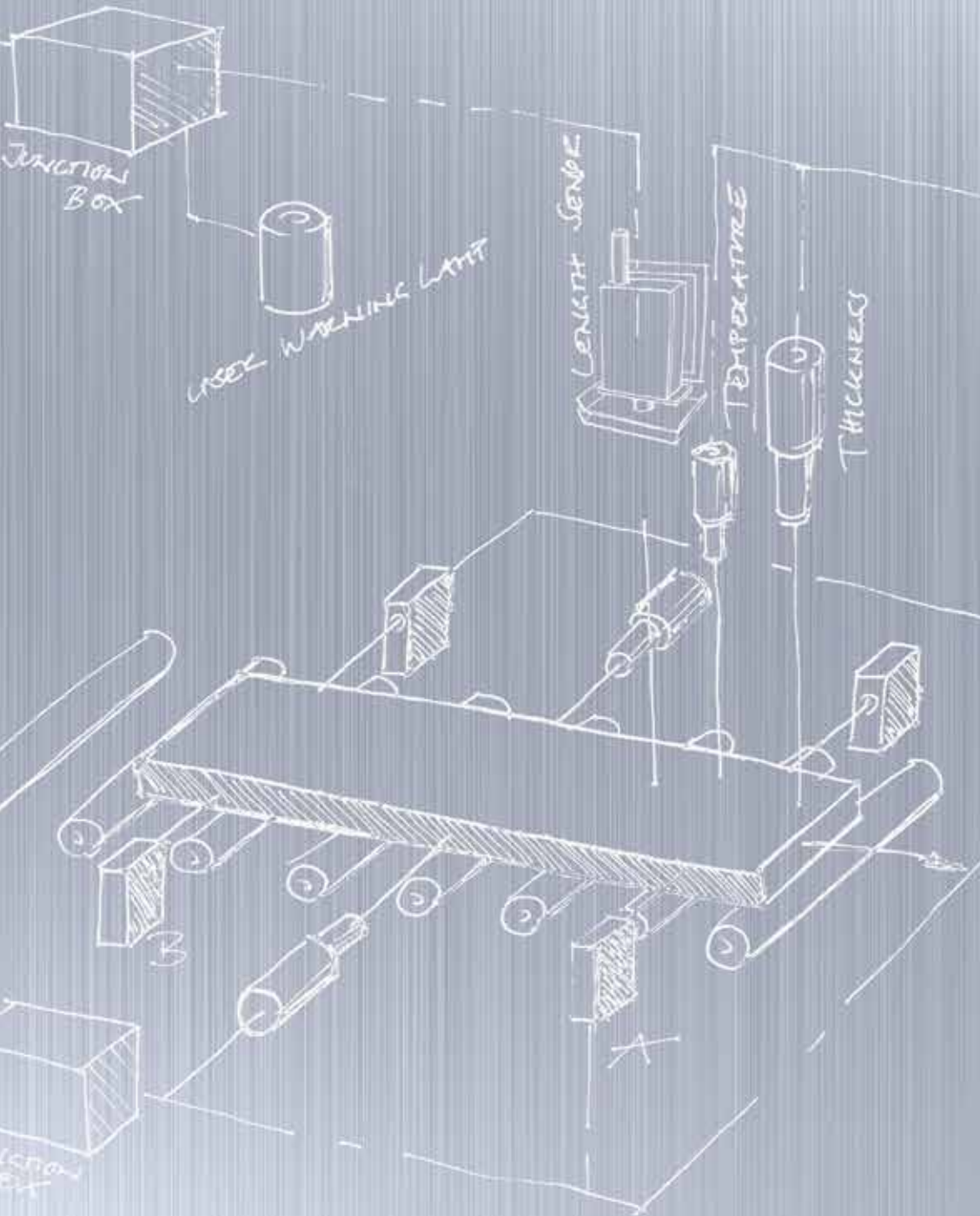
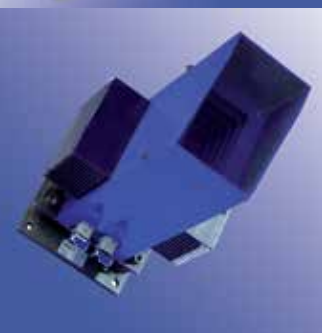
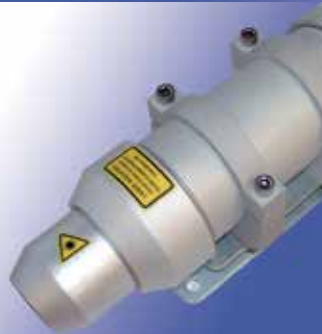


# LOKE®

Kempf GmbH & Co. KG



Experts for non-contact  
measuring technologies



## Detecting - Positioning - Measuring

Kempf GmbH & Co. KG realizes automation processes and logistic projects in heavy industries - especially in steelworks and nonferrous manufactures.

Over 25 years of experience makes us experts for non-contact measuring technologies. We are highly experienced in using laser technologies for measuring under harsh environmental conditions. Therefore Kempf GmbH & Co. KG develops solutions within millimeter precision of 1D- and 2D-measurements on hot surfaces of temperatures up to 1,450 °C or for measuring/ scanning physical dimensions of semi-finished parts during the production process.

## Only selling sensors and components is not enough for Kempf GmbH & Co. KG

We provide a comprehensive line of product solutions. For complex projects, we offer a complete service beginning with a systematical task analysis, application support, as well as getting installed systems into service.



## LOKE measuring and control systems - accuracy under harsh conditions

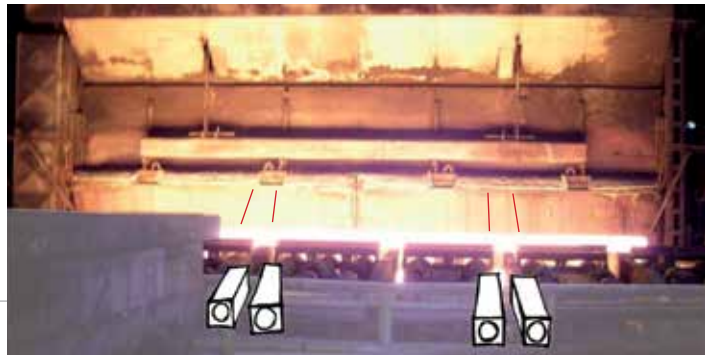
Kempf GmbH & Co. KG offers laser distance measuring systems and solutions for defined positioning, distance determination, dimensioning, and level monitoring under complex technical requirements and harsh environmental conditions. With our sensors and control systems, distances from 0.1 m up to 3,000 m, material lengths while processing speeds from 0 m/min up to 10,000 m/min, can be defined on all surfaces within millimeter accuracy. With pleasure we face up to customer specified tasks and provide customized solutions! Just use our experience and measuring systems for specifying lengths, widths and thicknesses, controlling geometric profiles or speed within your quality management or production optimizing processes.



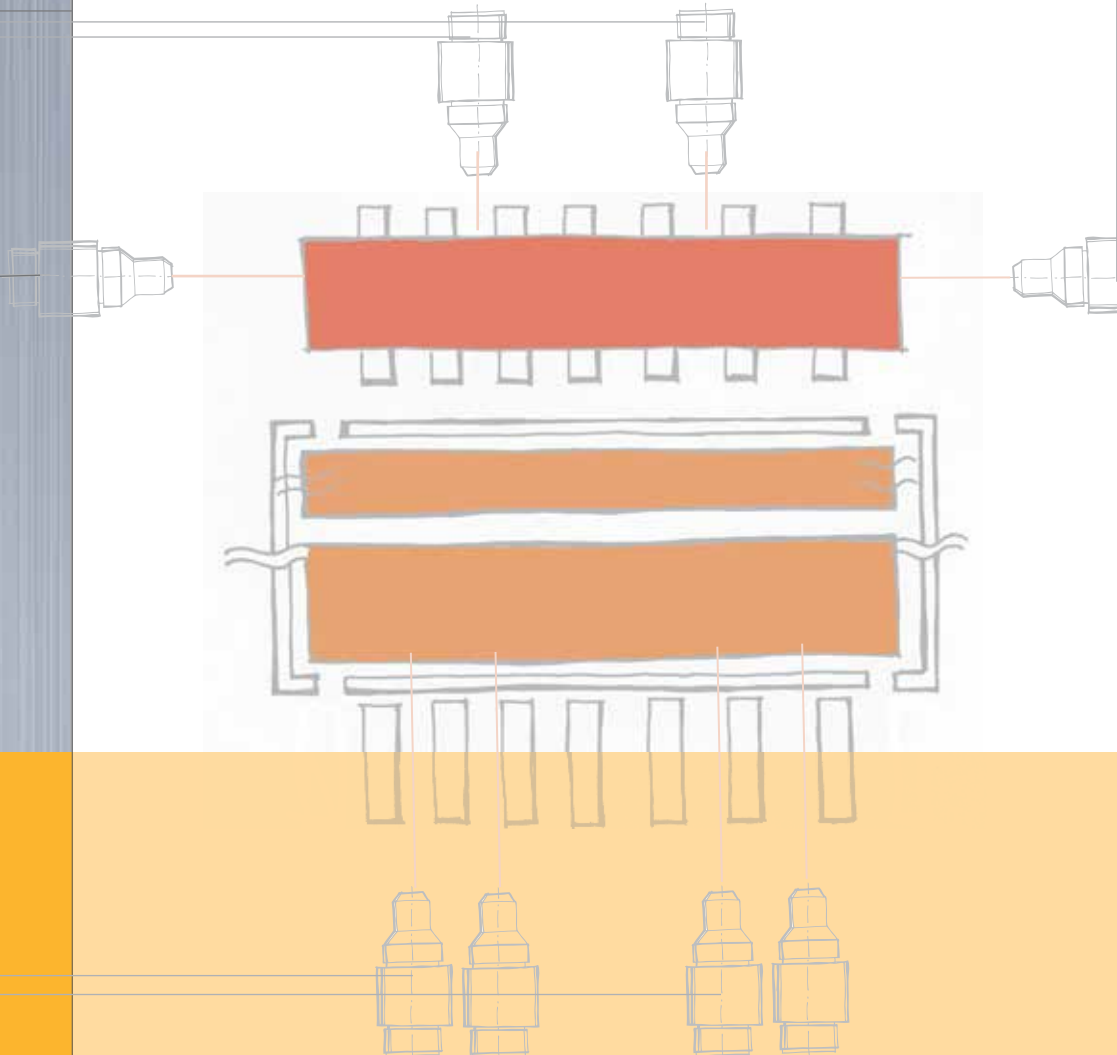
Stahl-Zentrum, Dillingen



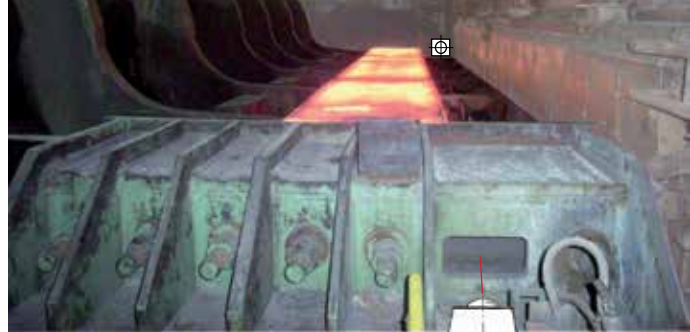
Stahl-Zentrum, SMS



Defining and positioning of a slab - walking beam furnace






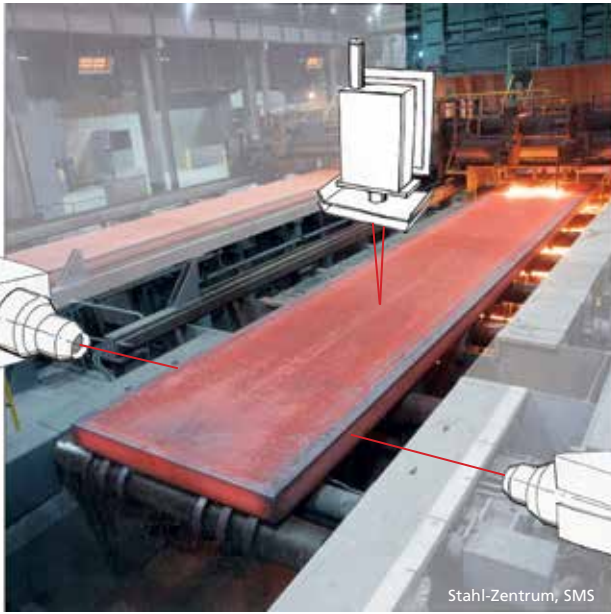
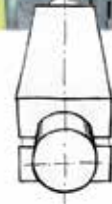


Length measuring frontal to walking beam furnace

### Phase-shift measuring

#### LMC-J-0050-X

- Millimeter accuracy
- Selective measuring with small angle of beam 0.6 mrd
- Resolution 0.1 mm
- Reflectorless up to 30 m on diffused reflecting surfaces
- Max. up to 150 m on reflector
- Data output rates up to 100 Hz
- On hot surfaces up to 1,450 °C (Laser cl. 3R)
- Diverse data interfaces available
- Cooling systems: air, water or Peltier-cooling
- Additional heating
-  design
- Parameterized device options



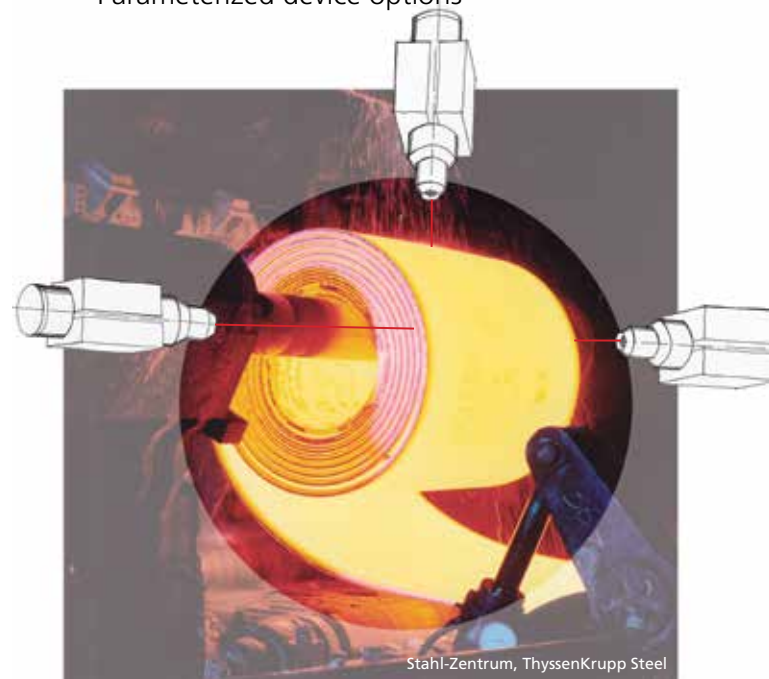
Detecting of length and width

### Measuring of speed and length

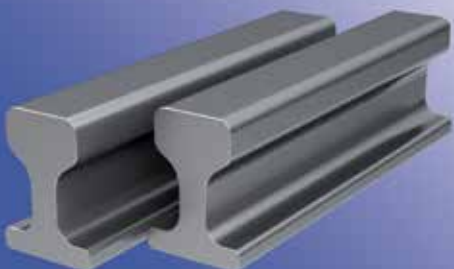
#### Laser Doppler Principle

#### LMC-L-XXXX-XXX, LMC-LB-XXXX-XXX

- Measuring rate 25 kHz
- $V=0\text{m/min}$  (LB-Model)
- Direction detection (LB-Model)
- Accuracy  $< 0.05\%$
- Repeat accuracy  $< 0.02\%$
- Material cognition  $< 1\text{ ms}$
- Update rate 0.04 ms
- Online gauging (L-Model)
- Measuring on hot surfaces up to 1,300 °C
- Stand off 150 up to 2,000 mm
- Depth of field 25 – 200 mm
- Data interfaces RS 232/RS 422, Ethernet, Profibus, SSI, Pulse output, Analog 4 ... 20 mA, Devicenet, W-LAN, other protocols on request



Determination of coil diameter - Coiler



Stahl-Zentrum, ThyssenKrupp Steel



Length measuring of pipelines - transversal transport

### Time Of Flight (TOF) Measuring LMC-J-0310-X, LMC-J-0150-X

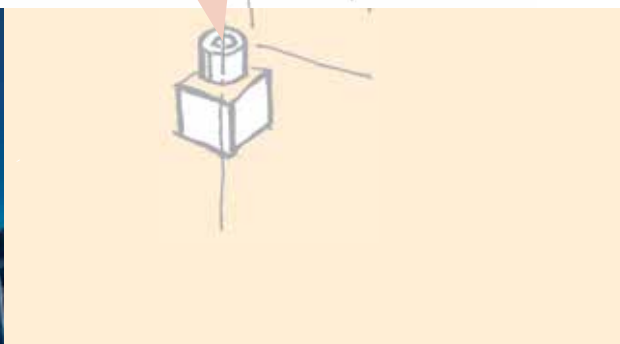
- Measuring within a centimeter accuracy
- Reflectorless up to 400 m
- Max. range over 3,000 m on reflector
- Resolution 1 mm
- Measuring rates up to 30 kHz
- Data interfaces RS 232/RS 422, Ethernet, Profibus, SSI, Analog 4 ... 20 mA, W-LAN, other protocols on request
- Compact design
- Housing with integrated Peltier-cooling
- Angle of beam 2 mrd (optional up to 40°)
- Laser class 1
- IR Laser with pilot laser for aligning

### LOKE LMC and LCG -

#### measuring systems based on laser technology and image-processing

In cooperation with our partners we develop and produce systems for measurements, control units and identification gates, based on laser-technology and image-processing:

- Profile inspection and length measurements
- Geometry detection
- Material identification / typeface recognition
- Scanning measurement systems e.g. for slitting optimization
- Crane guiding systems with subsequent inventory management





## High accuracy - Pulse back-mixing method

### Laser Distance Measuring Device LMC-J-0060-X-X



- Non-contact distance measurement up to 100 Hz
- Accuracy of 1 mm over entire measuring length of 500 m
- Measurement beam is visible
- Diverse industrial interfaces are available
- For hot surfaces up to 1,450 °C optionally

#### Technical data

- Supply voltage 10 - 30 V DC
- Power consumption < 5 W (with heating 15 W/24 V)
- Data interfaces RS 422, RS 232 or RS 485
- Analog output 4 ... 20 mA
- Switching output 3 x „high side“, up to 0.2 A
- 1 trigger in/out, 3 V DC ... 30 V DC
- Optional protocols ProfiBus, SSI, Ethernet TCP/IP
- Laser class 2
- Wave-length  $\lambda = 635 \text{ nm}$
- Divergence < 0.35 mrad
- Distance range 0.1 ... 500 m (reflector)  
0.1... 100 m (on natural surfaces)\*
- Measuring time 10 ... 1,000 ms
- Accuracy (1  $\sigma$ )  $\pm 1 \text{ mm}$  (100 Hz)
- Resolution 0.1 mm
- Access via industrial connector
- Aluminium housing (protection category IP 66)
- Operational temperature range -40 ... +60 °C (heating)

\*dependent on surface reflectivity, stray light, ambient conditions

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