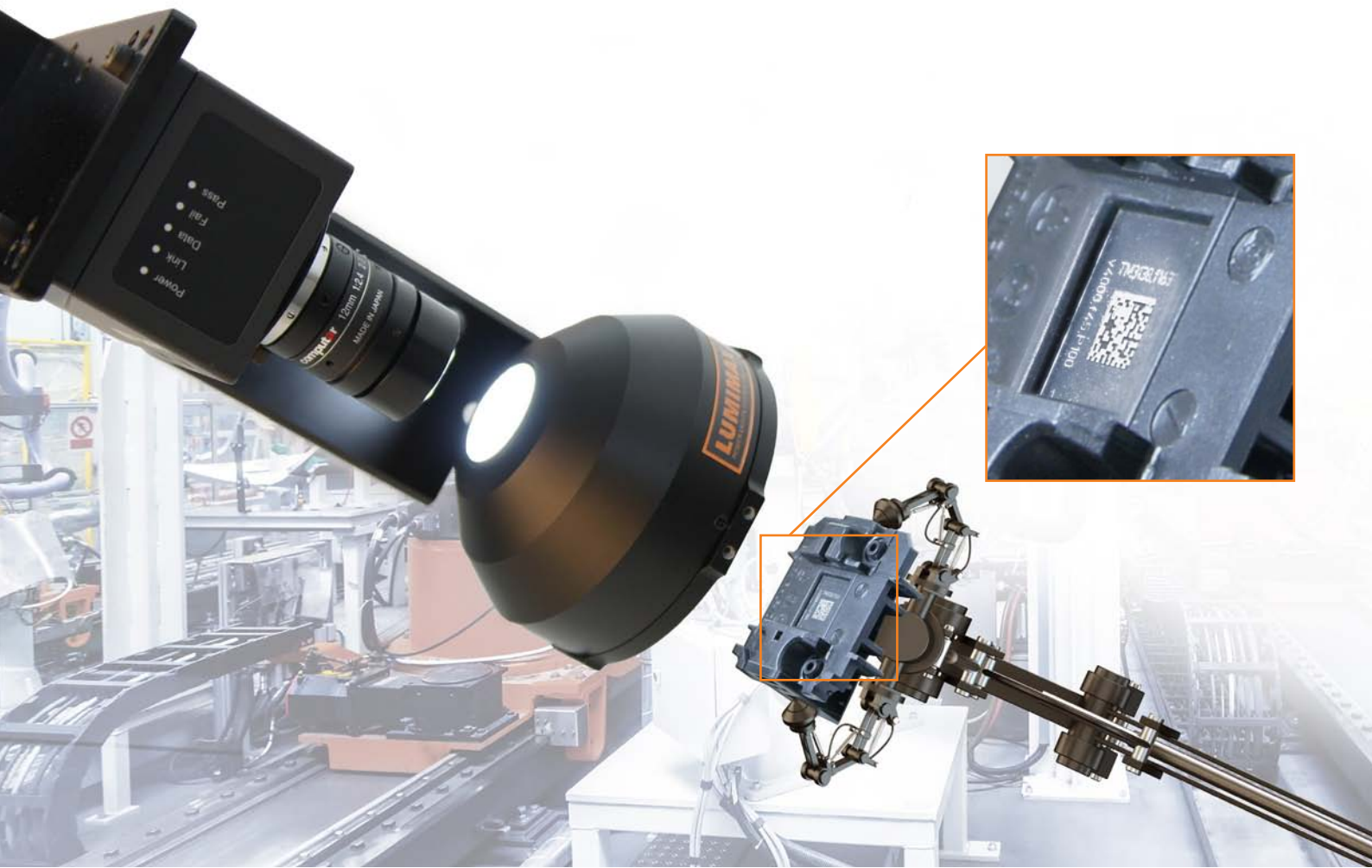


LUMIMAX[®]

Lighting for the standard-compliant
reading and verification of codes



**POWER
LIGHTS
FOR
MACHINE
VISION**

made by **iim** MEASUREMENT
ENGINEERING in Germany

The standards

The standards ISO/IEC 15415/ 15416 and ISO/IEC TR 29158 are particularly interesting when it comes to the standard-compliant reading and verification of codes.

ISO/IEC 15415/ 15416

ISO standard 15415/ 15416 relates to printed codes on labels and similar.

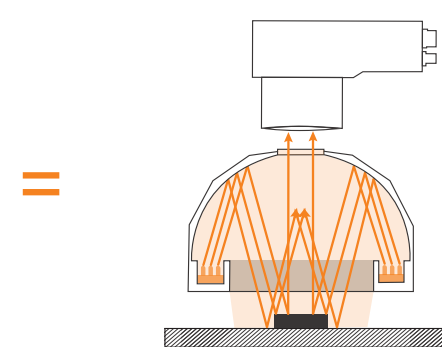
In contrast, the DPM standard ISO 29158 is used for direct part marking (DPM) and, for instance, also applies to lasered and needled codes on various surfaces.

Fundamentals

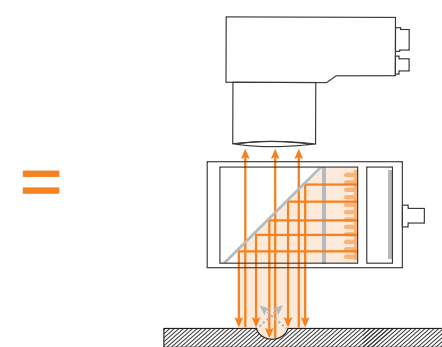
Verification and standard-compliant reading is not only used to decipher codes according to standardised processes but also to measure the quality of the code and assess how it can be analysed. The high-quality assessment of the code ensures that this can be read with absolute reliability under unchanged conditions. The code is assessed using a standardised procedure immediately after marking and assigned to a quality class (A...F or 0...5). Using this classification, the marking process can be optimised immediately, if required – even before the marking falls outside the tolerance range. This enables the readability of the applied code to be guaranteed throughout the entire production process.

To execute the reading and verification process in line with the standards, the lighting situation is determined alongside camera and software factors. A standard-compliant set-up always requires a 90° viewing angle for the camera and thus the camera must be positioned vertically to the test piece. Changes to this viewing angle would cause axial unevenness in the code and thus lead to a poor result in the quality assessment.

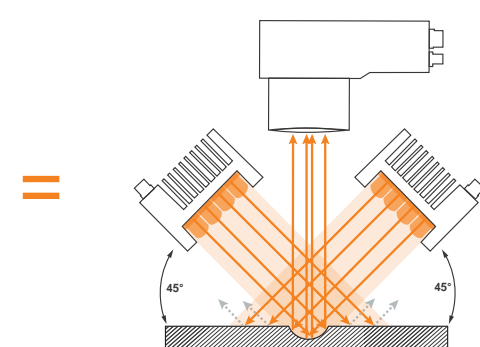
Standard-compliant set-up



Off-axis diffuse „D“
Norm ISO/IEC TR 29158



On-axis diffuse 90°, 90°
Norm ISO/IEC TR 29158
as well as
Norm ISO/IEC 15415/ 15416



Medium angle 45° /
Low angle 30°
Norm ISO/IEC 15415/ 15416:
■ four direction: „45Q“, „30Q“
Norm ISO/IEC TR 29158:
■ four direction: „30Q“
■ two direction: „30T“
■ one direction: „30S“

Application

ISO/IEC 15415/ 15416 for printed codes

The standard ISO/IEC 15415/ 15416 defines three lighting setups for the standard-compliant reading and verification of codes, whereby four lights arranged in a square at an angle of 45° to the surface are defined as standard lighting. However, the angle can also be reduced to 30° from the surface depending on the application.

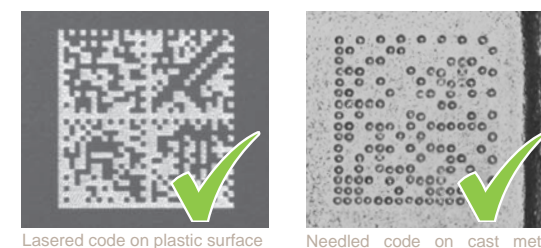
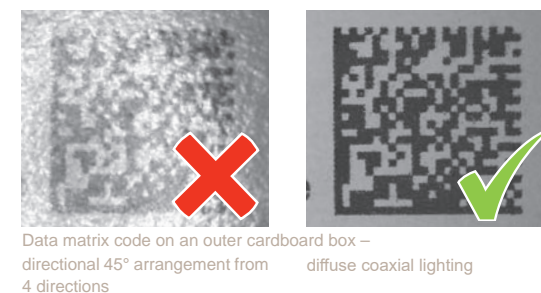
Under special conditions, for instance for glossy and reflective surfaces, diffuse lighting is also permitted, which is then positioned at a 90° angle to the object. The light field is thus parallel to the surface. Coaxial lighting is used for these applications. Here, a diffuse, homogeneous light source is mirrored over a semi-transparent reflector directly in the lens beam path. The object is thus illuminated in a very even manner without shadows.

ISO/IEC TR 29158 for direct part mark codes

In contrast to ISO/IEC 15415/ 15416, ISO/IEC TR 29158 permits five related lighting setups for directly marked codes. The arrangement of four lights at an angle of 45° to the surface is not considered a standard-compliant arrangement for direct part marked codes. However, the 30° arrangement is recommended for this standard as a version with four lights in a square, two lights facing each other, or one single light.

Depending on the material and shape of the test piece, a suitable version can be determined here:

- **plane, matt and rough surfaces:** four-sided 30° lighting arrangement
- **curved and rotationally symmetrical surfaces:** two- or one-sided 30° lighting arrangement
- **glossy and reflective surfaces:** Coaxial or dome lighting
- **glossy surfaces with a complex structure:** Dome lighting



Your benefits at a glance

- **industrial & innovative:** high-quality power LEDs with optimal heat management in conjunction with functional design ensure stable light conditions and a long durability
- **standard-compliant & understandable:** thanks to special assembly systems and verification adapters, standard-compliant positioning of the camera and, where required, defined swivelling in and out of the lighting are possible
- **speedy & secure:** reduction of extraneous light and motion blurring due to fast, high-performance flashing
- **plug & play:** fast, simple integration using functional accessories and a standardised connection concept
- **service & support:** feasibility studies by experienced employees and free loaning of components assist during realisation

Simple integration

Verification adapter for dome and coaxial lights and mini bar lights

- direct mounting on the camera system
- defined swivelling in and out of the lighting
- reproducible construction for all reading stations

Mounting system for mini bar lights

- four, two and one-sided arrangement
- defined fixing points for standard-compliant 30° and 45° setting

LUMIMAX® lighting in line with standards

Permitted lighting:

- LED dome lights in the DOM CD series
- LED coaxial lights in the ES series
- LED mini bar lights in the LSB series
- LED bar lights in the LB series
- also possible: LED area lights in the SQ, LG, LSG and LQ series, LED spots 3W and 5W, and LED ring lights* LR50 and LR70 and mini ring light* LSR24

Options:

- Operating types: continuous, switch, flashing operation
- Light colours: red, white, blue, green, IR, UV
- Verification adapter for dome light DOM CD50, coaxial light ES40 and mini bar lights of the LSB series
- four-sided mounting bracket for mini bar lights of the LSB series for standard-compliant 30° and 45° arrangement



* Ring lights are not listed according to ISO/IEC 15415/ 15416 and ISO/IEC TR 29158, although alternative types of lighting, such as ring lights, can also be used in exceptional cases.



iiM AG - The company

iiM AG measurement + engineering is developer, manufacturer and distributor of high-quality, high-performance products for industrial image processing.

In Suhl (Thuringia), we develop and manufacture high-performance and highly functional LED lights under the LUMIMAX® brand for machine vision applications in a very wide range of industrial areas, such as for the automobile, semiconductor, pharma, food, drinks and tobacco industries.

A second division develops and markets special measuring technology and peripherals for the cable and wire industry to record geometric features, particularly on insulating covers and cable sheathing, in accordance with standards.

A team of over 40 engineers, technicians and skilled workers assists our customers as a partner when realising their challenges.

LUMIMAX® LED lighting

Technology

High-performance lighting products with integrated controller technology for continuous, switch or flashing operation guarantee the utmost functionality and enable the stable, extraneous light-independent illumination of your test objects – even for extremely fast processes.

The integration of high-performance LEDs from renowned manufacturers combined with a very wide range of optical systems results in irradiances in new performance classes.

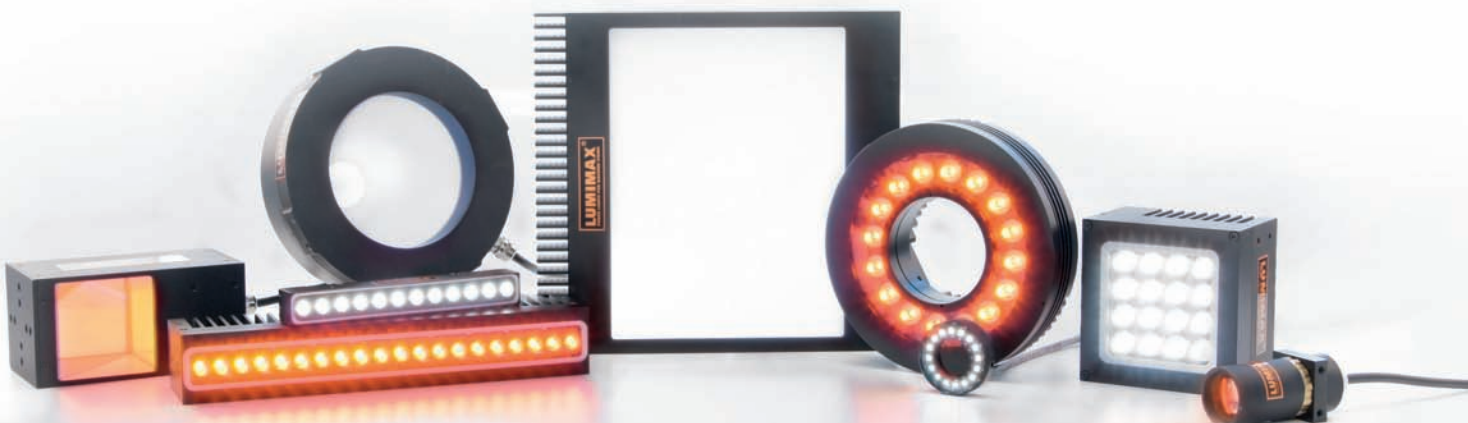
Functional accessories and sophisticated connection concepts reduce the time needed to integrate the LED lights into your image processing application.

Quality

Made in Germany - we are committed to the highest level of quality and functionality, guarantee you excellent service, and work with regional partners. All of the development and manufacturing takes place in the head office in Suhl. This means our customers benefit from short processing and delivery times. To ensure the high standard of all processes, the iiM AG quality management system is annually audited by DEKRA Certification GmbH in accordance with standard ISO 9001:2008.

Experience

We have extensive experience in industrial image processing and can apply this knowledge excellently when designing and realising our products and when providing consulting. We see our customers as partners. We thus rely on continuous and close cooperation.



Service & support

Selecting the right lighting is not only an essential part of stable, reproducible quality control and process control – it is also the key to resolving image processing tasks. What's more, it saves time and money during the planning, start-up and maintenance of image processing solutions in an industrial environment. This is why we guarantee you an extensive range of services in addition to exceptional product quality.

Our team, consisting of technicians and engineers with many years of experience in the field of machine vision, is available to you at any time for the following services:

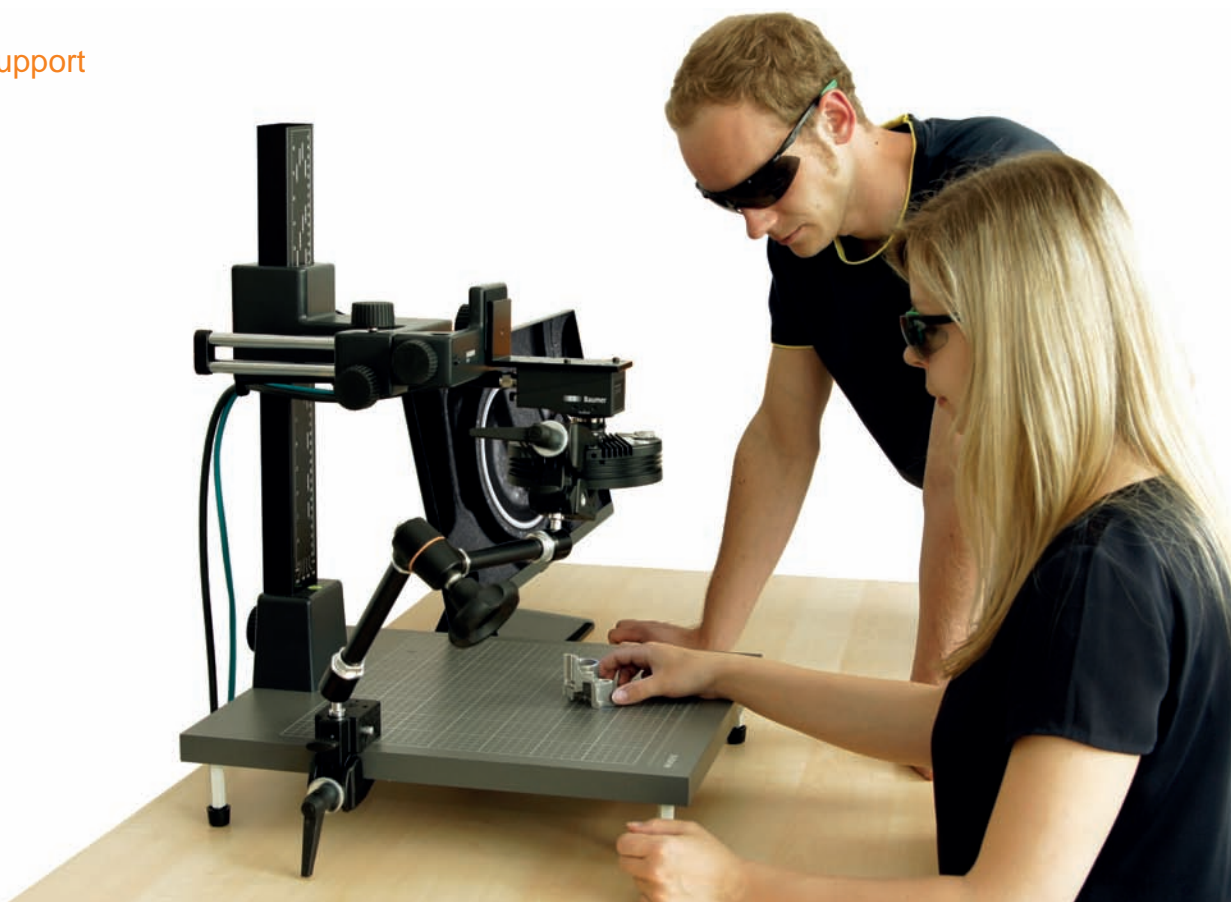
Feasibility studies

Customer-specific developments & adaptation of products

Loaned equipment & laboratory equipment

Consulting and support

Training



Contact



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