

Issued by Notified Body No. 0402 according to Directive 2014/32/EU MID annex II Module B, regarding:

Taximeter system Au2Tax

Issued to

TP Radio

Agenavej 37, SE-2670 Greve, Denmark

In accordance with

Annex II Module B of the Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments, implemented in Swedish law by SWEDAC Regulation STAFS 2016:1 and STAFS 2016:8, Regulation and Guidelines concerning Taximeters. RISE Certification Rule SPCR 302 issue 2021-12-21 has been applied.

Type of instrument and type designation

Taximeter, Au2Tax.

Conclusion of the examination

For the instruments mentioned in this Certificate, the following essential requirements of Directive 2014/32/EU apply:

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

For the instruments, the following harmonized standards or normative documents will be applied:

- OIML R21, edition 2007, (E), Taximeters Metrological and technical requirements, test procedures and test report format (applied partly)

For the instruments, the following technical specifications will be applied additionally:

- WELMEC 12.1, Taximeter common application, Directive 2017/32/EU, Annexes I & IX (2020)
- WELMEC 7.2, Software Guide (Issue 2015)

The measuring instrument's technical design which is described below complies with the above-mentioned essential requirements. With this Certificate, permission is given to attach the number of this Certificate to the instruments that have been manufactured in compliance with this Certificate.

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: 500-80 000 pulses/km	Climatic environment:	-20 to +50 °C Condensing Closed (installed in a car)

Originally issued: 2011-11-14
Valid until: 2032-03-07

This certificate replaces earlier issues.



Martin Tillander

Certificate 0402-MID-SC0970-11 | issue 10 | 2022-05-25

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The instruments must meet the following provisions:

1. Design of the instrument

1.1 General description/Construction

Product names

TP Radio taximeter Au2Tax consists of:

- CPU type TX201B (Central processor unit)
- Display DI803
- 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.

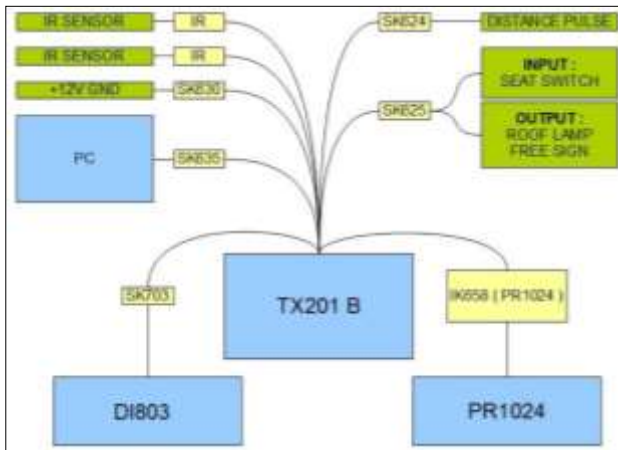


Figure 1: Connections between CPU and other parts of the taximeter system.

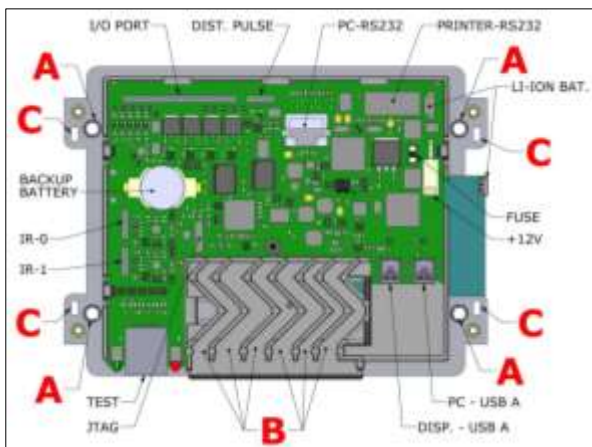


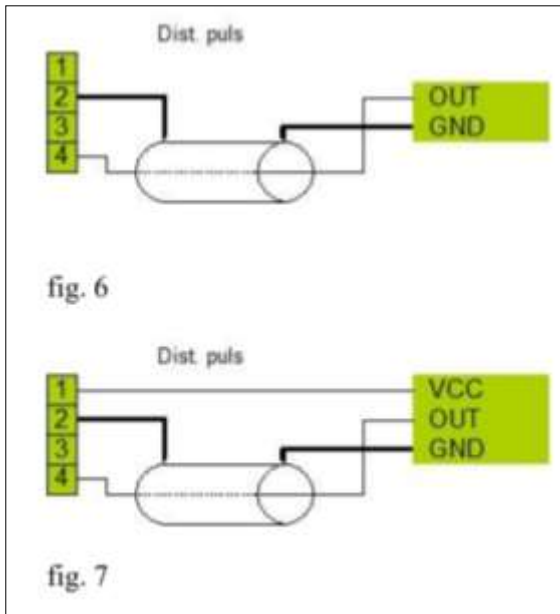
Figure 2: Connections of the CPU



Figure 3: CPU TX201B



Figure 4: Display DI803



Pin	Name	Function
1	+12V	+12V supply for encoder
2	GND	GND
3	Distance pulse AC	NC
4	Distance pulse DC	Distance pulse input

Figure 5 and 6: Connections of the vehicle interface cable and pin-configuration of the cable

Supply voltage

Taximeter: 9-16 V

1.2 Sensor

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

Vin low: $-12 < V_{in} < 1V$

Vin 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.

1.3 Measurement value processing

Hardware

CPU type TX201B

Display DI803

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

Software

The validation of software was based on the essential requirements given in MID and WELMEC Guide 7.2 (2015).

The following program versions are approved:

Type of program	Program version	Checksum
Taximeter program*	SE_1.1.3	7CB9ED28
Taximeter program	1.3.5	1697262053
Display program	SE_001.07.000	C3DA4D63

* = The software version SE_1.1.3 is including the Swedish requirements for an accessory device.

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.

1.4 Indication of the measurement results

The indication of the measurement result is shown on display DI803.

1.5 Optional equipment and functions subject to MID requirements

None identified.

1.6 Technical documents

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

1.7 Integrated equipment and functions not subject to MID

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

1.8 Parameter settings

No special requirements identified.

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 (hired and stopped):	99.999.999,9 km
Total number of hirings:	999.999
Total number of shifts:	999.999
Total amount:	999.999.999 monetary units
Total amount supplements:	99.999.999,9 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 class

Time elapsed:	± 0.1 %
Distance travelled:	± 0.2 %
Calculation of the fare:	± 0.1 %
Pulse range:	500 – 80 000 pulses/km
Maximum pulse frequency:	< 5 000 pulses per second

Environmental conditions / 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 utilization

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 utilizations

No special requirements identified.

5. Checking of instruments which are in operation

5.1 Documents required for the test

The procedure to control the accuracy after installation in a car is described in the user's manual Special test facilities or software

5.2 Identification of hardware and software

See clause 7

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 (1 000m) and stop the car.
- 4) Compare the driven distance (1 000m) 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 Mechanical seals

The CPU is to be sealed to the vehicle 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 2

6.2 Electronic seals

No special requirements identified.

6.3 Software seals

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

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 and postal address of the manufacturer
- the serial number
- the designation or type name (according to “Product names” on page 2)
- the EU type-examination certificate number, 0402-MID-SC0970-11
- the accuracy class
- markings regarding other approvals
- marking regarding additional devices not being covered by MID

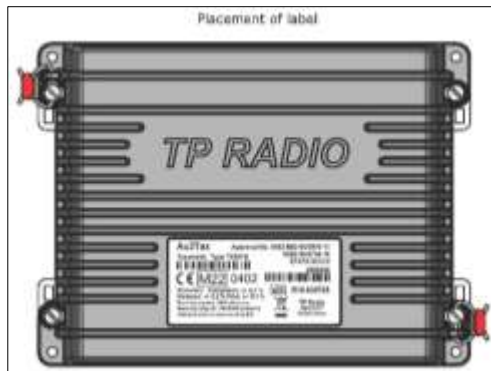


Figure 8: Placement of marking on the CPU.



Figure 9: Marking plate for CPU

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

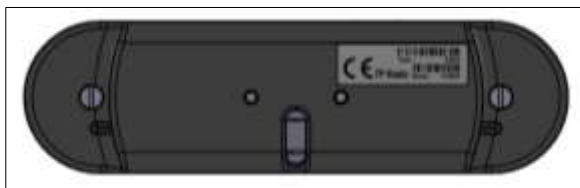


Figure 11: Placement of marking on the display.

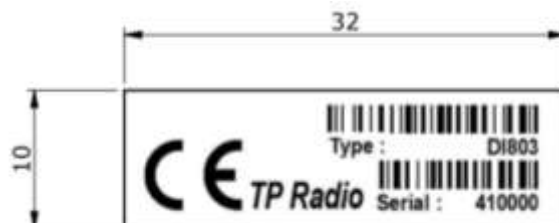


Figure 12: Marking plate on the display

7.2 Conformity marking in accordance with MID article 21

The instrument shall be marked in accordance with MID article 21 which e.g. describes the CE-marking together with M, year of marking and the id number of the notified body responsible for module D.

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).

<i>Program version</i>	<i>Title of manual</i>	<i>Document version</i>	<i>Dated</i>	<i>Language of examined version</i>
SW ver. SE_1.1.3	User Manual for Au2Tax_SE Taxi Meters	2.1	08/02 2022	English
SW ver. 1.3.5	User Manual for Au2Tax Taxi Meters	7.1	03/15 2022	English

For installation purposes the installation manual "Installation instructions for Au2Tax Taxi Meters", with revision 2.0 dated 28-10-2021 (examined in English version) is to be followed.

9. Testing and examination

Testing and examination has been carried out in accordance with report P112538.DP01.A01. The principal characteristics, approval conditions are set out in this certificate. All the plans, schematic diagrams and documentations are recorded under reference file P112538.

Vibration

Testing was carried out in three mutually perpendicular axes for 0,5 hours in each direction and the instrument was connected to power during testing.

IEC 60068-2-64 (OIML R21, Annex A clause A.5.4.4):

Total frequency range	10-150 Hz
Total RMS level	7 m/s ²
ASD level 10-20 Hz	1 m ² /s ³
ASD level 20-150 Hz	-3 dB/octave

Dry Heat

IEC 60068-2-2 (OIML R21, Annex A clause A.5.4.1), with a duration of 16h at the highest temperature +55°C. Functional control was carried out at +55°C. The test object was connected to power during the test. A functional test was performed as follows (at high temperature and after the test):

Cyclic damp heat

Two cycles of damp heat were carried out according to IEC 60068-2-30 (OIML R21, Annex A.5.4.2) temperature: +55 °C.

The test object was disconnected from power during the damp heat test. The test object was powered at the end of the damp heat test for the functional testing.

Cold

IEC 60068-2-1 (OIML R21, Annex A clause A.5.4.1), with a duration of 16h at the lowers temperature - 25°C.

The taximeter was not connected to power during testing. A functional test was performed as follows (at low temperature and after the test):

Emission

EN 55022:2006, /A1:2007 class A

Immunity

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, 6 kV CD/8 kV AD

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

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

Starting profile. Level III according to ISO 16750-2:2021 (E)

Load dump, Test B according to ISO 16750-2:2021 (E)

10. Revision history / Traceability of reports concerning EU type examination

Certificate

<i>Issue</i>	<i>Dated</i>	<i>Description</i>
1	2011-11-14	Certificate issued
2	2012-01-17	Update due to software update
3	2012-03-14	Update due to software update
4	2012-08-17	Update due to software update
5	2016-02-03	Update due to hardware update
6	2016-02-23	Update due to software update
7	2016-04-12	Update due to software update
8	2017-04-26	Update due to software update
9	2022-03-07	Renewal of certificate
10	2022-05-20	Update due to software update

EU type examination

<i>Report</i>	<i>Title</i>	<i>Date</i>
PX10553	EC Type examination of taximeter (module B)	2011-11-14
PX10553-02	Evaluation of Taximeter Software	2011-11-02
T200845 rev B	EMC test of Taxameter Au2Tax TX201*	2011-11-02
T200845-1 rev A	EMC immunity test of Taxameter Display DI 801*	2011-11-07

Supplementary EU type examination

<i>Report</i>	<i>Title</i>	<i>Date</i>
PX18645	Supplementary EC type examination of taximeter (module B)	2012-01-16
PX22307	Supplementary EC type examination of taximeter (module B)	2012-03-13
PX25889	Supplementary EC type examination of taximeter (module B)	2012-08-15
5P07203-MID rev.1	Supplementary EC type examination of taximeter (module B)	2016-02-16
5P07203-01	EMC Test on Taximeter system Au2Tax (TX201 and DI801) with accessory device (PR1024)	2016-01-04
5P07203-03	EMC test of Taximeter system Au2Tax	2016-01-26
5P06802-MID rev.2	Supplementary EC type examination of taximeter (module B)	2016-04-07
7P01234-MID	Supplementary EC type examination of taximeter	2017-04-26
7P01234-01	Evaluation of further conformity to WG7.2	2017-03-17
7P01234-02	Evaluation of Risk Analysis, Taximeter Au2Tax	2017-03-31
P112538.DP01.A01	EU type examination of taximeter (module B)	2022-03-01
P115003.DP01.A01	Supplementary EU type examination of taximeter	2022-05-05