**Digital Caliper 16 EWR with data output**

**Features**

**Functions:**
- ON/OFF
- RESET (Set display to zero)
- mm/inch
- Reference Lock/Unlock
- DATA (Data transmission via connection cable)
- Auto-ON/OFF

- Immediate measurement due to the Reference system
- Excellent resistance against dust, coolants and lubricants. protection class IP67
- MarConnect data output, choose alternatively: USB, OPTO RS232C or Digimatic
- Slide and beam made of hardened stainless steel
- Measuring blades for inside measurement
- Step measuring function
- Locking screw
- Supplied with: Case, battery, operating instructions

**Technical Data**

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>Resolution</th>
<th>Error limit G</th>
<th>Depth rod</th>
<th>Friction wheel</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm (inch)</td>
<td>mm/inch</td>
<td>mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150 (6&quot;)</td>
<td>0.01/.0005&quot;</td>
<td>0.03</td>
<td>0</td>
<td>0</td>
<td>4103064</td>
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<tr>
<td>150 (6&quot;)</td>
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<td>0</td>
<td>4103066</td>
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<tr>
<td>200 (8&quot;)</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>4103065</td>
</tr>
<tr>
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<td>0.01/.0005&quot;</td>
<td>0.03</td>
<td>0</td>
<td>0</td>
<td>4103067</td>
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<tr>
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<td>0</td>
<td>0</td>
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<tr>
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<td>0.01/.0005&quot;</td>
<td>0.05</td>
<td>0</td>
<td>0</td>
<td>4103071</td>
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**Accessories**

<table>
<thead>
<tr>
<th>Order no.</th>
<th>Description</th>
<th>Details</th>
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<tbody>
<tr>
<td>4102020</td>
<td>Depth Measuring Bridge 16 Em</td>
<td>16 Em</td>
</tr>
<tr>
<td>4102520</td>
<td>Battery 3V, Type CR 2032</td>
<td>16 EXu</td>
</tr>
<tr>
<td>4102357</td>
<td>Data Connection Cable USB (2 m)</td>
<td>16 EXr</td>
</tr>
<tr>
<td>4102410</td>
<td>Data Connection Cable Opto RS232C (2 m), with SUB-D jack 9-pin</td>
<td>16 EXr</td>
</tr>
<tr>
<td>4102411</td>
<td>Data Connection Cable Digimatic (2 m), Flat plug 10-pin</td>
<td>16 EXd</td>
</tr>
</tbody>
</table>

Accessories for Data Processing see Dimensional Metrology catalog, Chapter 11
**MarCal. The new Generation with the Reference-System**

WATERPROOF CALIPERS

Mahr once again sets a new standard in the caliper product segment with the new generation of MarCal Reference calipers:

With the new Reference system from Mahr the handling of the caliper has become considerably simpler and more far comfortable, as the zero-position only has to be set once. For all further measurements this setting remains stored. With the high degree of protection, in accordance to IP67 the MarCal 16 EWR is protected against dust, coolants and lubricants and is therefore suitable to be used in the most difficult workshop conditions. Furthermore, if you need to document your measured data, the MarConnect interface offers you the optimal connection to your evaluation system.

### Historic Overview

**1869**
- **Vernier Caliper No. 1**
  - The *first caliper* from Mahr

**1899**
- **Vernier Caliper Type Carl**
  - Caliper in the present modern form *for inside, outside and depth measurements*

**1951**
- **Super Vernier Caliper 16 N**
  - Caliper with a *recessed main scale for the protection of the graduation lines, a Mahr-Patent*

**1985**
- **Digital Caliper 16 E**
  - Digital caliper digital *with a data output* for the acquisition of measured values
The innovative Reference-System

Just set once to zero

All Mahr digital calipers with this logo are equipped with the innovative Reference-System. The zero position just has to be set once: after setting the zero position, the zero remains stored for all further measurements. Therefore, once the caliper is switched ON or the slide is moved the caliper is immediately ready for measurement. The need to reset to zero with a conventional caliper once the caliper is switched on has now become obsolete.

1. Switch ON  
2. Close the measuring jaws  
3. Set to zero  
4. Results of measurement

Conventional

REFERENCE - System

1999

Digital Caliper MarCal 16 EX

Caliper with a MarConnect interface for trouble-free connection to all commercial evaluation devices

2003

Digital Caliper MarCal 16 EW

Waterproof caliper with IP67 protection class and Reference-Lock function to secure the zero position

2009

Digital Caliper MarCal 16 EWR

Always ready to measure thanks to the Reference-System
MarCal. The new Generation with the Reference-System
WATERPROOF CALIPPERS

Superior quality of the guide ways

Only MarCal calipers have lapped guide way surfaces, these guarantee an even and sensitive run of the slide. Additionally, the service life of the caliper increases compared to a ground guide way due to the greater contact area on the guide way surface.

Surface of the guide way

- Lapped guide way
- Competitor A
- Ground guide way
- Competitor B
- Ground guide way

50% longer battery lifetime

The new Reference system is extremely energy efficient as when the caliper is in standby mode; almost no power is required, thus extending the life of the battery to up to 50%.

Security due to the Reference Lock function

- Zero-position is secured
- Operating error is not possible

The digital caliper MarCal 16 EWR Reference is equipped with a LOCK function. With this key lock the zero position is secured and operating error is avoided.
The only one with a universal MarConnect interface

Regardless of which evaluation device you are using, with a MarConnect interface you always have the optimal connection.

**USB ready:** For direct connection to a PC. In conjunction with the MarCom software you can transfer your measured values directly into MS Excel or with keyboard code into any application.

**Digimatic:** To connect to Digimatic compatible evaluation devices

**Mahr Opto RS232:** To connect to the COM interface on a PC

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Ergonomic Design

The handy non-slip thumb support of the MarCal 16 EWR ensures even in unclean working conditions trouble-free handling and therefore reliable measuring results.

The high-contrast display with 8.5 mm high digits enables accurate, fatigue-free reading of the measurement results.

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Excellent resistance against dust, coolant and lubricants

Due to the outstanding protection against dust and water the digital caliper MarCal 16 EWR Reference delivers precise and secure results even in the most difficult workshop conditions. The finished plastic components have an excellent outstanding chemical resistance.

Code initials | IP | International Protection
--- | --- | ---
First digit | 6 | Dust-tight
Second digit | 7 | Protected against temporary immersion in water
Degree of International Protection (IP)
WITH MAHR YOU ARE ON THE SAFE SIDE

**IP-Protection classes**

<table>
<thead>
<tr>
<th>First digit is the degree of protection according to IEC 60529</th>
<th>Second digit is the degree of protection according to IEC 60529 (approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection against particles, contaminants and dust</td>
<td>Protection against wet conditions (fluids)</td>
</tr>
<tr>
<td>0  Not protected</td>
<td>0  Not protected</td>
</tr>
<tr>
<td>1  Particles  &gt;  50.0 mm</td>
<td>1  Falling water drops - vertical</td>
</tr>
<tr>
<td>2  Particles  &gt;  12.5 mm</td>
<td>2  Falling water drops - tilted &lt; 15°</td>
</tr>
<tr>
<td>3  Particles  &gt;  2.5 mm</td>
<td>3  Spray water &lt; 60°</td>
</tr>
<tr>
<td>4  Particles  &gt;  1.0 mm</td>
<td>4  Water splashing from all directions</td>
</tr>
<tr>
<td>5  Dust protected</td>
<td>5  Water jets from all directions</td>
</tr>
<tr>
<td>6  Dust tight</td>
<td>6  Powerful water jets</td>
</tr>
<tr>
<td>7  Temporary immersion in water</td>
<td>7  Temporary immersion in water</td>
</tr>
<tr>
<td>8  Continuous immersion in water</td>
<td>8  Continuous immersion in water</td>
</tr>
</tbody>
</table>

Example:

IP67 means that the product is "Dust tight" and is protected against "Temporary immersion in water".