
wenglor
the innovative family

# Home of Innovation

## Welcome to the realm of the people who invented the Red Light Sensor ...

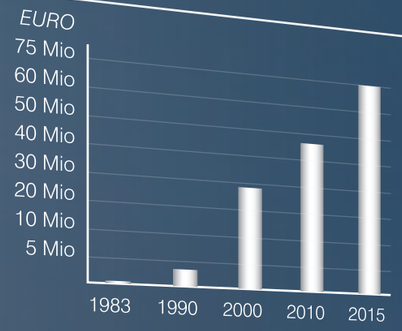
**... the Sanitary Switch, the Vision Sensor, the WinTec and InoxSens Technology, ...**
Again and again, our passion for invention results in fresh motivation for the development of intelligent sensor technologies, safety and image processing systems. Our courage to implement new ideas exemplifies the foundation of our corporate philosophy and, at the same time, serves as a basis for our worldwide success. All of our hard work has lead to awards and distinguishments for innovative top products and efficient corporate management, as well as rankings amongst the 20 mid-sized companies with the strongest growth rates. Our mission is to provide intelligent solutions today for the automation systems of tomorrow – every day and everywhere around the globe.

the innovative family

# At Home on Lake Constance and Around the Globe

Subsidiaries in 44 countries around the globe,
R&D and production at 4 locations in Europe

## SALES




**95 %** of all sales generated by products developed and manufactured in-house

**>10 %** of all proceeds from sales are invested in R&D

**100 %** direct marketing

## PRODUCTS

**Product selector**
Just a few clicks to the desired product

**Approx. 99 %** product availability

**100 %**
technical support

Same-day order shipping

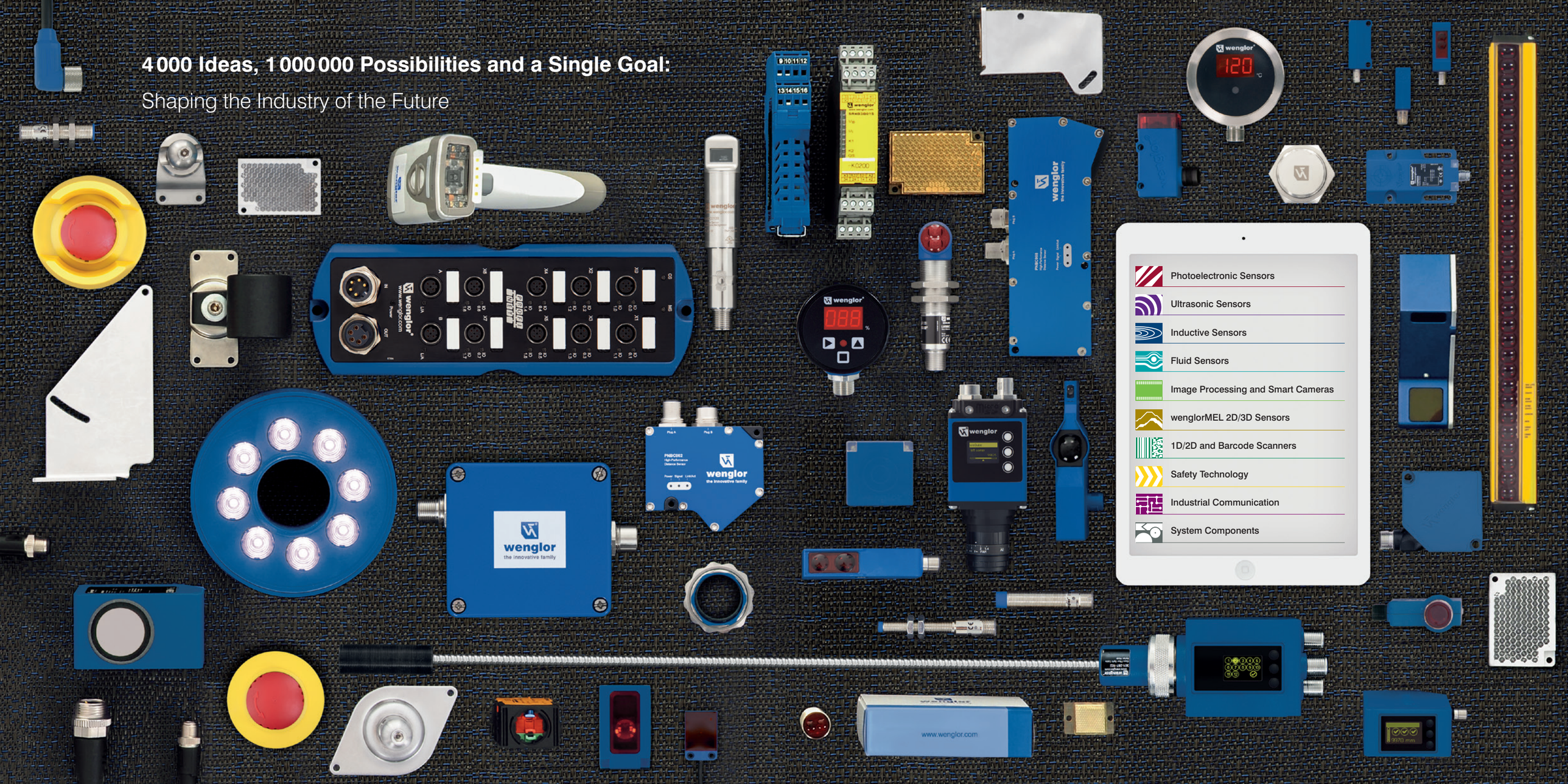
## SUSTAINABILITY / RESPONSIBILITY

$CO_2$ savings of up to 416 tons per year by means of geothermal heat, solar power and modern communication standards

**>10 %** training quota with over 800 employees

# 4 000 Ideas, 1 000 000 Possibilities and a Single Goal:

Shaping the Industry of the Future



**Logistics**
Sensors with compact formats integrated into the shuttle measure, detect and differentiate amongst objects from distances of up to 3 meters regardless of color, degree of gloss or angle.

# Photoelectronic Sensors

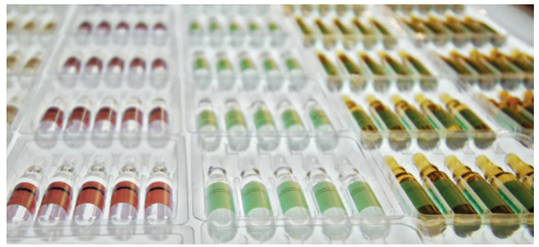
## Detect, Distinguish and Measure with Light

wenglor has been revolutionizing the market for optical sensors for decades with pioneering developments. As an internationally established technology leader for individual sensor concepts and series applications, our products are unparalleled with regard to quality, precision and performance. From retro-reflex sensors for diverse applications right on up to intelligent, high-performance distance sensors with communications capabilities, we offer top products for all automation processes.

Our portfolio includes patented sensors with various types of light, as well as numerous housing formats and functional principles. And thus the ideal product is always available for any application and reliable functioning is ensured at temperatures ranging from −40 to 350° C over distances of 0.4 µm to 100 meters.

**Ready for Industrie 4.0**

**Woodworking Industry**
Optical sensors detect glossy, matte, dark or rough wood surfaces with red or infrared light – even in dusty or contaminated environments.



**Automotive Industry**
Sensors with various functional principles in a uniform format permit easy integration into existing system concepts. They detect various surfaces such as aluminum, zinc and die-cast metals, as well as painted or corroded surfaces from different angles.

**Pharmaceuticals Industry**
Reliable detection of clear glass and transparent objects: The InoxSens product range is waterproof thanks to its welded stainless steel housing and glass optics – even when subjected to water-jet cleaning – and is resistant to cleaning agents and chemicals (IP69K).

**Tyre Industry**
WinTec sensors detect black rubber parts in extremely inclined positions from angles of up to 89°.

**Food Industry**
The unique InoxSens design with PMMA optics fulfills strict hygiene and cleaning requirements for the processing of high quality food products.

**Beverages and Packaging Industry**
wenglor sensors reliably detect clear glass and PET bottles at high speeds in production and in return systems.

## Photoelectronic Sensors

- Through-Beam Sensors
- Retro-Reflex Sensors
- Reflex Sensors
- Reflex Sensors with Background Suppression
- High-Performance Distance Sensors
- Color Sensors
- Sensors for Roller Conveyor Systems
- Fork Sensors
- Fiber-Optic Cable Sensors
- Contrast Sensors
- Luminescence Sensors
- Print Mark Readers
- Gloss Sensors
- Light Curtains
- Temperature Sensors for Contactless Measurement

## Systems Integration

- RS-232
- IO-Link
- Ethernet TCP/IP
- PROFINET
- EtherNet/IP™
- EtherCAT

**Beverage Industry**
Ultrasonic sensors are ideally suited for fill-level detection and monitoring in filling systems.

# Ultrasonic Sensors

## Making the Invisible Measurable

wenglor's high-performance ultrasonic sensors are distinguished by their insensitivity to interference factors such as extraneous light, dust, smoke, fog and vapor. They recognize liquids and measure dark, transparent and reflective objects – regardless of material, color transparency and surface characteristics.

The various settings and operating modes available for the ultrasonic sensors can be easily selected via the IO-Link interface or at the display. Switching to the multiplex operating mode prevents reciprocal influence amongst sensors which are in direct proximity to each other. Ultrasonic sensors detect several objects on a large surface area in the synchronous operating mode.

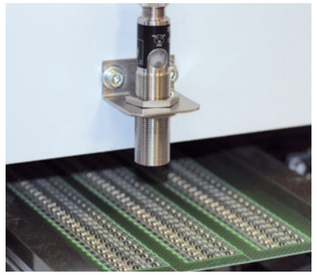
**Ready for Industrie 4.0**

**Agriculture Industry**
Ultrasonic sensors measure distance to the ground in dusty environments in harvesting machines, in order to prevent them from bottoming out and the resultant damage.

**Automotive Industry**
In automobile production, ultrasonic sensors reliably detect transparent objects like windshields.

**Metalworking Industry**
Ultrasonic sensors determine the diameter of coils of sheet metal during coiling and uncoiling.

**Textiles Industry**
Whether velvet, wool or leather is concerned – wenglor's ultrasonic sensors detect nearly all types of fabrics used in the textiles industry.



**Electronics Industry**
Ultrasonic sensors detect stamped and perforated surfaces of sensitive PCBs over large surface areas.

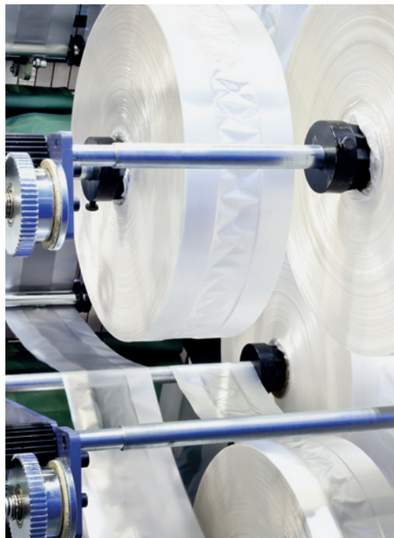
**Packaging Industry**
By means of slack monitoring, ultrasonic sensors control the feeding of material to machines by measuring the material's loop depth and checking it for cracks.

## Ultrasonic Sensors

- High-Performance Distance Sensors
- Reflex Sensors
- Reflex Sensors with Analog Output

## Systems Integration

- IO-Link



**Machinery Manufacturing**
Inductive sensors with weproTec and increased switching distances permit the automation of systems within very tight spaces.

# Inductive Sensors

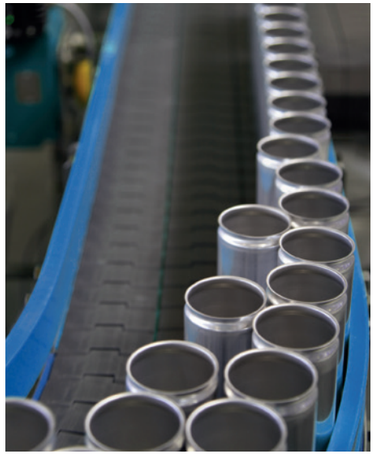
## Quality Means Inspiring Standard Features

wenglor's inductive sensors can be used for contactless detection and measurement of metal objects under extremely difficult conditions such as contamination, impacts, high atmospheric humidity, moisture or extremely high temperatures. A large selection of various formats and housing materials ensures flexibility when designing systems, as well as while installing the sensors. At the same time, standard variants offer a great deal of functions which open up new applications and revolutionize inductive sensor solutions.

The new, innovative weproTec generation prevents sensors from influencing each other reciprocally. And thus weproTec makes it possible to mount sensors directly next to or opposite each other. Combined with up to three times the switching distance required by the standard and an integrated IO-Link interface, they're setting new standards for inductive sensor technology.

**Ready for Industrie 4.0**

**Automotive Industry**
Inductive sensors with analog output are used in automobile production to measure the thickness of brake discs.



**Beverages Industry**
Installing weproTec sensors opposite each other makes it possible to detect cans regardless of their position on the conveyor belt.

**Recycling Industry**
Inductive sensors with selective performance differentiate between ferrous and non-ferrous metals. For example, they separate aluminium from steel sheet in recycling processes, thus assuring unmixed recovery of the metals.

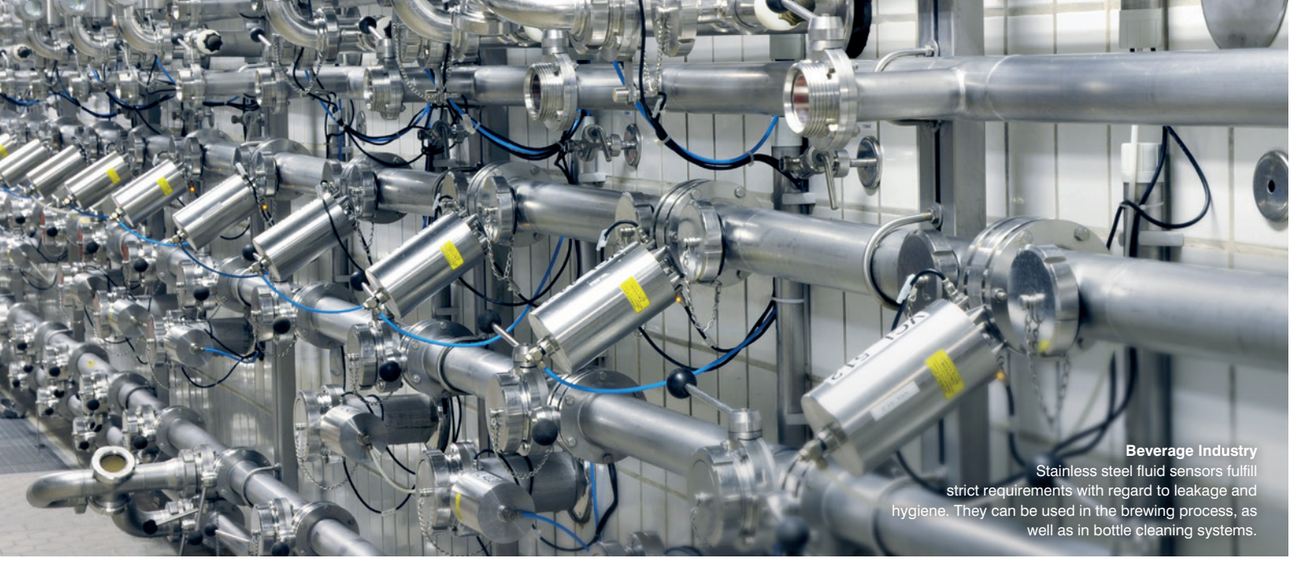
**Metalworking Industry**
Special variants of wenglor's inductive sensors are capable of reliable operation in extreme heat at up to 450°C, and execute precise position sensing.

## Inductive Sensors

- Inductive Sensors with Standard Switching Distances
- Inductive Sensors with Increased Switching Distances
- Inductive Sensors with IO-Link
- Inductive Sensors with Full-Metal Housing
- Inductive Sensors with Analog Output
- Inductive Sensors with Selective Performance
- Inductive Sensors for High Temperature Ranges
- Inductive Sensors with Correction Factor 1

## Systems Integration

- IO-Link



**Beverage Industry**
Stainless steel fluid sensors fulfill strict requirements with regard to leakage and hygiene. They can be used in the brewing process, as well as in bottle cleaning systems.

# Fluid Sensors

## Precision in its Element

wenglor's range of fluid sensor technology includes more than 800 flow, pressure and temperature sensors, which measure liquid and gaseous media in closed systems with or without display. They monitor processes in cooling, cleaning and hydraulic systems, as well as in environments where strict demands are placed upon hygiene and durability. The modular system concept makes it possible to implement customer-specific solutions.

**UniFlow sensors** measure both the speed and the temperature of liquid media. The patented measuring method delivers highly precise results (flow: ±2%, temperature: ±1° C) regardless of position and direction of flow, thus ensuring highly flexible installation.
**UniBar pressure sensors** measure both the pressure and the temperature of any desired media within a range of –1 to 600 bar with minimal deviation of just ±0.5% and ±1° C.
**UniTemp temperature sensors** reliably monitor temperature in processes with liquid and gaseous media within a range of −50 to 200° C with a measuring error of just ±0.1° C.

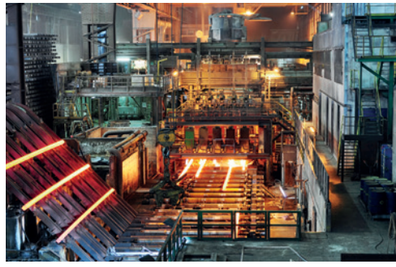
**Ready for Industrie 4.0**

**Automotive Industry**
UniFlow sensors monitor coolant water circuits in welding robots. At the same time, they also check coolant water quantity and temperature regardless of position and direction of flow. This reduces the number of measuring points and sensors, and permits easy, flexible installation.

**Machinery Manufacturing**
UniBar sensors monitor the compression of gases in hermetically sealed refrigeration compressors.

**Food Industry**
Thanks to their high degree of protection (IP69K), UniFlow and UniBar sensors with stainless steel housings can be used in the food industry. They offer ideal prospects for cleaning in process (CIP).

**Metalworking Industry**
With their large measuring range, UniTemp sensors reliably monitor coolant water circuits in environments with especially high temperatures.



**Equipment Manufacturing**
In order to assure that pumps are protected from running dry and the resultant damage, UniBar sensors monitor prevailing pressure. Furthermore, UniFlow sensors check the delivery rates of pump systems in order to detect wear at an early stage and prevent downtime.

## Fluid Sensors

- UniFlow Flow Sensors
- UniBar Pressure Sensors
- UniTemp Temperature Sensors

## Systems Integration

- IO-Link

**Packaging Industry**
weQube checks for the presence and correct positioning of bottles and their caps in a fully automated packaging system. The colors of the bottle caps are inspected as well.

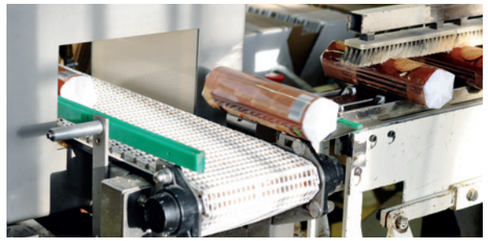
# Image Processing and Smart Cameras

## Monitoring Complex Processes and Assuring Quality

wenglor's image processing product range includes sensor-based solutions such as OCR Readers, Vision Sensors and weQube – the Smart Camera, as well as the VisionSystem$^+$ image processing system. They execute numerous tasks involving the inspection of specified characteristics and contribute to the assurance of highest possible quality standards. Their ability to differentiate and sort according to shape, size, structure and color makes these intelligent wenglor products some of the most important components for modern industry.

Tutorials, as well as reference and demo videos available for viewing at www.wenglor.com, demonstrate just how simple it is to handle these products. Teach$^+$, feasibility studies, initial start-up and in-house training provide ideal support from concept to commissioning.

**Ready for Industrie 4.0**

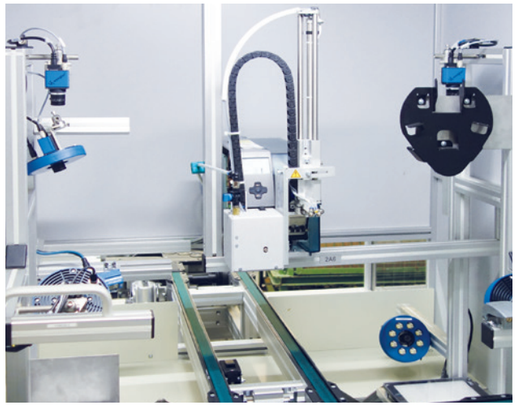



**Food Industry**

weQube – the Smart Camera – monitors package sealing and reads the bar-code at the same time.

OCR Readers detect all alphabetical characters and numbers in all languages. And thus they're suitable, for example, for reliably reading expiration dates on food packages.

**Automotive Industry**
The Vision System$^+$ consists of a control unit to which up to 10 cameras, illumination components and lenses can be connected. The central control unit evaluates the images and reads out comprehensive image information.



**Electronics Industry**
weQube takes control of entire color sequences during the assembly of cable harnesses regardless of the orientation and the position of the object.

## Vision Systems

- weQubeVision
- weQubeOCR
- weQube – the Smart Camera
- Image Processing VisionSystem$^+$
- Cameras and Lenses
- Illumination Technology

## Systems Integration

- RS-232
- Ethernet TCP/IP
- PROFINET
- EtherNet/IP™
- Rotary Encoder Input

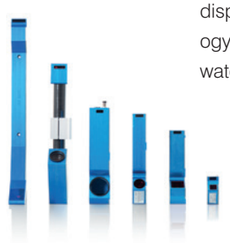
**Railway Measurement**
Highly precise 2D/3D sensors mounted to a railway measuring vehicle check the rail's cross profile in order to identify even the slightest cracks and unevenness at speeds of up to 200 kilometers per hour.

# wenglorMEL 2D/3D Sensors

## High-Speed Profiling in the Micron Range

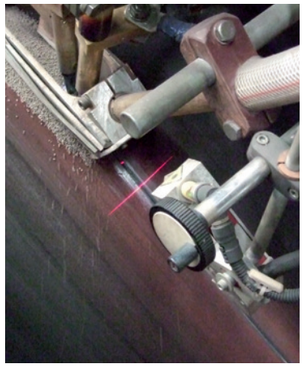
2D/3D sensors are specialized in complete, 360° object measurement, exact positioning control for machines and highly accurate surface inspection – regardless of degree of gloss, color and surface characteristics. The ascertainment of precise data regarding shape, size and condition of the measured object is an essential constituent of quality control.

2D/3D sensors from wenglorMEL offer a large selection of measuring ranges and types of light, as well as laser and performance classes. With resolution all the way down into the micron range, linearity error of just 0.2% and a scanning rate of up to 6 kHz, they're the ultimate precision tool for applications which run at extremely high speeds. The scatter plot read out by the sensor can be displayed and processed with the help of suitable software. Thanks to innovative cooling technology and a rugged steel housing, they can be used under all types of ambient conditions – under water and at temperatures of up to 500°C.



**Ready for Industrie 4.0**

**Welding Technology**
Automated welding head guidance by means of 2D/3D sensors ensures that the welding head is always in the optimum welding position relative to the welding groove.



**Automotive Industry**
2D/3D sensors monitor gaps in automobile production by measuring the distance between individual body parts in the micron range.

**Food Industry**
2D/3D sensors detect the overall volume of a piece of meat, thus permitting precise, uniform portioning for further processing – with optimized utilization of available resources.

**Woodworking Industry**
When inspecting the surfaces of panels used in furniture manufacturing, 2D/3D sensors examine them micron for micron in order to detect unevenness and damage. Glossy, painted surfaces can also be easily evaluated.

**CNC Production**
Several 2D/3D sensors measure the finished workpiece fully automatically after the machining process in a CNC milling machine, and compare their measured values with the target values at the CNC controller.

## wenglorMEL 2D/3D Sensors

- 2D Profile Sensors
- 3D Profile Sensors

## Systems Integration

- Ethernet TCP/IP 10/100 Mbit

**Pharmaceuticals Industry**
Handheld scanners with innovative illumination technology make it possible to read codes on curved surfaces.

# 1D/2D and Barcode Scanners

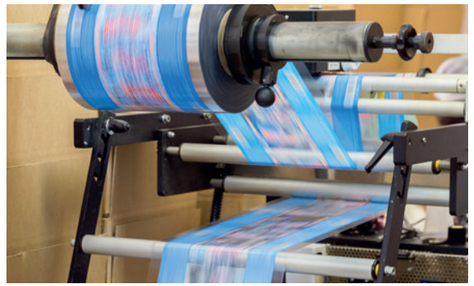
## Quick and Reliable Object Tracing

Identify, decipher and inspect codes – up to 100 times faster than the blink of an eye. 1D/2D and barcode scanners, reliably process everything from simple barcodes right on up to complex, directly applied 2D codes at high speeds. Their diverse range of applications encompasses checking for completeness and quality control, as well as the identification of products during and after the manufacturing process.

The scanners can be used in both static and dynamic applications and recognize codes within specified areas, or on large surfaces – even at varying distances. Innovative system solutions via the most up-to-date interfaces and separate gateways also offer greatest possible flexibility for design engineering and incorporation into existing systems.

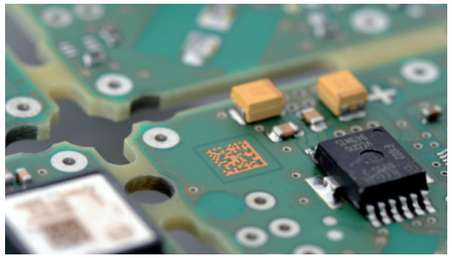
**Ready for Industrie 4.0**

**Automotive Industry**
1D/2D code scanners read laser printed data matrix codes by means of which components can be identified and retraced after the manufacturing process (track & trace).



**Packaging Industry**
Line and raster scanners are especially well-suited for applications with high throughput rates. They read up to 1400 barcodes per second from labels.

**Electronics Industry**
1D/2D code scanners read etched codes on PCBs at high speeds and varying distances. The housing dissipates electrostatic charges thus permitting use in ESD zones as well.



**Logistics**
Sweep raster scanners offer a decisive advantage where the scanning of barcodes on packages is concerned. They scan large surfaces at high speeds so that the barcodes don't have to be passed directly in front of the scanner.

## 1D/2D and Barcode Scanners

- weQubeDecode
- Barcode Line Scanners
- Barcode Raster Scanners
- Barcode Sweep Raster Scanners
- 1D/2D Code Scanners
- 1D/2D Handheld Scanners

## Systems Integration

- RS-232/422/485
- USB
- Bluetooth
- PROFIBUS
- Ethernet TCP/IP / Ethernet UDP
- PROFINET
- EtherNet/IP™

**Finger or Hand Protection**
In the case of semi-automated assembly operations, safety light curtains provide reliable protection for fingers and hands.

# Safety Technology

## Foresighted. Safe. Intelligent.

wenglor safety technology makes an important contribution to personal safety and system security by preventing the occurrence of hazardous situations. Certified in accordance with the latest international safety standards, it executes demanding tasks involving the securing of areas and the monitoring of protective devices, as well as body, hand and finger protection (type 2, PL d/type 4, PL e). Intelligent self-monitoring with numerous diagnosis functions avoids undesired machine stoppages.

wenglor safety components are distinguished by simple integration, uncomplicated settings and additionally increased protection against tampering. Outstanding service is available at any time from initial start-up, right on up to testing of protective devices at regular intervals.

**Position Monitoring**
Safety switches with RFID technology monitor secure locking of doors, hoods and flaps.

**Securing Areas**
Safety light arrays provide optimized body protection by securing access to danger zones.

**Machine Controls**
Ergonomically shaped enabling switches permit safe changeovers and servicing in the danger zone. Self-monitoring emergency stop switches shut the machine down in case of emergency by simply pressing a button.

**Systematic Safety**
Safety locks and safety light curtains can be connected via Safety Relays in order to provide comprehensive personal safety in assembly areas. The relays evaluate the signals generated by the interconnected components.

## Safety Technology

- Safety Through Beam Sensors
- Safety Light Curtains
- Multi-Beam Safety Light Arrays
- Emergency Stop Switches
- Enabling Switches
- RFID Safety Switches
- Safety Locks
- Safety Relays
- Protection Columns

## Systems Integration

- Performance Level c/d/e


**Electronics Industry**
A total of 26 PROFINET Connection Boxes collect data for energy management systems. In order to avoid peak loads due to washing machines, induction furnaces, compressed air systems and other end users in production facilities, wenglor's boxes evaluate information concerning temperature and general condition, and switch power consumers on and off accordingly.

# Industrial Communication

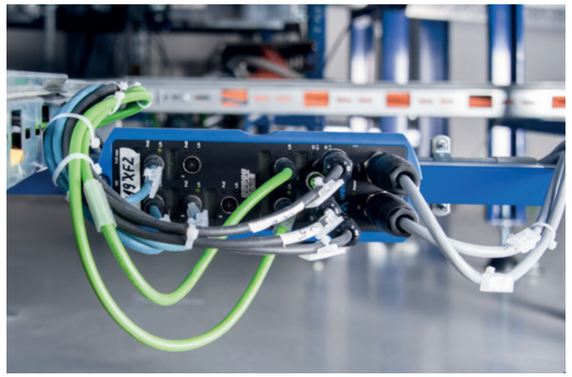
## Intelligent Communication for a New Age

Quick and active exchange of information between physical and virtual worlds is at the heart of the fourth industrial revolution. This future will necessitate more intelligent components than ever before for factory automation. Intelligent sensors and network components from wenglor can be consistently incorporated into high-tech systems, where they evaluate complex data and communicate actively with other system users.

wenglor is the first sensor manufacturer anywhere in the world to make it possible to communicate process and parametric data from sensors and actuators directly to the controller via interfaces in real-time. High-performance point-to-point communication via IO-Link and Industrial Ethernet protocols including PROFINET, EtherNet/IP™ and EtherCAT are now a wenglor standard. And thus in combination with wenglor's rugged complimentary network components such as connection boxes, gateways, switches and junctions, production in the smart factory of the future is being revolutionized.

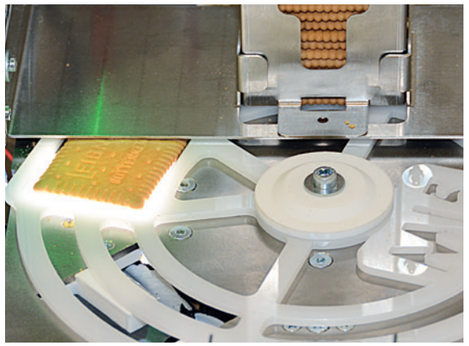
**Ready for Industrie 4.0**

**Special Machinery Manufacturing**
Tool changes on robot arms are monitored by high-performance distance sensors. Position data and information regarding the currently utilized tool are made available online via a PROFINET controller. Parameters configuration, diagnosis and remote maintenance can be conducted conveniently via a PC.



**Logistics**
PROFINET switches installed underneath a raceway conveyor ensure that signals from sensors and actuators are centrally collected and evaluated.

**Food Industry**
In a cookie production facility, various types of sensors communicate with a master controller via an EtherCAT Junction, intelligently evaluate information and pass it on within the system. Active communications capabilities as well as individual presentation within the system are assured.

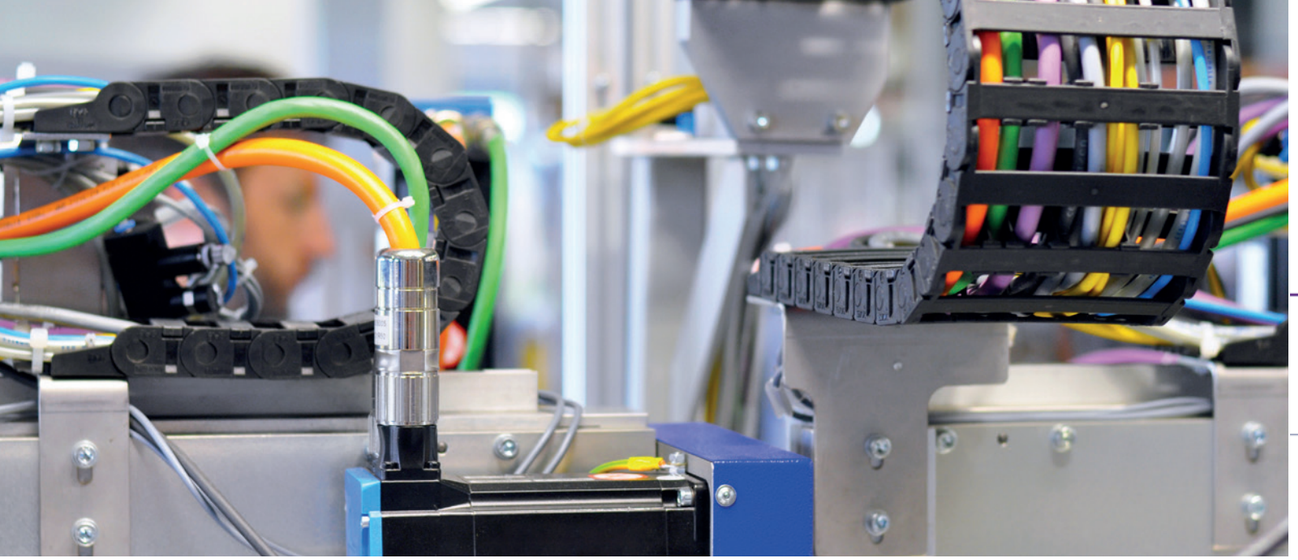


## Industrial Communication

- Photoelectronic Sensors
- Ultrasonic Sensors
- Inductive Sensors
- Fluid Sensors
- wenglorMEL 2D/3D Sensors
- 1D/2D and Barcode Scanners
- Vision Systems
- Fieldbus Gateways
- IO-Link Masters
- Ethernet Connection Boxes
- Switches and Junctions

## Systems Integration

- IO-Link
- PROFINET
- EtherNet/IP™
- EtherCAT



## System Components

### Freedom for Systems Engineering

wenglor system components secure, integrate, connect, expand and protect all utilized sensors, as well as image processing and safety systems. Mounting and connection technology for all conceivable applications, in some cases patented, is available in a broad range of materials and variants.

In order to meet demanding requirements for durability and hygiene, protective housings additionally expand the range of applications and increase system availability.

- Mounting Technology
- Connection Equipment
- Reflectors
- Protective Housings
- Complementary  Accessories

Our genetic code:

**A Passion for Invention.**

www.wenglor.com

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