



EC type Examination Certificate

0402-MID-SC0970-11

Issued to

TP Radio, Agenavej 37, 2670 GREVE, Denmark

In respect of (type of instrument)

Taximeter TP Radio type Au2Tax

In accordance with

The Measuring Instruments Regulations STAFS 2016:1 and The Regulations and Guidelines concerning Taximeters STAFS 2016:8 dated 2016-03-29, implementing in the NB's country law the Directive 2014/32/EU of 26 February 2014 on measuring instruments (MID).

Applicable essential requirements of directive 2014/32/EU

- Annex I, Essential requirements
- Annex IX (MI-007), Taximeters

Harmonised standards and normative documents used

OIML R21 Taximeters Metrological and technical requirements, test procedures and test report format (applied partly)

Further applied documents

WELMEC 7.2, Software Guide (Issue 5)

OIML D 11 Edition 2004 (E), General requirements for electronic measuring instruments

Information regarding applied environmental testing is evident from clause 9 of the appendix.

Rated operating conditions

Measurand:	Time and or distance	Mechanic environment class:	M3
Measurement range:	Maximum 6 digits on the display (corresponding to the fare to be paid)	Electromagnetic environment class:	E3
Accuracy:	- Time elapsed: $\pm 0,1\%$ - Distance travelled: $\pm 0,2\%$ - Calculation of the fare: $\pm 0,1\%$ - Measuring range: 500-800000 pulses/km	Climatic environment:	-25 to +55 °C Condensing Closed (installed in a car)

Miscellaneous

Valid until November 14, 2021. This certificate is the eighth edition with this number and replaces the earlier edition dated April 12, 2016.

The principal characteristics, approval conditions are set out in the appendix hereto, which forms part of the approval documents and consists of 11 pages. All the plans, schematic diagrams and documentations are recorded under reference files ELe PX10553, PX18645, PX22307, PX25889, 5P07203, 5P06802 and 7P01234.

2017-04-26

SP Technical Research Institute of Sweden
Certification - Notified Body No. 0402

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Certificate issue 8, dated 2017-04-26

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The instruments / measuring systems must correspond with the following specifications:

1 Design of the instrument

1.1 Construction

Product names

TP Radio taximeter Au2Tax consists of:

CPU type TX201 and TX201B (Central processor unit)

Display DI801 and DI802

A printer can be connected to the system, but is not a requirement according to directive 2014/32/EU.

Measuring system description

The taximeter is designed to measure time and receive information to calculate distance. Time is measured by its internal real time clock and distance is calculated by the number of pulses received from the pulse generator of the car in relation to the given pulse constant (number of pulses/km). The supply voltage is taken from the battery of the vehicle. For connections see the schematic picture below.

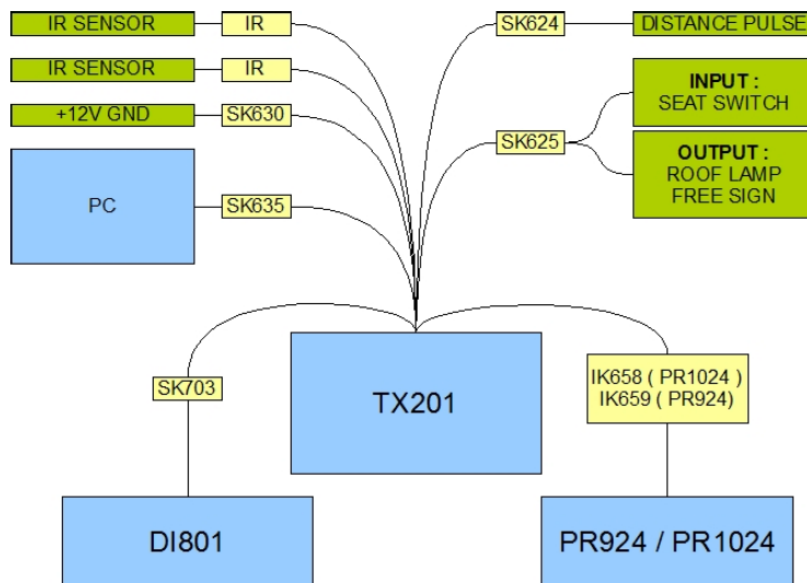


Figure 1: Connections between CPU and other parts of the system

The box TX201 is representative for both CPU TX201 and TX201B.

The box DI801 is representative for both Displays DI801 and DI802

The box PR1024 is representative for both printers PR1024 and PR1024S

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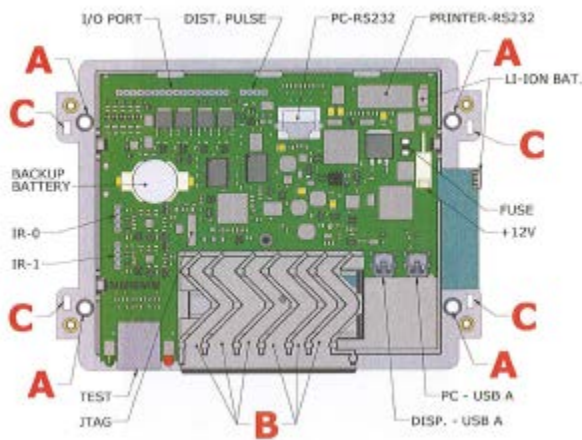


Figure 2: Connections of the CPU



Figure 3: CPU type TX201 or TX201B



Figure 4: Display DI801 with touch keypad and display program 01.03.



Figure 5: Display DI802 without touch keypad and display program SE_001.07.000.

The differences between the CPU types TX201 and TX201B are:
 TX201 lamp output connects to GND (Low) and TX201B lamp output connects to +12V (high).
 TX201B can go to full sleep mode if power supply is disconnected.

Supply voltage

Taximeter: 9-16 V

Connection to pulse generator of the vehicle

The pulse from the pulse generator of the car is to fulfil the following requirements according to the manufacturer:

The distance signal generator should produce pulses where rise and fall time are not exceeding 10% of the pulse width.

Voltage pulse input $V_{in\ low}: -12 < V_{in} < 1V$
 $V_{in\ high}: 3V < V_{in} < 16V$
 Input resistance $> 4.7k\Omega$

The upper limit for input frequency of distance pulse is 5kHz.

Constant of distance generator: min 500 pulses/km, max 80 000 pulses/km.



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1.2 Software

The validation of software was based on the essential requirements given in MID and WELMEC Guide 7.2.

Software version

The following program versions are approved:

Type of program	Program version	Checksum
Taximeter program	1.3	2566391418
	1.3.1	1321107108
	1.3.2	2897146055
	1.3.3	3136443048
	1.3.3T	3449141472
	SE_1.1.1* **	E0C9A2A3
	SE_1.1.2* **	66A47CB7
	1.3.4	4010299134
Display program	01.03	-
	SE_001.07.000**	C3DA4D63

Software versions starting with SE are intended for Sweden. Other versions are intended for Denmark/Norway.

The taximeter version and checksum (SOFTWARE VERSJON and CHK. SUM) can be seen by pressing "arrow right", arrow down until "Setup" is marked and then pressing return.

*program version for Sweden can be seen by pressing "|", arrow down until "Setup" is marked and then press "P" for a print-out.

** Alternatively if a printer is connected the taximeter program version with checksum and display program version with checksum can be read by making a "Taxameterkontroll"*** by pressing the "|" button, "arrow down" until "KONTROLL" is marked, print out the "TAXAMETERKONTROLL" (Taximeter control) by pressing "P" button.

*** The mode "Taxameterkontroll" is a print-out intended for the police or other authority in order to check e.g. the totalisers, the date of securing and the tariff values.

The display program version with checksum is displayed when the taximeter system is powered on.

No function of minimum price or shared price has been verified to fulfil the requirements.

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1.3 Components included for electronic function

- TX201 document list rev 0.2 (according to the change description), dated 05-10-2011
- DI801 document list rev 0.1, dated 05-10-2011 Technical description for Au2Tax Taximeters rev 1.0 dated 16-08-2011.
- Technical description for Au2Tax Taxi Meters
- Differences between documentation and products are evident from report PX10553.
- Hardware changes are evident from the test reports listed in "Traceability of reports concerning changes of the taximeter" described in Appendix 1 of report 7P01234-MID.

1.4 Optional equipment and functions subject to MID requirements

None identified

1.5 Technical documentation

For market surveillance the construction, software and included components are described in 1.1, 1.2 and 1.3.

1.6 Integrated equipment and functions not subject to MID

Software to fulfil national requirements or to communicate with booking central, card reader etc. must not influence the accuracy of measurements such that the maximum permissible error is exceeded or the required functions are changed.

2 Technical data

2.1 Rated operating conditions

Measurand

Time and or distance.

Measurement range

Maximum levels for the taximeter:

Total distance:	99 999 999.9 km
Total distance in taxi traffic (driver logged in):	99 999 999.9 km
Total number of hirings:	999 999
Total amount:	99 999 999.9 monetary units
Total amount supplements:	999 999 99.9 monetary units

The limitation is the maximum fare that can be displayed. The amount is limited to six digits (integers) e.g. NOK 999 999,9.



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Measurement range for taximeter program version SE_1.1.1.

Maximum levels for the taximeter:

Total distance:	999 999 999 km
Total distance in taxi traffic (driver logged in):	999 999 999 km
Total number of hirings:	999 999 999
Total amount:	999 999 999 monetary units
Total amount supplements:	999 999 999 monetary units

The limitation is the maximum fare that can be displayed. The amount is limited to six digits (integers) e.g. SEK 999 999,9.

Accuracy

- Time elapsed: ± 0.1 %
- Distance travelled: ± 0.2 %
- Calculation of the fare: ± 0.1 %
- Pulse range: 500 – 80 000 pulses/km

Environments classes / influence quantities

Mechanic:	class M3
Electromagnetic:	class E3
Ambient temperature limits:	-25°C to +55°C
Humidity:	condensing
Location:	closed (inside a car)

2.2 Other operating conditions

Not applicable.

3 Interfaces and compatibility conditions

See clause 1.1

4 Requirements on production, putting into use and utilisation

The requirements of the installation manual are to be followed when installed in a car and put into use.

4.1 Requirements on production

No special requirements identified.

4.2 Requirements on putting into use

The taximeter must be adapted to the vehicle.

4.3 Requirements for consistent utilisations

No special requirements identified.



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5 Control of the measuring tasks of the instrument in use

5.1 Documentation of the procedure

The procedure to control the accuracy after installation in a car is described in the user's manual.

5.2 Special equipment or software, if applicable

A stop watch or other time measure equipment is needed.

5.3 Calibration-/adjustment procedure

The taximeter can be controlled after installation in a car in the following way.

Accuracy of distance measurement

To check the accuracy of distance measurement the following procedure is to be followed:

- 1) Start printing the taximeter setup (or scroll down to see the KALIB.TALL (taximeter constant))
- 2) Chose menu TEST. The taximeter shows pulses and meters and start counting.
- 3) Drive the test distance (1000m) and stop the car.
- 4) Compare the driven distance (1000m) with the number or meters shown on the display.

Compare the number of pulses on the display with the KALIB.TALL from the print/check of the setup parameters.

Accuracy of time measurement

To check the accuracy of time measurement the following procedure is to be followed:

- 1) Have your own timer ready before start.
- 2) Chose TEST and start your own timer simultaneously.
- 3) Press arrow down on the display to select menu TEST(T). The taximeter now shows time pulses an minutes:seconds
- 4) Stop your own timer when the display shows 20:00. Verify that your own timer shows 20 min. +/- 1.2 seconds.

The calculation of fare is done by the software and hence will be done in the same way if the same software is used as for the type examined taximeter.

To change the taximeter constant the sealing must be broken and a service program from the manufacturer must be used.

6 Security measures

6.1 Sealing

The CPU is to be sealed to the vehicles by using the screw holes placed under the lid of the box. The CPU itself is to be sealed in two opposite corners (marked with P) in accordance with figure 6. The display is to be sealed in accordance with figure 7.



Figure 6: Sealing of CPU



Figure 7: Sealing of display

To prevent the cables from being drawn out they are placed in chicanes in accordance with figure 2 on page 3.

6.2 Data logger

The totalisers are stored in Flash memory with a typical retention time of 20 years according to the manufacturer.

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Change of program version will be stored in non-volatile memory. The taximeter has an event log which is showing loading of new program version, change of k-value, breaking of electronic sealing, power loss and change of tariff. The event log can be seen by pressing “arrow right”, arrow down until “LOGG” is marked and then pressing return. The log items are stored for 2 years. If the taximeter log file is full, it is no longer possible to make a transition from Free mode to Hired mode.

7 Labelling and inscriptions

7.1 Information to be borne by the instrument

The marking on the instrument shall contain the following information:

- the name of the manufacturer
- the serial number
- the designation or type name (according to “Product names” Appendix page 1)
- the EC-type examination certificate number,
- the accuracy
- Information regarding additional devices
- markings regarding other approvals



Figure 8: Placement of marking on the CPU.



Figure 9: Marking plate for CPU . XXXXXX is to be replaced by the approval number. The number 11 in the rectangle is to be replaced by year of affixing of marking

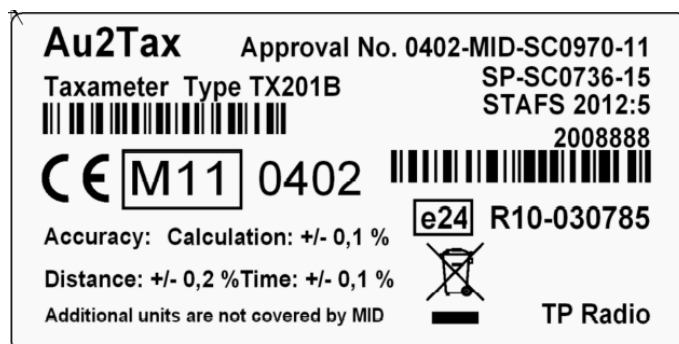


Figure 10: Alternative marking plate for CPU TX201B with taximeter program version SE_1.1.2. . The number 11 in the rectangle is to be replaced by year of affixing of marking

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Marking of display unit is to be placed on the backside of the unit.

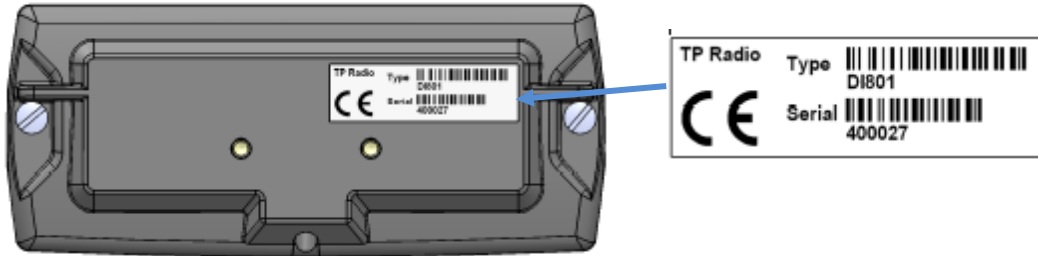


Figure 11: Placement of marking on the display and display label. Figure 12: Marking plate for the display

7.2 Conformity marking in accordance to MID article 17

The instrument shall be marked in accordance to MID article 17 which e.g. describes the CE-marking together with M, year of marking and the notified body number.

7.3 Further inscriptions, if necessary

Further inscriptions e.g. e- or E-marking and national markings are necessary, but are not connected to this directive.

8 Manuals

The following manuals are to accompany the different systems in the official language of the country of use (the manufacturer is responsible for the translation of approved documents).

Program version	Title of manual	Document version	Dated	Language of examined version
*	User Manual for Au2Tax Taxi Meters	5	18/10 2011	English
SE_1.1.1	User Manual for Au2Tax Taxi Meters	SW ver. 1.1.1	07/12 2015	English
SE_1.1.2 1.3.4	User Manual for Au2Tax_SE Taxi Meters	SW ver. 1.1.2	06/02 2017	English

* = for all of the program versions that are approved before SE_1.1.1 and 1.3.4.

For installation purposes the installation manual "Installation instructions for Au2Tax Taxi Meters", with revision 1.1 dated 16-08-2011 (examined in English version) is to be followed.



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9 Applied environmental testing

Vibration

IEC 60068-2-64 revision 1, test Fh (this is a higher severity than Class M3 in accordance with OIML D11):

10-20 Hz: 0.05 g²/Hz

20-500Hz: -3 dB/octave

Testing was carried out in three mutually perpendicular axes for 0.5 hours in each direction and the taximeter was connected to power during testing.

Dry Heat

OIML D11, clause 10.1.1 with testing according at IEC 60068-2-2 test Bd, but with the duration 16h and the highest temperature +70°C. Functional control was carried out at +55°C.

The test object was connected to power during the test.

Cyclic damp heat/Cold

Testing of cold and damp heat was carried out in accordance with the climate sequence of IEC 60068-2-61.

First one cycle damp heat was carried out according to IEC 60068-2-30 edition 2 revision 1. test Db. temperature: +55 °C. The taximeter was not connected to power during testing.

After recovery in controlled atmosphere during 1 h ±5 min cold test according to IEC 60068-2-2 edition 5 revision 2 test Ab at -40 °C during 16 h was carried out. Functional testing was carried out at -25°C.

After finalisation of the cold test 5 cycles of damp heat was carried out according to IEC 60068-2-30. edition 2. revision 1. test Db. +55 °C. The taximeter was not powered during testing.

Emission

EN 55022:2006, /A1:2007 class B

Immunity (Fro CPU TX201 and display DI801)

OIML D11 12.2 Electrostatic discharged according to IEC61000-4-2, level 3

OIML D11 12.1.1/1 and 12.1.1/2 Radiated RF immunity according to IEC61000-4-3, 24 V/m

OIML D11 12.1.2 Injected RF immunity according to IEC61000-4-6, 20 V

OIML D11 14.2.2 Automotive voltage transient immunity according to ISO 7637-2, level 4, pulses 1, 2a, 2b, 3a, 3b, 4 and 5a

OIML D11 14.2.3 Automotive voltage transient immunity ISO 7637-3, level 4, pulses 3a and 3b

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Immunity (Fro CPU TX201B and display DI802)

OIML R21 A.5.4.5.1 Radiated RF immunity according to IEC61000-4-3, 24 V/m

OIML R21 A.5.4.5.2 Injected RF immunity according to IEC61000-4-6, 24 V

OIML R21 A.5.4.6 Electrostatic discharged according to IEC61000-4-2, level 3

OIML R21 A.5.4.7.1 Automotive voltage transient immunity according to ISO 7637-2, level 4, pulses 1, 2a, 2b, 3a, 3b, 4 and 5a

OIML R21 A.5.4.7.2 Automotive voltage transient immunity ISO 7637-3, level 4, pulses 3a and 3b

OIML R21 A.5.4.3.1 Supply voltage limit variations according to ISO 16750-2, 9VDC/16VDC

OIML R21 A.5.4.3.2 Voltage drop below limit according to ISO 16750-2, 0-40-90%

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