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Road Marking Control Kit

Contents & User Manuals

Digital measurement of pavement marking thickness



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TABLE OF CONTENTS

1. Notes and Contents of Road Marking Control Kit
2. Marking Thickness Gauge
3. Wet Film Comb
4. Insertion Thermometer
5. Thermometer and Hygrometer
6. Electronic Weight
7. Illuminated Microscope
8. Magnifying Glass
9. Folding Ruler

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1. Notes and Contents of Road Marking Control Kit

The Road Marking Control Kit is exclusively designed for the quality control of road markings. Any other application is not in accordance with its intended use. The manufacturer is not liable for damage caused by inappropriate use; the user bears the full responsibility. Use the instrument according to this user manual avoiding unsafe usage.

The Road Marking Control Kit is assembled by the manufacturer. Any modifications of or changes to the items will invalidate the guarantee.

During transportation the Road Marking Control Kit is to be handled with proper care. DELTA recommends to transport and store the instrument in the original transportation box. If the instrument should be damaged, contact DELTA or one of our authorised dealers for assistance.

Warranty for the items in the Road Marking Control Kit is 2 years.

The Road Marking Control Kit delivers the following items:

- Marking Thickness Gauge
- Wet Film Comb
- Insertion Thermometer
- Thermometer and Hygrometer
- Electronic Weight
- Illuminated Microscope
- Magnifying Glass
- Folding Ruler

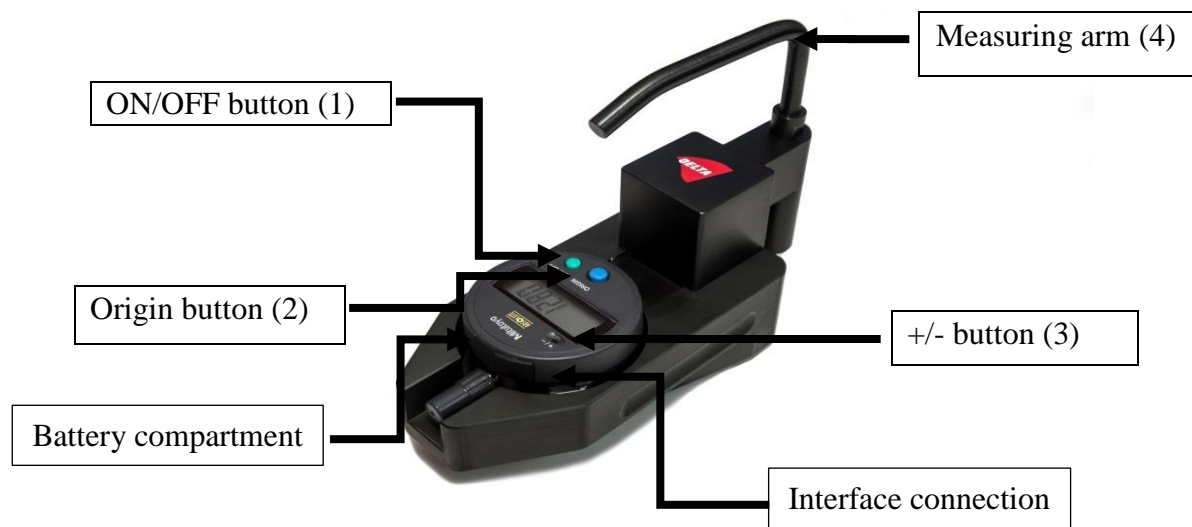
2. Marking Thickness Gauge

The Marking Thickness Gauge is a digital device for measuring the thickness of dry pavement markings after application. The Marking Thickness Gauge is a robust instrument which will last many years if handled with care and transported in the original transportation box. The Marking Thickness Gauge has a measurement range of -12.7 mm to +12.7 mm or -0.5 inch to +0.5 inch.

Calibration

Calibration of the Marking Thickness Gauge (MTG) is done by the following steps:

1. Place the MTG on an even surface beside the object to be measured.
2. Switch on the digital indicator by pushing the green ON/OFF button (1).
3. Hold the MTG with one hand and push the measuring arm (4) down with the other hand until it reaches the surface. Push at the centre of the arm.
4. Press the blue origin button (2) as far as it will go and hold it for 2 seconds. The display will now show 0.00. The instrument is ready to measure.
5. By pushing the +/- button (3) the display can show + or – values as required.



Measuring procedure

To measure the thickness of a pavement marking, make the following steps.

1. Switch on the MTG.
2. Calibrate the MTG as described in section 2.
3. Place the MTG beside the marking to be measured.
4. Press the measurement arm downwards until the arm firmly touches the marking, then read the measured value.

When making measurements to ensure correct results it is recommended to push at the centre of the measurement arm.



Battery replacement

The MTG uses a silver oxide battery (SR44).

1. Remove the battery holder by using a screwdriver or the like.
2. Remove the current battery.
3. Set a new battery into the holder with its positive (+) side facing the front.
4. Set the battery holder into its original position.

Interface, data transfer

If you want to save marking thickness data measured with the MTG, DELTA recommends the Mitutoyo Digimatic Data Logger DPI-VR. The Data Logger, or Mini Data Processor as named by Mitutoyo, is able to store and print results and carry out statistical analyses as well as other operations. The instrument can be viewed for example on www.mitutoyo.co.uk. DELTA does not offer this item.

Specifications

Dimensions180 x 70 x 130 mm / 7.1 x 2.8 x 5.1 inch
 Weight950 gr / 2.1 lbs.
 MaterialAnodised aluminum

Mitutoyo Absolute Digimatic Indicator

Resolution0.01 mm / 0.0004 inch
 Range+/- 12.7 mm / 0.5 inch
 Accuracy0.02 mm / 0.0008 inch
 Display.....LCD

Battery

Battery IDSR44
 Battery type silver oxide
 Battery life.....Approx. 20.000 hours under normal use

Dust / water protection level.....IP42

3. Wet Film Comb

The Wet Film Comb is designed for the determination of the thickness of liquid coatings such as road paint and thermoplastic marking materials.

Features

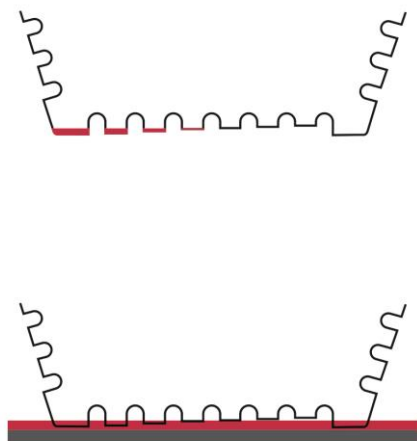
The Wet Film Comb is a polygon with a series of teeth on each side. The two outer teeth of each side are the base line. The inner teeth in between are progressively shorter so that a range of gaps between the teeth and the baseline is shown. For each tooth the distance to the baseline is indicated and the thickness of the coating can be established.

Handling

- Select the appropriate comb according to the approximate known thickness of the material to be measured.
- Hold the comb in an upright position and press it firmly into the liquid coating directly after application. The two outer teeth have to be in contact with the road surface.
- Remove the Wet Film Comb and examine which tooth or teeth have been wetted by the coating.
- The wet film thickness of the coating is between the last wetted tooth and the first tooth which has not been wetted (see the figure below).
- Clean the comb with a proper solvent.

Specifications

Measuring range.....25 - 3.000 microns / 1 – 118 mil per thou
Step graduation.....25 - 200 microns / 1 – 8 mil per thou





4. Insertion Thermometer

The Insertion Thermometer is designed for checking the temperature of liquid coatings such as road paint and thermoplastic marking materials.

Use of the Insertion Thermometer

- Remove the protecting cover.
- Turn on the Insertion Thermometer on the on/off button. After a brief self-test the instrument is ready for use.
- Place the Insertion Thermometer in the coating material to be measured.
- After a short period the temperature of the coating material can be read.
- Remove the Insertion Thermometer from the coating material after the measurement has been finished and turn it off on the on/off button.
- Clean the Insertion Thermometer carefully and let it dry.
- Put the protection cover back on and store until the next measurement.
- If the measured temperature is lower than $-10^{\circ}\text{C} / + 14^{\circ}\text{F}$ “Lo” will be shown and if the temperature is higher than $+220^{\circ}\text{C} / +428^{\circ}\text{F}$ “Hi” will be shown on the display.

Battery replacement

- Turn off the instrument.
- Unscrew the four screws on the back of the instrument and remove the cover.
- Remove carefully the battery and substitute it with a new one. Make sure it is placed correctly.
- Put the cover back on the Insertion Thermometer and tighten the screws.

Specifications

Measurement areas.....	-10° to $+ 220^{\circ}\text{C} / + 14^{\circ}$ to $+428^{\circ}\text{F}$
Accuracy.....	$+ / - 5\%$
Type of battery.....	AG-13 or LR44 / SR 44
Length of sensor.....	111 mm / 4.4 inch



5. Thermometer and Hygrometer

The Thermometer and Hygrometer display the temperature and the air humidity at the installation location as well as at an outdoor or different location if installed.

Operation

The sensor for the indoor Thermometer and Hygrometer are located inside the housing and thus displays the values for the interior of the housing. Therefore, to obtain more accurately measured values do not hold the device in your hand nor hang it near a heat source, but place it in an open area out of direct sunlight. The measurement display needs about 15 to 30 minutes to stabilise and show accurate values.

- In normal mode, the display shows the actual values for the temperature and air humidity on the location, where the meter has been placed as well as the temperature at the location where the outside sensor has been placed.
- Pres the MAX button once to get the maximum values.
- Pres the MIN button once to get the minimum values.
- Push the corresponding button again to return to the current values.
- While being in the display section for the maximum or minimum value, press the RESET key to delete the data saved for the corresponding display and start recording again.
- Press the °C / °F key to change the display unit for temperature values.

Battery replacement

Open the battery compartment on the rear of the housing and insert 1 battery of the type AAA/Micro with the correct polarity indicated in the battery compartment. After inserting the battery the device will be operating. Close the compartment.

The battery must be replaced, if the contrast on the display fades or the display does no longer function.

Specifications

Operating voltage.....	1.5V DC (battery type AAA/Micro)
Battery life.....	Approximately 2 years
Thermometer – Measuring range indoor.....	- 10 to + 50 °C / +14 to + 122 °F
Thermometer – Measuring range outdoor.....	-50 to + 70 °C / -58 to + 158 °F
Thermometer – Resolution.....	0.1 °C / 0.2 °F
Hygrometer – Measurement range.....	20 – 95% relative humidity
Hygrometer – Resolution.....	1% relative humidity
Dimensions.....	102 x 136 x 19 mm / 4.0 x 5.4 x 0.7 inch



6. Electronic Weight

The Electronic Weight is intended to determine the weight of a material in question. The procedure is non-automatic. The result will be given in grams.

Operation

A warm-up time of 3 minutes after switching on the weight stabilises the measured values. The material to be determined should be placed carefully at the centre of the weighing plate. The weighing value can be read after a stable weighing value has been obtained.

To measure weight of an object, take the following steps:

- Turn on the weight on the ON / TARE button and let it warm up for 3 minutes.
- Place the object to be measure at the centre of the weighing plate and read the result on the display.
- When finished turn off the instrument on the OFF button.

The weight can switch between different measurement modes (gr, oz, ozt & dwt) by holding down the ON / TARE button for 5 to 10 seconds after the instrument has been turned on.

Battery replacement

The weight is operated by 2 batteries type AA (2 x 1.5V). Change the batteries in the compartment at the back of the instrument ensuring correct positioning of the batteries. See the indication for plus and minus positioning on the compartment.

Specifications

Weighing range.....	max. 2.200 gr / 77.6 ounce
Readout.....	1 gr / 0.035 ounce
Reproducibility.....	1 gr / 0.035 ounce
Linearity.....	+/- 2 gr / 0.070 ounce
Operating temperature.....	+5°C to +35°C
Air humidity.....	max. 80%, non-condensing
Units.....	gr, oz, ozt, dwt
Weighing plate.....	Ø 150 mm / 5.9 inch
Auto-off.....	3 minutes

Please check the operating instruction for further details on Adjustment (Calibration), Taring, Auto-Off function and Reset Function.



7. Illuminated Microscope

The Illuminated Microscope has an ocular and objective optical system (40x magnification), adjustable focus and blue filtered illumination for inspection e.g. glass beads and structures on road paint and thermoplastic marking materials.

Operation

- Pull the two tubes apart to switch on the illumination.
- Place the transparent ring directly on the surface of the object to be viewed.
- Look through the eyepiece
- Adjust the focus using the wheel on the side of the microscope to make the image clear.
- Align measuring scale with the object component image to be measured.
- Read length of scale between the 2 points being measured.
- Push the two tubes together when finished to turn of the light.

Battery replacement

- Pull the two tubes apart.
- Push battery cover upwards to remove (look for the ‘open’ text).
- Insert 2 AA type batteries with positive ends towards the bulb.
- Put the battery cover back on.

Specifications

Magnifying power.....40x
 Scale graduation.....0.05 mm / 0.002 inch

Please check the operating instruction for further details about e.g. replacing illumination bulb and cleaning of the microscope.

8. Magnifying Glass

The Magnifying Glass can magnify objects 6 times. Open the unit and place it over the object to be viewed.

9. Folding Ruler

The Folding Ruler is used for measuring the length of the objects.