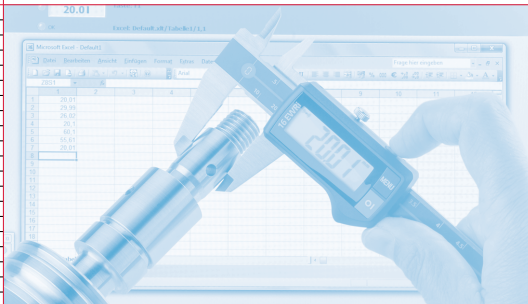


DIMENSIONAL METROLOGY | PRECISION GAGES



MEASURING INSTRUMENTS WITH INTEGRATED WIRELESS SYSTEM



|
- 0 +



E X A C T L Y

MarConnect Integrated Wireless

► | With Integrated Wireless, you have a new Integrated Wireless data transmission system from Mahr for the price of a cable. Data acquisition with digital indicators is now even simpler: Simply transmit your measuring data without being tangled up between cables directly into MS Excel® or via a keyboard code into any other Windows program.



Inexpensive



With the Integrated Wireless receiver up to 8 measuring instruments can be connected per i-stick, therefore expensive interface boxes are no longer required. When just attaching a measuring instrument with the Integrated Wireless function you have already a wireless data transmission for the price of a data cable.



Secure data transmission

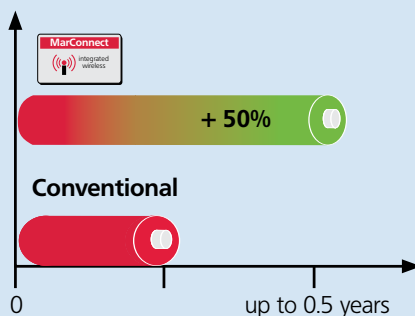


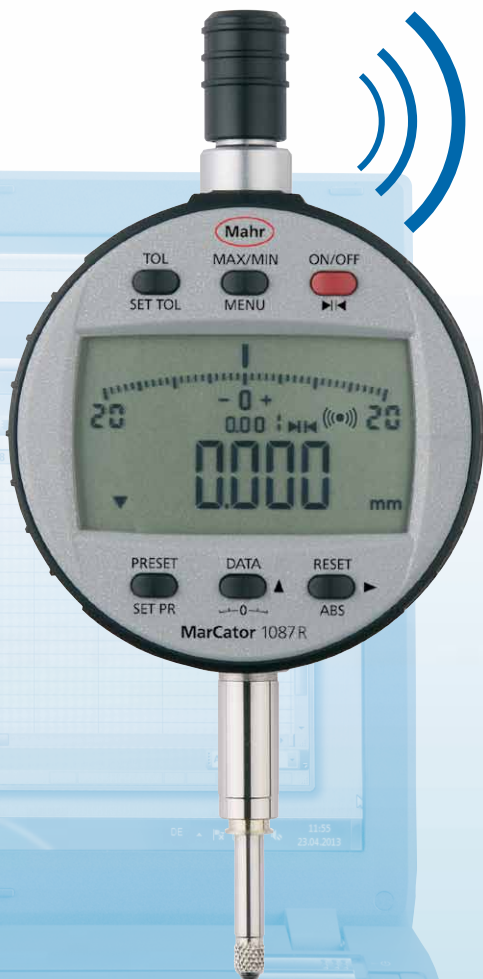
When using Integrated Wireless your data will be transferred to the digital measuring instruments. This is confirmed with a message in the display of the measuring instrument to whether the sent data has been transferred correctly, and/or whether you are in the reception range of the i-stick.

Long battery life span



As the wireless interface is Integrated in the digital measuring instruments, these are extremely energy efficient. In addition contrary to conventional wireless data transmission systems no additional battery is needed.





Simple data transmission

MarConnect



With the i-stick you can simply **transfer your measured values via the Integrated Wireless to the PC**. The measured values are sent directly (as with a data cable) via the MarCom software to MS Excel® or by a keyboard code into any other Windows program.

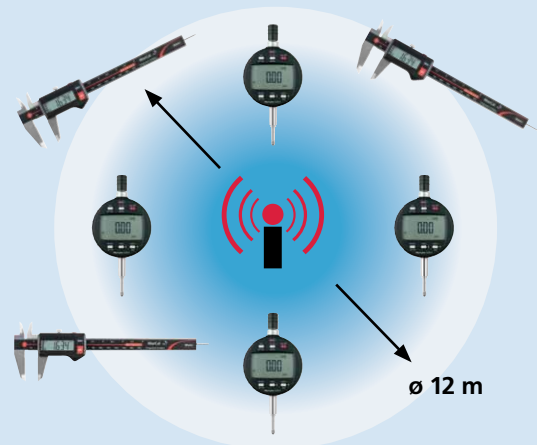
Programm	Meßgröße	Beschreibung	Messwert	Anforderung
			Stärke	Ziel
1	USB-Gerät	MarCator 1087 R	10.001	Tasche F3
RF1		MarCator 1087 R	OK	Excel: Kartenschein 3/1/1
RF2		MarCator 1087 R	49.999	Excel: Kartenschein 3/1/1
RF2		MarCator 1087 R	OK	Excel: Kartenschein 3/1/1

Large freedom of movement

MarConnect



Integrated Wireless offers you considerably more **freedom of movement**. Whether at a measuring station, or measuring on or at the machine or with large workpieces you are not obstructed by any cables.



Excellent ergonomics

MarConnect



Conduct measurements without additional modules. Compared to a bulky conventional radio transmission which requires a large external transmitter with a separate battery; the Integrated Wireless transmitter is integrated in the measuring instrument.

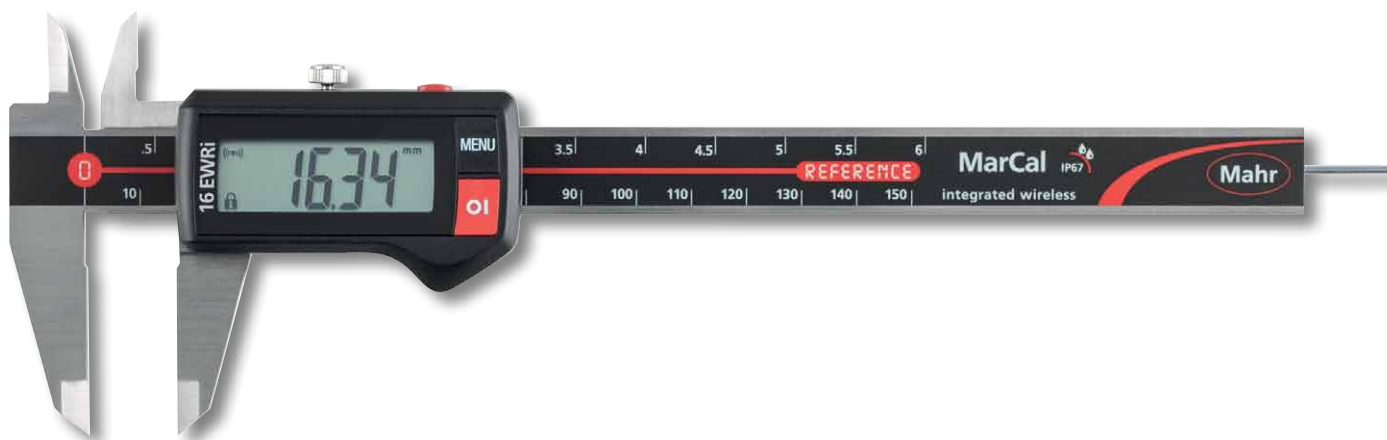
MarCal. The new Generation

WATERPROOF DIGITAL CALIPERS WITH THE REFERENCE-SYSTEM AND INTEGRATED WIRELESS

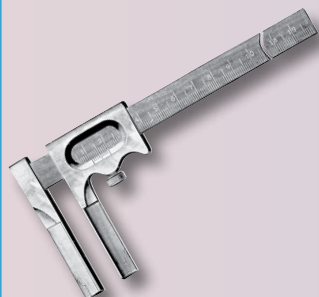
► | Once again Mahr sets a new standard in the digital indicator product segment with the new generation of MarCator Reference indicators.

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 EWri is protected against dust, coolants and lubricants and is therefore suitable to be used in the most difficult workshop conditions.

Also, if you need to document your data, we can offer you the Integrated Wireless, an integrated energy efficient wireless data transmission system; the optimal solution for transmitting your measured values to a PC.



1869



**Vernier Caliper
Nr. 1**

1899

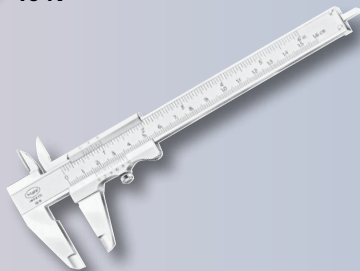
**Vernier Caliper
Type Carl**



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

MarConnect Integrated Wireless - wireless data transmission for the price of a data cable



With Integrated Wireless, you have a new Integrated Wireless data transmission system from Mahr for the price of a data cable. Data acquisition with digital indicators is now even simpler: Simply transmit your measured data without being caught up between cables directly into MS Excel or via a keyboard code into any Windows program.

Secure data transmission



With Integrated Wireless your data will be transferred to the digital indicator; this is confirmed with a message in the digital indicator's display to whether the sent data has been transferred correctly, and/or whether you are in the reception range of the i-stick.



1999

Digital Caliper
MarCal 16 EX



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

2009

Digital Caliper
MarCal 16 EWR



REFERENCE

Always ready to measure thanks to the **Reference-System**

2013

Digitaler Messschieber
MarCal 16 EWRi



Integrated Wireless patent pending

MarCal. The new Generation

WATERPROOF DIGITAL CALIPERS WITH THE REFERENCE-SYSTEM AND INTEGRATED WIRELESS

Security due to the Reference-Lock function

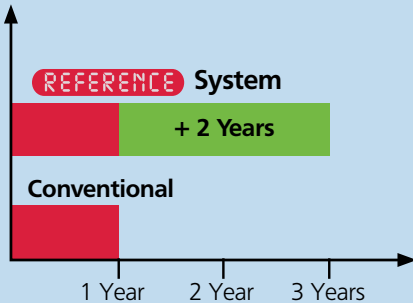
- Zero-position is secured
- Operating error is not possible

The digital caliper MarCal 16 EWRi Reference is equipped with a LOCK function. With this key lock the zero position is secured and operating error is avoided.



Battery service life is 3 years

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 up to 3 years***.



* When Integrated Wireless is deactivated

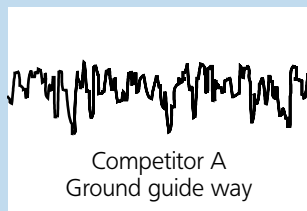
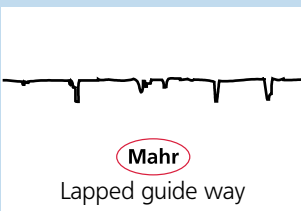


Superior quality of the guide ways

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



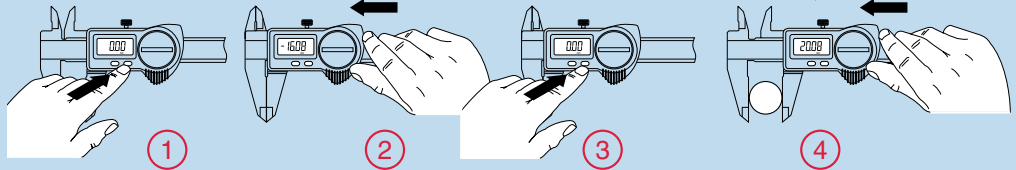
The innovative Reference-System

Just set once to zero

All Mahr digital calipers with this logo **REFERENCE** 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



Ergonomic Design

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



The high-contrast display with 11 mm high digits enables accurate, fatigue-free reading of the measurement results.

Excellent resistance against dust, coolant and lubricants



Due to the outstanding protection against dust and water the digital caliper MarCal 16 EWRI 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



Digital Caliper MarCal 16 EWRi



REFERENCE




Features

Functions:

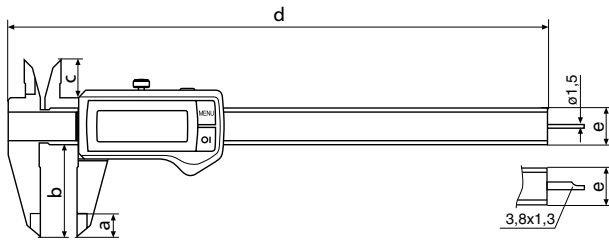
ON/OFF
RESET (Set display to zero)
mm/inch
Reference-Lock/Unlock
Auto-ON/OFF
Hold
DATA

- Integrated Wireless data transmission
- Immediate measurement due to the Reference system
- Excellent resistance against dust, coolants and lubricants, protection class IP67
- Dirt wipers are integrated in the slide
- Life of the battery up to 3 years
- Max measuring speed 2,5 m/s (100"/s)
- High contrast LCD with 11 mm high digits
- Lapped guide way
- 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

Measuring range		Resolution	Error limit G		Depth rod		Friction wheel	Order no.
mm	(inch)	mm/inch	mm	/ inch	DIN 862			
150	(6")	0.01/.0005"	0.03	/ .001"	●	●		4103400
150	(6")	0.01/.0005"	0.03	/ .001"	●	●	●	4103401
150	(6")	0.01/.0005"	0.03	/ .001"	●		●	4103402
150	(6")	0.01/.0005"	0.03	/ .001"	●		●	4103403
200	(8")	0.01/.0005"	0.03	/ .001"	●		●	4103404
200	(8")	0.01/.0005"	0.03	/ .001"	●		●	4103405
300	(12")	0.01/.0005"	0.04	/ .0015"				4103406
300	(12")	0.01/.0005"	0.04	/ .0015"			●	4103407

Technical Data



Dimensions

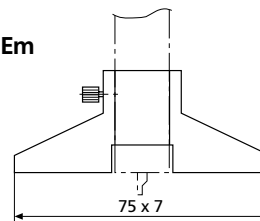
mm	a	b	c	d	e
150	10	40	16	235	16 x 3
200	10	50	19	285	16 x 3.5
300	14	64	19	388	16 x 4

Accessories

		Order no.
Depth Measuring Bridge	16 Em	4102020
Battery 3V, Type CR 2032		4102520
i-Stick wireless receiver inkl. MarCom Standard		4102220
Software MarCom Professional 3.1		4102552
Software MarCom Standard 3.1		4102551

Accessories for Data Processing see Dimensional Metrology catalog, Chapter 11

16 Em



MarCator. The new Generation

DIGITAL INDICATORS WITH THE REFERENCE-SYSTEM AND INTEGRATED WIRELESS

► | Once again Mahr sets a new standard in the digital indicator product segment with the new generation of MarCator Reference indicators:

With the new Reference system the MarCator digital indicators can be applied immediately as the zero-position only has to be set once for all further measurements. Also, if you need to document your data, we can offer you the Integrated Wireless, an integrated energy efficient wireless data transmission system; the optimal solution for transmitting your measured values to a PC. I ◀

Just set once to zero

REFERENCE

The new Digital Indicators 1086 Ri / 1087 Ri are equipped with the innovative Reference-System. The zero position only has to be set one time: once it is set, the zero remains stored for all further measurements. Therefore, when the indicator is switched ON or the measuring spindle is moved the indicator is immediately ready for measurement; thus the need to reset as with a conventional indicator is now obsolete.

MarConnect Integrated Wireless - wireless data transmission for the price of a data cable

MarConnect



With Integrated Wireless, you have a new Integrated Wireless data transmission system from Mahr for the price of a data cable. Data acquisition with digital indicators is now even simpler: Simply transmit your measured data without being caught up between cables directly into MS Excel or via a keyboard code into any Windows program.

1931

Precision Dial Indicator 810



with a **constant measuring force**
(Mahr-Patent)

1954

Precision Dial Indicator 810 ST



with a **shock proof movement**

1987

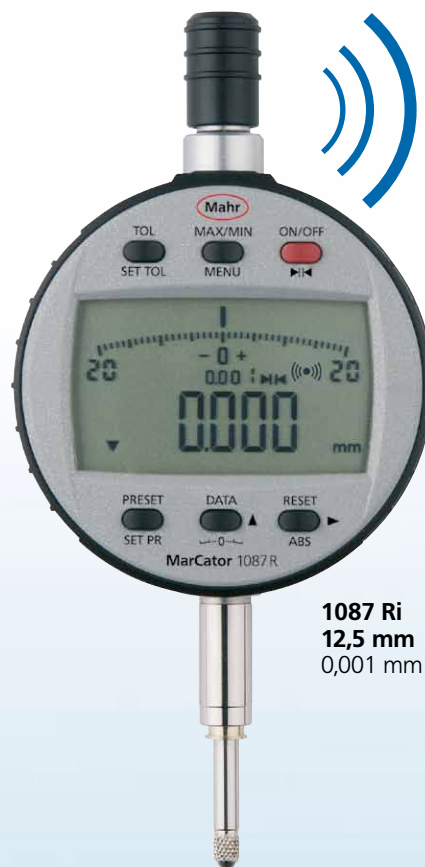
Digital Indicator Millitast 1071



The first digital indicator, already with a **data output**



1086 Ri
12,5 mm
0,001 mm



1087 Ri
12,5 mm
0,001 mm



1994

Digital Indicator Millitast 1085



The first digital indicator with a **combined analog and digital display**

1999

Digital Indicator MarCator 1075



The first digital indicator with the **universal MarConnect interface**

2012

Digital Indicators MarCator 1086 Ri / 1087 Ri



Digital indicator with **Reference System and Integrated Wireless**

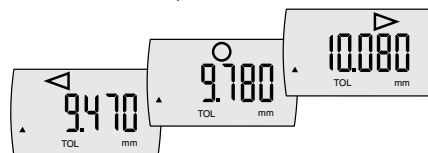
MarCator 1086 Ri

► | The new Digital Indicator **MarCator** 1086 Ri. With the large display and the integrated tolerance function, your measurement results are clearly visual. I ◀

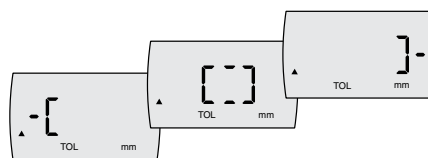
Clear display

Tolerance indication with the displayed value

Displayed is the actual measured value and the tolerance zone position



Tolerance indication without the value in the display. In and Out of tolerance will be indicated in the display as a symbol.



IP Protection class IP54 (optional)

- Protection cap is sealed
- Rubber bellows for the measuring spindle
- Sealed battery compartment

Code Initial	IP	International Protection
First Numeral	5	Dust protected
Second Numeral	4	Protection against splash water in all directions

Error free operation



Lock function: This prevents unintentional activation of an operating button. Either all the operating buttons or only certain individual buttons can be locked. If a locked operating button is pressed the "LOC" symbol will appear in the display.

Universal Data-Interface



• Integrated Wireless

The wireless interface for the price of a data cable



• USB

No interface box is required! Simple and inexpensive way to set up a multiple measuring instruments via a USB hub



• Digimatic

To connect a Digimatic compatible evaluation instrument



• Mahr Opto RS232C

For direct connection to a COM port on a PC

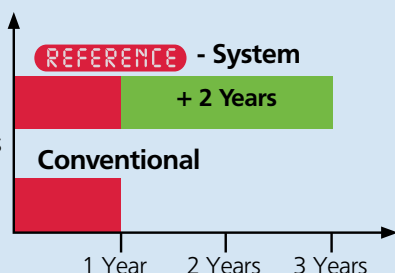
ABS

Absolute function:

Digital Indicator can be set in any position to 0.000 without losing the reference to the preset value.

Battery service life is 3 years

The new Reference system is extremely energy efficient as when the indicator is in standby mode; almost no power is required, thus **extending the life of the battery up to 3 years***.



* When Integrated Wireless is deactivated

Just set once to zero

REFERENCE

The new Digital Indicators 1086 Ri are equipped with the innovative Reference-System. The zero position only has to be set one time: once it is set, the zero remains stored for all further measurements. Therefore, when the indicator is switched ON or the measuring spindle is moved the indicator is immediately ready for measurement; thus the need to reset as with a conventional indicator is now obsolete.

Digital Indicators MarCator 1086 Ri

ABS

IP42

TOL



USB

MarConnect
RS232C

Digimatic

MarConnect
integrated wireless

REFERENCE



4337124



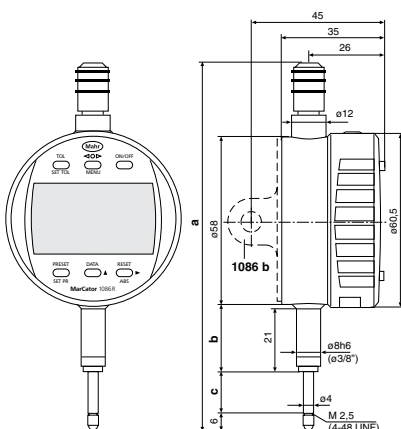
4337134

Features

Functions:

- ON/OFF
- RESET (Set display to zero)
- mm/inch
- Reversal of the counting direction
- PRESET (Allows the entry of any value using set buttons)
- TOL (Enter tolerance limit values)
- ABS (Display can be set to zero, without losing the reference to the Preset value)
- <0> (Tolerance GO / NO GO display mode)
- DATA (when connected with a data connection cable)
- Factor (adjustable)
- Immediate measurement due to the Reference system
- Individual buttons can be locked - Lock Function
- Operating and display unit (bezel) can be rotated 280°
- High contrast LCD with 11 mm high digits
- Operating time approx. 3 years (2000 work. hrs/year)
- Maximum measuring speed 1.5 m/s (60"/s)
- Lifter protection cap on the measuring spindle
- MarConnect data output: choose either
USB
OPTO RS232C
Digimatic
Integrated Wireless
- Operating temperature 10 - 40°C
- Class of protection IP42 in accordance to IEC 60529

Supplied with:
Battery,
Operating instructions



Dimensions

Meas. range	a	b	c
mm (inch)	mm	mm	mm
12.5 (.5")	126.3	23	13.5

Technical Data

Measuring range	Resolution	Span of error*	Measuring force	Weight	Mounting shank	Order no.
mm (inch)	mm / inch	mm	N	g		
12.5 (.5")	0.001 / .00005"	0.005	0.65 - 0.90	130	8h6	4337124
12.5 (.5")	0.01 / .0005"	0.02	0.65 - 0.90	130	8h6	4337134

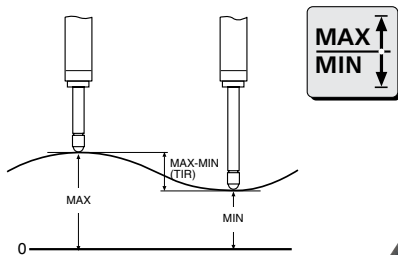
* in any zero point

MarCator 1087 Ri

► | The new Digital Indicator **MarCator** 1087 Ri. The multi-functional Digital Indicator with a combined analog and digital display as well as tolerance and dynamic measuring functions. | ◀

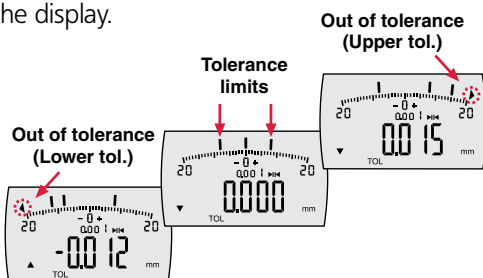
Dynamic measuring functions

- **MAX-MIN**-Function ideal for testing flatness and concentricity
- **MAX** and / or **MIN** for searching the reversal point



Clear display Tolerance indication

The Integrated bar graph visualizes the tolerance deviation. Out of tolerance; above the upper or below the lower tolerance limit is represented by arrows shown in the display.



Universal Data-Interface



• Integrated Wireless

The wireless interface for the price of a data cable



• USB

No interface box is required! Simple and inexpensive way to set up a multiple measuring instruments via a USB hub



• Digimatic

To connect a Digimatic compatible evaluation instrument



• Mahr Opto RS232C

For direct connection to a COM port on a PC



ABS

Absolute function:

Digital Indicator can be set in any position to 0.000 without losing the reference to the preset value.

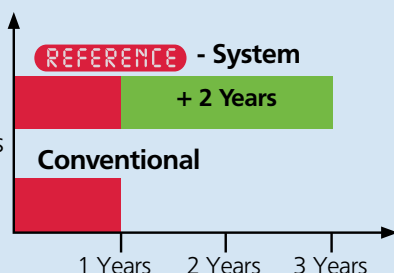
Just set once to zero

REFERENCE

The new Digital Indicators 1087 Ri are equipped with the innovative Reference-System. The zero position only has to be set one time: once it is set, the zero remains stored for all further measurements. Therefore, when the indicator is switched ON or the measuring spindle is moved the indicator is immediately ready for measurement; thus the need to reset as with a conventional indicator is now obsolete.

Battery service life is 3 years

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 up to 3 years***.



* When Integrated Wireless is deactivated

Error free operation

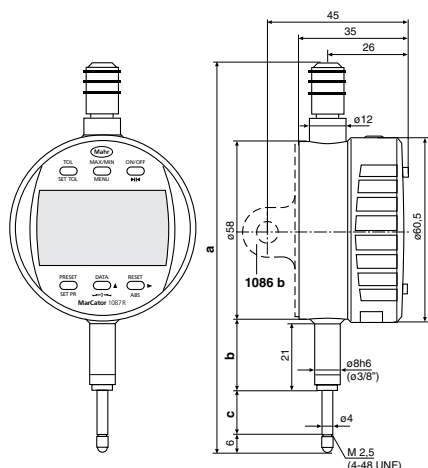


Lock function: This prevents unintentional activation of an operating button. Either all the operating buttons or only certain individual buttons can be locked. If a locked operating button is pressed the "LOC" symbol will appear in the display.

Digital Indicators MarCator 1087 Ri with analog display



REFERENCE



Dimensions

Meas. range	a	b	c
mm (inch)	mm	mm	mm
12.5 (.5")	126.3	23	13.5

Analog display

Readings			Display range		
mm	/	inch	mm	/	inch
0.001	/	.00005	± 0.02	/	± .001
0.002	/	.0001	± 0.04	/	± .002
0.004	/	.0005	± 0.08	/	± .01
0.01	/	.001	± 0.2	/	± .02

Features

Functions:

- ON/OFF
- RESET (Set display to zero)
- mm/inch
- Reverse the counting direction
- PRESET (Allows the entry of any value using set buttons)
- TOL (Enter tolerance limit values)
- Tolerance band max. 1.6 mm
- MAX/MIN memory, ideal for searching the reversal point
- TIR (MAX-MIN) ideal for testing concentricity and flatness
- ABS (Display can be set to zero, without losing the reference to the Preset value)
- 0 (Set analog display to zero)
- DATA (when connected with a data connection cable)
- Factor (adjustable)
- Immediate measurement due to the Reference system
- Individual buttons can be locked - Lock Function
- Operating and display unit (bezel) can be rotated 280°
- High contrast LCD with 8.5 mm high digits
- Operating time approx. 3 years (2000 work. hrs/year)
- Maximum measuring speed 1.5 m/s (60"/s)
- MarConnect data output: choose either
 - USB
 - OPTO RS232C
 - Digimatic
 - Integrated Wireless
- Operating temperature 10 - 40°C
- Class of protection IP42 in accordance to IEC 60529

Supplied with:
Battery,
Operating instructions

Technical Data

Measuring range	Resolution	Span of error*	Measuring force	Weight	Mounting shank	Order no.
mm (inch)	mm / inch	mm	N	g		
12.5 (.5")	0.001 / .00005"	0.005	0.65 - 0.90	140	8h6	4337163

* in any zero point

Digital Indicator MarCator 1087 BRI for 2 point inside measurement



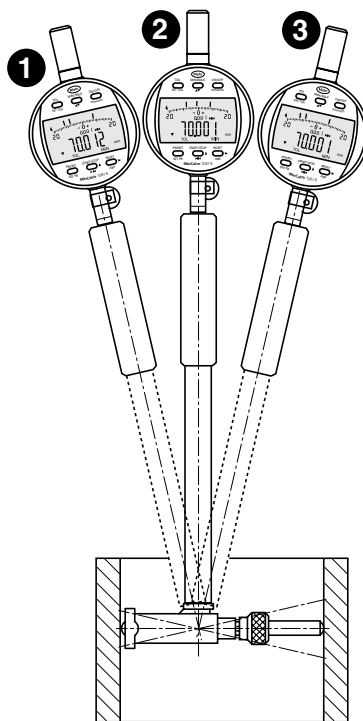
REFERENCE



Dimensions

Meas. range	a	b	c
mm (inch)	mm	mm	mm
12.5 (.5")	126.3	23	13.5

Example of application



With a 2 point inside measuring instrument the point of reversal is automatically determined through rocking back and forth. The actual value is detected and stored by the MIN function and indicated in the display (3).

Analog display

Readings			Display range		
mm	/	inch	mm	/	inch
0.001	/	.00005	± 0.02	/	± .001
0.002	/	.0001	± 0.04	/	± .002
0.004	/	.0005	± 0.08	/	± .01
0.01	/	.001	± 0.2	/	± .02

Features

Functions:

- ON/OFF
- RESET (Set the display to zero)
- mm/inch
- Reversal of the counting direction
- PRESET (Allows the entry of any value using set buttons)
- TOL (Enter tolerance limit values)
- Tolerance band max. 1.6 mm
- START/STOP for searching the reversal point
- MAX/MIN memory, ideal for searching the reversal point
- ABS (Display can be set to zero, without losing the reference to the Preset value)
- 0 (Set analog display to zero)
- DATA (when connected with a data connection cable)
- Factor (adjustable)
- Immediate measurement due to the Reference system
- Individual buttons can be locked - Lock Function
- Operating and display unit (bezel) can be rotated 280°
- High contrast LCD with 8.5 mm high digits
- Operating time approx. 3 years (2000 work. hrs/year)
- Max. meas. speed 1.5 m/s (60"/s)
- Sealed protection cap
- MarConnect data output:
 - choose
 - USB
 - OPTO RS232C
 - Digimatic
 - Integrated Wireless
- Operating temperature 10 - 40°C
- Class of protection IP42 in accordance to IEC 60529
- Supplied with:
 - Battery,
 - Operating instructions

Technical Data

Measuring range	Resolution	Span of error*	Measuring force	Weight	Mounting shank	Order no.
mm (inch)	mm / inch	mm	N	g		
12.5 (.5")	0.001 / .00005"	0.005	0.65 - 0.90	140	8h6	4337164

* in any zero point

Accessories for MarCator

Accessories for 1086 Ri, 1087 Ri and 1087 BRi

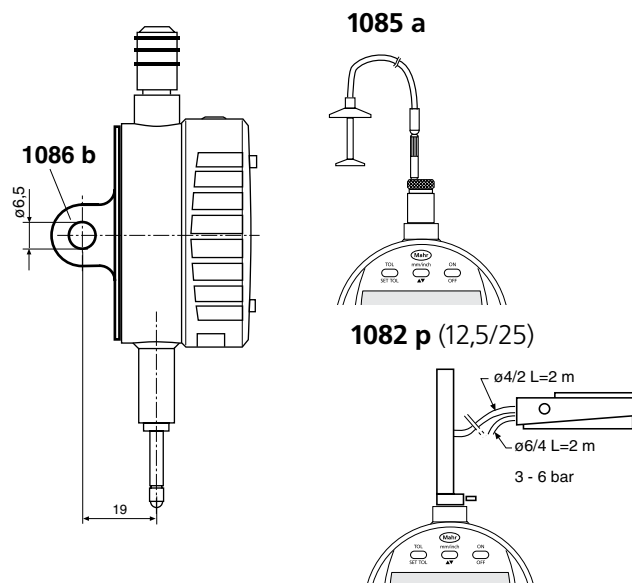
		Order no.
Battery 3V , Type CR 2450		4884464
Mounting Lug	1086 b	4337421
Cable Release for measuring ranges 12.5 and 25 mm	1085 a	4336311
Pneumatic Lifter for measuring ranges 12.5 and 25 mm	1082 p	4336237

Additional Accessories		Catalog page
Contact Points	901-913	5-52
Special Holder	941	5-53
Sensor Lever	943	5-53

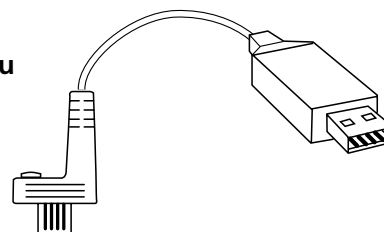
MarCom Software

		Order no.
Data Connection Cable USB (2 m) incl. MarCom Standard	16 EXu	4102357
Data Connection Cable Opto RS232C (2 m), with SUB-D jack 9-pin	16 EXr	4102410
Data Connection Cable Digimatic (2 m), Flat plug 10-pin	16 EXd	4102411
i-Stick wireless receiver inkl. MarCom Standard		4102220
Software MarCom Professional 3.1		4102552
Software MarCom Standard 3.1		4102551

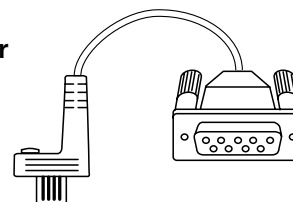
Accessories for Data Processing see Dimensional Metrology catalog, Chapter 11



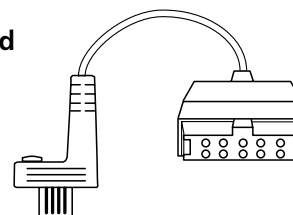
16 EXu



16 EXr



16 EXd



MarConnect. MarCom Software

► | Regardless of whether you use the well established **MarConnect** interface or the new wireless transmission system Integrated Wireless, the MarCom software enables simple and fast connection data transmission from the measuring station to a PC.



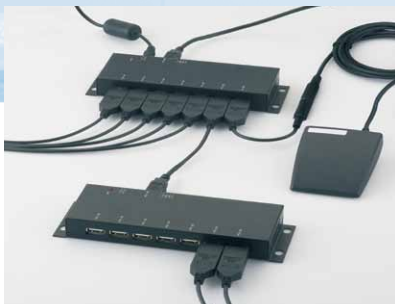
- **MarConnect Integrated Wireless - the wireless transmission system for the price of a cable.** With a i-Stick receiver connect up to 8 Integrated Wireless measuring instruments via the wireless data transmission.
- **Compatible** with all **MarConnect USB** ready measuring instruments

Program	Beschriftung	Messwert	Anforderung
	Gerät, Anschlusskabel	Status	Ziel
4 USB-Geräte	Schalter Messstation	OK	Messung Nr.: 0/1
USB1	Werte 1	OK	
	400X 16Dx	OK	Excel: Default.xls/Tabelle1/1
USB2	Breite	OK	
	16Dx 16Dx	OK	Excel: Default.xls/Tabelle1/2
USB3	Messstation 3	OK	
	1096 16Dx	OK	Timer 00:00:10
USB4		OK	Excel: Default.xls/Tabelle1/1



- **Clear and flexible data acquisition** with the easy to use **MarCom Professional Software**

- **Choose alternative methods of data transmission** either with a foot switch or a PC keyboard, with the Timer function or direct on the measuring instrument.



- **Easily extendable** with additional USB hubs



- **Multiple measuring station** is easily set up with a USB hub, up to 100 measuring devices can be simultaneously connected.

MarCom Software

The screenshot displays a Microsoft Excel spreadsheet with a table of measurement data. The table has columns for 'Value', 'Messstelle 1', 'Messstelle 2', and 'Messstelle 3'. The data rows are numbered 1 to 31. The MarCom software interface is overlaid on the spreadsheet, showing a list of USB devices and their measurement results. The interface includes a 'Mahr' logo and a 'Merkmal 2' label. The software windows show various settings and measurement data, including a table of measurement results and a 'Mahr' logo.

Features

Software MarCom Professional 3.1

- Measured values can be directly transferred into either MS Excel® (from version 97), into a text file or as a key code
- The measured values from each instrument can be sent to a different column, table or folder in Excel
- Data transmission is possible via USB and 2 serial COM interfaces
- USB hub is also suitable as a measuring instrument interface
- Connect up to 100 measuring instruments with USB data cable
- Clear portrayal of the chosen measuring instruments with the aid of icons
- Several foot switches can be connected up and freely assigned in conjunction with USB measuring instruments
- Individually define and configure measurement cycles
- There are a variety of ways to transmit data, you can either press the "Data" button on the measuring instrument or on the data cable; via a computer, timer, keyboard; or by activating a foot switch connected to a USB interface
- Text file can be edited; making translation in another language easy

Software MarCom Standard 3.1

(USB cable or the i-Stick are not included in the scope of supply)

Features and system requirements are identical to MarCom Professional, except that it only has one USB and one serial COM interface

Systemanforderung

IBM AT compatible PC
MS Windows® 2000, XP, Vista, 7
USB interface, higher than 1.1
up to 10 MB
CD / DVD drive
Recommended: MS Excel from Version 97 onwards

Order no.

Software MarCom Professional 3.1
Software MarCom Standard 3.1

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WWW.MAHR.COM

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Mahr

EXACTLY

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