

**proceq**

# **ZMM 5000 Digital Marking Gauge**

## **Instruction Manual**



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## **Exclusion of liability**

Illustrations, descriptions as well as the technical specifications conform to the instruction manual on hand at the time of publishing or printing.

However, Proceq SA policy is one of continuous product development. All changes resulting from technical progress, modified construction or similar are reserved without obligation for Proceq SA to update.

Some of the images shown in this instruction manual may be of a pre-production model and/or are computer generated; therefore, the design / features of the delivered product may differ in various aspects.

The instruction manual has been drafted with the utmost care. Nevertheless, errors cannot be entirely excluded. The manufacturer will not be liable for errors in this instruction manual or for damages resulting from any errors.

The manufacturer will be grateful at any time for suggestions, proposals for improvement and indications of errors.

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## **1 Description of device**


The ZMM 5000 is a unique precision marking gauge with digital display for rapid determination of dry film thickness of all types of road markings and similar coatings.


### **In particular, this instrument has the following features**

- Measurements relative to the substrate or to the marking itself are possible (upwards and downwards measurements)
- Optional measuring bridge for measurements over the whole width of the marking, for representative measurements on wide road markings as well as for drawing up cross-sections
- Digital display providing reliable measuring results within seconds
- Easy to operate
- Sturdy construction and ergonomic design


## 2 Safety information


### 2.1 Symbols used


 This note comprises instructions needed to follow directions, specifications, proper working procedure and to avoid data loss, damage or destruction of the instrument.


 This note signifies a warning about dangers to life and limb if the apparatus is handled improperly. Observe these notes and be particularly careful in these cases. Also inform other users on all safety notes. Besides the notes in this instruction manual the generally applicable safety instructions and regulations for prevention of accidents must be observed.


### 2.2 Safety notes and hints


 It is strictly forbidden to open the housing of the ZMM 5000. If not observed, all the guarantee and liability claims to Proceq SA will be void.


 The ZMM 5000 is a high quality, state of the art instrument and is safe to operate. Nevertheless there is always risk when the instrument is handled inappropriately.

 Every person working with the ZMM 5000 or maintaining the ZMM 5000 must read and understand the manual completely. In particular the safety precautions and warnings.

 The ZMM 5000 Digital Marking Gauge is exclusively intended for rapid determination of dry film thickness of road markings and similar coatings. Any other use is considered as not being in accordance with the intentions of the manufacturer. The manufacturer is not liable for damage resulting from inappropriate application. The user bears the full responsibility.

 Never leave the ZMM 5000 under direct sun exposure. Always store the device in its carrying case.

 **Proceq SA** refuses all warranty and liability claims for damages caused by usage of the ZMM 5000 in combination with **non-original accessories**, or accessories from 3<sup>rd</sup> party suppliers.

 Unauthorized modifications and changes of the ZMM 5000 are not allowed.

 Reproduction without permission is not allowed.

- ! All maintenance and repair work which is not explicitly allowed and described in this manual (see chapter 8.1 “Maintenance which can be carried out by the user” on page 12 shall only be carried out by **Proceq SA** or your authorized Proceq agent, failure to comply voids warranty.
- ! Keep the device dry. **Danger of short circuit!**
- ! For the operation of the ZMM 5000 apply all local safety regulations.

### 3 Delivery of device

#### 3.1 Damages during carriage

On the receipt of the goods, check for any visible damages on the packaging. If it is undamaged you may sign the receipt of the goods. If you do suspect by your visual inspection that damage has occurred, make a note of the visible damage on the delivery receipt and request the courier to countersign it. Moreover, the courier service must be held responsible for the damage in writing.

If a hidden damage is discovered while unpacking, you have to inform and hold the courier liable immediately in the following way: “When opening the parcel we had to notice that ... etc.” This superficial checking of the goods has to be done within the time limit set by the carrier, which is normally 7 days. However, the period could vary depending on the courier. Hence, it is recommended to check the exact time limit when receiving the goods.




If there are any damages also inform your authorized Proceq agent or **Proceq SA** immediately.

#### 3.2 Shipment






Should the device be transported again, it must be packaged properly. Preferably use the original packaging for later shipments. Additionally use filling material in the package to protect the device from any shock during carriage.

### 3.3 Standard delivery

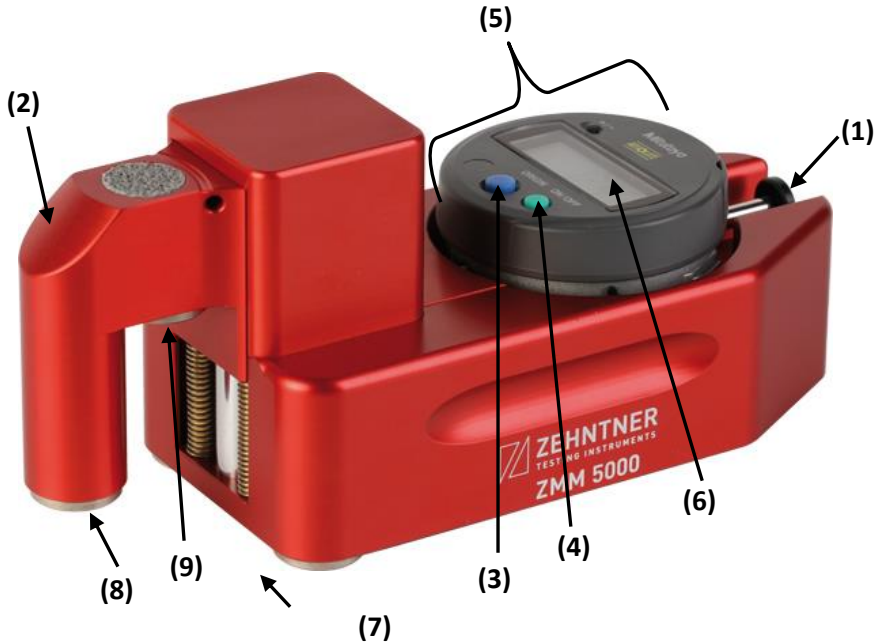
Following parts are included in the delivery:

1 Digital Marking Gauge	
1 certificate of manufacturer	
1 carrying case	

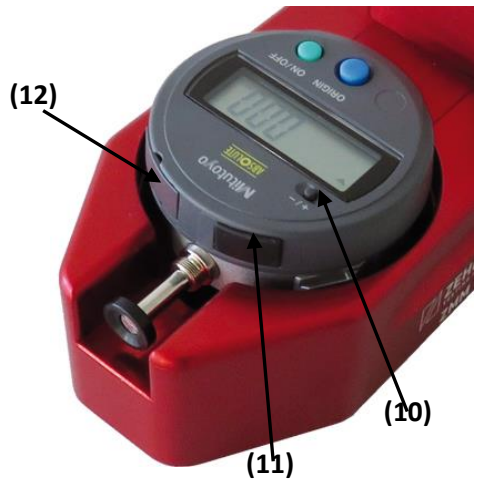
### 3.4 Options

<ul style="list-style-type: none"><li>ZMM 5000.inch Display mm/inch, changeable</li></ul>	
<ul style="list-style-type: none"><li>Measuring bridge adjustable in width</li></ul>	
<ul style="list-style-type: none"><li>Portable statistics printer incl. connection cable</li></ul>	
<ul style="list-style-type: none"><li>PC-connection set (1 connection cable IDS/IDC/IDU, 1 interface Mitutoyo DMX)</li></ul>	
<ul style="list-style-type: none"><li>Calibration and certification (incl. certificate)</li></ul>	

#### 4 Device overview



- (1) **Calibration button**
- (2) **Measuring arm**
- (3) **„ORIGIN“ button**
- (4) **ON/OFF button**
- (5) **Digimatic indicator**
- (6) **Display**
- (7) **Foot**
- (8) **Measuring button**
- (9) **Measuring button for measuring bridge**
- (10) **+/- button**
- (11) **Interface**
- (12) **Battery case**



## 5 Calibration

- Switch on the device with the “ON/OFF” (4) button.
- Hold the digital marking gauge in one hand and press the black calibration button (1) as far as it goes.
- While holding the calibration button (1), press the „ORIGIN“ button (3), until „0.00mm“ is shown on the display (6). (Picture: Calibrating)
- Release the calibration button (1) now. The display indicates a number. If there is a “-“ in front of this number, press the “+/-“ button (10). (Picture: Example just after calibration)
- The device is ready to measure now

Calibrating



Example just after caibration





## 6 Measuring procedure

- ! Before starting the measurements calibrate the ZMM 5000 according to chapter 5 “Calibration” on page 8.
- Place the three feet (7) of the marking gauge either on the marking to be measured (figure 1) or next to the marking (figure 2).
- ! All three feet (7) have to sit on the marking or on the substrate.



Figure 1: Placement on the marking



Figure 2: Placement next to the marking

- Press the measuring arm (2) downwards until the measuring button (8) sits on the marking or on the substrate respectively.
- Read off the measured value.
- ! Please note that in practice the second decimal place has no significance due to the roughness of the road surface and marking. So only read the value including the first decimal place.
- Repeat several times at several places to obtain an average value.

## 7 Optional measuring bridge

### 7.1 Calibration with measuring bridge

- Switch on the device with the “ON/OFF” button.
- Press the „ORIGIN” button (3), until the „□□□□□□” is shown on the display (6).
- Press the „+/-” button (10), until a small triangle is indicated on the display (6).



- The device is ready to measure now.

### 7.2 Measuring procedure with measuring bridge

With the optional measuring bridge you are able to carry out cross profile measurements.

- ! In case markings on chipseals should be tested, it is recommended to use the rectangular big feet for chipseals (13).
- Remove the round feet of the measuring bridge (14) by loosening the screws with the TORX® key.
- Assemble the rectangular big feet (13) and tight the screws.

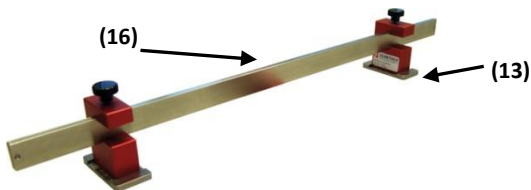


Figure 3: Measuring bridge with mounted big feet



Figure 4: Measuring bridge with round feet

- ! Calibrate the ZMM 5000 before the first measurement.
- Place the measuring bridge in an angle of 90° across the marking to be measured, so that the feet of the measuring bridge sit on the road surface (or in case of test samples on the substrate).
- To ensure greater measuring accuracy, loosen the screws of the side parts (16) and move the side parts as close to the marking as possible. Tighten the screws (16) again.
- Place the ZMM 5000 with the three feet (7) onto the marking so that the measuring arm (2) overlaps the measuring bridge.
- ! All three feet (7) of ZMM 5000 have to sit on the marking.



Figure 5: Placing with optional measuring bridge

- Press the measuring arm (2) downwards until the measuring button for measuring bridge (9) firmly touches the measuring bridge.
- Read off the measured value.
- ! Please note that in practice the second decimal place has no significance due to the roughness of the road surface and marking. So only read the value including the first decimal place.
- Repeat the measurement several times over the entire width of the marking.
- Repeat the whole measuring process at several places of the marking and make an average.

## 8 Maintenance and cleaning

### 8.1 Maintenance which can be carried out by the user

The user is only allowed to carry out the following maintenance and cleaning work:

- Outer cleaning of the device (see chapter 8.2 on page 12)
- Changing the battery (see chapter 8.3 on page 12)

! All other maintenance and repair work shall only be carried out by **Proceq SA** or your authorized Proceq agent, otherwise all the guarantee and liability claims will be void.

### 8.2 Cleaning of the device


For cleaning of the aluminium housing use a proper, soft cloth. Only use soft cleaning agents.

- ! Do not use aggressive solvents or cleaning agents.
- ! Keep the ZMM 5000 dry.
- ! During cleaning take care that under no circumstances water or cleaning liquid flows into the interior of the instrument.

### 8.3 Changing the battery

- Pull out the battery case (12) with the aid of a pen or similar device, and change the battery as shown below.



- ! The battery must be recycled, respectively disposed separately from household garbage. **CE 0682** 

## 9 Technical specification

Material:	red anodised aluminium
Measuring range:	5000.mm -12.5 mm to +12.5 mm 5000.inch -0.5" to +0.5" changeable to -12.5 mm to +12.5 mm
Resolution:	10 µm (0.4 mil)
Bearing area (WxL):	min 67 mm x 100 mm (2.64" x 3.94")
Display:	digital
Dimensions (LxWxH):	180 mm x 70 mm x 80 mm (7.1" x 2.8" x 3.15")
Weight:	926 g (2.04 lbs)
Standards:	EN 13197, ZTV M 13
Warranty:	2 years digimatic indicator: 1 year

### 9.1 Technical specification of digimatic indicator

Measuring range:	12.7 mm
Digital step:	0.01 mm
Accuracy:	0.02 mm
Contact point:	Carbide ball, thread M 2.5 x 0.45 mm
Power supply:	battery SR-44

## Glossary

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