



National  
Measurement &  
Regulation Office

UK/0126/0171

MI-007

## EC type-approval certificate UK/0126/0181 Revision 1

Issued by:

**The National Measurement and Regulation Office  
Notified Body Number 0126**

In accordance with the requirements of the Non-automatic Weighing Instruments Regulations 2000 (SI 2000/3236) which implement, in the United Kingdom, Council Directive 2009/23/EC, this EC type-approval certificate has been issued to:

**Cygnus Automotive Ltd  
Unit 10  
Advance Business Park  
Burdock Close  
Hemlock Way  
Cannock  
Staffordshire  
WS11 7FG  
United Kingdom**

In respect of taximeters designated the MR400 and MR400S, 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.

This revision replaces previous versions of the certificate.

**Issue Date: 02 June 2015**  
**Valid Until: 09 November 2024**  
**Reference No: TS16/0008**

**P R Dixon**  
**Certification Services Director**  
*For and on behalf of the Chief Executive*



0135

# Descriptive Annex

## 1 INTRODUCTION

The pattern is a taximeter designated the MR400, 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 (Figures 1 and 2) is connected to a pulse generator fixed to a moving part of the vehicle.

- All electronics are enclosed in a case, comprising opaque ABS front and rear DieCast case.
- The user control and display interface (Figure 3) 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, Distance transducer, Lamp Output, Relay Output and Communications
- A screw located at the bottom right corner is used to seal the taximeter to the installation bracket (Figure 3).
- 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
- Totalisers
- Recorded journey information

### 2.3 Hardware variants

The MR400 may be fitted with an RS485 ("London" version, Part Number C00886) or RS232 ("Provincial" version, Part Number C00885) communication port.

### 3 TECHNICAL DATA

3.1 The MR400 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)	0-2 V to 4- 20 V
Pulse frequency	0 to 10 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
London MR400 Taximeter User Guide	C03164	2.0
London MR400 Taximeter User Guide	C03165	2.0
Schematic diagram	C710	4
MR400 (London) Taximeter Parts list	C917	2.0
MR400 (Provincial) Taximeter Parts list	C919	2.0
Technical file	C00873	2.0

### 3.3 Software

3.3.1 The software identification shall be as follows:

London Version	09a47.00
Provincial version	07a47.00

This information can be displayed via the software menu (as described in the User Guides).

The tariff identification can also be displayed via the software menu.

#### 3.3.2 Security

The legally relevant software is protected by a 16-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 MR400 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.

Measurement data (totalisers) is protected by a 16-bit checksum, and cannot be deleted by the user.

Access to the software/tariff card connector is prevented by a mechanical seal (see section 6.2).

## **4 PERIPHERAL DEVICES AND INTERFACES**

### **4.1 Interfaces**

The instrument has the following interfaces:

- Distance transducer input
- Lamp Output
- Relay Output
- RS485 (London version)
- RS232 (Provincial version)
- Software/tariff connector (sealed)

### **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 4):

'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 Sealing measures

The installation bracket includes 6 tabs that are pushed out, preventing its removal from the vehicle. The taximeter is fitted on the bracket via the installation screw located at the bottom right corner. Sealing of the installation screw prevents access to the electronics and to the distance transducer, and seals the taximeter in the vehicle.

Access to the Software/tariff connector (bottom left corner of the instrument's front face) shall be sealed

The sealing method may be a wire and seal, tamper evident label or plastic cover, bearing a 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.

Note: an additional recess is located to the left of the installation screw. This does not provide any form of mechanical sealing but may be used for identification purposes according to National/local regulations (e.g. tariff colour code for London).

## 7 ALTERNATIVES

7.1 Having a modified taximeter designated the MR400S (Figure 6). The taximeter is identical to the MR400 but fitted with the ST400 Secure Tariff Module (Figure 7). The ST400 comprises a PCB, an LED and a slot for tariff or supervisor cards, designed for the download of tariff via a tariff key.

## 8 ILLUSTRATIONS

Figure 1	MR400 taximeter front view
Figure 2	MR400 taximeter rear view
Figure 3	Installation bracket
Figure 4	Front layout
Figure 5	Markings (example)
Figure 6	MR400S taximeter
Figure 7	ST400 Secure Tariff Module

## 9 CERTIFICATE HISTORY

ISSUE NO.	DATE	DESCRIPTION
UK/0126/0181	10 November 2014	Type examination certificate first issued.
UK/0126/0181 Rev 1	02 June 2015	MR400S added to the front page. Section 7.1 added.



Figure 1 MR400 taximeter front view



Figure 2 MR400 taximeter rear view

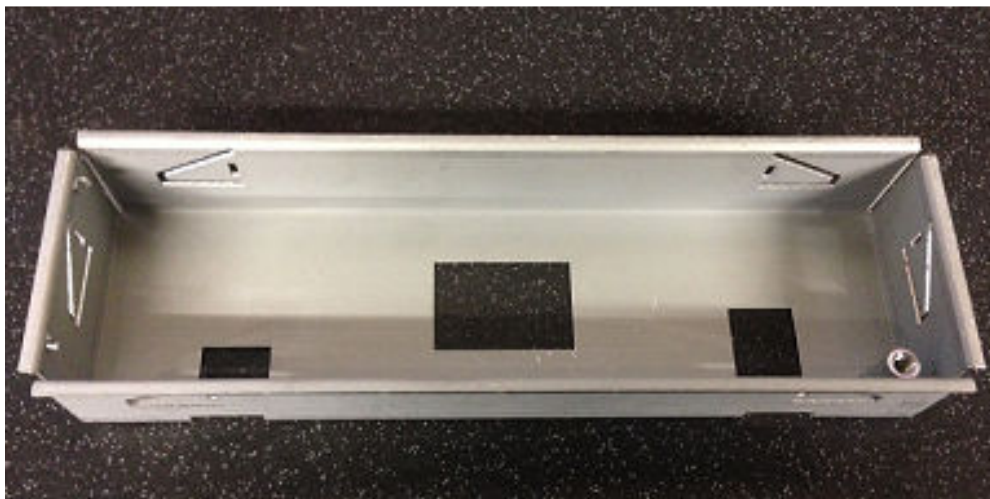


Figure 3 Installation bracket

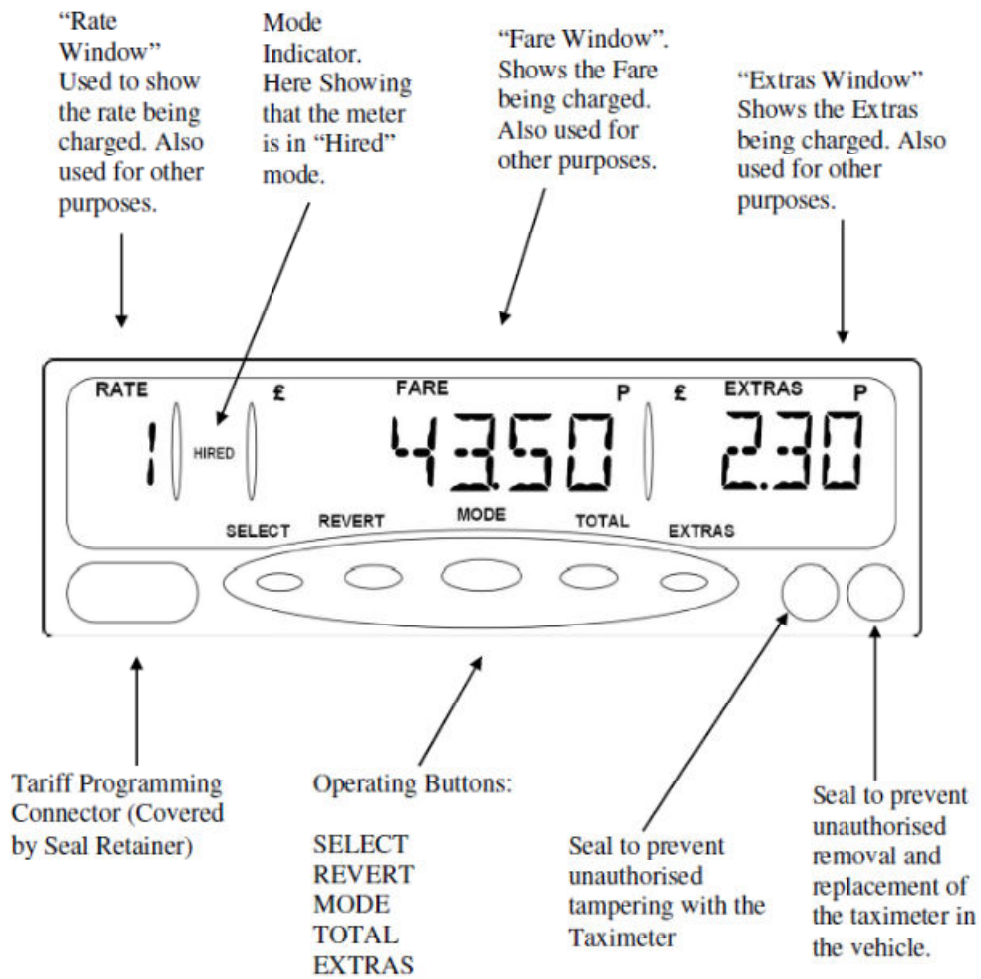


Figure 4 Front layout

**Cygnus** **MR400**  
TAXIMETER  
www.taxiworld.co.uk

**RATINGS**  
Accuracy: <MPE  
Power: +12V DC -ve Earth  
Temp Range: -40°C / +70°C

**CE M14**  
EC Type Examination Cert. No.:  
**UK/0126/0181**

**MADE IN THE UK**  
**SAFETY WARNING: THIS TAXIMETER SHOULD BE SECURELY FITTED TO THE VEHICLE INTERIOR!**

Unit 10, Advance Business Park, Burdock Close, Cannock, Staffordshire, WS11 7FG. UK.

The markings are on a black background with white text. On the left, there is a crossed-out icon of a trash bin. The CE mark and M14 are enclosed in a box.

Figure 5 Markings (example)



Figure 6 MR400S taximeter



Figure 7 ST400 Secure Tariff Module