

Ongoing developments in the data transfer, storage and reporting of Coating Inspection Data

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Coating Inspection – Trends

- Originally it was coating thickness but now other factors in the coating process are recognised as key to coating performance
- Project specifications are requiring inspection at all key stages of the application process
 - Surface Preparation
 - Climate Conditions
 - Film Thickness
 - Adhesion & Porosity
 - Appearance

Coating Inspection – Trends

- The coatings market is demanding:
 - Increased inspection throughout the whole process
 - Proof that inspections were completed
- Proof of inspection requires formal reporting
- The amount of measurements and data is increasing
- Trend is for electronic data capture
- Electronic data capture reduces risk of human error

Coating Inspection – The Solution

Elcometer have developed a range of Gauges and Reporting Packages in response to these market demands



Data Collection – Elcometer Solution

- Surface Preparation
 - Elcometer 224 Surface Profile Gauge
 - 150,000 readings in 2,500 batches
 - Bluetooth and USB connectivity
 - Compatible with ElcoMaster



Data Collection – Elcometer Solution

- Surface Preparation
 - Elcometer 130 Salt Contamination Meter
 - 150,000 readings in 2,500 batches
 - Salt Mapping capability
 - Bluetooth and USB connectivity
 - Compatible with ElcoMaster



Data Collection – Elcometer Solution

- Climatic Conditions
 - Elcometer 319 Dewpoint Meter
 - 25,000 readings in 999 batches
 - Measuring RH%, Ta, Ts, Td and $T\Delta$
 - Bluetooth and USB connectivity
 - Compatible with ElcoMaster



Data Collection – Elcometer Solution

- Coating Thickness
 - Elcometer 456 Dry Film Thickness Gauge
 - 150,000 readings in 2,500 batches
 - Bluetooth and USB connectivity
 - Compatible with ElcoMaster



Data Collection – Elcometer Solution

- Adhesion
 - Elcometer 510 Automatic Adhesion Tester
 - Measurement range up to 100 MPa
 - 10,000 readings and load graph memory
 - Bluetooth and USB connectivity
 - Compatible with ElcoMaster



Data Collection – Elcometer Solution

- Appearance
 - Elcometer 480 Glossmeter
 - Automatic Calibration and Diagnostics
 - Measurement range up to 2000 GU
 - 40,000 readings in 2,500 batch memory
 - Bluetooth and USB connectivity
 - Compatible with ElcoMaster



Data Storage & Reporting – The Solution

- To host, store and report the data collected during inspection Elcometer have developed software packages:
 - ElcoMaster 2 for PC and Laptop
 - ElcoMaster Mobile for Tablet and Phone
- Both packages provide one standard platform for all gauges
- Data can be stored on Cloud, Server, Host Unit and Email

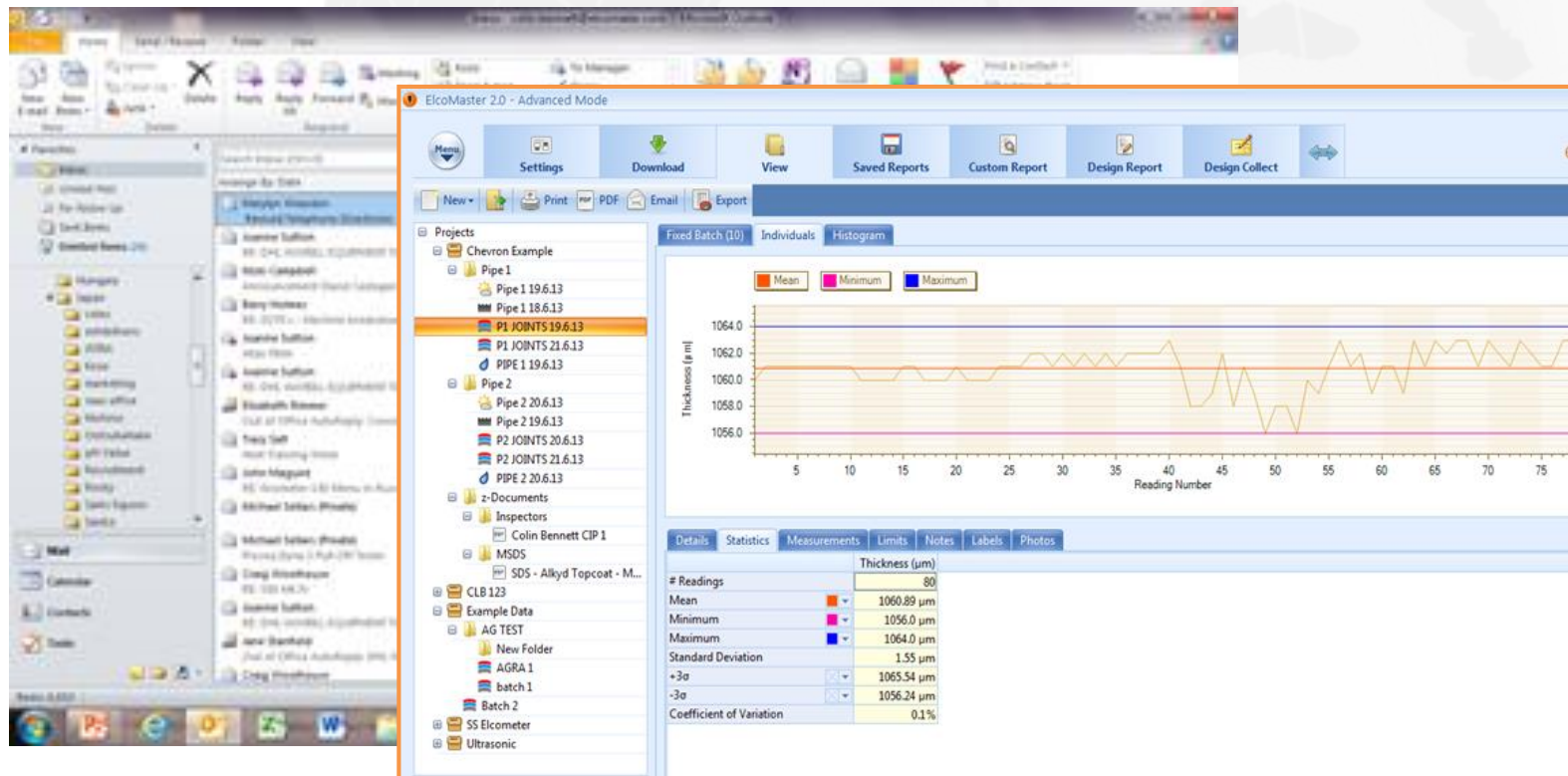
Data Storage & Reporting – ElcoMaster 2

- Visual appearance and data storage based on windows applications



Data Storage & Reporting – ElcoMaster

- Data is organised into Projects/Folders/Batches – all details of the batch readings can be seen

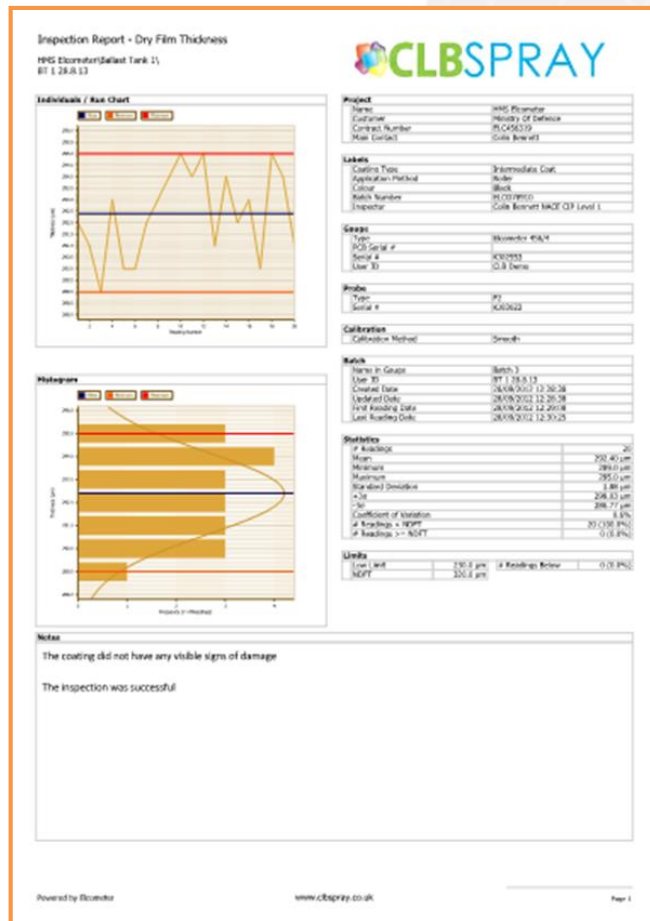


Data Storage & Reporting – ElcoMaster

- Reports are generated as PDF or editable ElcoMaster Files
- A variety of reports can be produced from a one page summary to a full multi-page Project Report
- Customer specific report formats are widely used

Data Storage & Reporting – ElcoMaster

- Batch Summary Page



Data Storage & Reporting – ElcoMaster

- Batch Photographs

The screenshot displays an inspection report for 'Dry Film Thickness' (DFT) for 'HSC Elemevator/Salad Tank 1)' on 'BT 1 28.A.13'. The report is titled 'CLBSPRAY' and includes the following sections:

- Individuals / Bar Chart:** A line graph showing DFT measurements over 10 points. The y-axis ranges from 200 to 300. A blue line represents the data, fluctuating between approximately 220 and 280. Horizontal lines indicate target ranges: a red line at 280, a blue line at 250, and an orange line at 220.
- Product Information:**

Product Name	HSC Elemevator
Customer	Metrolia of Salade
Contract Number	
Material Contact	
- Labels:**

Coating Type	
Application Method	
Color	
Batch Number	
Inspector	
- Geop:**

Type	
ISO Serial #	
Sensor #	
User ID	
- Probe:**

Type	
Serial #	
- Calibration:**

Calibration No.	
-----------------	--
- Batch:**

Name in Geop	
User ID	
Created Date	
Updated Date	
Not Working	
Last Activity	
- Statistics:**

# of Readings	
Mean	
Minimum	
Maximum	
Standard Dev.	
CV	
Coefficient of Variation	
# of Readings > of Threshold	
- Limits:**

Low Limit	
High Limit	
- Notes:**

The coating did not have any visible signs of damage

The inspection was successful
- Batch Photographs:** A photograph showing a close-up of a metal rail track with a curved profile.

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Data Storage & Reporting – ElcoMaster

- Batch Readings

Inspection Report - Dry Film Thickness
HFG Elcometer (Rail Tank 1)
BT 1 28-A-13

Individual / Bar Chart

Histogram

Notes
The coating did not have any visible signs of damage
The inspection was successful

CLBSPRAY

Product
Name: HFG Elcometer
Customer: Ministry of Defence
Contract Ref: [redacted]
Main Contact: [redacted]

Labels
Coating Type: [redacted]
Application: [redacted]
Color: [redacted]
Batch Number: [redacted]
Inspector: [redacted]

Coat
Type: [redacted]
ISO Serial #: [redacted]
Serial #: [redacted]
Lot #: [redacted]

Probe
Type: [redacted]
Serial #: [redacted]

Calibration
Calibration No: [redacted]

Batch
Items in Batch: [redacted]
User ID: [redacted]
Created Date: [redacted]
Updated Date: [redacted]
First Reading: [redacted]
Last Reading: [redacted]

Statistics
of Readings: [redacted]
Mean: [redacted]
Minimum: [redacted]
Maximum: [redacted]
Standard Dev: [redacted]
Unit: [redacted]
Coefficient of Variation: [redacted]
of Readings > [redacted]

Limits
Low Limit: [redacted]
High Limit: [redacted]

Inspection Report - Dry Film Thickness
HFG Elcometer (Rail Tank 1)
BT 1 28-A-13

Rail Tank Filled by

CLBSPRAY

Inspection Report - Dry Film Thickness
HFG Elcometer (Rail Tank 1)
BT 1 28-A-13

Date & Time	#	Thickness (µm)
28/06/2012 12:28:00	1	253.0
28/06/2012 12:28:03	2	251.0
28/06/2012 12:28:07	3	289.0
28/06/2012 12:28:11	4	293.0
28/06/2012 12:28:14	5	296.0
28/06/2012 12:28:18	6	290.0
28/06/2012 12:28:22	7	252.0
28/06/2012 12:28:25	8	293.0
28/06/2012 12:28:29	9	294.0
28/06/2012 12:28:33	10	295.0
28/06/2012 12:28:37	11	294.0
28/06/2012 12:28:41	12	295.0
28/06/2012 12:28:44	13	291.0
28/06/2012 12:28:48	14	294.0
28/06/2012 12:28:52	15	295.0
28/06/2012 12:28:56	16	291.0
28/06/2012 12:28:59	17	294.0
28/06/2012 12:29:03	18	293.0
28/06/2012 12:29:07	19	295.0
28/06/2012 12:29:11	20	294.0
28/06/2012 12:29:15	21	295.0
28/06/2012 12:29:19	22	294.0
28/06/2012 12:29:23	23	295.0
28/06/2012 12:29:27	24	294.0
28/06/2012 12:29:31	25	291.0

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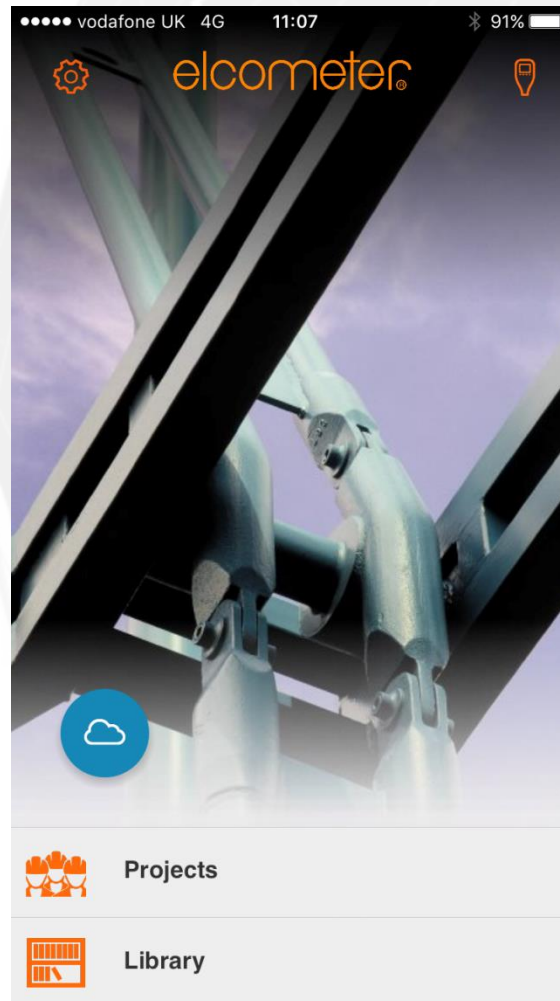
Introducing the 2017 ElcoMaster Mobile for Android and iOS

Data Storage & Reporting – ElcoMaster Mobile

- ElcoMaster 2 links with ElcoMaster Mobile
 - Android and iOS platforms
 - Tablet
 - Mobile Phone
 - Bluetooth
 - Cloud

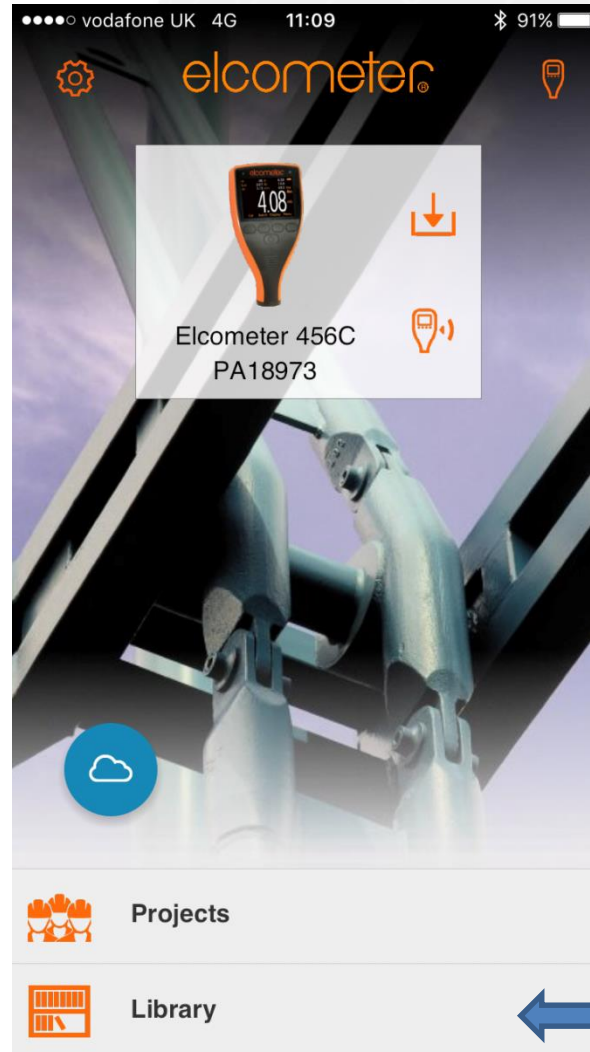


ElcoMaster Mobile from 2017



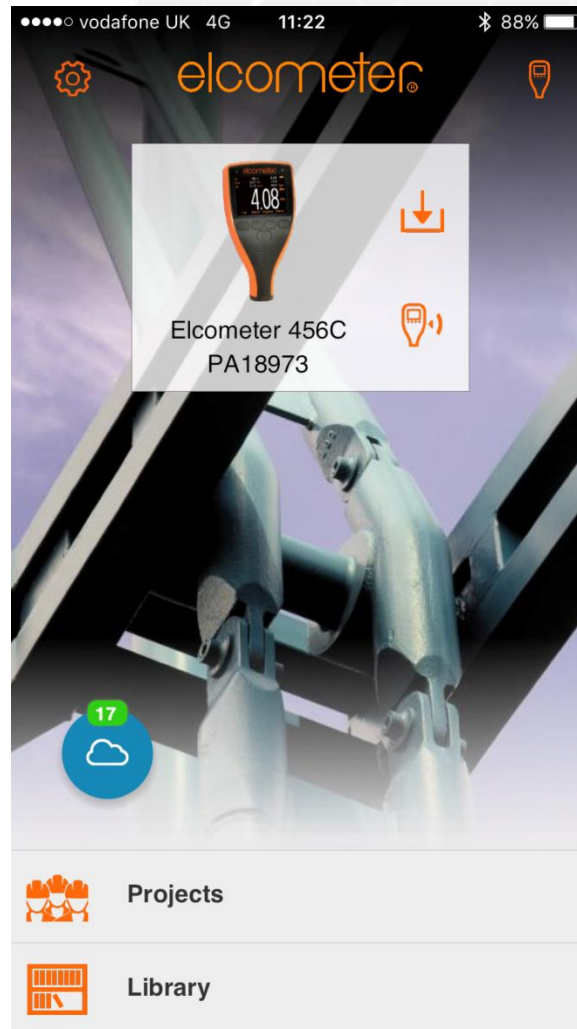
Data Management – ElcoMaster Mobile

- Report Template Library



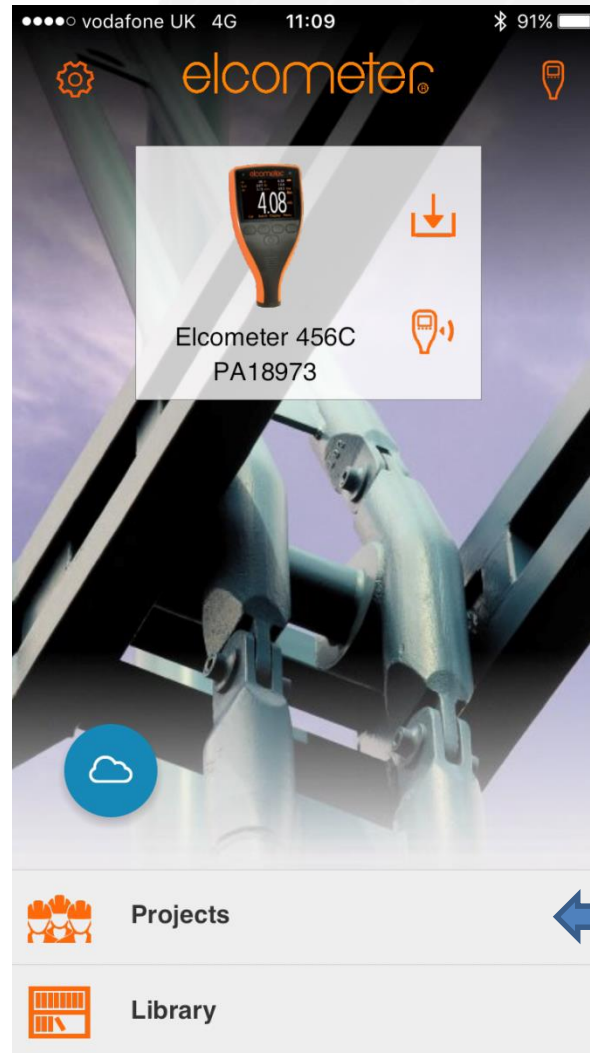
Data Management – ElcoMaster Mobile

- Synchronise your Cloud Library
example shows 17 files to update



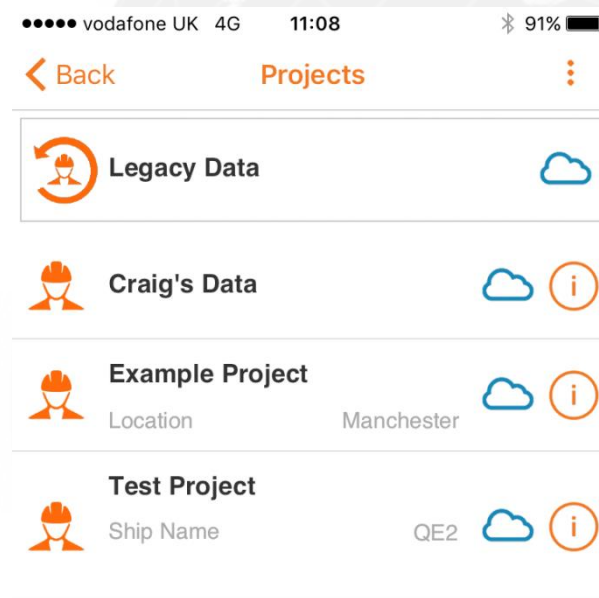
Data Management – ElcoMaster Mobile

- Add a project



Data Management – ElcoMaster Mobile

- Add a project



Data Management – ElcoMaster Mobile

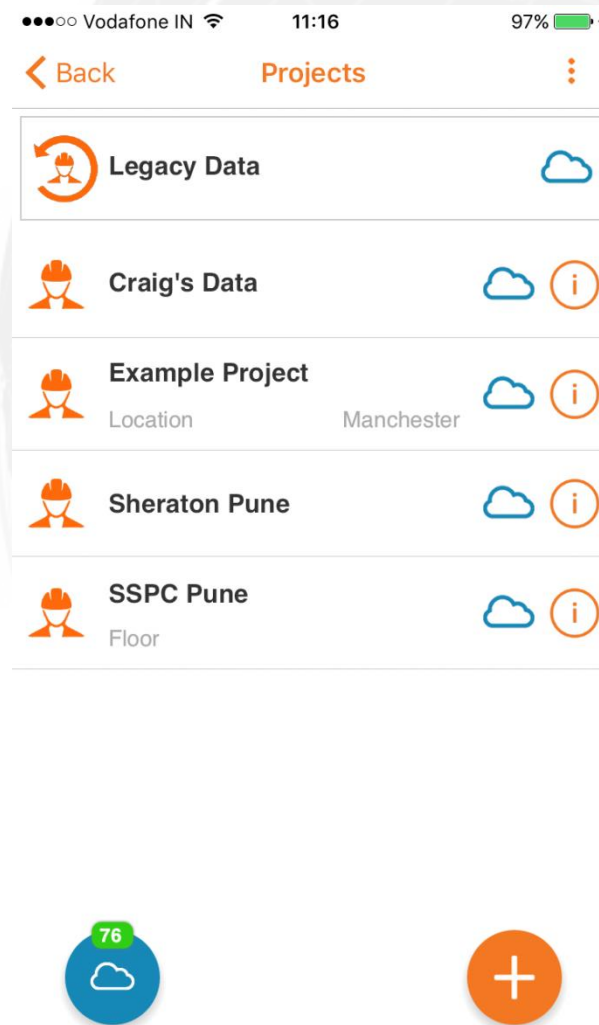
- Add a project

The screenshot shows the 'Add a project' screen in the ElcoMaster Mobile app. At the top, there are status icons for signal strength, carrier (Vodafone IN), Wi-Fi, time (11:15), and battery (97%). Below this, there are 'Cancel' and 'Create' buttons. The 'Name' field contains 'Sheraton Pune' and has a barcode icon to its right. Below the name field is a 'Cloud Synchronise' toggle switch, which is currently turned on. There are two more options: 'Project Labels' and 'Batch Labels', each with a right-pointing chevron. At the bottom of the screen, there is a keyboard with a 'Done' button in the top right corner. The keyboard shows the text 'Pune' in quotes, 'Puneetha', and 'Puneetha's' as suggestions.



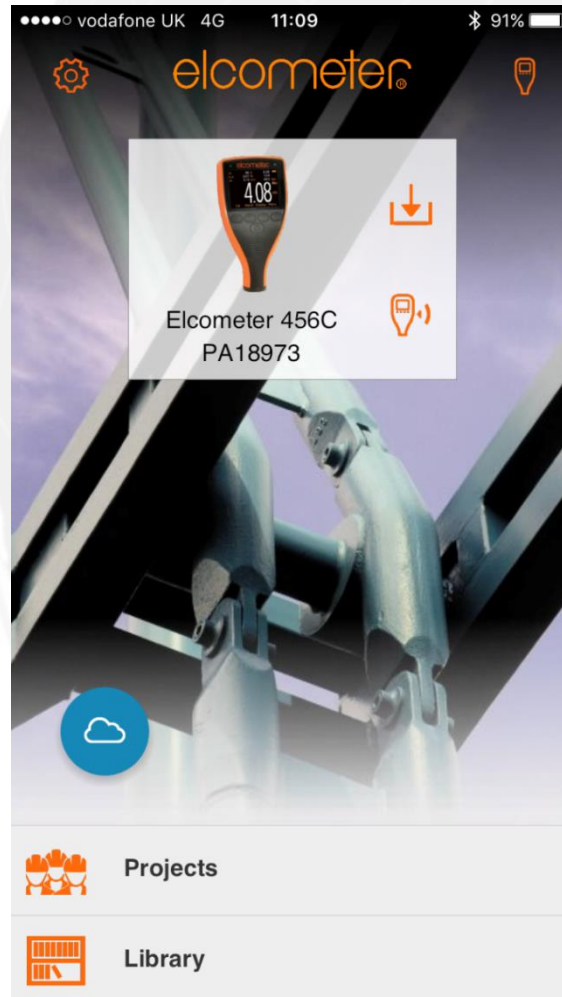
Data Management – ElcoMaster Mobile

- Add a project



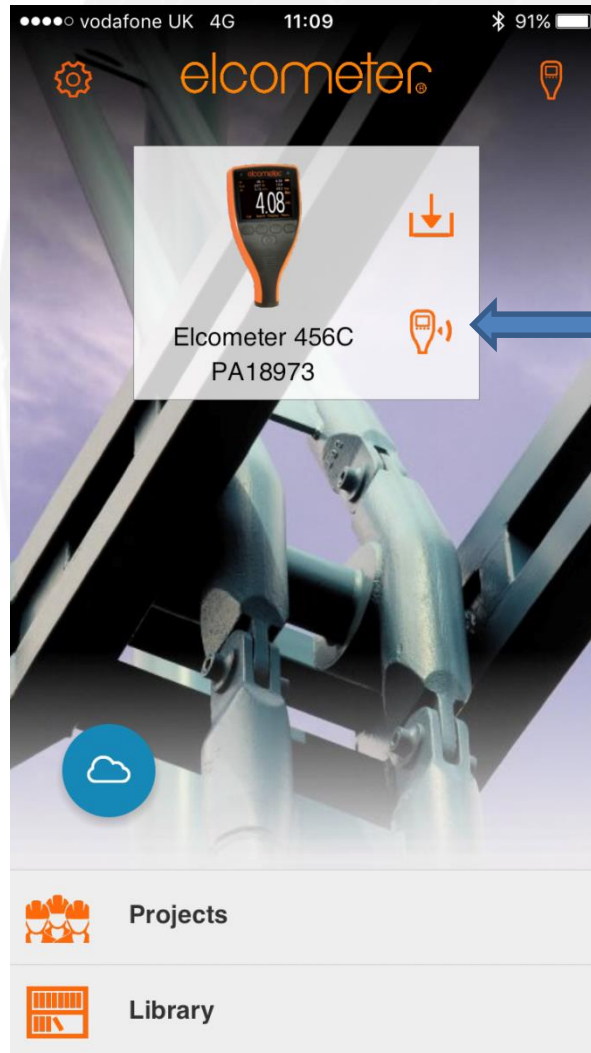
Data Management – ElcoMaster Mobile

- Adding a gauge



Data Management – ElcoMaster Mobile

- Add live readings from a gauge



Data Management – ElcoMaster Mobile

- Add live readings from a gauge

Vodafone IN 11:28 100%

Hotel Done

Thickness (μm)

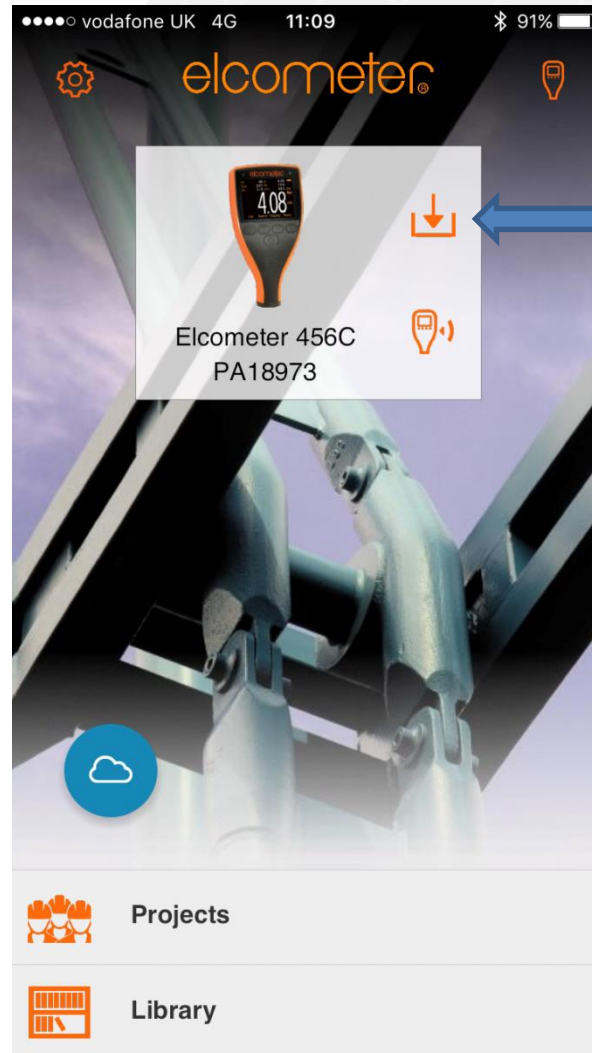
# Readings	5	> High Limit
Mean	27.60 μm	< Low Limit
Maximum	30.0 μm	>= Nominal
Minimum	25.4 μm	< Nominal
Range	4.6 μm	

1	16/02/2017 11:27:51	30.0	i
2	16/02/2017 11:27:53	28.9	i
3	16/02/2017 11:27:54	25.4	i
4	16/02/2017 11:28:00	26.4	i
5	16/02/2017 11:28:01	27.3	i



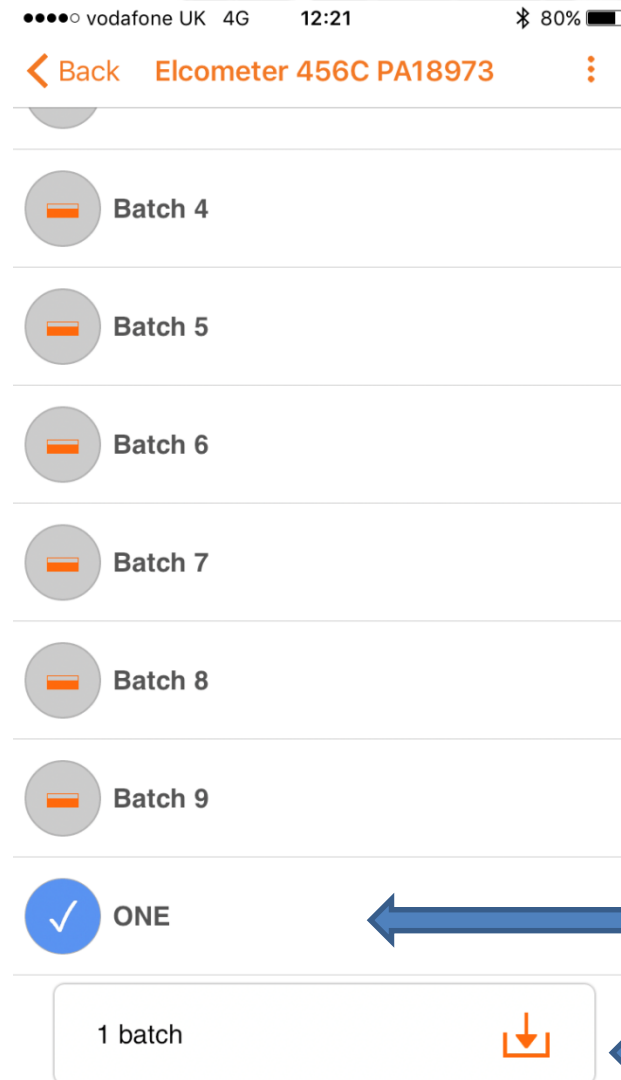
Data Management – ElcoMaster Mobile

- Download from a gauge



Data Management – ElcoMaster Mobile

Select batch
or batches
and download



ElcoMaster Mobile - view data

- View batch and tab through batch information

Project Sections **SSPC Pune**

Dry Film Thickness

ONE

Room

Room

ONE Done

# Readings	19	CV%	10.4%
Mean	24.96 µm	> High Limit	
Maximum	29.3 µm	< Low Limit	
Minimum	20.9 µm	>= Nominal	
Range	8.4 µm	< Nominal	
Std Deviation	2.60 µm		

1	10/02/2017 17:40:03	24.0	i
2	10/02/2017 17:40:04	25.2	i
3	10/02/2017 17:40:05	26.3	i
4	10/02/2017 17:40:06	26.7	i
5	10/02/2017 17:40:07	26.9	i
6	10/02/2017 17:40:09	26.1	i
7	10/02/2017 17:40:10	21.4	i
8	10/02/2017 17:40:12	22.2	i
9	10/02/2017 17:40:27	20.9	i
	10/02/2017 17:40:32	25.5	i

ElcoMaster Mobile - view data

The screenshot displays four sequential screens of the ElcoMaster Mobile application, each showing a different data view for a thickness measurement.

Screen 1: Readings Data
 Shows a list of 19 readings with their timestamps and values. The CV% is 10.4%.
 # Readings: 19 CV%: 10.4%
 Mean: 24.96 μm > High Limit
 Maximum: 29.3 μm < Low Limit
 Minimum: 20.9 μm >= Nominal
 Range: 8.4 μm < Nominal
 Std Deviation: 2.60 μm

1	10/02/2017 17:40:03	24.0
2	10/02/2017 17:40:04	25.2
3	10/02/2017 17:40:05	26.3
4	10/02/2017 17:40:06	26.7
5	10/02/2017 17:40:07	26.9
6	10/02/2017 17:40:09	26.1
7	10/02/2017 17:40:10	21.4
8	10/02/2017 17:40:12	22.2
9	10/02/2017 17:40:27	20.9
	10/02/2017 17:40:32	25.5

Screen 2: Individual Data
 Shows the current reading of 24.5 μm for Elcometer 456C PA18973. It includes a statistics summary and a keypad for adding limits.
 Thickness: 24.5 μm
 Statistics:
 Thickness: 19
 # Readings: 19
 Mean: 24.96 μm
 Maximum: 29.3 μm
 Minimum: 20.9 μm
 Range: 8.4 μm

1	2	3
4	5	6
7	8	9
.	0	<X>

Screen 3: Add Limits
 Shows the configuration of limits for the thickness measurement. The current nominal value is 28.0 μm .
 Thickness (μm):
 High Limit: 28.0
 Low Limit: 22.0
 Nominal: 28.0

Screen 4: Run Chart
 A line graph showing the thickness readings over 19 readings. The y-axis is labeled μm and ranges from 18.0 to 32.0. The x-axis is labeled Reading # and ranges from 0 to 15. The graph shows a fluctuating line with a high limit at 28.0 μm and a low limit at 22.0 μm .

Readings Data

Individual Data

Add Limits

Run Chart

ElcoMaster Mobile - view data

The screenshot displays the ElcoMaster Mobile app interface across three panels. The top status bar shows 'vodafone UK 4G' and '12:24' on the left, and '80%' battery on the right. The app's navigation bar includes 'ONE', 'Done', and a camera icon. The main content area is divided into three sections: a histogram on the left, a photograph of a construction site in the middle, and a Google map with a location pin on the right. The histogram shows 'Thickness' in meters (m) on the y-axis (ranging from 18.0 to 32.0) and 'Frequency' on the x-axis (ranging from 0 to 4). A blue shaded area represents the data, with a yellow curve above and below it. Horizontal dashed lines indicate 'High Limit' at approximately 28.0m and 'Low Limit' at approximately 22.0m. The photograph shows a construction site with a concrete pump truck and a crane. The map shows a large industrial building with a blue location pin. A text input field labeled 'Enter note here' is positioned below the photograph. A plus sign icon is located at the bottom center of the interface.

Histogram

Add Photograph

Photograph

Add GPS data

ElcoMaster Mobile – generate report

The collage illustrates the workflow: selecting a report type, auto-emailing the report, receiving the email on a mobile device, and finally storing or amending the report.

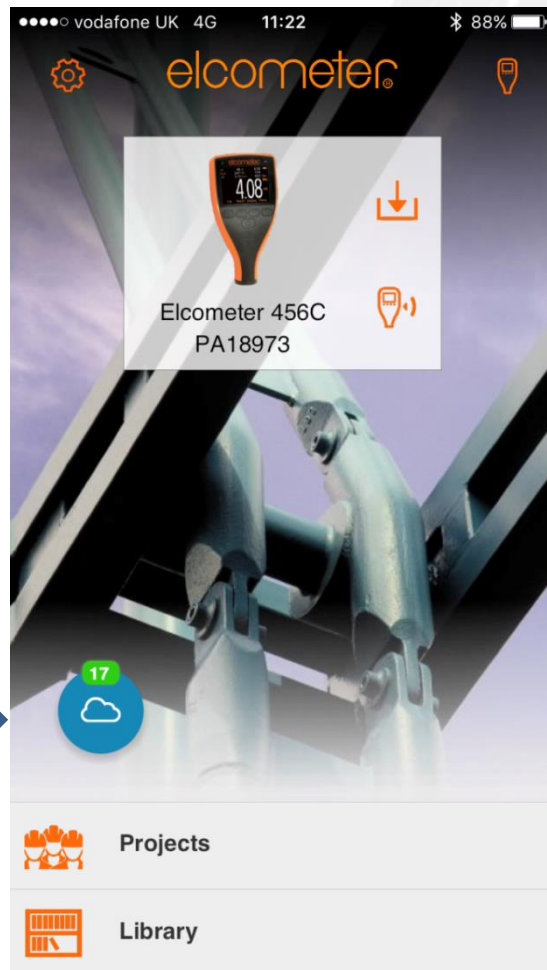
Select Report Type

Auto email

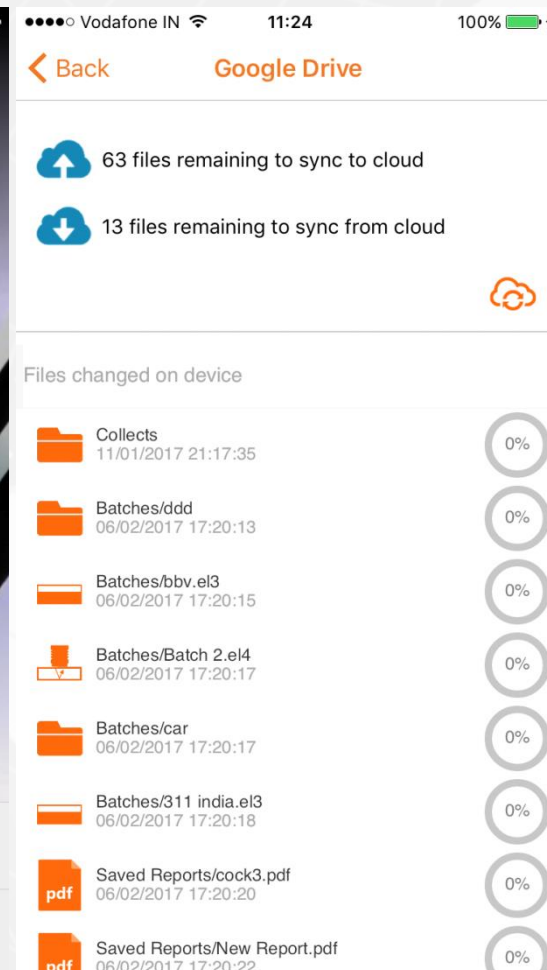
Receive email

Store/Amend Report

ElcoMaster Mobile – Cloud Storage



Simply click here



and then here



ElcoMaster Mobile – Summary

- Intuitive to use Android and iOS software package
- Stores data from multiple gauge types
- Supports live reading function
- Simple Report Formats
- Cloud, Server, PC and Host storage available
- Available since April 2017
- Free download from Google Play and App Store

ElcoMaster Mobile – what is next?

- Bespoke Report Format
- Two way communications with Gauge
- Bespoke Customer Specific Packages

ElcoMaster – where to find it?

- ElcoMaster PC Version
 - Free download from www.elcometer.com
- ElcoMaster Mobile
 - Free download from Google Play and App Store



Thank you for your time

Questions?