Leuze

CRT 448 and 648

Sensors for color and mark detection

The Sensor People

Sensor technology for demanding color recognition and sorting tasks

Color sensors detect the color of an object or print mark and compare it to a set reference value. The special reflection diffuse sensors are used when the color is to serve as a distinguishing criterion. Color sensors are a cost-effective and compact alternative to image processing systems and are suitable for many sectors, including mechanical engineering and the automotive, plastics, pharmaceutical and packaging industries.

Color sensors can be used to detect, inspect and sort colored surfaces. The result is output to the control either as a switching signal or as an RGB color value via the IO-Link interface.

CRT 648 color sensors: universal use with simple operation

With their large LC display, the CRT 648 series color sensors in robust die-cast zinc housings are easy to operate. Thanks to distance-independent color recognition, special luster suppression and seven pre-settable colors, the powerful sensors can be used flexibly.

Your benefit

- Versatile use thanks to operating ranges of up to 150 mm and up to seven color settings
- Simple operation and parameterization via integrated display or IO-Link
- New application-optimized variants
  - Detection of glossy surfaces through luster suppression
  - New brightness evaluation with autocorrect enables tolerance in object guidance and distance-independent color detection up to 65 mm
  - Optimized for use in demanding environments with robust zinc die-cast housing with protection classes IP 67 and IP 69, as well as ECOLAB certification

CRT 448 color sensors: Simple color differentiation

The CRT 448 series color sensors in plastic housings offer an introduction to color detection with 3 switching outputs and teach-assigned reference values. Two light spot shapes and variants with PNP or NPN outputs are available for typical color detection in the working range up to 32 mm.

Your benefit

- Color detection with operating ranges up to 22 mm or 32 mm and up to three color settings
- Simple operation and parameterization with teach button and LEDs
- Sensor in PMMA housing with protection class IP 67

Applications

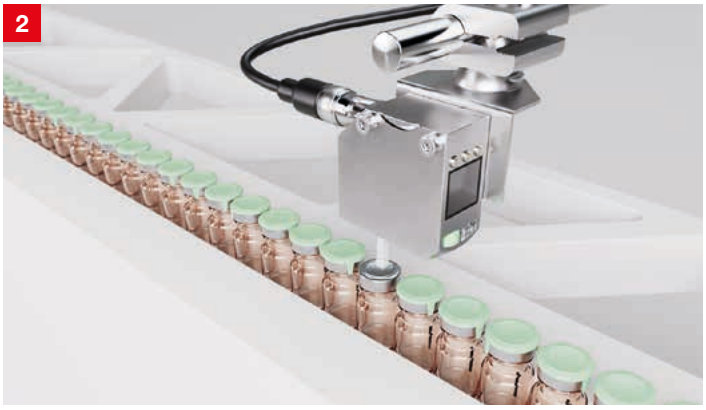
Final inspection in food packaging

Requirement: In a packaging system, the color of cereal bowls must be checked before they are placed in the container packaging. As the bowls are to be packaged according to type, it must be ensured that the same color comes off the conveyor belt every time.

Solution: The new CRT 648 color sensors can be taught up to seven colors. They are equipped with a large light spot and reliably detect the colors of both the packaging and the cover. The large operating range of up to 150 mm ensures reliable detection, even when switching to other formats.

Monitoring of vials in pharmaceutical packaging

Requirement: The quality requirements for pharmaceutical packaging are high. Defective vials, for example without caps, must be detected on the conveyor belt and ejected. The high-gloss vial caps pose a challenge for sensors.



Solution: The CRT 648 color sensors with luster suppression detect the high-gloss vial caps while ensuring process stability. Operating and adjusting the sensors is quick and easy thanks to the large LC display.

Automated checks in car manufacturing

Requirement: In the automotive industry, the color of rear lights is to be checked automatically at an assembly station. In the first process step, the connector color must be tested, and different test programs are then run depending on this. The second step in this application is to evaluate the light color and intensity of the rear light.

Solution: In the first process step, a CRT 648 color sensor checks the color of the connector. Another CRT 648 checks whether the rear light has the correct light color and intensity.

Strapping machine for carton packaging / sealing

Requirement: Different carton packaging items run on a conveyor belt. The appropriate strapping should be automatically selected to match the carton color.

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Solution: The CRT 648 series color sensors detect the carton color and transmit the information to the strapping machine. This allows the system to select the appropriate strap color.

Checking the sealing cap color

Requirement: When closing the ampoules on a filling line, a cover in a specific color should be used.

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Solution: The taught color of the cover is detected by the CRT 448 and incorrect covers are sorted out by the output signal of the sensor with sorting device.

Highlights

Simple operation: Quick teach-in process and seven color settings

The CRT 648 are easy and intuitive to operate with a **large, integrated LC display** with keypad. If different product variants are tested in one system, **up to seven color settings** can be saved on the sensor and tested simultaneously. The large operating range opens up further possibilities: This means that one sensor can easily be used for different tasks – ensuring flexibility with increasing variation and reducing the outlay for sensors and set-up times.

Transparency and remote access via IO-Link

The new CRT 648 series color sensors can be set either remotely by teaching via cable or – much more conveniently – via IO-Link. The format change can be simplified considerably via IO-Link and additional data can be recorded from the sensors.

- Effective process monitoring thanks to the internal object counter and high color resolution, made possible by 3 linkable outputs and digital inputs.
- Real-time signal information as RGB color value output via IO-Link
- Further diagnostic data such as temperature, signal quality, switching operations

Overview of technical data

		CRT 648-32.G/L44-M12	CRT 648-60/LT-M12	CRT 648-60/L44-M12	CRT 648-150/LT-M12	CRT 648-150/L44-M12
Features	Housing material	Metal, die-cast zinc	Metal, die-cast zinc	Metal, die-cast zinc	Metal, die-cast zinc	Metal, die-cast zinc
	Operating range	18 … 32 mm	18 … 60 mm	18 … 60 mm	20 … 150 mm	20 … 150 mm
	Light spot size	6 x 6 mm @ 25 mm	4 x 4 mm @ 40 mm	4 x 4 mm @ 40 mm	8 x 8 mm @ 60 mm	8 x 8 mm @ 60 mm
	Number of colors	7	1	7	1	7
	Number of switching outputs	3	1	3	1	3
	Switching output	Push-pull (PNP, NPN configurable)	Push-pull	Push-pull (PNP, NPN configurable)	Push-pull	Push-pull (PNP, NPN configurable)
	Switching input	Configurable (Teach, Trigger, Key Lock)	Teach	Configurable (Teach, Trigger, Key Lock)	Teach	Configurable (Teach, Trigger, Key Lock)
	Switching frequency configurable	3 … 500 Hz	3 … 3,000 Hz	3 … 3,000 Hz	3 … 3,000 Hz	3 … 3,000 Hz
	Ambient temperature operation	–20 … +55°C	–20 … +55°C	–20 … +55°C	–20 … +55°C	–20 … +55°C
	IO-Link data output	Switching outputs or color value output	Switching output	Switching outputs or color value output	Switching output	Switching outputs or color value output
	Protection class	IP 67, IP 69	IP 67, IP 69	IP 67, IP 69	IP 67, IP 69	IP 67, IP 69
	Certification	CE, UL, China RoHS ECOLAB, UKCA	CE, UL, China RoHS ECOLAB, UKCA	CE, UL, China RoHS ECOLAB, UKCA	CE, UL, China RoHS ECOLAB, UKCA	CE, UL, China RoHS ECOLAB, UKCA
	Connection	M12 (5 pin)	M12 (4 pin)	M12 (5 pin)	M12 (4 pin)	M12 (5 pin)
	Dimensions	25 x 50 x 50.5 mm	25 x 50 x 50.5 mm	25 x 50 x 50.5 mm	25 x 50 x 50.5 mm	25 x 50 x 50.5 mm

		CRT 448.S3/444-M12	CRT 448.S3/222-M12	CRT 448.L3/444-M12	CRT 448.L3/222-M12
Features	Housing material	Plastic, ABS, PMMA	Plastic, ABS, PMMA	Plastic, ABS, PMMA	Plastic, ABS, PMMA
	Operating range	12 … 32 mm	12 … 32 mm	18 … 22 mm	18 … 22 mm
	Light spot size	Ø 4 @ 30 mm	Ø 4 @ 30 mm	1 x 5 mm @ 20 mm	1 x 5 mm @ 20 mm
	Number of colors	3	3	3	3
	Number of switching outputs	3	3	3	3
	Switching output	PNP	NPN	PNP	NPN
	Switching frequency	500 Hz	500 Hz	500 Hz	500 Hz
	Ambient temperature operation	–10 … +55°C	–10 … +55°C	–10 … +55°C	–10 … +55°C
	Protection class	IP 67	IP 67	IP 67	IP 67
	Certification	CE, UL, China RoHS, UKCA	CE, UL, China RoHS, UKCA	CE, UL, China RoHS, UKCA	CE, UL, China RoHS, UKCA
	Connection	M12 (8 pin)	M12 (8 pin)	M12 (8 pin)	M12 (8 pin)
	Dimensions	17 x 50 x 50 mm	17 x 50 x 50 mm	17 x 50 x 50 mm	17 x 50 x 50 mm

Our portfolio at a glance

Switching sensors
- Optical sensors
- Inductive sensors
- Capacitive sensors
- Ultrasonic sensors
- Fiber optic sensors
- Fork sensors
- Light curtains
- Special sensors

Measuring sensors
- Distance sensors
- Positioning sensors
- 3D sensors
- Light curtains
- Bar code positioning systems
- Fork sensors

Safety
- Safety Solutions
- Safety Laser Scanners
- Safety Light Curtains
- Single and Multiple Light Beam Safety Devices
- Safety Radar Sensors
- Secure Locking Devices, Switches and Proximity Sensors
- Safety Controllers and Relays
- Machine Safety Services

Identification
- Bar Code Identification
- 2D-Code Identification
- RF Identification

Data transmission
- Optical data transmission systems

Network and connection technology
- Connection technology
- Modular connection units

Industrial image processing
- Light section sensors
- Industrial IP cameras
- Vision sensors

Accessories and add-on products
- Signaling devices
- Mounting systems
- Reflectors

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