National Measurement Office

UK/0126/0127

MI-007

EC type-examination certificate UK/0126/0127

Issued by:

The National Measurement Office
Notified Body Number 0126

In accordance with the requirements of the Measuring Instruments (Taximeters) Regulations 2006 (SI 2006/2304) and the Measuring Instruments (Non-Prescribed Instruments) Regulations 2006 which implement, in the United Kingdom, Council Directive 2004/22/EC, this EC type-examination certificate has been issued to:

Cygnus Automotive Ltd
Unit 10
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Cannock
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WS11 7FG
United Kingdom

in respect of a taximeter designated the MR500 and having the following characteristics:

Taximeter constant : k = 650 to 360,000 pulses/mile
Maximum speed : 255 mph

The necessary data (principal characteristics, alterations, securing, functioning etc) for identification purposes and conditions (when applicable) are set out in the descriptive annex to this certificate.

Issue Date: **12 October 2012**
Valid Until: **11 October 2022**
Reference No: **TS16/0002**

Signatory: **P R Dixon**
for **Chief Executive**

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UKAS PRODUCT CERTIFICATION
0135

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Descriptive Annex

1 INTRODUCTION

The pattern is a taximeter designated the MR500, designed to be installed in a road vehicle for the calculation of fares. The fares are calculated based on measurement of distance and time, the instrument operates in single mode calculation (time or distance counting). The instrument is powered via the vehicle battery.

The distance measuring device (transducer) is not covered by this certificate.

2 FUNCTIONAL DESCRIPTION

2.1 Construction

The instrument (Figure 1) is connected to a pulse generator fixed to a moving part of the vehicle.

- All electronics are enclosed in a Polycarbonate ESA case, comprising opaque front and rear cases.
- The user control and display interface comprises an LED display behind a transparent lens, and five function keys located at the bottom of the front panel.
- The taximeter has a number of electrical connections, located at the back of the instrument, for Power, Lamp Output, Relay Output and Communications
- A screw located at the top left corner can be sealed to prevent access to the case.
- A sealable cover located at the bottom left corner of the instrument's front face allows access to the tariff or software card connector.

2.2 Devices

The instrument has the following devices:

- Time or distance counting
- Fare calculation (initial fare, fare increments, extras)
- Display of rate, mode (For Hire, Hired, Stopped) and fare (actual fare and total fare with extras)
- Optional printing
- Loading of tariffs and software
- Real time clock
- Totals (various parameters are recorded and can be recalled on demand)
- Recorded journey information

3 TECHNICAL DATA

3.1 The MR500 has the following technical characteristics.

Power supply	12 V DC
Taximeter constant k	650 to 360,000 pulses/mile
Maximum speed	255 mph
Pulse voltage amplitude (low-high)	2-4 V to 0- 20 V
Pulse frequency	0 to 25 kHz
Electromagnetic classification	E3
Mechanical environment	M3
Climatic environment	-40°C to +70 °C
	Non-condensing (closed)

3.2 Documentation and drawings

Description	Drawing / Document number	Revision/Issue
User Manual	C2468	6
Dealer Manual	C2469	4
Schematic diagram	C2242 (7 sheets)	8
Block diagram	C2492	2
Technical file	C02515	4

3.3 Software

3.3.1 The software is designated version 2.10.00, which can be displayed via the software menu.

3.3.2 Security

The legally relevant software is protected by a 32-bit checksum. When power is applied to the taximeter, a separate boot loader application performs a checksum calculation on the legally relevant software. If the checksum fails, the legally relevant software is not executed.

The legally relevant software may be changed only by means of an encrypted software card. The card carries various data, including program data blocks and checksums, in a format that is unique to the MR500 taximeter. The boot loader application will reject any card that does not meet the physical, electrical, data format and encryption requirements.

Parameters affecting the measurement data can only be changed by means of an encrypted software/tariff card.

4 PERIPHERAL DEVICES AND INTERFACES

4.1 Interfaces

The instrument has the following interfaces:

- Comms/CAN connector (8-pin)
- Power/Top Sign/Speed Pulse connector (6-pin)
- Relays connector (4-pin)
- Software/tariff connector

4.2 Peripheral devices

The instrument may be connected to any peripheral device that has been issued with a test certificate or parts certificate by a Notified Body responsible for Annex B (MI-007) under Directive 2004/22/EC in any Member State and bears the CE marking of conformity to the relevant directives; or

A peripheral device without a test certificate may be connected under the following conditions:

- it bears the CE marking for conformity to the EMC Directive;
- it is not capable of transmitting any data or instruction into the measuring instrument, other than to release a printout, checking for correct data transmission or validation;
- it prints measuring results and other data as received from the measuring instrument without any modification or further processing; and
- it complies with the applicable requirements of Paragraph 8.1 of Annex I.

5 APPROVAL CONDITIONS

The certificate is issued subject to the following conditions:

5.1 Legends and inscriptions

The instrument bears the following legends (Figure 2):

'CE' marking
Supplementary metrology marking
Notified body identification number
Serial number
Manufacturers mark or name
Certificate number
Temperature range

6 LOCATION OF SEALS AND VERIFICATION MARKS

6.1 The 'CE' marking, supplementary metrology marking and certificate number are located on the rear face. The CE mark shall be impossible to remove without damaging it. The data plate shall be impossible to remove without it being destroyed.

The markings and inscriptions shall fulfil the requirements of Paragraph 9 of Annex I of the Directive 2004/22/EC.

6.2 Components that may not be dismantled or adjusted by the user (case, test connector, transducer connection) will be secured by either a wire and seal or tamper evident label and securing mark.

The securing mark may be either:

- a mark of the manufacturer and/or manufacturer's representative, or
- an official mark of a verification officer.

6.3 The tariff card port may be secured as in 6.2, or may be left unsecured if allowed in National Regulations to allow tariff updates.

7 ALTERNATIVES

There are currently no authorised alternatives.

8 ILLUSTRATIONS

Figure 1 MR500
Figure 2 Rating plate

9 CERTIFICATE HISTORY

ISSUE NO.	DATE	DESCRIPTION
UK/0126/0127	12 October 2012	Type examination certificate first issued.

Figure 1 MR500

Figure 2 Rating plate