing),
- Prescribed markings and positions for verification and control marks,
- A drawing or picture of the relevant printed circuit board(s), (If necessary put in a non-public part or supplied on demand by the Notified Body to authorised bodies),
- MID relevant software identification (for example checksums),
- How to display the software identification, tariff parameters and totalisers,
- If the taximeter has parameters/settings to comply with MID, the correct values and how to recall the values, these parameters/settings have to be separately secured (Annex IX, 14.2),
- How to access evidence of an intervention (for example checksums and software logs),
- Access to the constant of the distance signal generator ( $k$ ),
- The certificate may be written in the language of the NB, a translation may be required.
- As the taximeter without distance signal generator is covered by MID, the distance signal generator is not content of the certificates. The interface for the distance signal generator has to be specified (e.g. signal generator with characteristic pulse shape or CAN-bus).

### **3 Nationally required additional devices (e.g. printer) not covered by MID**

#### **3.1 Absence of or improper function**

The concept of MID is that these devices and their functionalities are not covered by national legislation. Whether the device provides a suitable signal in the case of improper operation is not covered by the directive.

MI-007, clause 4 specifies that the taximeter shall detect if the device is missing and has an interface for a signal in case of improper function.

Reaction of the taximeter:

- automatic switch off controlled by the device; or,
- inhibits operation showing an error message.

In case the improper functioning is solved the taximeter can resume operation.

#### **3.2 Housing**

The functionality and /or hardware of an additional device may be included in the same housing with the taximeter.

#### **3.3 Examples for additional devices not covered by MID**

- working time regulations
- shift control
- fiscal aspects

#### **3.4 Additional national requirements related to fiscal aspects**

Such devices may not be in contradiction to MID. Such devices shall only require information delivered by the MID taximeter.

Cryptographic protection of the data is considered adequate.

#### **3.5 Working time regulations and shift control**

Shift management and working time regulations may be carried out by a device regulated nationally. It is allowed to automatically switch off the taximeter via this device. This shall happen in position "For Hire" (not in the positions "Hired" or "Stopped").