# elcometer®

inspection equipment

# Elcometer 224

surface profile gauge

# elcometer®

## Elcometer 224  Digital Surface Profile Gauge

**Elcometer 224**

**STANDARDS:**
ASTM D 4417-B, SANS 5772,
SSPC PA 17, US Navy NSI 009-32,
US Navy PPI 63101-000

Stores up to 150,000 readings in up to 2,500 alpha numeric batches

Time and date stamped measurements

Accurate, immediate and repeatable results

User replaceable tough tungsten carbide tips

Integral & separate probe options for flat and convex* surfaces

Fast reading rate of 50+ readings per minute^

USB and Bluetooth® data output to ElcoMaster® software

Auto rotating display with tap awake feature

Dust and water resistant rugged design equivalent to IP64

Review batch data or last 20 readings in a graph format

compatible with **ElcoMaster®**

available with **Bluetooth®** wireless technology

Suitable for use in Cloud Computing

Measures on flat and convex surfaces

**Android™**

Made for
iPod  iPhone  iPad

2.4" colour screen provides enhanced reading visibility at all angles

Ergonomic design for comfort during continuous use

Integral or separate probes measure profiles up to 500µm (20mils) on flat or curved surfaces*

The Elcometer 224 provides the very latest in surface profile measuring technology for measuring profile on either flat or curved surfaces. Fast, accurate and very user friendly, the Elcometer 224 is available with or without memory and Bluetooth®.

* Patent applied for

^ Convex probe up to 25 readings per minute

## elcometer®

## Elcometer 224     Digital Surface Profile Gauge

# Designed with you in mind

## User Friendly

- Large buttons ideal for gloved hands
- Easy to use menus in multiple languages
- High contrast colour LCD with auto rotate
- High and low reading limit indicators
- Factory calibrated for immediate use

## Accurate

- Measurement capability to ±5%
- Can be used in accordance with National and International Standards
- Temperature stable measurements
- Statistics are calculated and displayed in real time
- Live and batch readings graph format for instant analysis

## Reliability

- Repeatable and reproducible measurements
- 2 year gauge warranty
- Supplied with fully traceable Test Certificates
- Batch & individual readings are date and time stamped

## Tough

- Sealed, heavy duty and impact resistant
- Dust and waterproof equivalent to IP64
- Suitable for use in harsh environments
- Scratch and solvent resistant display
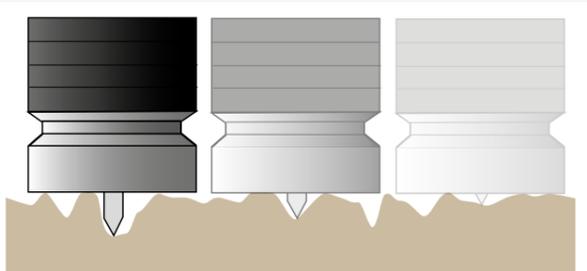- Durable gauge and probe construction

## Efficient

- Fast reading rate of 50+ per minute
- Integral and separate probe versions to suit your application
- Alpha numeric batch identification
- Compatible with ElcoMaster® and ElcoMaster® Mobile App
- Powersave mode with tap awake

## Powerful

- User replaceable tough tungsten carbide tip - can be used for up to 20,000 readings
- USB and Bluetooth® data output to iPhone* or Android™ devices
- Stores up to 150,000 readings in 2,500 batches
- Measures profiles up to 500μm (20 mils)

### How to measure surface profile



1. Calibrate on a glass zero tile.
2. Ensure probe is 90° to substrate to ensure accurate readings.
3. Take a minimum of 10 readings over an area to establish the average surface profile.

*Compatible with iPod, iPhone and iPad.

---

## elcometer®

## Digital Surface Profile Gauge     Elcometer 224

### Product Features

| | Model B | Model T |
|---|:---:|:---:|
| Fast, accurate reading rate; *50+ readings per minute^* | ■ | ■ |
| Repeatable & reproducible measurements | ■ | ■ |
| Easy to use menu structure; *in 30+ languages* | ■ | ■ |
| Tough, impact, waterproof & dust resistant; *equivalent to IP64* | ■ | ■ |
| Bright colour screen; *with permanent back light* | ■ | ■ |
| Scratch & solvent resistant display; *2.4" (6cm) TFT* | ■ | ■ |
| Large positive feedback buttons | ■ | ■ |
| Flat & convex surfaces* | ■ | ■ |
| USB power supply; *via PC* | ■ | ■ |
| Test certificate | ■ | ■ |
| 2 year gauge warranty† | ■ | ■ |
| Automatic rotating display; *0°, 90°, 180° & 270°* | ■ | ■ |
| Ambient light sensor; *with adjustable auto brightness* | ■ | ■ |
| Emergency light mode | ■ | ■ |
| Gauge software updates[1]; *via ElcoMaster® software* | ■ | ■ |
| Data output | ■ | ■ |
|     USB; *to computer* | ■ | ■ |
|     Bluetooth®: *to computer, Android™ & iOS‡ devices* | | ■ |
| On screen statistics | ■ | ■ |
|     Number of readings, $\eta$; Mean (average), $\overline{x}$; Standard deviation, $\sigma$; Highest reading, *Hi;* Lowest reading, *Lo;* Coefficient of variation, *CV%* | ■ | ■ |
|     High & low limits; *definable audible & visual alarms* | | ■ |
|     Number above high limit; | | ■ |
|     Number below low limit; | | ■ |
| ElcoMaster® software & USB cable | | ■ |
| Date and time stamp *for each reading* | | ■ |
| Replaceable screen protectors | ■ | ■ |
| Protective case | ■ | ■ |
| Plastic transit case | □ | ■ |
| Measurement range | 0-500μm (20 mils) | 0-500μm (20 mils) |
| On-screen calibration instructions; *in 30+ languages* | ■ | ■ |
| Number of batches | | 2,500 |
| Gauge memory; *number of readings* | Last 5 | 150,000 |
| Delete last reading | ■# | ■ |
| Limits; *user definable audible & visual pass/fail warnings* | | ■ |
|     Gauge (g) or gauge & batch specific (gb) limits | | gb |
| Batch types; *normal, counted average* | | ■ |
| Review, clear & delete batches | | ■ |
| Copy batches and calibration settings | | ■ |
| Alpha-numeric batch names; *user definable on the gauge* | | ■ |
| Fixed batch size mode; *with batch linking* | | ■ |
| Trend graph; *last 20 readings* | | ■ |
| Review batch graph | | ■ |

■ Standard     □ Optional     ‡ Visit www.elcometer.com/sdk to find out how to integrate Elcometer's MFi certified products to your App.

[1] Internet connection required    *Up to the last 5 readings can be deleted    * Patent applied for    ^Up to 25 readings per minute for the convex probe

† The Elcometer 224 is extendable within 60 days from date of purchase, free of charge, to 2 years via www.elcometer.com.
Elcometer 224 probes are covered by a 1 year warranty.

elcometer®

## Elcometer 224    Digital Surface Profile Gauge

### Model Options

| Part Number | | Description | Certificate |
|---|---|---|---|
| Integral Gauge | Separate Gauge^ | | C |
| E224C-BI | E224C-BS | Elcometer 224 Model B Digital Surface Profile Gauge | ● |
| E224C-TI | E224C-TS | Elcometer 224 Model T Digital Surface Profile Gauge | ● |

### Technical Specification

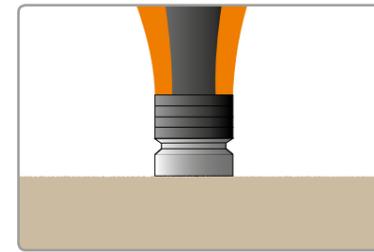| | |
|---|---|
| Display information | 2.4" (6cm) QVGA colour TFT display, 320 x 240 pixels |
| Battery type | 2 x AA batteries, rechargeable batteries can also be used |
| Battery life | Approximately 24 hours of continuous use at 1 reading per second# |
| Minimum Headroom | Integral: 185mm (7.3") |
| | Separate: See page 7 |
| Gauge dimensions (h x w x d) | Integral: 168 x 73 x 37mm (5.61 x 2.87 x 1.46") |
| | Separate: 141 x 73 x 37mm (5.55 x 2.87 x 1.46") |
| Gauge weight (including batteries) | Integral: 218g (7.69oz) |
| | Separate: 161g (5.68oz) |
| Measurement range | 0-500µm (0-20mils) |
| Probe tip | Tungsten carbide tip 60° angle;  Tip Radius: 50µm (2mil) |
| Operating temperature | -10 to 50°C (14 to 122°F)    Storage temperature    -10 to 60°C (14 to 140°F) |
| Accuracy & Resolution | Accuracy*: ±5% or ±5µm (±0.2mil); Resolution: 1µm (0.1mil) |
| Packing List† | Elcometer 224 gauge, glass zero tile†, 2 x calibration foils†, wrist harness, plastic transit case (T), protective case, screen protector, probe protection cap†, 2 x AA batteries, test certificate, operating instructions, USB cable (T) & ElcoMaster® software (T) |

## Elcometer    Digital Inspection Kits

These digital inspection kits have been specifically designed to undertake the three principal inspection requirements in the Protective and Industrial Coatings Industry– climate, surface profile and dry film thickness.  Ideal for 'paperless' quality assurance systems the kits come complete with ElcoMaster® Data Management Software for professional reporting and analysis.

### Technical Specification

| Part Number | Description |
|---|---|
| YKIT-DIGITAL-B | Elcometer Basic Digital Inspection Kit (F) |
| YKIT-DIGITAL-T | Elcometer Top Digital Inspection Kit (F) |
| YKIT-DIGITALFNF-B | Elcometer Basic Digital Inspection Kit (FNF) |
| YKIT-DIGITALFNF-T | Elcometer Top Digital Inspection Kit (FNF) |

* Whichever is the greater                                    ^ Probes are supplied separately, see page 7 for details

# Using default settings & lithium batteries, alkaline or rechargeable batteries may differ.

† For separate gauges, the test foils, glass zero tile and probe protection cap are supplied with the separate probe.

● Test Certificate supplied as standard.
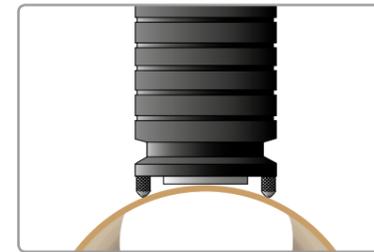
## Digital Surface Profile Probes    Elcometer 224

**Flat Surface Profile Probes**
Supplied with either standard cables or armoured metal reinforced heavy duty cables, Elcometer surface profile probes are supplied with a glass zero plate, calibration test foils; nominal values 125µm (5.0mils) & 508µm (20mils) and an Elcometer test certificate.

### Technical Specification    C

| Range: 0-500µm (0-20mils) | | Resolution: 1µm (0.1mil) | | Accuracy: ±5% or ±5µm (±0.2mil) | |
|---|---|---|---|---|---|
| Probe Design | Part Number | Minimum Headroom | Minimum Sample Diameter | Certificate | |
| Flat Surface: Standard | T224C500US | 125mm (4.92") | 25mm (1.0") | ● | |
| Flat Surface: Armoured | T224C500UARM | 165mm (6.50") | 25mm (1.0") | ● | |

**Convex Surface Profile Probes**
Supplied with either standard cables or armoured metal reinforced heavy duty cables, Elcometer convex surface profile probes are supplied with a glass zero tile, calibration test foils (nominal values 125µm (5.0mils) & 508µm (20mils)) and an Elcometer test certificate.

### Technical Specification    C

| Range: 0-500µm (0-20mils) | | Resolution: 1µm (0.1mil) | | Accuracy: ±5% or ±5µm (±0.2mil) | |
|---|---|---|---|---|---|
| Probe Design | Part Number | Minimum Headroom | Minimum Pipe Diameter | Certificate | |
| Convex Surface: Standard* | T224C500UX | 135mm (5.31") | 75mm (3.0") | ● | |
| Convex Surface: Armoured* | T224C500UXARM | 175mm (6.89") | 75mm (3.0") | ● | |

### Accessories

| Part Number | | Description |
|---|---|---|
| Integral Gauge | Separate Gauge | |
| T22419793 | T22419793 | Probe Tip Protection Cap |
| T22420072 | T22420072 | Glass Zero Tile with Wallet |
| T22421882C | T22421882C | Certified Calibration Test Kit: 125µm & 500µm (5 & 20mils) Calibration Foils, Glass Zero Tile & Calibration Certificate |
| T99921325 | T99921325 | USB Cable |
| T99924797 | T99924797 | USB Bluetooth® Adaptor (V2.0+) - for PC's without Bluetooth® |
| T99922341 | T99922341 | Self Adhesive Screen Protectors (x10) |
| T22420053 | T22420053 | Replacement Tip (Pack of 2) with Fixing Tool |
| T22420095 | T22420095 | Replacement Tip (Pack of 5) |
| - | T45622371 | Benchtop Inspection Stand |

● Test Certificate supplied as standard.
Elcometer 224 probes are covered by a 1 year warranty

* Patent applied for

elcometer®

elcometer®

**ElcoMaster®**
data management software

**Data Management Software**

**ElcoMaster®**
data management software

## ElcoMaster® Mobile App brings the office to where you are.

You can connect Elcometer Bluetooth® enabled inspection gauges directly to iPhone, iPad and iPods or Android™ mobile phones and tablets via ElcoMaster® Mobile App.
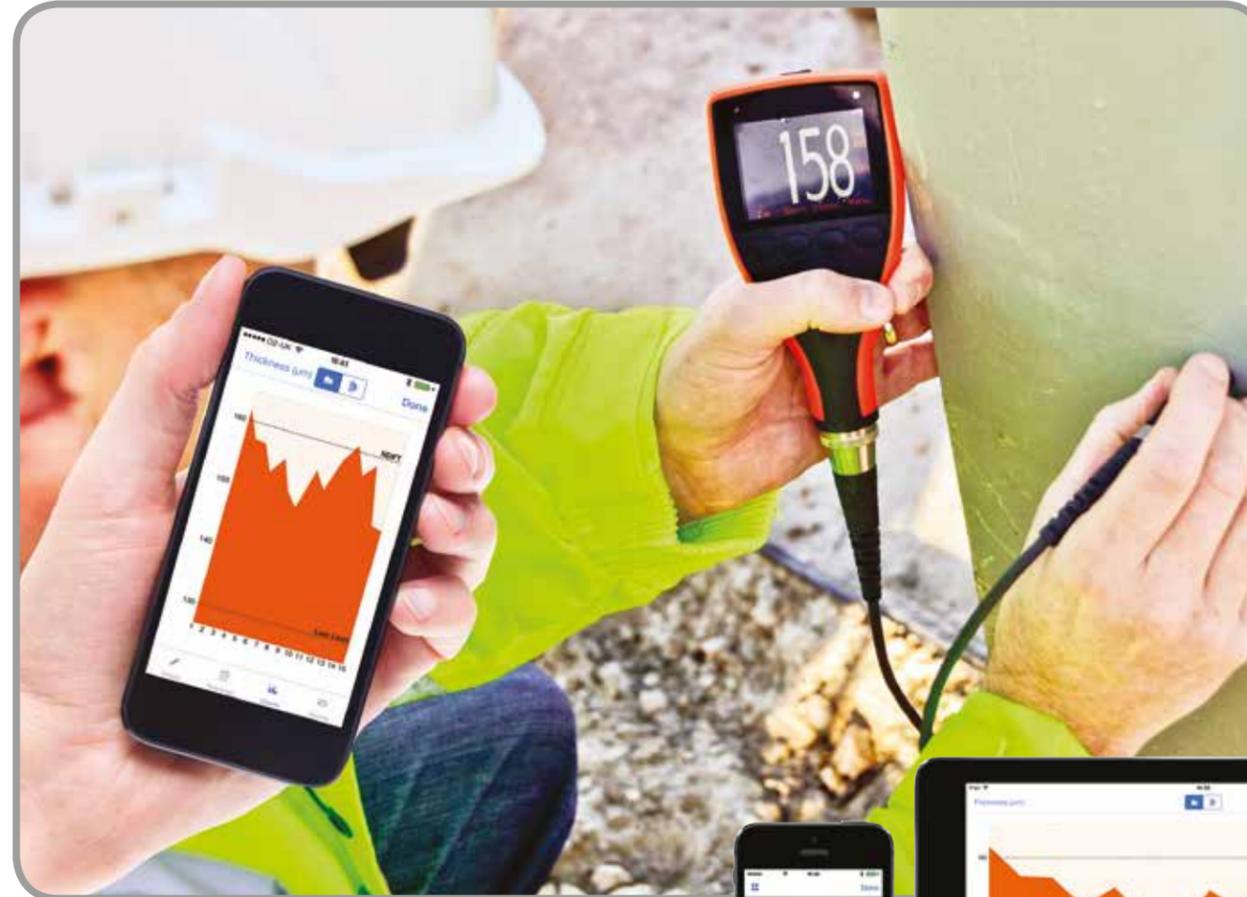
When out in the field or on site, you can review data instantly using our free ElcoMaster® Mobile App. Press 'Generate PDF' and watch the ElcoMaster® App produce a professional report instantly. Email the report to your client seconds after you have finished inspecting or upload it via cloud technology so it can be accessed anywhere in the world.

With data transferred to mobile devices whilst out in the field, the Elcometer gauge does not have to be returned to the office for data download. Inspection work can continue without interruption.

ElcoMaster® Mobile App shares many features of ElcoMaster® for PC:
• Download batches from Elcometer Bluetooth® enabled gauges
• Add notes, photographs and diagrams
• Pdf.[1] and email reports
• Using the phone's GPS[2] feature, add this data to batch files
• Use collection batch measurement location points on photos or images to indicate to users where each measurement needs to be taken

[1] Available on iOS devices only

**Bluetooth®**

□ Surface Profile
□ Salt Contamination
□ Climatic Conditions
□ Coating Thickness
□ Corrosion Thickness
□ Adhesion Testing
□ Gloss Measurements

**ANDROID APP ON**
**Google play**

**Download on the**
**App Store**

**Send**
Email inspection data from a mobile device to a PC for further analysis and reporting or transfer data via the Cloud.

Cloud          Email

[2] Available on Android™ only

## With data transferred to mobile communication devices the Elcometer gauge does not have to be returned to the office for data download. Inspection work can continue without interruption.
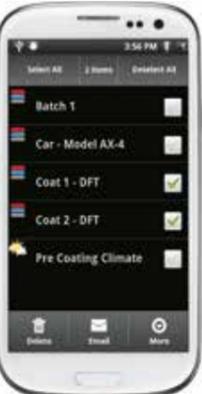
**Connect**
Connect gauge via Bluetooth® to phone to see live readings directly on the phone and save them into batches.

**Review**
Review average, maximum and minimum readings instantly.

**Analyse**
Analyse data via sequential readings, statistics, charts & histograms or on images.

**Manage & Print**
Store all data; dry film thickness, surface profile, climate and manual reports in easy to manage folders.

**Photos & Notes**
Add photos, notes and comments.

**GPS**
Store GPS locations in batches and view location on Google Maps[2].

**ElcoMaster®** data management software | **How ElcoMaster® Works**

# The different ways ElcoMaster® can help you do your job better

ElcoMaster® has been designed to be a very intuitive method of developing professional reports, it is however extremely versatile. Here are just a few ways ElcoMaster® can be used in day-to-day activities of a coating professional.

## 1. Gauge to PC to Excel

Transferring inspection data straight into Microsoft Excel via Bluetooth® or USB is simple and easy.

## 2. Gauge to PC data transfer into ElcoMaster®

Using Bluetooth® or USB, ElcoMaster® transfers inspection data in seconds, archiving data and generating reports at the click of a button.

## 3. ElcoMaster® Mobile App for immediate data transfer from the site to the office

Email

Transfer inspection data straight to mobiles and tablets via Bluetooth® when on site for instant analysis, generate .pdf reports[1] and email them back to the office for storing, review and QA reporting.

## 4. Upload to a cloud for real time analysis anywhere

Using ElcoMaster® Mobile App you can upload inspection data, photos, notes and GPS coordinates direct to a Cloud[2] account of your choice via 3G/4G or WiFi.

All data is instantly visible to other approved users of the account - through a secure log-in on any computer or mobile device anywhere in the world.

## 5. Seamlessly link multiple sites or production lines

ElcoMaster® gives you real time quality control monitoring from multiple inspection projects in any location.
You can compare and combine inspection data from different production lines or different locations, to produce specific Project Inspection Reports quickly and easily.
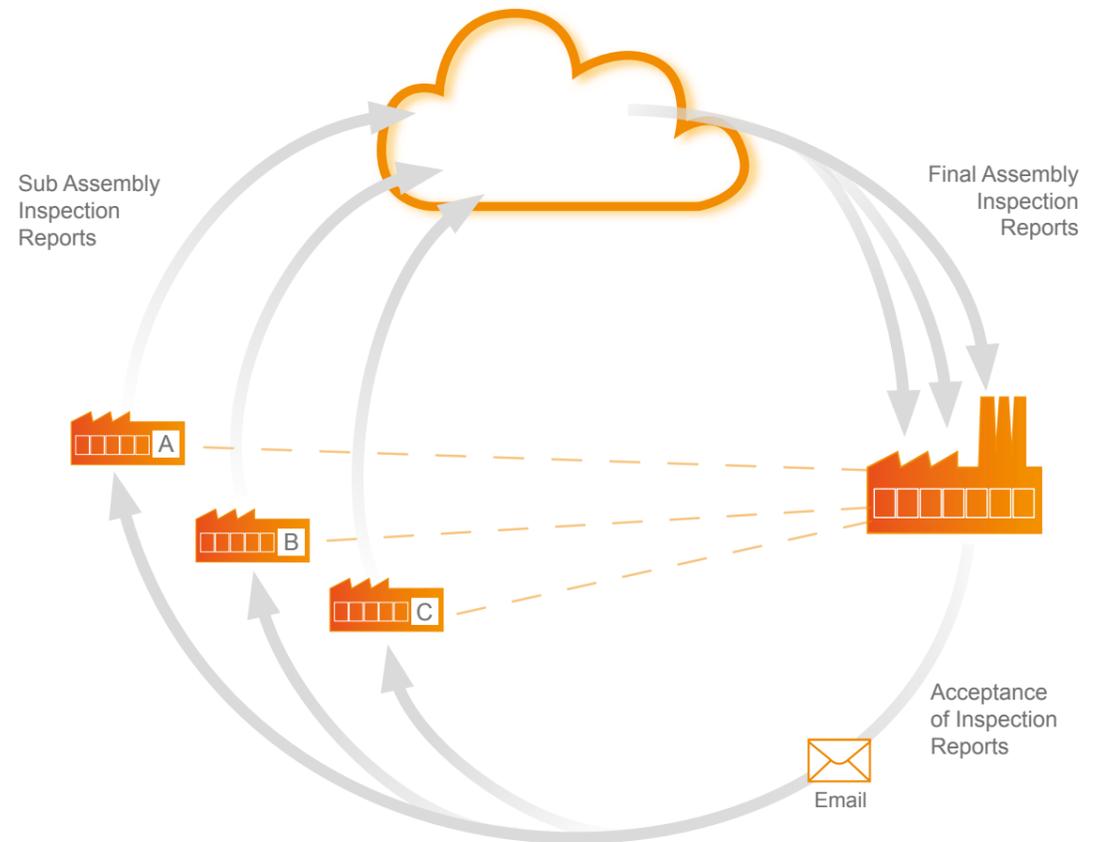
[1] Available on iOS devices only          [2] Available on Android™ only

## 6. Real time collaboration for multi-site projects

Sub Assembly Inspection Reports

Final Assembly Inspection Reports

A

B

C

Acceptance of Inspection Reports

Email

**Real time collaboration for multi-site projects**
When working with manufacturers of sub-assemblies across the globe ElcoMaster® can collate all inspection data from each site, assembly line and project into one shared location. Contractors can then:
• Accept or reject parts before shipment from sub-assembly plants.
• Combine all data from sub assembly and final assembly inspection to generate Project Inspection Reports for quality management, both during the project and after completion of the project.
• Have real time in progress visibility across the whole project, no matter where the sub-assembly manufacturing is in the world.
• Have multi-site collaboration, real time dialogue and decision making to improve efficiency and quality throughout the production process.
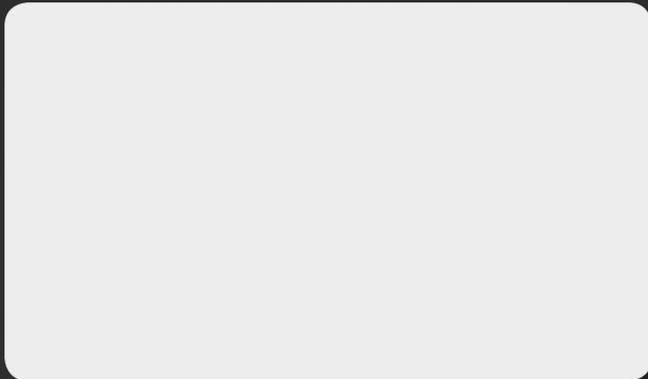
**Real time communication**
Featuring instant messaging the ElcoMaster® Mobile App lets you add messages to inspection data, projects and files, allowing you to immediately discuss key points with your colleagues, managers or clients, send work instructions and store messages within the project file.

**Your data - your choice - your control**
ElcoMaster® allows you to decide which Cloud service provider to use. It is your data, it is secure as only approved users can have access, no third parties can see your data.
ElcoMaster® Mobile App is compatible with a range of cloud service providers and FTP servers including:

works with Google Drive    FTP server    Dropbox

## elcometer®
www.elcometer.com

**ENGLAND**

Elcometer Limited
Manchester M43 6BU
Tel: +44 (0)161 371 6000
Fax: +44 (0)161 371 6010
sales@elcometer.com

**BELGIUM**

Elcometer SA
B-4681 Hermalle /s Argenteau
Tel: +32 (0)4 379 96 10
Fax: +32 (0)4 374 06 03
be_info@elcometer.com

**FRANCE**

Elcometer Sarl
45380 La-Chapelle-Saint-Mesmin
Tel: +33 (0)2 38 86 33 44
Fax: +33 (0)2 38 91 37 66
fr_info@elcometer.com

**GERMANY**

Elcometer Instruments GmbH
D-73431 Aalen
Tel: +49(0)7361 52806 0
Fax: +49(0)7361 52806 77
de_info@elcometer.de

**THE NETHERLANDS**

Elcometer NL
Euclideslaan 251
3584 BV  Utrecht
Tel: +31 (0)30 259 1818
Fax: +31 (0)30 210 6666
nl_info@elcometer.com

**JAPAN**

Elcometer KK
Saint Paul Building,
6F, 5-14-11,Higashiooi,
Shinagawa-ku,Tokyo 140-0011
Tel: +81-(0)3-6869-0770
Fax: +81-(0)3-6433-1220
jp_info@elcometer.com

**REPUBLIC OF SINGAPORE**

Elcometer (Asia) Pte Ltd
Singapore 589472,
Tel: +65 6462 2822
Fax: +65 6462 2860
asia@elcometer.com

**USA**

MICHIGAN

Elcometer Inc
Rochester Hills Michigan 48309
Tel: +1 248 650 0500
Toll Free: 800 521 0635
Fax: +1 248 650 0501
inc@elcometer.com

TEXAS

Elcometer of Houston
1146 Sheffield, Unit D,
Houston, TX 77015
Tel: +1 713 450 0631
Toll Free: 800 521 0635
Fax: +1 713 450 0632
inc@elcometer.com