LUMINESCENCE: AS YOU SEE, YOU CANNOT SEE A THING

Luminescence sensors detect marks that light up exclusively under UV light. This is due to fluorescent substances contained in the mark, which convert UV light into visible light. The reflected light beam is detected and evaluated by the luminescence sensor.

Reliable detection of fluorescent materials

The LUMIMUS IQ sensor, equipped with an integrated electronics and a high-frequency oscillator, allows the use of 600 mA to 3000 mA current, ensuring a long-term stable marking with the same properties.
Operating principle

Luminescence sensors emit modulated UV light with a wavelength of 375 nm. Fluorescent substances are excited by this, and send back light with a longer wavelength in the visible spectrum (approx. 480 to 750 nm). This light is detected and evaluated by the luminescence sensor.

Luminophores

The illumination effect of the fluorescent substance is attributable to advanced luminophores — small particles that convert UV light into visible light in different wavelength ranges and at different intensities. Luminophores can be applied to almost all substances. Typical examples are chalk or wax crayon, ink, oil paint, earth, and felt-tip pens.

Space-saving miniature housing

Thanks to its innovative miniature housing, the LUTM can also be installed in confined spaces. The luminescence sensor is configured through a straightforward teach-in operation and the integrated O-Link interface facilitates remote control and rapid analysis.

Application Areas

Pharmaceutical Industry

Whether inserting package slips into packages or attaching labels to ampoules, LUTM luminescence sensors maximize process reliability. They are able to do this by drawing on their additional strengths from switching frequency and detection reliability.
SMALL, INTELLIGENT LUMINESCENCE SENSOR

Product description
Enhanced performance for fluorescent materials: The new LUTM luminescence sensor from SICK features a miniaturized housing combined with an IO-Link function. It is ideal for all applications where fluorescent marks need to be reliably detected in confined spaces. Even when the level of luminescence is low, the LUTM allows the relevant marks using its enhanced system sensitivity. This mini luminescence sensor can be set using a straightforward teach-in method. The innovative IO-Link function enables enhanced, intelligent diagnostics and visualization of sensor parameters, as well as provide quick and easy format changes. Thanks to an increased switching frequency of up to 4 kHz, the LUTM is also suitable for high machine production capacities.

At a glance:
- Luminescence sensor in a miniature housing
- Static and dynamic teach-in methods in a single variant
- Reliable detection even at low level luminescence
- Improved gloss behavior

Your benefits:
- Minimal housing enables installation in small spaces
- Quick and easy commissioning saves time and costs
- Increased switching frequency for improved machine productivity
- Enhanced process reliability thanks to gloss suppression
- Highly flexible during commissioning thanks to too range of teach-in methods

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Food and beverage industry
Manufacturers of luxury goods do not want control marks to impair the visual impact of high-quality label designs. Labels and sealing flaps on these items are aligned with invisible luminescent marks which light up exclusively under UV light and can be detected by the LUTM with ease. Moreover, SICK’s luminescence sensors are easy to adjust and put into operation.
LUMINESCENCE SENSORS LUTM

Detailed technical data

Features

- **Dimensions (L x W x H)**: 12 mm x 31.3 mm x 31 mm
- **Light source**: UV-LED
- **Light emission**: Long side
- **Light spot direction**: Vertical
- **Adjustment**: 2-point touch-le static/dynamic
- **Output function**: L4551/4554 SWITCH

Mechanics/electronics

- **Supply voltage** $V_{cc}$: DC 12 V ... 24 V
- **Ripple**: $\leq 1.5 \%$
- **Power consumption**: $\leq 50 \text{ mA}$
- **Switching frequency**: $6 \text{ kHz}$ depending on the max. intensity
- **Response time**: 80 μs
- **Switching output**: PNP: HIGH $= V_{cc}$, LOW $= 0 \text{ V}$
  - NPN: HIGH $= V_{cc}$, LOW $= 0 \text{ V}$
- **Output current** $I_{out}$: $\leq 100 \text{ mA}$
- **Jitter**: 40 μs
- **Input, teach-in (ET)**: PNP
  - Teach: $U = 10 \text{ V}$, $< U_{cc}$
  - Run: $U = 2 \text{ V}$ or open
  - NPN
  - Teach: $U = 0 \text{ V}$
  - Run: $U = 10 \text{ V}$, $< U_{cc}$ or open

- **Connection type**: Male connector M12, 4-pin
- **Protection class**: II
- **Circuit protection**: $V_{cc}$ connections reverse-polarity protected
- **Output Q short-circuit protected
- **Interference suppression**: EMI 87
- **Enclosure rating**: IP 67
- **Weight**: Approx. 10 g
- **Housing material**: ABS

Ambient data

- **Operating temperature** 40°C...+60°C
- **Storage**: 20°C ± 15°C
- **Shock load**: 10g 100 Hz
- **UL RLO No.**: 02414931 & 02414932

Ordering information

<table>
<thead>
<tr>
<th>Scanning range</th>
<th>Sensing distance tolerance</th>
<th>Operating range</th>
<th>Light spot size</th>
<th>Receiving range</th>
<th>Switching output</th>
<th>Type</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.5 mm</td>
<td>1.5 mm</td>
<td>5 mm...20 mm</td>
<td>2 mm x 2.3 mm</td>
<td>490 cm...750 mm</td>
<td>PNP</td>
<td>LUTM</td>
<td>16073701</td>
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<tr>
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</table>

Dimensional drawings (Dimensions in mm/inch)

Adjustments

1. **Status indicator LED**: yellow Status monitoring output
2. **Status indicator LED**: green Power on
3. **Teach in button**:

Connection type and diagram

Cable with connector M12, 4-pin
Cable with connector M12, 4-pin, 10-pin

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Setting the switching threshold via teach-in (static 2-point teach-in)

1. Position fluorescent mask
2. Position background

Press and hold teach-in button > 3 s.
Yellow LED flashes slowly.
Press and hold teach-in button > 3 s.
Yellow LED goes out.

Setting the switching threshold via teach-in (dynamic)

1. Position background
2. Move at least the fluorescent mark and background using the light spot.

Press the teach-in button and keep it pressed. LED flashes slowly.
Keep the teach-in button > 3 < 30 s pressed.
Release the teach-in button.
Yellow LED will illuminate, when emitted light is on the fluorescent mark.

Example

Internal signal received
Switching threshold

Switching threshold

Output Q

Output Q

Switching characteristics

Static teach-in: light/dark setting is defined using teach-in sequence.
Dynamic teach-in: switching output active on fluorescent mark, if background is longer in the field of view during the teach-in. The switching threshold is set automatically between the background and the mark.

Teach-in can also be performed using an external control signal (only dynamic teach-in).

Keylock activation and deactivation: hold down teach-in button > 30 s.

Teach-in failure: yellow LED indicator and the transmitted light of the sensor flashing quickly.
For dynamic teach-in with BT signal (516) via switching output Q.
## Recommended accessories

### Universal bar clamp systems

<table>
<thead>
<tr>
<th>Figure</th>
<th>Material</th>
<th>Description</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Image](538x692 to 542x745)</td>
<td>Steel, zinc coated</td>
<td>Universal clamp bracket for rod mounting</td>
<td>BEF-KHS-K1</td>
<td>343776</td>
</tr>
<tr>
<td>![Image](102x440 to 107x530)</td>
<td>Zinc plated steel (sheet), stainless steel 304 (sheet)</td>
<td>Plate 1 for universal clamp bracket</td>
<td>BEF-A1004H1</td>
<td>4771097</td>
</tr>
<tr>
<td>![Image](112x440 to 118x465)</td>
<td>Stainless steel 304 (sheet)</td>
<td>Plate NO6 for universal clamp bracket</td>
<td>BEF-KHS-A08</td>
<td>3051007</td>
</tr>
<tr>
<td>![Image](138x480 to 143x563)</td>
<td>Steel, zinc coated</td>
<td>Plate NO8 for universal clamp bracket</td>
<td>BEF-KHS-A08N</td>
<td>2051616</td>
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</table>

### Mounting brackets/plates

<table>
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<tbody>
<tr>
<td>![Image](141x592 to 145x637)</td>
<td>Stainless steel</td>
<td>Mounting bracket for wall mounting</td>
<td>BEF-WS1004A</td>
<td>5373550</td>
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<tr>
<td>![Image](141x672 to 145x738)</td>
<td>Steel, zinc coated</td>
<td>Mounting bracket for four mounting</td>
<td>BEF-WS1005501</td>
<td>4019008</td>
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### Mounting plates

<table>
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<tr>
<td>![Image](141x717 to 145x738)</td>
<td>Stainless steel</td>
<td>Adapter plate XT3 to KTM</td>
<td>BEF-WS1005501</td>
<td>2007140</td>
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### Flag connectors and cables

<table>
<thead>
<tr>
<th>Connecting cable</th>
<th>Female connector type</th>
<th>Model name</th>
<th>Part no.</th>
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</thead>
<tbody>
<tr>
<td>3-pin, PVC</td>
<td>Female connector, M12, 4-pin, straight, unshielded</td>
<td>Cables, open conductor heads</td>
<td>2m, 4-pole</td>
</tr>
<tr>
<td></td>
<td>Cables, open conductor heads</td>
<td>5m, 4-pole</td>
<td>D01-1204-4079A</td>
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</tbody>
</table>

### Female connector (heads to assemble)

<table>
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<tr>
<th>Model name</th>
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<td>M12, 4-pin</td>
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## LUTM LUMINESCENCE SENSORS

### Universal bar clamp systems

<table>
<thead>
<tr>
<th>Figure</th>
<th>Connection type head A</th>
<th>Connection type head B</th>
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### Female connector, M12, 4-pin, straight, unshielded

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<td>Screen-type terminals</td>
<td>E03-1204-W</td>
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### Female connector, M12, 4-pin, angled, unshielded

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