

# MOISTURE ANALYSERS



# 2017

PROFESSIONAL  
MEASURING

# KERN Pictograms

	<b>Internal adjusting:</b> Quick setting up of the balance's accuracy with internal adjusting weight (motordriven).		<b>Piece counting:</b> Reference quantities selectable. Display can be switched from piece to weight.		<b>Rechargeable battery pack:</b> Rechargeable set.
	<b>Adjusting program CAL:</b> For quick setting up of the balance's accuracy. External adjusting weight required.		<b>Recipe level A:</b> Separate memory for the weight of the tare container and the recipe ingredients (net total).		<b>Universal mains adapter:</b> with universal input and optional input socket adapters for A) EU, GB B) EU, GB, CH, USA C) EU, GB, CH, USA, AUS
	<b>Memory:</b> Balance memory capacity, e.g. for article data, weighing data, tare weights, PLU etc.		<b>Recipe level B:</b> Internal memory for complete recipes with name and target value of the recipe ingredients. User guidance through display.		<b>Mains adapter:</b> 230V/50Hz in standard version for EU. On request GB, USA or AUS version available.
	<b>Alibi memory:</b> Electronic archiving of weighing results, complying with the 2009/23/EC standard. For details see page 199		<b>Recipe level C:</b> Internal memory for complete recipes with name and target value of the recipe ingredients. User guidance through display, multiplier function, adjustment of recipe when dosages are exceeded or barcode recognition.		<b>Power supply:</b> Integrated in balance. 230V/50Hz standard EU. More standards e.g. GB, USA or AUS on request.
	<b>Data interface RS-232:</b> To connect the balance to a printer, PC or network.		<b>Totalising level A:</b> The weights of similar items can be added together and the total can be printed out.		<b>Weighing principle: Strain gauges</b> Electrical resistor on an elastic deforming body.
	<b>RS-485 data interface:</b> To connect the balance to a printer, PC or other peripherals. High tolerance against electromagnetic disturbance.		<b>Weighing units:</b> Can be switched to e.g. nonmetric units at the touch of a key. See balance model. Please refer to KERN's website for more details.		<b>Weighing principle: Tuning fork</b> A resonating body is electromagnetically excited, causing it to oscillate.
	<b>USB data interface:</b> To connect the balance to a printer, PC or other peripherals.		<b>Percentage determination:</b> Determining the deviation in % from the target value (100 %).		<b>Weighing principle: Electromagnetic force compensation</b> Coil inside a permanent magnet. For the most accurate weighings.
	<b>Bluetooth* data interface:</b> To transfer data from the balance to a printer, PC or other peripherals.		<b>Weighing with tolerance range:</b> Upper and lower limiting values can be programmed individually for e.g. dosing, sorting and portioning		<b>Weighing principle: Single cell technology</b> Advanced version of the force compensation principle with the highest level of precision.
	<b>WLAN data interface:</b> To transfer data from the balance to a printer, PC or other peripherals.		<b>Hold function:</b> (Animal weighing program) When the weighing conditions are unstable, a stable weight is calculated as an average value.		<b>Verification possible:</b> The time required for verification is specified in the pictogram. <b>DAKkS calibration possible (DKD):</b> The time required for DAKkS calibration is shown in days in the pictogram.
	<b>Control outputs (optocoupler, digital I/O):</b> To connect relays, signal lamps, valves, etc.		<b>Protection against dust and water splashes IPxx:</b> The type of protection is shown in the pictogram. For details see page 56.		<b>Package shipment:</b> The time required for internal shipping preparations is shown in days in the pictogram.
	<b>Interface for second balance:</b> For direct connection of a second balance.		<b>ATEX explosion protection:</b> Suitable for use in hazardous industrial environments, in which there is explosion danger. The ATEX marking is specified for each device.		<b>Pallet shipment:</b> The time required for internal shipping preparations is shown in days in the pictogram.
	<b>Network interface:</b> For connecting the scale to an Ethernet network. With KERN products you can use a universal RS-232/LAN converter. See page 166		<b>Stainless steel:</b> The balance is protected against corrosion.		<b>Warranty:</b> The warranty period is shown in the pictogram.
	<b>Wireless data transfer:</b> between the weighing unit and the evaluation unit using an integrated radio module.		<b>Suspended weighing:</b> Load support with hook on the underside of the balance.		<b>GLP/ISO log:</b> The balance displays the weight, date and time, regardless of a printer connection.
	<b>GLP/ISO log:</b> The balance displays the weight, date and time, regardless of a printer connection.		<b>Battery operation:</b> Ready for battery operation. The battery type is specified for each device.		<b>GLP/ISO log:</b> With weight, date and time. Only with KERN printers, see "Accessories", see page 163.



**Balances & Test service catalogue**

Provides a complete overview of the KERN line of balances, test weights, and services such as verification, calibration, etc.



**Medical scales catalogue**

Complete line of medical scales, from infant scales to patient scales, chair scales and adiposity scales, as well as hand grip dynamometers, chemist's balances and veterinary scales.



**Microscopes & refractometers catalogue**

Extensive range in the area of optical instruments, such as, for example, biological microscopes, stereo microscopes, metallurgical microscopes, polarisation microscopes as well as analogue and digital refractometers.



**SAUTER measuring equipment catalogue**

Test instruments for industry and commerce, such as force, coating thickness, material thickness and calibration service.



**DAkkS calibration service brochure**

Detailed information on topics pertaining to the calibration and verification of balances, test weights, and force measuring devices.

**Your advantages**

**fast**

- 24 hours delivery service – ordered today, on its way tomorrow
- Sales & service hotline available from 8:00 am to 6:00 pm

**reliable**


- 3 years warranty for balances over € 400,-
- Precision in weighing technology for more than 170 years


**competent**

- DAkkS accreditation DIN EN ISO/IEC 17025
- Certified QM system DIN EN ISO 9001:2008
- Authorisation for initial verification by the manufacturer 2014/31/EU
- Medical certifications DIN EN ISO 13485 and 93/42/EEC


**versatile**

- One-stop shopping: from pocket balances through to floor scales – everything from one supplier
- Find the product you want at lightning speed with the “Balance Quick-Finder” at [www.kern-sohn.com](http://www.kern-sohn.com)


 **Order hotline**  
+49 [0] 7433 9933-0


 **Service hotline**  
+49 [0] 7433 9933-199


 **Calibration hotline**  
+49 [0] 7433 9933-196

 **Our team of consultants will assist you**  
from Monday to Friday  
from 8:00 am to 6:00 pm

 **Online Shop**  
[www.kern-sohn.com](http://www.kern-sohn.com)

 **E-mail order**  
[info@kern-sohn.com](mailto:info@kern-sohn.com)

 **Fax order**  
+49 [0] 7433 9933-146

 **[www.kern-sohn.com](http://www.kern-sohn.com)**  
Information on current product availability, product data sheets, user instructions, useful knowledge, technical glossary, images and much for you to download, practical topic areas, which will guide you to the right product in your industry as well as a clever test weight and balance search engine.

## Moisture analysers

Moisture analysing is an integral part of production and processing of many raw and finished products and has a crucial impact on the quality of the product.

Moisture analysers are used particularly in the food industry, water resource management (sewage plants, etc.), plastics industry, agriculture and the energy industry (bio-energy plants, etc.).

Determining moisture requires a great deal of experience. Depending on the type of sample and the task involved, various drying processes are used.

KERN has concentrated on the most widely-used drying method: halogen drying, which brings many advantages:

- Sample is evenly warmed from above, without risk of burning the sample surface
- Affordable purchase costs ensure rapid amortisation of the device
- Most common temperature ranges from 35 – 200 °C
- High measuring precision, up to 0.01 %
- Sufficient buffer capacity, weighing range up to 160 g
- Various drying programs (soft drying, standard drying, drying in levels, rapid drying (Boost))

The numerous memories of the KERN moisture analyser are particularly useful, as they hold information on the complete drying processes with drying parameters such as drying time, drying period, drying temperature, display settings, switch off criteria, etc. This saves an enormous amount of time and helps to achieve repeatable results.

On the internet, you will find a practical application handbook containing many examples, field reports, settings and tips for each KERN moisture analyser.

### Determination of drying parameters

We would be pleased to carry out individual analyses on the sample you submit, which will help you when setting the parameters of your moisture analyser and will lead to results which can be reproduced.





KERN 964-243, € 95,-/hour

### Temperature calibration by KERN moisture analyzers (factory calibration certificate)

In order to guarantee the comparability of the results of moisture analyses it is crucial that the heating chamber and therefore the sample are maintained at the correct temperature. Over time, for example, deposits or dirt can contaminate the heating chamber of the moisture analyser and this can distort the measuring results. It is therefore necessary to carry out regular temperature calibration.

KERN 964-305, € 140,-




## Quick-Finder Moisture analysers

Read-out [d]	Weighing range [Max]	Model KERN	Price excl. of VAT ex works €	Page				
0,001 g	50 g	MLS 50-3D	1450,-	42	1	●	●	●
0,001 g	60 g	DBS 60-3	1270,-	40	1	●	●	●
0,001 g	110 g	DAB 100-3	1130,-	39	1	●	●	●
0,001 g	160 g	DLB 160-3A	1170,-	41	1	●	●	●

● = standard ○ = option



### Your product specialist's recommendation:

-  **Powerful halogenquartz glass heater 400 W**
-  **High level of process reliability thanks to drying programs which can be stored**
-  **Display of the drying process in conjunction with BalanceConnection SCD 4.0 software (see page 165)**



Jesús Martínez

Product specialist Moisture analysers

Tel. +49 [0] 7433 9933-209

Fax +49 [0] 7433 9933-29209

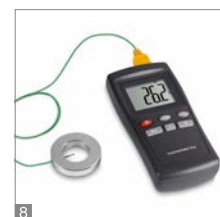
jesus.martinez@kern-sohn.com

**KERN DBS**

only €  
**1270,-**

▶ page 40





04

## Moisture analyser with user-friendly graphics display and 15 memories for drying programs

### Features

- Backlit graphic display, digit height 14 mm
- 1 Drying process active
- 2 Active heating profile
- 3 Active switch-off criteria
- 4 Previous drying time
- 5 Current temperature
- 6 Current moisture content in %
- **Halogen quartz glass heater** 400 W
- **Observation window above the sample**, useful during initial setting

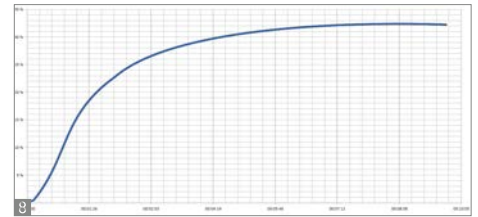
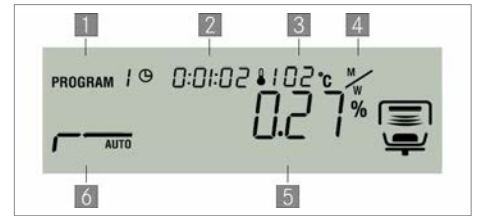
- **Internal memory** for automatic sequence of 15 complete drying processes and 5 drying processes carried out
- The last value measured remains on the display until it is replaced by a new measurement
- **50 sample plates included**
- **Application handbook:** On the internet, you will find a practical application handbook containing many examples, field reports, settings and tips for each KERN moisture analyser

### Accessories

- **Sample plates aluminium**, Ø 90 mm. Unit of 80 pieces, KERN MLB-A01A, € 45,-
- **Round fiberglass filter** e.g. for samples that splash or become encrusted. Box with 100 pieces, KERN RH-A02, € 80,-
- 8 **Temperature calibration set** consists of measuring sensor and display device, KERN DAB-A01., € 190,-
- **RS-232/Ethernet adapter** for connection to an IP-based Ethernet network, KERN YKI-01, € 290,-
- **RS-232/Bluetooth adapter** to connect to Bluetooth capable devices, such as Bluetooth printers, tablets, laptops, smartphones, etc., KERN YKI-02, € 190,-
- **RS-232/WiFi adapter** for wireless connection to networks and WLAN capable devices, such as tablets, laptops or smartphones, KERN YKI-03, € 750,-
- **Thermal printer**, KERN YKB-01N, € 290,-

STANDARD										OPTION	

<b>Model KERN</b>	<b>DAB 100-3</b>
<b>Readout [d]</b>	0,001 g/0,01 %
<b>Weighing range [Max]</b>	110 g
<b>Reproducibility, weight of sample 10 g</b>	0,02 %
<b>Display after drying (Display can be switched over at any time)</b>	
<b>Moisture [%] = Moisture content (M) from wet weight (W)</b>	0- 100 %
<b>Dry content [%] = Dry weight (D) from W</b>	100-0 %
<b>Moisture content (M)</b>	Absolute value in [g]
<b>Temperature range</b>	35 °C - 160 °C in steps up to 1 °C
<b>Drying modes</b>	<input type="checkbox"/> Standard drying <input type="checkbox"/> Gentle drying <input type="checkbox"/> Rapid drying
<b>Switch off criteria</b>	<ul style="list-style-type: none"> <li>• Automatic switch off (2 mg loss in weight in 45 s)</li> <li>• Time controlled switch off (3 min - 99 h 59 min, 10 s increments)</li> <li>• Manual switch off at the press of a button</li> </ul>
<b>Log output</b>	<ul style="list-style-type: none"> <li>• At the end of the drying process, manual or automatic (Only in connection with KERN YKC-01)</li> </ul>
<b>Overall dimensions WxDxH</b>	240x365x180 mm
<b>Net weight</b>	4,82 kg
<b>Price €, excl. of VAT, ex works</b>	<b>1130,-</b>
<b>Option DAkKS Calibr. Certificate</b>	963-127, € 72,-



## Moisture analyser with graphics display and 10 memories for drying programs

### Features

- Backlit graphic display, digit height 15 mm
  - Drying program
  - Previous drying time
  - Current temperature
  - Unit for displaying the results
  - Current moisture content in %
  - Active heating profile

- Halogen quartz glass heater** 400 W
- Observation window above the sample**, useful during initial setting
- Internal memory** for automatic sequence of 10 complete drying processes and 100 drying processes carried out
- The last value measured remains on the display until it is replaced by a new measurement

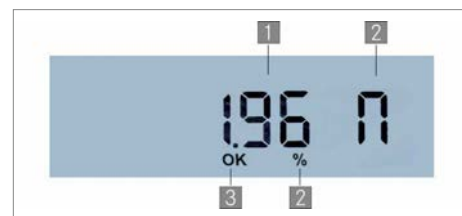
- Sample description** for up to 99 samples, 2 digits, freely programmable, and is printed in the measuring protocol
- Date and time display** as standard
- 10 sample plates included**
- Application handbook:** On the internet, you will find a practical application handbook containing many examples, field reports, settings and tips for each KERN moisture analyser

STANDARD										OPTION	

<b>Model KERN</b>	<b>DBS 60-3</b>
<b>Readout [d]</b>	0,001 g/0,01 %
<b>Weighing range [Max]</b>	60 g
<b>Reproducibility weight of sample 2 g</b>	0,15 %
<b>Reproducibility, weight of sample 10 g</b>	0,02 %
<b>Display after drying (Display can be switched over at any time)</b>	
<b>Moisture [%] = Moisture content (M) from wet weight (W)</b>	0-100 %
<b>Dry content [%] = Dry weight (D) from (W)</b>	100-0 %
<b>ATRO [%] [(W-D) : D] · 100%</b>	0-999 %
<b>Moisture content (M)</b>	Absolute value in [g]
<b>Temperature range</b>	50 - 200 °C in steps up to 1 °C
<b>Drying modes</b>	<input type="checkbox"/> Standard drying <input type="checkbox"/> Drying in levels <input type="checkbox"/> Gentle drying <input type="checkbox"/> Rapid drying
<b>Switch off criteria</b>	<ul style="list-style-type: none"> <li>Automatic unrestricted switch off (Selectable loss in weight 0,01%-0,1% in 30 s)</li> <li>Time controlled switch off (1 min - 12 h)</li> <li>Manual switch off at the press of a button</li> </ul>
<b>Recall of measurement/ Log output</b>	Interval can be set from 1 sec - 10 min (Only when used with printer KERN YKB-01 or PC)
<b>Overall dimensions W×D×H</b>	202×336×157 mm
<b>Net weight</b>	approx. 4,2 kg
<b>Price €, excl. of VAT, ex works</b>	<b>1270,-</b>
<b>Option DAkKS Calibr. Certificate</b>	963-127, € 72,-

### Accessories

- Protective working cover**, standard, can be re-ordered, scope of delivery: 5 items, KERN DBS-A03S05, € 65,-
- Sample plates aluminium**, ø 90 mm. Unit of 80 pieces, KERN MLB-A01A, € 45,-
- Round fiberglass filter** e.g. for samples that splash or become encrusted. Box with 100 pieces, KERN RH-A02, € 80,-
- Temperature calibration set** consists of measuring sensor and display device, KERN DBS-A01., € 480,-
- USB interface kit** for bi-directional data exchange between balance/moisture analyser and computer. Scope of delivery: USB cable, driver, Software Balance Connection, KERN DBS-A02, € 290,-
- Display of the drying process** in conjunction with BalanceConnection, KERN SCD-4.0, € 150,-
- Thermal printer**, KERN YKB-01N, € 290,-



## The moisture analyser for heavy, high-volume samples

### Features

- Backlit LCD display, digit height 17 mm
  - 1 Current moisture content in %
  - 2 Unit for displaying the results
  - 3 Drying process active
- **Halogen quartz glass heater** 400 W
- **Internal memory** for automatic sequence of 5 complete drying processes
- The last value measured remains on the display until it is replaced by a new measurement

- **10 sample plates included**
- **Application handbook:** On the internet, you will find a practical application handbook containing many examples, field reports, settings and tips for each KERN moisture analyser

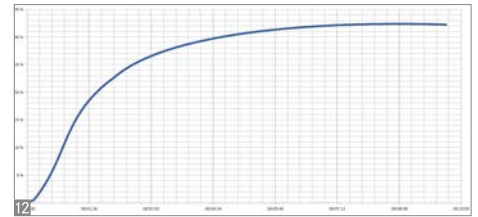
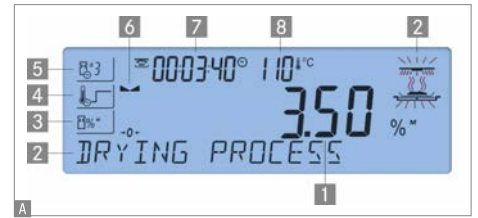
### Accessories

- **Sample plates aluminium**,  $\varnothing$  90 mm. Unit of 80 pieces, KERN MLB-A01A, **€ 45,-**
- **Round fiberglass filter** e.g. for samples that splash or become encrusted. Box with 100 pieces, KERN RH-A02, **€ 80,-**
- **4 Temperature calibration set** consists of measuring sensor and display device, KERN DLB-A01, **€ 290,-**
- **Protective working cover**, standard, can be re-ordered, scope of delivery: 5 items, KERN ALJ-A01S05, **€ 40,-**
- **Thermal printer**, KERN YKB-01N, **€ 290,-**

STANDARD										OPTION	
CAL EXT	MEMORY	RS 232	GLP	UNIT	230 V	DMS	1 DAY	3 YEARS WARRANTY	DAKKS	+3 DAYS	

Model KERN	DLB 160-3A
Readout [d]	0,001 g/0,01 %
Weighing range [Max]	160 g
Reproducibility, weight of sample 10 g	0,05 %
Display after drying (Display can be switched over at any time)	
Moisture [%] = Moisture content (M) from wet weight (W)	0-100 %
Dry content [%] = Dry weight (D) from W	100-0 %
ATRO [%] [(W-D) : D] · 100%	0-999 %
Moisture content (M)	Absolute value in [g]
Temperature range	35 °C - 160 °C in steps up to 1 °C
Drying modes	<input type="checkbox"/> Standard drying <input checked="" type="checkbox"/> Rapid drying, Pre-heat level, can be switched on
Switch off criteria	<ul style="list-style-type: none"> <li>• Automatic unrestricted switch off (Selectable loss in weight 0,1%-9,9% in 60 s)</li> <li>• Time controlled switch off (1 min - 99 min)</li> <li>• Manual switch off at the press of a button</li> </ul>
Log output	<ul style="list-style-type: none"> <li>• Continuous output (residual weight)</li> <li>• At the end of the drying process, manual or automatic (Only in connection with KERN YKB-01N printer or PC)</li> </ul>
Overall dimensions W×D×H	210×340×225 mm
Net weight	approx. 4,2 kg
Price €, excl. of VAT, ex works	<b>1170,-</b>
Option DAKKS Calibr. Certificate	963-127, € 72,-

Price reduction



## Infrared moisture analyser with graphics display and a vast database

### Features

- Backlit graphic display, digit height 14 mm

#### A Display during the drying process:

- 1 Current moisture content in %
- 2 Drying process active
- 3 Active result display
- 4 Active heating profile
- 5 Active switch-off criteria
- 6 Stability display

- 7 Previous drying time

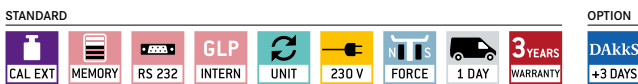
- 8 Current temperature

#### B Display after the drying process:

- 9 End result moisture content in %
- 10 Drying process has finished
- 11 Drying period

- Infrared heater 400 W
- Observation window above the sample, useful during initial setting

- **Balance contains memory** for automatic sequence of 100 complete drying programs (92 drying programs with optimised drying characteristics for rapid sample warming and therefore shorter drying times, pre-installed at factory), 100 users with related authorisations, 1.000 drying processes performed and 1.000 weighing results (ring memory)
- The last value measured remains on the display until it is replaced by a new measurement
- **10 sample plates included**
- **Application handbook:** On the internet, you will find a practical application handbook containing many examples, field reports, settings and tips for each KERN moisture analyser



Model KERN	MLS 50-3D
Readout [d]	0,001 g/0,01 %
Weighing range [Max]	50 g
Reproducibility weight of sample 2 g	0,1 %
Reproducibility, weight of sample 10 g	0,02 %
Display after drying (Display can be switched over at any time)	
Moisture [%] = Moisture content (M) from wet weight (W)	0-100 %
Dry content [%] = Dry weight (D) from W	100-0 %
ATRO [%] [(W-D) : D] · 100%	0-999 %
Moisture content (M)	Absolute value in [g]
Temperature range	40 °C - 160 °C in Schritten zu 1 °C
Drying modes	<input type="checkbox"/> Standard drying <input type="checkbox"/> Drying in levels <input type="checkbox"/> Gentle drying <input type="checkbox"/> Rapid drying
Switch off criteria	• Automatisches Abschalten (AUTO 1 - 5) • Automatisches freies Abschalten (wählbar 1-10 mg / 10 - 120 s) • Zeitgesteuertes Abschalten (1min - 99h 59 min) • Manuelles Abschalten per Tastendruck
Recall of measurement / Log output	Manuell oder automatisch, Intervall einstellbar von 1 sec - 5 min (Nur in Verbindung mit Drucker KERN YKB-01N oder PC)
Overall dimensions W×D×H	206×333×192 mm
Net weight	ca. 4,9 kg
Price €, excl. of VAT, ex works	1450,-
Option DAkKS Calibr. Certificate	963-127, € 72,-

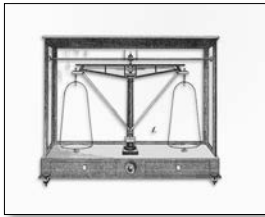
### Accessories

- **Protective working cover**, standard, can be re-ordered, scope of delivery: 5 items, KERN ALS-A02S05, € 42,-
- **Sample plates aluminium**, Ø 90 mm. Unit of 80 pieces, KERN MLB-A01A, € 45,-
- **Round fiberglass filter** e.g. for samples that splash or become encrusted. Box with 100 pieces, KERN RH-A02, € 80,-
- **Temperature calibration set** consists of measuring sensor and display device, KERN MLB-A12., € 720,-
- **Display of the drying process** in conjunction with BalanceConnection, KERN SCD-4.0, € 150,-
- **Thermal printer**, KERN YKB-01N, € 290,-



# Tradition and innovation for more than 170 years

An independent family business, KERN since already 7 generations is synonymous with quality and reliability in customer service.



► 1844

KERN is founded – precision balances are produced



► 1863

A proud Gottlieb Kern with his staff



► 1880

Pharmaceutical balance with Aesculap



► 1923

Inflation – KERN wages are paid with self printed currency



► 1980

The electronic balance ousts mechanical devices



► 1994

Accredited DKD laboratory (ISO 17025)



► 2000

New premises in Balingen



► 2002

Existing QM system certification in accordance with DIN EN ISO 9001:2000 standards



► 2007

Approval for the manufacture of medical products (DIN EN 13485 and 93/42/EEC)



► 2008

Authorisation for initial verification by the manufacturer (2009/23/EU)



► 2009

Approval for the manufacture and sale of height rods (DIN EN 13485 and 93/42/EEC)



► 2012

Verification point for non-automatic balances and test weights.

New customer portal [www.kern-sohn.com](http://www.kern-sohn.com) goes live



► 2014

Expansion of the product range to include optical instruments (microscopes and refractometers)



► 2015

Inauguration of Ziegelei 2.0 with computer-controlled high-bay warehouse

**KERN & SOHN GmbH**  
Balances, Test weights, DAkkS Calibration laboratory  
Ziegelei 1  
72336 Balingen  
Germany

Tel. +49 [0] 7433 9933-0  
Fax +49 [0] 7433 9933-149

info@kern-sohn.com  
www.kern-sohn.com

