

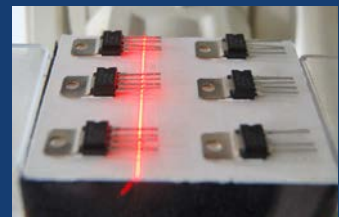
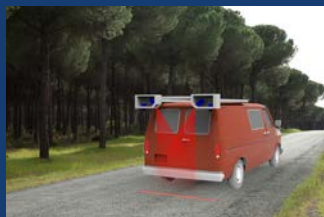
Z-LASER

Intelligent Solutions in Light

LASERS FOR MACHINE VISION

- » Wavelengths from 405nm - 980nm
- » Output power from <1mW - 6000mW
- » Micro-lines
- » Exceptional uniformity
- » Waterproof / dustproof (IP67 protection class)
- » Customized assembly

Analysis
Science
Metrology
Metal
Wood
Food & Beverage
Automotive
Robotics
Medical
Electronics



Z-LASER

Intelligent Solutions in Light

With more than 30 years of experience, Z-LASER is THE leading provider of lasers and laser-based systems to a wide variety of industries across the world.

Examples for applications:

- Solder paste inspection
- Wafer inspection
- Accuracy of metal parts
- Robotic surveying systems
- Bin-Picking
- Automatic sorting
- Weight control (i.e. food)
- Weld inspection
- Driving assistance systems
- Review of gap sizes in cars
- Inspection of body components
- Check bend radius of pipe profiles
- Measurement of tire profiles
- Train wheel inspection
- Inspection of rails
- Road profiling
- Measuring of filling levels
- Dental inspection
- PCB inspection
- Particle analysis
- Spectroscopy
- Interferometry
- etc.

Lasers for machine vision are used as a structured light source in many image-processing systems during laser triangulation techniques. This form of lighting can capture the spatial contours of moving and fixed objects. Depending on the type of objects to be examined, micro or macro lines or various patterns (multi-lines, dot matrices, crosses, circles, etc.) and a variety of colours (red, green, blue, IR) are used.

Z-LASER focus on the highest quality level and only manufacture long lasting industrial products. We are your partner for customised laser systems with demanding specifications.



ZM18



- Output power: 1-200mW
- Wavelength: 405-980nm (red, green, blue, infrared)
- Points, Gaussian / uniform lines, multi-line, dot matrix, crosses, other projections on request
- Dimensions: M18 thread with optical head Ø20mmx[76-138mm]
- IP67 protection class, waterproof and dustproof
- Analog intensity setting and TTL modulation up to 500kHz
- Internal storage of operating parameters such as temperature, operating hours, ...
- Simple, hand focusing on optical head
- Supply voltage: 5-30VDC with connector or 4-6VDC with integrated cable
- M12 plug connector guarantees optimal connection
- LED power indicator & pre-warning failure

ZM12



- Output power: 1-100mW
- Wavelength: 635-850nm (red, infrared)
- Points, Gaussian / uniform lines, multi-line, dot matrix, crosses, other projections on request
- Dimensions: M12 thread with optical head Ø15mmx[40-85mm]
- IP67 protection class, waterproof and dustproof
- TTL modulation up to 100kHz
- Simple, hand focusing on optical head
- Supply voltage: 5-30VDC with connector or 4-6VDC with integrated cable
- M12 plug connector guarantees optimal connection
- LED power indicator

ZQ/ZQ2



- Output power: up to 6W
- Wavelength: 405-808nm (red, blue, infrared)
- Points, Gaussian / uniform lines, other projections on request
- Boresight: <3mrad
- 10kHz modulation via external TTL trigger or PLC (software configurable)
- Communication interfaces: RS-232, USB, PLC - each of them galvanically isolated (optional)
- Monitoring of all operating parameters
- Simple, hand focusing on optical head - 50mm-10,000mm (at ZQ2)
- Supply voltage: 24VDC

ZFSM/ZFMM



- Output power: 1-50mW
- Wavelength: 405-808nm (red, blue, green, infrared)
- Points, Gaussian / uniform lines (within $\pm 5\%$), multi-line, dot matrix, crosses, other projections on request
- Pointing Stability: <3 μ rad/°K
- Projection size: <6 μ m (1/e²)
- Power Stability: <1% in steady state (1h)
- Analog intensity setting and TTL modulation up to 100kHz
- Supply voltage: 4.5-30VDC supply via USB is supported
- Communication interfaces: USB, Ethernet, I²C, RS-232

Features

Wavelength

The lasers have wavelengths from 405nm (violet) to 980nm (infrared).

Your benefit:

Optimal wavelength and excellent visibility!



Output power

Ranges from <0.2mW up to 6000mW.

Your benefit:

Optimal power adjustment suiting your conditions!

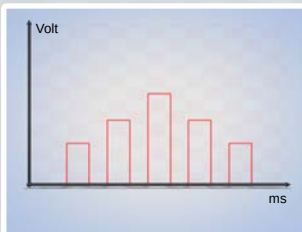


Modulation

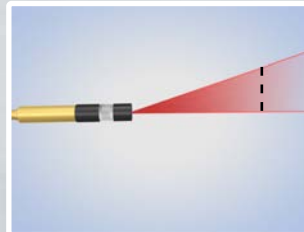
Some laser models have optionally analog and/or digital modulation.

Your benefit:

Synchronization with your camera, extension of product life!



Boresight Accuracy



Very accurate adjustment of the beam relative to axis of housing.

Your benefit:

Change of module without any adjustments!

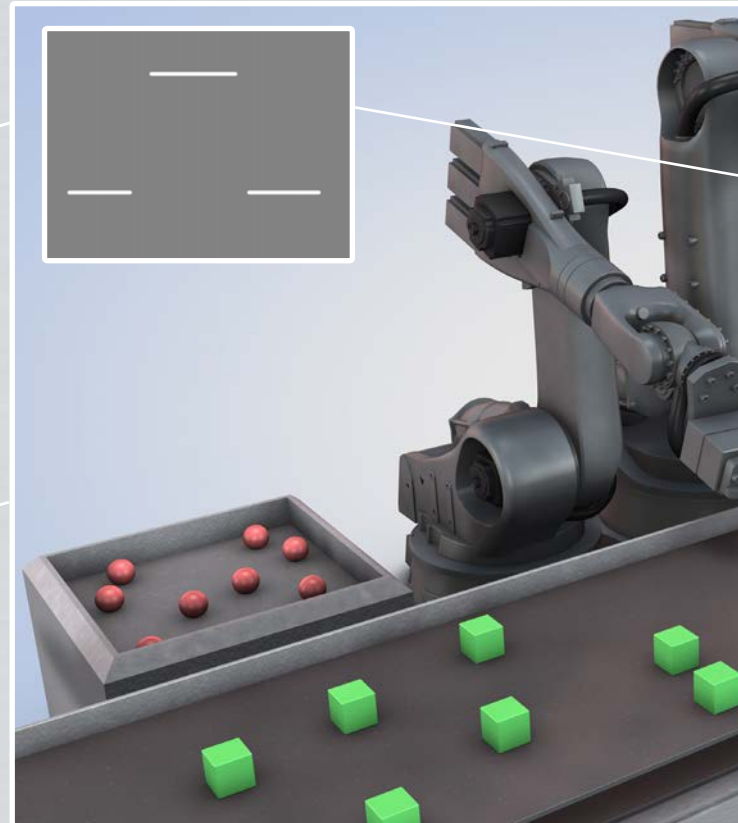
IP67 protection



The ZM12 and ZM18 product families are IP67 rated.

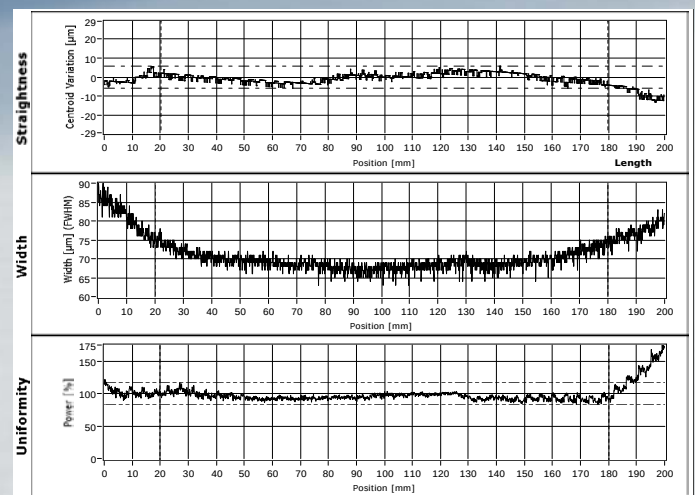
Your benefit:

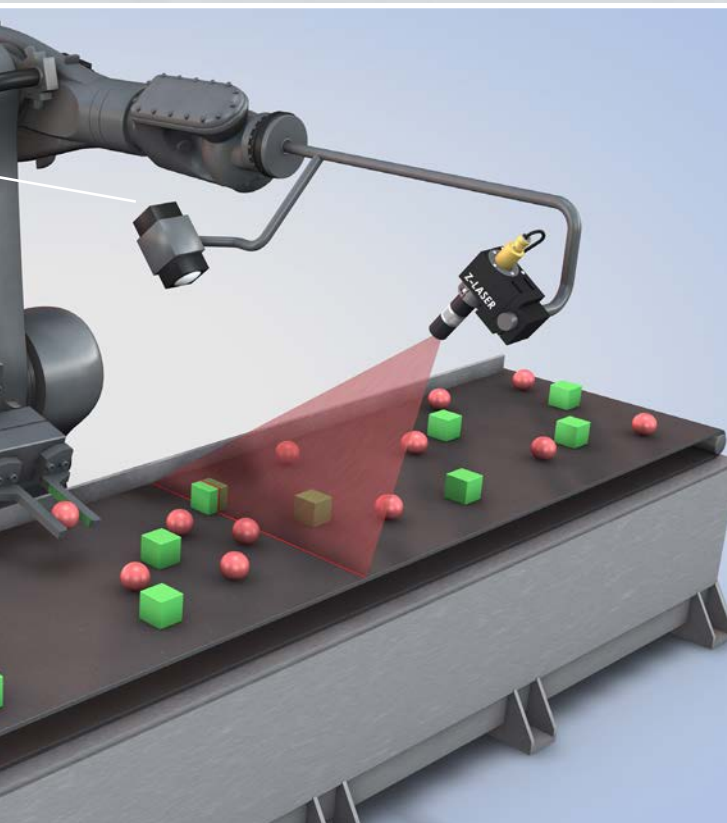
Suitable for extreme conditions!



Measurement of line quality

A test site was specifically developed for high-precision measurements of our laser lines. Parameters such as line straightness, line thickness or homogeneity distribution can be detected quickly with very high accuracy. All calculated values are uploaded into a database and can be provided simultaneously as protocol to clients. Manufacturers of image processing systems can use this data for developing of correction algorithm to make measurements of our line lasers with greater precision.





Line thickness



6µm projection thickness is achievable with exclusive systems.

Your benefit:
Detection of smallest structures!

Uniformity



We provide laser lines with highest homogeneity ($\pm 5\%$).

Your benefit:
Optimal illuminated measuring range!

Optics



Through a modular component system, the right projection for the requirements of each application can be chosen.

Your benefit:
Flexible combination with standard modules!

Line straightness

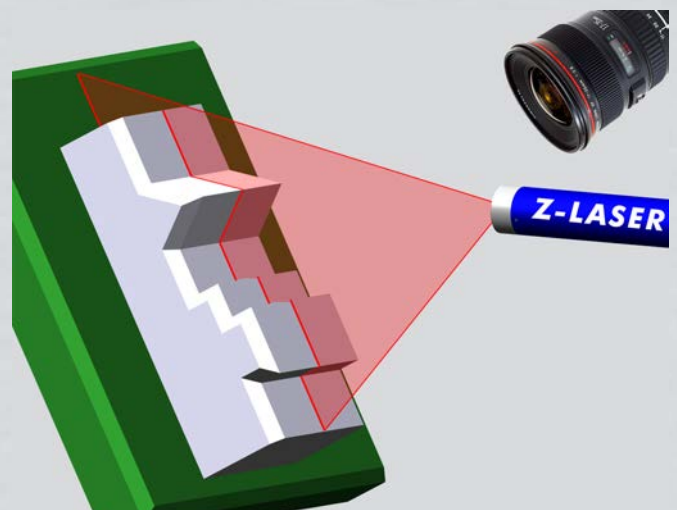


Our lasers project lines with very high straightness.

Your benefit:
Very high measurement resolution in measurement systems available!

The triangulation method

Triangulation is a purely trigonometric measuring principle and measurements can be done very rapidly and continuously. This method is particularly suitable for the rapid and accurate measurement of surfaces and objects in motion. Laser triangulation uses a diversified structured laser line which is projected onto an object. Depending on the shape of the object, this line is curved and/or interrupted. The changes are detected by a camera and evaluated. The system knows the exact mounting angles and distances of the components (camera, lighting). With this information the changes on the object can be allocated and translated into a altitude profile by using a mathematical angle function (therefore: triangulation).

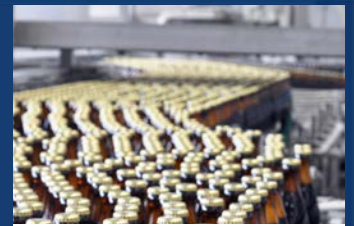


Food & beverage

Hardly any industry sector has a greater demand on quality than the food industry. The aim is to provide customers with consistent and high quality. This can only be realized by a corresponding inspection effort for all production steps. Nevertheless, optical measurement equipment is increasingly used in order to continue achieving high production rates. An example is the use of triangulation systems to determine the weight and volume of meat and cheese for automatic cutting.

Other possible applications:

- Automatic sorting
- Quality control / dimensional accuracy (of pastries, fruit, etc.)
- Automated portioning



Electronics

To demonstrate the functionality of electronic components, the correct position must be guaranteed for the assembly of components for PCBs. Lasers are used for this purpose with very narrow lines and a homogeneous intensity distribution. The laser triangulation determines whether all of the required components were located and installed in the required positions.

Other possible applications:

- Solder paste inspection
- Wafer inspection
- Review of connectors

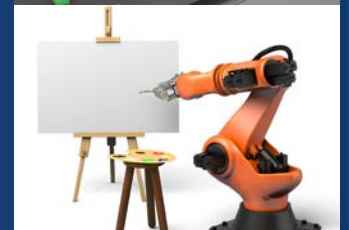


Robotics

In today's manufacturing technology, industrial robots are here to stay. If it is too dangerous for humans or if large loads must be moved, the use of an industrial robot is commonplace. Modern systems work independently and must therefore be able to orient in space. This can be realized for example by triangulation sensors. Lasers are used with so-called diffractive optics with which a complex projection is created. A camera system observes the projection and determines, via the image, the distance to a surface or an object.

Other possible applications:

- Robotic surveying systems
- Weld inspection
- Bin-picking



Metal

Our customers are often confronted with adverse conditions during the measurement of metallic surfaces such as highly reflective surfaces, self-emission of the material or high ambient temperatures. In steel production (e.g. roller mills), lasers are used for surface inspection and for detection of dimensional accuracy of hot steel slabs. The difficulty here is the intrinsic emission of the specimen. Nevertheless, to ensure sufficient contrast for measurements temperature-stabilized laser sources with output powers up to 6W and different wavelengths (450nm / 635-690nm / 808 nm) are available.

Other possible applications:

- Inspection of brake discs
- Dimensional inspection of bolts
- Review of the bending radius of pipes



Medical

In human medicine, everything possible is being done to obtain accurate diagnosis as quickly as possible. Optical test methods are used since optimal local conditions for the treatment should be established. Lowest pollution in the air will thus be reviewed. For this purpose, particle counters are used to examine, quickly and reliably, the exact level of contamination of the surrounding air.

Other possible applications:

- Measurement of bodies and body parts
- Imaging techniques in ophthalmology
- Verification of dental replacements
- Correct positioning of a patient in CT, MRT, X-ray devices



Automotive

In the automotive sector (cars, trains, airplanes), a 100% quality assurance is essential. Using laser triangulation, also critical components are measured with high precision in order to achieve maximum accuracy. A classic example is the continuous monitoring of wheel profiles. To detect waste and defects early and reduce the risk to workers, they use lasers to examine the components regularly for damage.

Other possible applications:

- Driving assistance systems
- Wheel alignment / inspection
- Verification of gap dimensions
- Inspection of body parts



Made in Germany



Z-LASER

Intelligent Solutions in Light



We are available for you around the world. You will find our international representatives online at:
www.z-laser.com

Z-LASER sets industry standards. By continually investing in the corporate infrastructure, **Z-LASER** has cultivated a leading market position in various industries for over 30 years.

Z-LASER has been certified to ISO 9001 since 1997. Quality audits of important industrial quantity buyers are performed regularly. To ensure we earn the high quality label "Made in Germany", each laser is subjected to stringent controls.

"The fascination of the perfect light inspired me 35 years ago to make the laser my passion."

In the beginning, simple wood positioning applications in sawmills were realised with He-Ne gas lasers, which were initially built in my living room. Today, I take pride in watching the 6 axis optical machines in our clean room that produce eye-safe high-end laser modules e.g. for the automotive industry.

From the early years on, all team members support the idea not to supply the arms industry."



Kurt-M. Zimmermann
Founder and owner **Z-LASER**



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