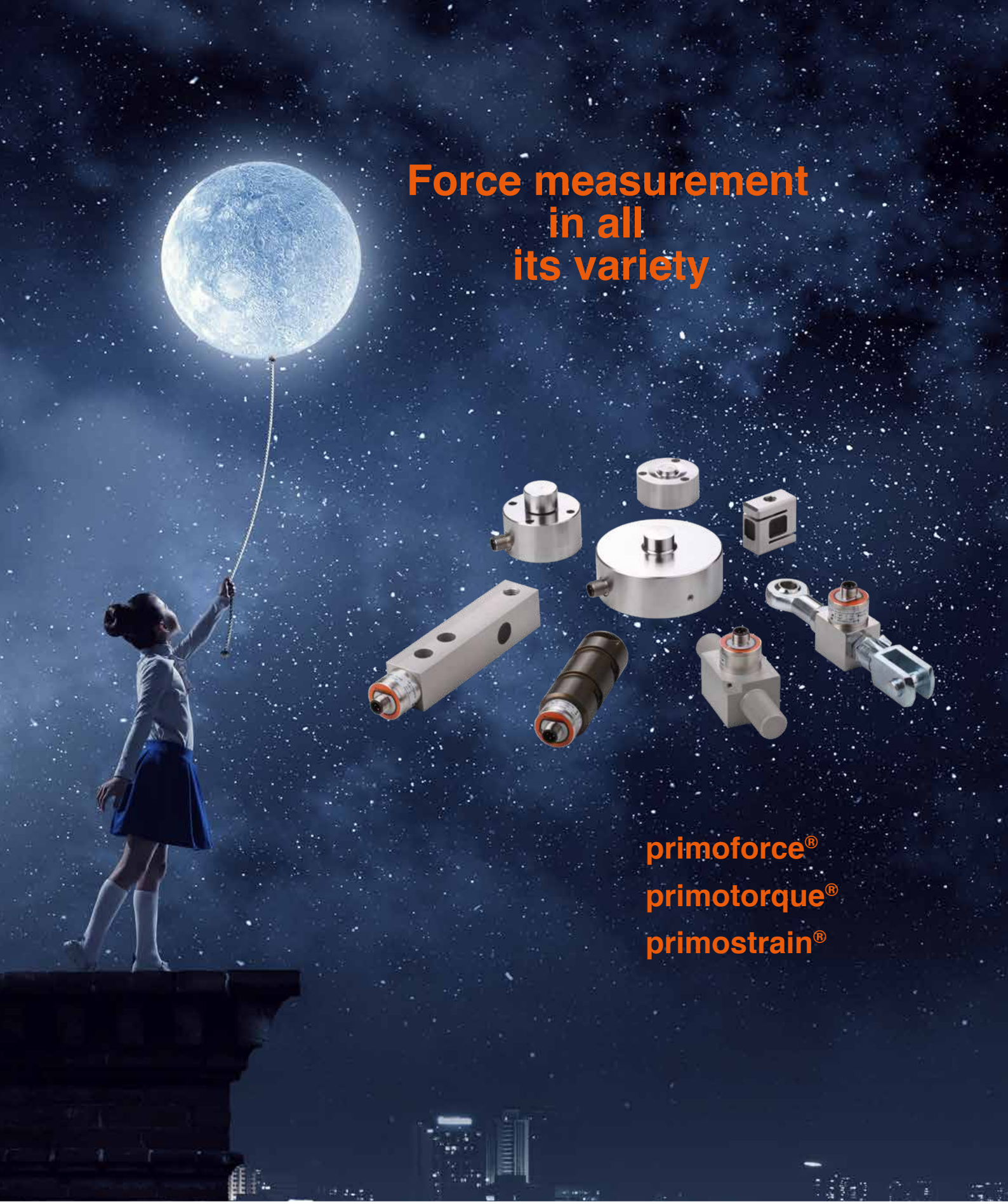
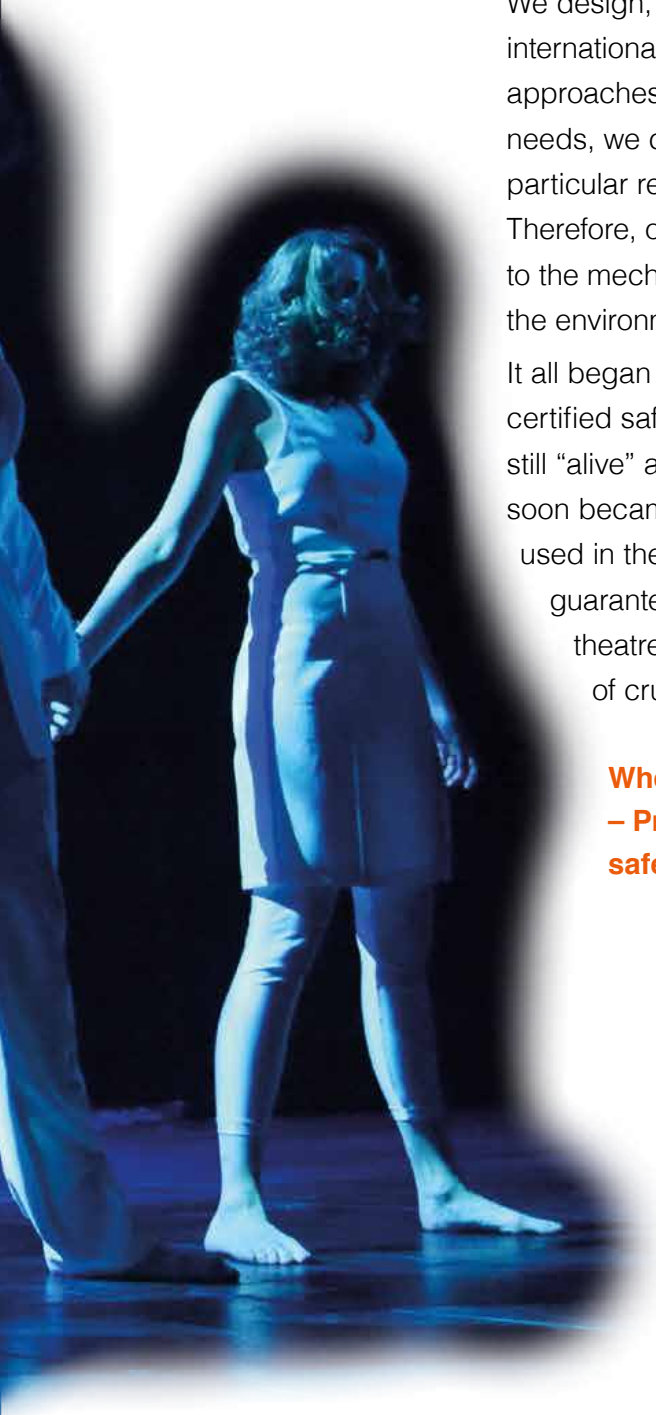
Force measurement in all its variety



primoforce®
primotorque®
primostrain®

Primosensor

Primosensor – in the beginning was stage technology



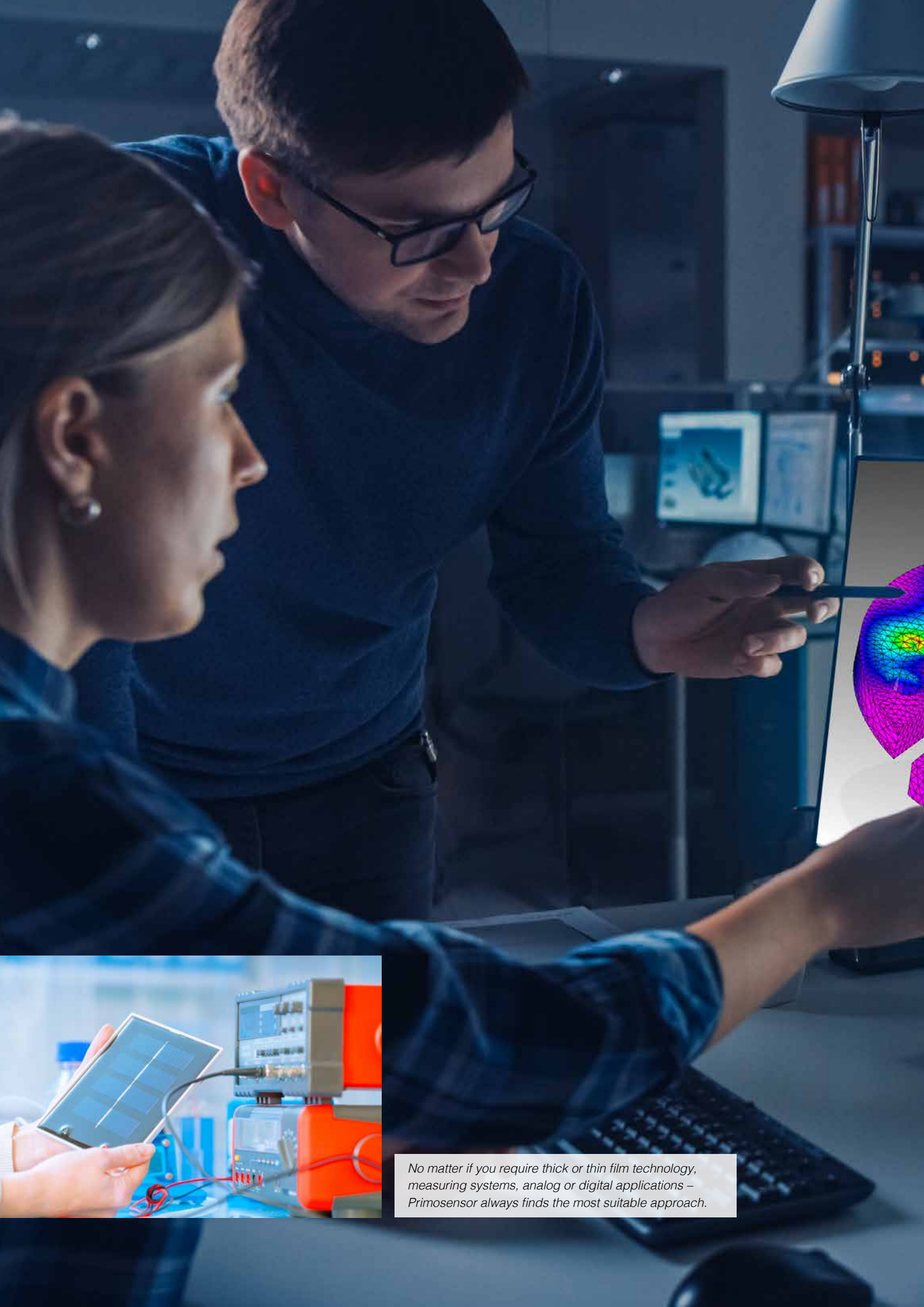
We design, develop and produce force transducers for international customers – whether you need customized approaches or ready-made products. Based on our customers' needs, we develop end products which perfectly suit the particular requirements of the respective application. Therefore, our sensors are perfectly adjusted to the mechanical and electrical challenges of the environment they are used in.

It all began with Primosensor developing a certified safety application to check whether a sensor is still "alive" and fulfilling its safety-relevant task. This application soon became popular for checking load measuring sensors used in the upper and lower parts of stage machinery. It guarantees safety for man and machine in international theatres, opera houses, and event halls – even on board of cruise ships.

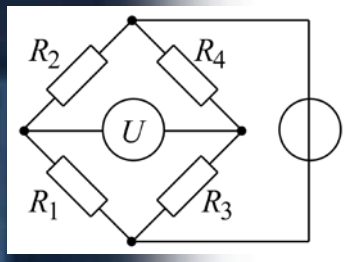
Whether on stage, on a cruise ship, or in theatre – Primosensor is familiar with places where high safety standards are required.

force measuring technology

- safe
- robust
- reliable
- various



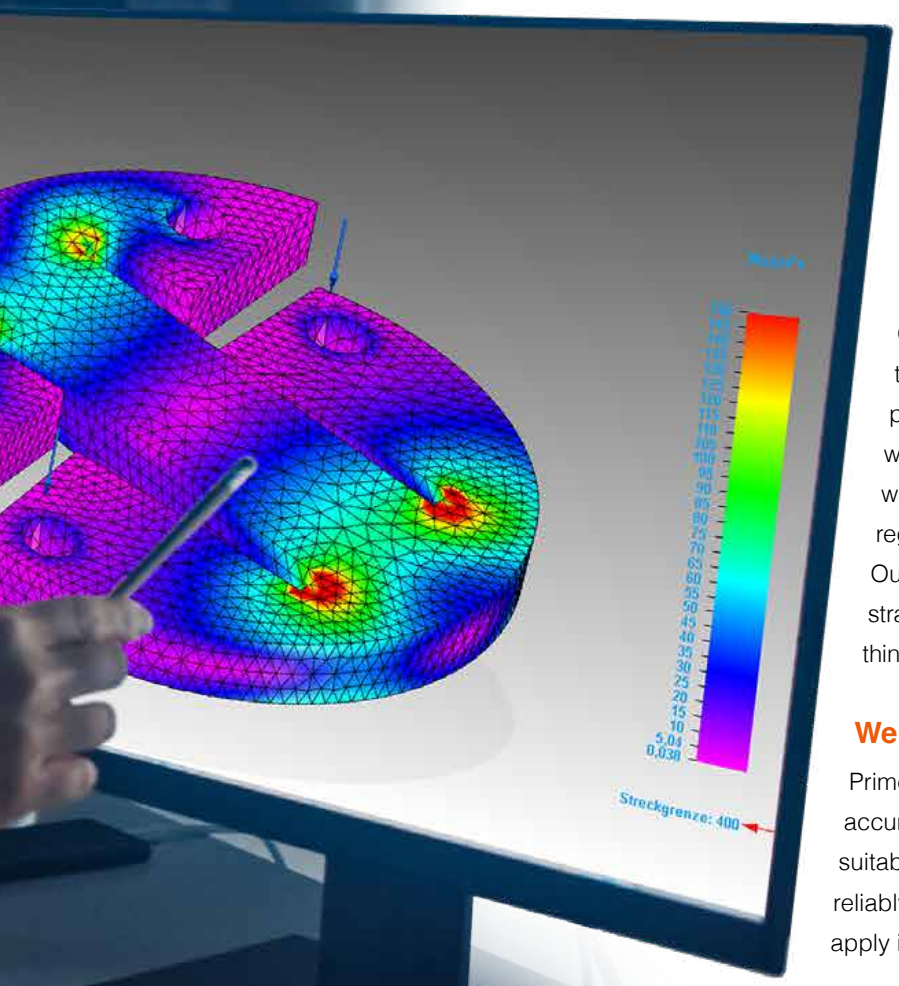
No matter if you require thick or thin film technology, measuring systems, analog or digital applications – Primosensor always finds the most suitable approach.



Wheatstone bridge

Inventive. Customer-driven. Flexible.

When force measuring devices are needed, we are the experts to support you with many ideas and great competence. We either offer the ideal product for your project or we customize it accordingly. However, we also pursue completely new approaches in cooperation with our customers.

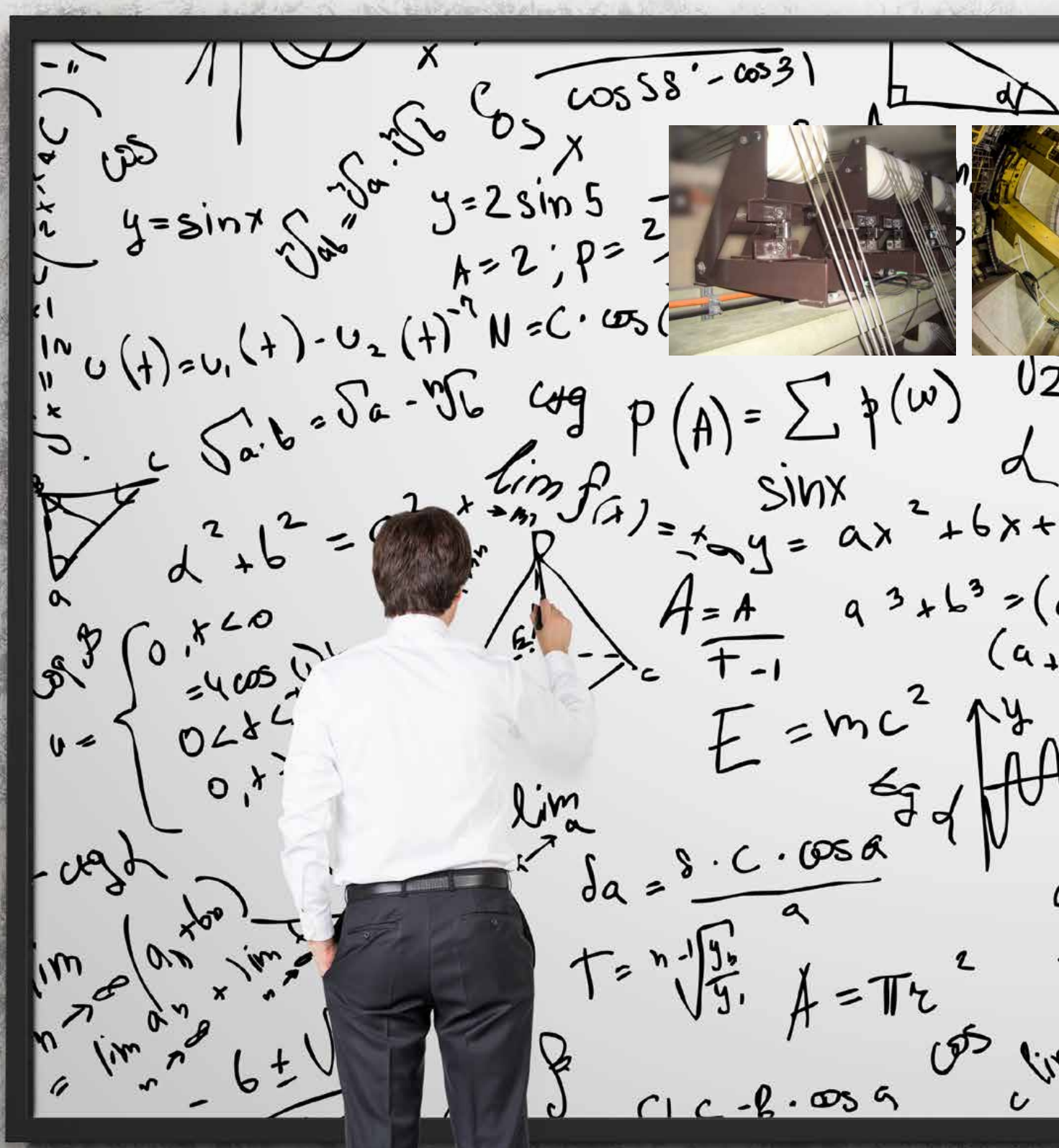


Independent from technologies

Our workflows do not depend on certain technologies. In other words, our end products are based on strain gauges and we produce them by that kind of technology which offers the best price-performance ratio regarding the quantity and precision required. Our force transducers either consist of glued strain gauges or sensors produced by thick or thin film technology.

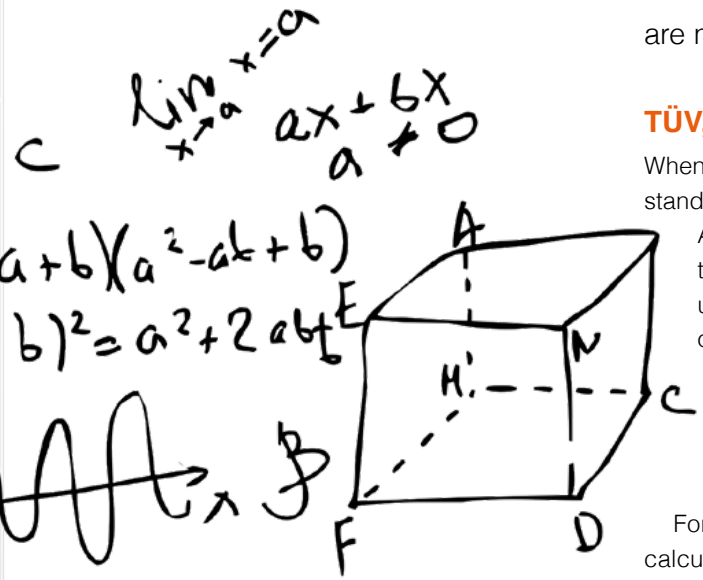
We always strive for the best solution.

Primosensor measuring systems are designed accurately, produced efficiently and tested in suitable facilities. With our sensors, you can reliably measure the forces and torques that apply in your plant and machinery.


y = sin x
y = 2 sin 5
P(A) = Σ p(ω)
sin x
E = mc²
lim
A = πr²

More than just products.

If special requirements are needed, we love to support you in finding the perfect design of force transducers. Thanks to Finite-Element-Analysis, we are able to forecast certain characteristics of the future product during the development process. Force transducers designed and manufactured by Primosensor will get all approvals which are necessary for your application.



TÜV, DNV GL, ATEX

When it comes to plant safety, components must adhere to safety standards set up and monitored by institutions like TÜV, DNV GL, or ATX. For instance, we have developed a TÜV-approved force transducer system for theatre and stage machinery. Sensors used in the maritime industry are approved by DNV GL. If forces or loads need to be measured in explosive environments, we cooperate with the relevant authorities.

Component simulation, component strength, consultation

Force sensors are repeatedly exposed to mechanical stress. We calculate the component stresses in the sensor by FEM and then estimate component strength. The effect of lateral or external forces on the output signal of the sensor can be simulated. Based on simulations, we discuss advantages and disadvantages of different sensor concepts with our customers.

As calculations do not always represent reality correctly, we also perform documented tests on breaking loads or vibration resistance on request.

KTA 3902 or FKM directive

Every mechanical engineer knows it. The FKM directive reflects our current knowledge about the design of machine components. We issue safety certificates for our sensors on request – both for static and dynamic loads.

Studies and development projects

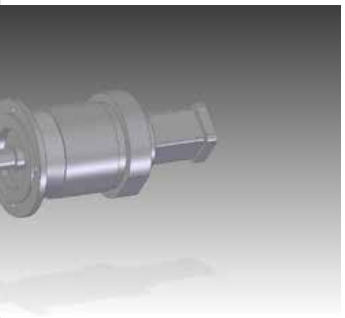
It does not always have to be a doctor thesis. Based on our profound product and application experience, we carry out expertises on all kinds of topics concerning force measurement. We develop new sensor concepts for industrial and weighing applications and adjust entire force measuring systems to the requirements of our plant or machine.

Familiar with many industries.

We have been selling various types of load pins and tension and compression force sensors to customers who work with stage machinery since 2010. With certified safety applications, you can for example move loads above people. We have broadened our product range by developing force sensors for monitoring event halls, fair buildings, and temporary structures. Our sensors used in the field of **rigging** usually have two independent signal outputs. At the moment, we are developing shackles to quickly determine the load applied to the ceiling of a fair building.

In engineering, force sensors are used not only for safety reasons, but also to monitor quality, for example in processes. We have developed customized approaches for **presses**. Therefore, we offer sensors, which are used in **tablet presses** – mostly load cells and shears – to ensure a high quality of tablets and capsules.

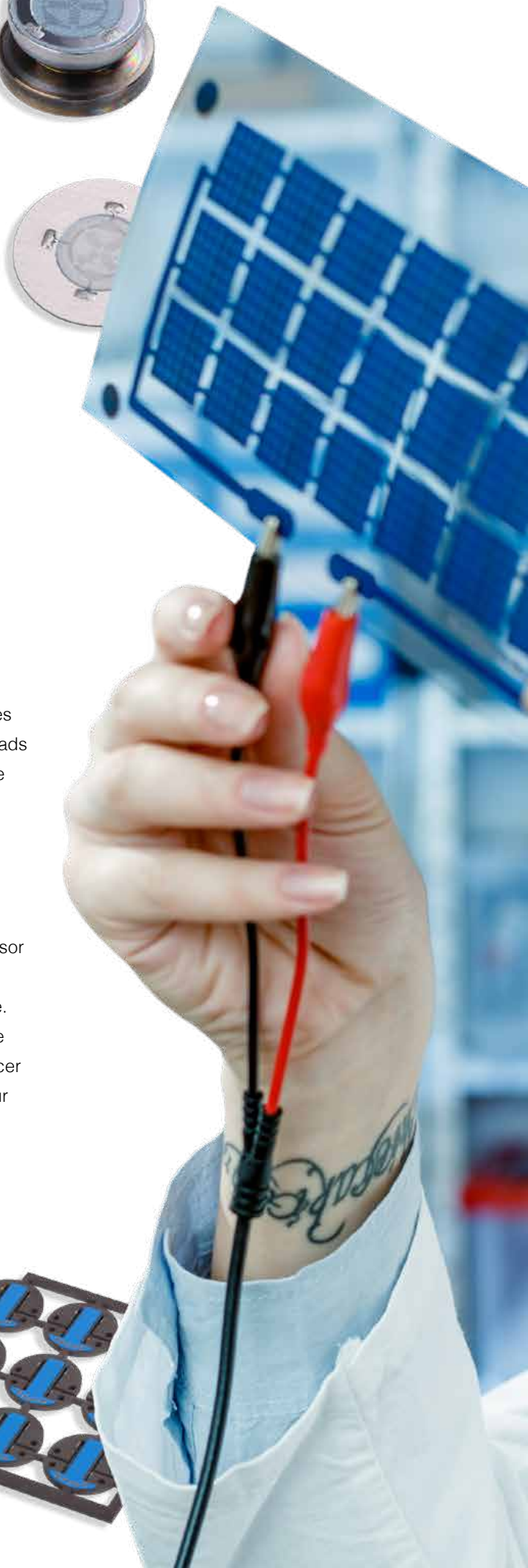
Our strain sensors are used in **riveting, punching, and embossing machines** to report and ensure compliance with constant parameters and to early identify tool wear. Our sensors ensure product quality in **crimping machines**. If too much force is applied in the crimping process, the core material will be damaged; if there is not enough force applied, the connection will not be durable.



Our sensors are also used to monitor the quality of welding spots in **welding tongs**. X- and C-shaped tongs either have an analogue amplifier or a CANopen output. Modified transducers are also used in other **welding machines**, such as in friction or projection welding machines which are used to weld metal or plastic parts together.

We have developed torque arms for winches of **forestry machines** in order to measure the tension force applied to the steel cables to protect them from breaking. If you would like to avoid using torque arms in your design, Primosensor torque measuring rings enable you to measure a winch's reaction torque directly at its power train. A huge variety of force sensors is used as part load measuring systems in **cranes and hoists** in order to measure the load spectrum and/or protect the lifting device from being overloaded.

We have been facing a new challenge most recently: measuring forces in a **construction machine** which is used underground. The sensors face the most extreme conditions simultaneously here: peak loads, up to 10 bar water pressure, high temperatures, and severe vibration. First prototypes have been delivered...



Familiar with all kinds of technology.

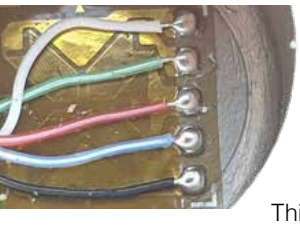
Most force transducers are produced with glued strain gauges. We at Primosensor always doublecheck whether the customer's requirements can be fulfilled better by using thin or thick film technology.

Glued strain gauges

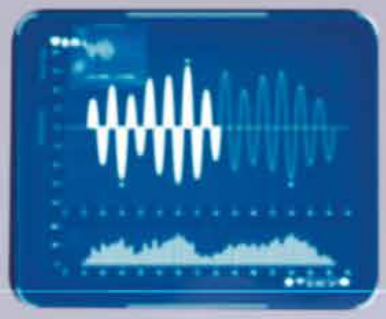
Strain gauges can be used in various ways. Measurement springs exist in almost every shape. Flat or arched surfaces can be used to determine strains. Sensors with nominal loads from a few grams up to several hundred tons can easily be produced. If sensors are optimally applied, they achieve accuracy within ppm range.

Thin or thick film technology

Using thin film technology, high quantities of force transducers can be produced more efficiently. Small sensor components with a Wheatstone full bridge are implanted to a deformable body during a high-tech procedure. Those sensor components are produced on a large scale and then welded in or onto the force transducer by laser. Elaborated process monitoring ensures our products' high quality.



Thick film technology is not commonly used for force measuring purposes – without any reason! Ever since steel instead of ceramics is used for spring bodies, robust and durable force sensors can be produced very efficiently by means of this technology. Primosensor also breaks new ground here.



Competent and forward-thinking.

We are regularly conducting studies for clients and our own business and therefore are constantly developing new technologies and features for our force sensors. We are catering to well-known suppliers to the automotive industry, manufacturers of heating systems, and medical technology as well as a leading manufacturer of brake systems.

Well-prepared for the future.

In order to maintain our successful business status, we are researching and developing in a variety of fields, such as

- radio systems for wireless data transmission.
- WLAN- or 5G-enabled sensors which send data to the cloud where they are available 24/7.
- battery driven sensors, which be installed or removed quickly, as they are independent from power supply cables.

Finding the best way of measuring traction applied to stays and shrouds on sailing ships and creating suitable software is also challenging our engineers.

One step into the future.

In cooperation with a partner company, we are developing a wireless bus system to simplify the replacement process of force transducers. Inductive couplers mutually transfer energy and data over a gap, which facilitates installing and removing sensors significantly. Laid cables do not have to be removed.

The new sensor is placed in front of the coupler and is immediately ready to use. Additionally, this approach simplifies hermetically sealing the sensors, as no cable glands are needed and the sensors can be countersunk in the casing.

More space for great deeds.

Turning our good intentions into action, we significantly extended the production area in Dieburg in 2019. In 2016, we founded a production company for the industrial large-scale production of force sensors in the Polish city of Rzeszow.

Primosensor therefore stays capable of flexibly dealing with customers' requests. Small quantities, special devices and prototypes are quickly and easily shipped to the customer. When a product becomes popular, medium and large quantities will be produced at reasonable prices. Individually designed production processes help avoiding mistakes and ensure product quality.


/Administration
/Human Resources
/Legal
/Accounting
/Finance
/Marketing
/Publicity
/Promotion
/Research
/Business
/Manufacturing
/Engineering

Just in time inventory or express delivery.

The customer requests the product, type, quantity and delivery date. We then make sure that our products are delivered quickly and safely. Some standard products can be easily ordered in our online shop. If you need help finding the right product, our customer service is happy to provide advice.

We ship worldwide

We have been producing force transducers for over 10 years, and shipping them to clients all over the world. This is made possible by both an efficient production and a well-coordination distribution system. Our stock is well-equipped with those parts and products that we need at short notice or that are demanded on a regular basis. Our administration system enables us to monitor our stock and, last but not least, you can always count on our staff.

Easily order online

We put our clients' needs first. That is why we make ordering as convenient as possible for you: Our online shop is available 24/7. There, you can choose some of our standard products and check all options and versions. The product you might urgently need is only a few clicks away.

You are not sure which device or version to choose for your project? Contact us via telephone or email and our customer service will get back to you within 24 hours on working days.


CHECK-IT
Mobile Indicator
0 – 20 mA
0 – 10 V
Output
ON
TEST

primoforce® MD
Compression force transducers / Load cells

10 t

Load cells with an accuracy of 0.5% F.S.

Load cells measure static and dynamic loads. Only two sizes cover nominal loads from 500 kg up to 20 t. Screw threads on the bottom side make them easy to mount. Force is introduced via a convex area in the centre.

The whole range of force transducers, load cells, and supplies

Please find a quick overview of our products here. You can find more products on our website or in our online shop. If you wish to experience Primosensor products in real life, please do not hesitate to pay us a visit.

primoforce® SST
Shear beams

Shear beams are commonly used for force measurement purposes in the manufacturing industry.

They are easily installed by two screws at one end. Load is applied at the opposite end using different holding fixtures. Shear beams are often used for bin weighing. At drives they serve as torque arm.

primoforce® MA Load pins

Load pins are force transducers which are used in fork bearings, where they replace ordinary bolts.

Load pins are often the connector between upper and lower part of a construction, which makes them the ideal spot to measure forces. Load pins are a popular type of force transducer, as fork bearings are widely used in machine and plant construction and there is usually no further design change necessary in order to apply them.

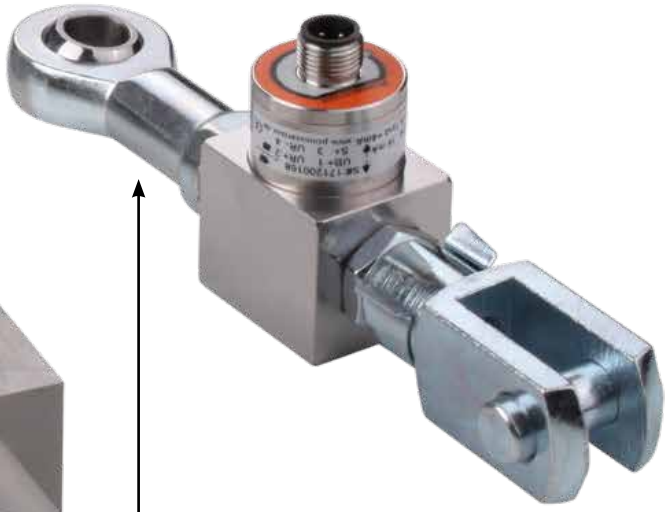
primoforce® MSY Mini S-Type

Ideal for installation in narrow spaces.

This S-Type is characterised by its small size which makes it perfect for installation in narrow spaces. S-Types are used for measurement of tension and/or compression.

IND5R Indicators

5-Digit indicator with inputs for mA- and V-standard signals and not amplified mV/V force transducers. The device is equipped with clearly visible 14 mm high characters. It is suitable for panel-mounting. Minimum and maximum values will be stored. Programming is done via the front buttons. Various units can be displayed.



IND3S33 Mobile indicator Check-it

3.5 digit mobile indicator for testing of sensors with industrial output signal 0/4…20 mA or 0….10 V. The device is battery-operated and therefore particularly suitable for on-site service or facility start-ups. The function of sensors can be checked easily. The test signal of Primosensor SIL-force transducers can be activated and verified.

Swivel head or fork head

Primosensor sells a huge number of supplies for force transducers and force measuring systems, such as various mounting parts, force transmission elements, and installation kits.

primoforce® ZDA tension / compression force sensor

Tension and compression force transducers are widely used in the manufacturing industry. Forces are usually applied to tension and compression force transducers via swivel heads or fork heads. If there is enough space, the force transducers adjust themselves when force is applied and measure exactly.

Torque measuring rings for platforms

Our long-standing customer Serapid needed to build a very flat event platform which was able to recognize overload. For that, they needed a force sensor with a maximum height of 10 mm on the push chain. We found a way! We designed a torque measuring ring which is installed between gear and chassis and measures the reaction torque there.

Additional height on the push chain: 0 mm!

Professional blood pressure monitor

One of our customers needed suitable sensors for a non-invasive, high-precision, and professional blood pressure monitor. The device was to be placed on the wrist but the vein's position there differs from person to person. We have developed a pectinate sensor structure which ensures that at least one tooth generates an analysable signal. The sensor was produced by thin film technology.

CUSTOMIZED APPROACHES

Forestay sensor

Measuring the forces applied to the forestay or the sheets makes it easier to trim sails ideally, not only once, but constantly, to fully use the wind's potential.

The wireless and battery-driven sensor is placed at the forestay and sends data to the onboard computer, which analyses and displays it. The helmsman can check the forces applied to the forestay on the display and find the perfect way to position the sails.

Press-in sensor

In some cases, the original component cannot be replaced by a sensor for measuring purposes. However, using press-in sensors, the original components can be upgraded to sensors.

We use this approach for our axle load measuring system for goods wagons. The tracks are pierced at the required distance and equipped with press-in sensors.

Sensor for the hand rim of an electric wheelchair

An electric wheelchair needs not only a drive but also a force sensor to control power.

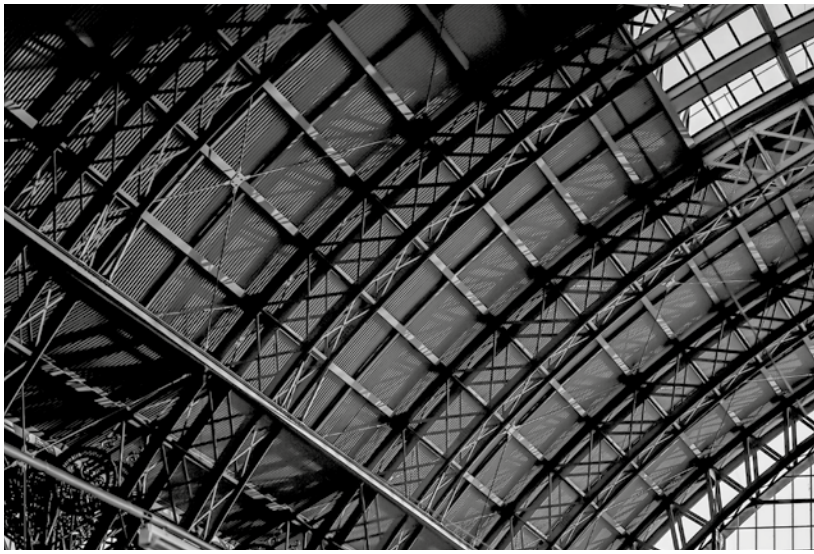
Our cubic sensor can easily be installed between hand and wheel rim. It measures very precisely the direction of movement but is also robust in any other direction, which enables them to endure for example high weights.

Yarn tension sensor for weaving machines

Our customer needed a cheap sensor to measure yarn tension in weaving machines. We decided to cut all metal components out of metal sheets by laser and then layer and blend them. The deformation of a component under load can be determined by means of the Hall effect and is converted to 0...10 V.

Strain transducers

Strain transducers are screwed on the original components in order to measure strain applied to their surface and calculate the stress applied to the component. They are popular equipment for forming presses, punching and embossing machines, and welding devices.



Shackles

Among others, eyebolts, chains, hooks, and shackles are used to attach and secure lights, loudspeakers and other items needed on stage. We mostly use shackles to measure the stress applied to ceiling, supporting and crossbeam structures.

Maximum effect with minimalistic technology.

More than 10 years ago, Dipl.-Ing. Joachim Hose-von-Wolfframsdorff and Dipl.-Ing Stephen Birkmann met while working for the same provider of force measuring technology. Back then, they already had over 20 years of experience in this field.

They had realized that force measuring technology and its applications could have been enhanced significantly and so they founded their company “Primosensor” in 2010. “We have always done it that way” was never to be said there.

Instead, Primosensor had been focussing on high flexibility and optimal, customized concepts from the very beginning. For over ten years, we have been designing, developing and producing force sensors which are perfectly adjusted to the respective client’s requirements.

We have built production facilities for small, medium and large quantities at two locations. We are looking ahead, being well-prepared and optimistic. Together with our clients, we will develop new products and make the world a little better. We are excited – what about you?

07.2020 Lacking Werbeagentur

Primosensor

Primosensor GmbH
Lagerstraße 11 64807 Dieburg / Germany
Phone: +49 (0) 6071 63467-50 Fax: +49 (0) 6071 63467-60
info@primosensor.de www.primosensor.com