Sensitive 1/2016

The magazine for non contact measurement gauges

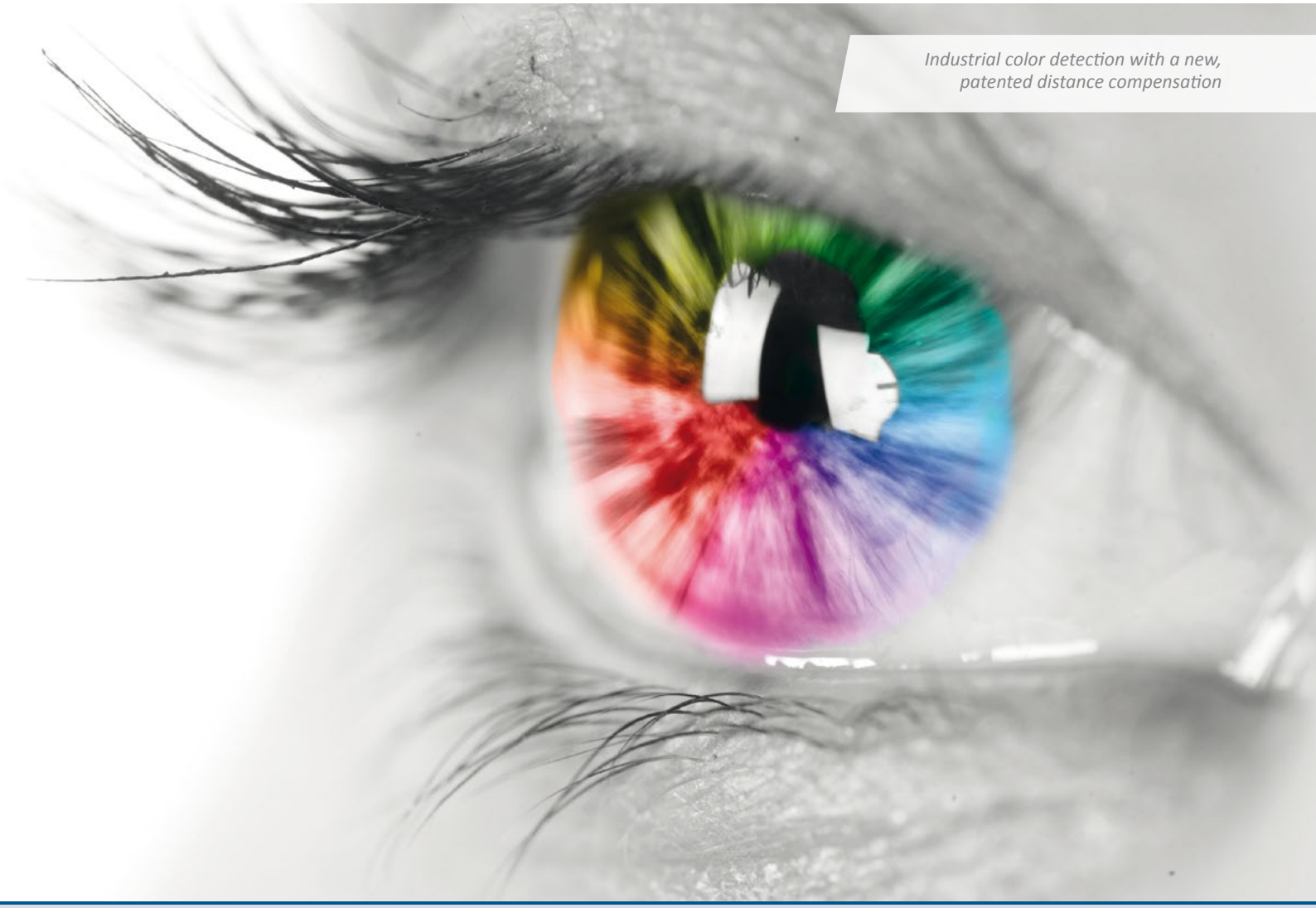
Dear readers,

the ASTECH team is pleased to present the first edition of the *Sensitive* in 2016.

In 1995, the very first *Sensitive* was published by introducing the velocity and length sensor VLM200. Since then, the *Sensitive* has been the medium to propose products and their application areas.

Now, two decades later, ASTECH revives its magazine. In the future, the *Sensitive* will appear regularly and will keep you informed about product applications and developments.
The first edition in 2016 introduces the latest sensor for industrial color detection purposes, the CR500, from the CROMLAVIEW® family and its ability to detect colors even if the working distance changes. Additional news can be found on page 4.

We hope you enjoy the first edition of our *Sensitive* in 2016,
Your ASTECH Team



Industrial color detection with a new, patented distance compensation

In this edition

World debut

Color recognition in varying measurement distances

The accurate detection of colors by using fiber optic sensors requires a defined measurement distance. In many practical applications – especially in the industrial automation – it is not possible to guarantee fixed measuring distances. This often leads to misrecognition that make the use of color sensors impossible. Therefore, ASTECH implemented a brand new and patented method for overcoming the distance dependence. This is implemented in the new color sensor CROMLAVIEW® CR500.

The industry always had the desire to eliminate the influence of the measuring distance to the measuring signal. Thereby, there are various reasons that can lead to distance measurement variations. Those are for example:

- the measurement object is arranged on a height-variable conveyor,
- the measurement object affects the measuring distance due to its uneven surface,
- different sizes of the measurement object cause distance variations,
- the measurement object has no guidance and passes the sensor at a different distance,
- „sheet flutter“ in endless tapes, such as printed films.

The perceptual (modeled on the human color perception) color sensor family CROMLAVIEW® that consists of the color sensors CR50, CR100, CR200 and CR210, is now expanded by the CR500.

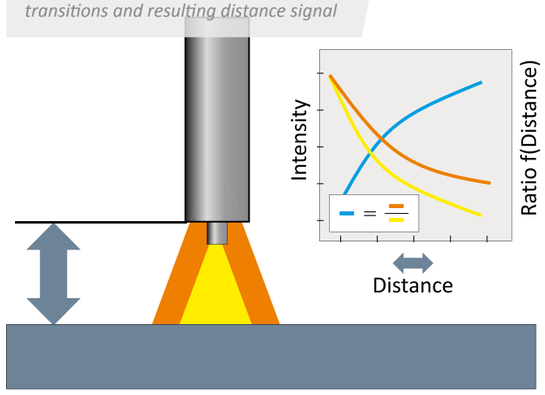
Color sensor CR500 with fixed fiber optic

Distance compensated color sensor CROMLAVIEW® CR500

With the development of the CROMLAVIEW® CR500, it is now possible to achieve compensation of the measurement distance changes in form of a calibrated fiber optic device with a fixed fiber optic. Two RGB photodiodes are assigned to a main and a side receiving channel. Both receiving channels must be identical in terms of electrical, optical and spectral properties. It is necessary for the measuring principle that the two receiving channels have a different characteristic function, with respect to its distance sensitivity. At the fiber optics side of the measuring object the individual fiber is split into two individual fibers. One fiber bundle is located at the probe center and contains part of the illumination fibers and the main channel fibers. The second fiber bundle is arranged coaxially and relocated by a few millimeters in the probe of the light guide. It contains the remaining illumination fibers and the side channel fibers.

Thereby, the distance difference between the two planes (see probe figure) to the object causes different characteristics of the signal intensity at a distance change. From these characteristics the intensity ratio can be calculated, which represents a measure for the distance.

Structure of probe, optical- and intensity transitions and resulting distance signal

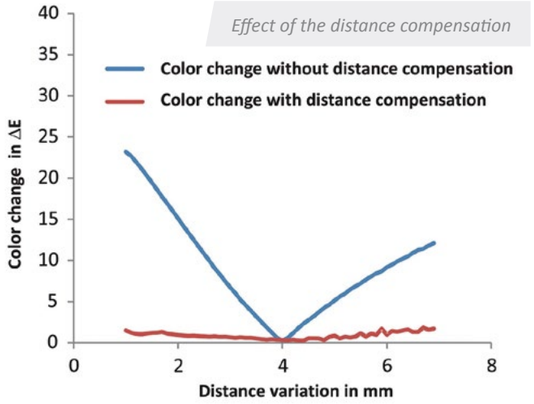


From this, a correction signal for distance compensation can be obtained.

Results of distance compensation

The following diagram shows the typical compensation result of the distance correction. The signal change in the typical colorimetric unit ΔE corresponds to the apparent color change by the distance variation. The chosen distance variation of 6 mm is very large for fiber optic color sensors. This can be seen from the color change without compensation (blue curve). The red curve illustrates the color change with effective compensation.

Effect of the distance compensation



Evident is a very stable color value for a wide range of distances. Due to this compensation, the use of color sensors is now possible for many applications with varying measuring distances in automated processes. Elaborate guidance or fixing of the measurement object can be omitted.

The patented distance compensation method is quoted at ASTECH under the brand name CROMLADIST®.

Compensation of drift-appearance and ambient light

Drifts by varying temperatures and the aging of the light source must also be reliably compensated by the color sensor system. A method is used for the long-term stabilization, which is based on an additional measurement channel and a correction calculation.

BUNDESREPUBLIK DEUTSCHLAND

URKUNDE

über die Erteilung des

Patents

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Bezeichnung
Abstandsvariationskompensiertes Farbsensorsystem

Patentinhaber
ASTECH Angewandte Sensortechnik GmbH, 18057 Rostock, DE

Erfinder
Wego, Ansgar, Dr., 18196 Dummerstorf, DE

Tag der Anmeldung
16.05.2012

München, den 29.08.2013

Die Präsidentin des Deutschen Patent- und Markenamts

Rudloff-Schäffer

An additional RGB photodiode supervises the light source as a monitor.
Deviations from reference values stored in the sensor are used to calculate correction factors. In this way, the effects of aging and temperature drift are compensated. Color variations are no longer perceptible with effective drift compensation.

For ambient light compensation a chopper method is used in the color sensor system.
By using two consecutive measurements with and without measuring lights, the ambient light, which is superimposed from the ambience of the measuring point with the measuring light, can be filtered by subtraction.

The compensation of drifts and the ambient light are also implemented in all other CROMLAVIEW® color sensors.

VLM500 parametrizing at the push of a button

The VLM500 is used in various industries (for example steel or paper) for process control or length measurement. By means of internal control loops, the VLM adjusts itself automatically to the surface condition of the object to be measured. Nevertheless, there are applications where the customer changes the process parameters such as velocity or acceleration in its manufacturing process. Alternative measurement information send through a communication interface or a different pulse rate for the encoder emulation could also be reasons to change parameters.
In order to adapt the VLM500 to these changes within the process, the internal firmware provides now the option to store complete parameter sets in the device and to activate those when needed with a single command. This process can be carried out fast and safely via a communication- (USB, RS232, RS485) or a fieldbus interface (Profinet, Profibus) of the VLM500. Using the service- and parameterization software *VLMTool* the parameter sets (up to five) are easily generated and maintained.

The latest version of the firmware and *VLMTool* for the VLM500 can be downloaded from the website http://www.astech.de/download.html.

Internal

ASTECH strengthens its direct sales

From now on Mr. Daniel Strandt takes care of the company's sales force and will exercise the direct sales operating business in the future.

He has been working as an application engineer and specialist for non-contact measurements at ASTECH for many years.
Henceforth Mr. Strandt will support, guide and advise customers in order to find the best measuring solution and to implement their needs efficiently.

By doing so ASTECH expands one of its strengths, the customer-specific support in the field of non-contact measurement. The expansion of sales, allows ASTECH to focus more effectively and faster on the needs of customers.
ASTECH is the specialist for sensor technology and non-contact measurements in the industry. Its optical sensors for the detection of speed, length, distance, position, width and color are characterized by a very long life and quality „Made in Germany".

Daniel Strandt

Contact

ASTECH Angewandte Sensortechnik GmbH
Schonenfahrerstr. 5, 18057 Rostock, GERMANY
Phone: +49 381 44073-0
Fax: +49 381 44073-20
sensitive@astech.de

www.astech.de

Simply scan the QR Code to open our website and gain information about ASTECH and our products.

Editor: ASTECH Angewandte Sensortechnik GmbH, Schonenfahrerstr. 5, 18057 Rostock
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