

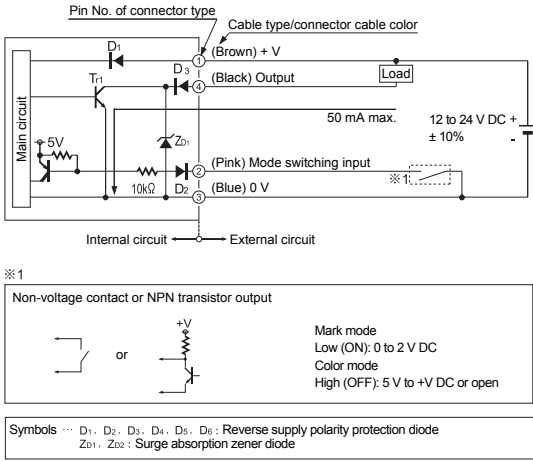
• SPECIFICATIONS

Type		Cable type	Connector type
Model	NPN output	LX-111	LX-111-Z
	PNP output	LX-111-P	LX-111-P-Z
Sensing range		10±3 mm	
Spot size		1×5 mm (at a setting distance of 10 mm)	
Supply voltage		12 to 24 V DC ± 10% / Ripple P-P 10% or less	
Power consumption		850 mW or less (Power voltage 24V, current consumption 35 mA or less)	
Mode switching input		<NPN output type> Mark mode ·Low...0 to +2 V (Source current 0.5mA or less) ·Input impedance: approx. 10 kΩ	<PNP output type> Color mode ·High...+5 V to +V (Sink current 3mA or less) ·Input impedance: approx. 10 kΩ
		Color mode ·High...+5 V to +V or open	Mark mode ·Low...0 to + 0.6V or open
Output		<NPN output type> NPN open-collector transistor ·Maximum sink current: 50 mA ·Applied voltage: 30 V DC or less (between output and 0 V) ·Residual voltage: 1.5 V or less (at 50 mA sink current) (Note 1)	<PNP output type> PNP open-collector transistor ·Maximum source current: 50 mA ·Applied voltage: 30 V DC or less (between output and + V) ·Residual voltage: 1.5 V or less (at 50 mA source current) (Note 1)
		Mark mode: Light ON during light receiving, Color mode: Light ON in consistency	
Output operation Short-circuit protection		Incorporated (Auto reset type)	
Response time		Mark mode: 45 μs or less, Color mode: 150 μs or less	
Operation indicator		Orange LED (light ON when output is ON)	
Protection		IP 67 (IEC)	
Ambient temperature		-10 to + 55 °C (No condensation or icing), Storage: -20 to + 70 °C	
Ambient humidity		35 to 85% RH, Storage: 35 to 85% RH	
Emitting element		Red / green / blue LED (Peak emitting wavelength: 640 nm / 525 nm / 470 nm)	
Material		Enclosure: PBT, Operation key: Silicone rubber, Operation panel: Poly carbonate, Lens: Poly carbonate	
Cable		0.2 mm ² 4-core cabtyre cable (standard length: 2 m)	(Note 2)
Cable extension		Total length can be extended up to 100 m with cable of 0.3 mm ² or more.	
Weight		Net weight: approx. 110 g	Net weight: approx. 50g
		Packing weight: approx. 120 g	Packing weight: approx. 55g

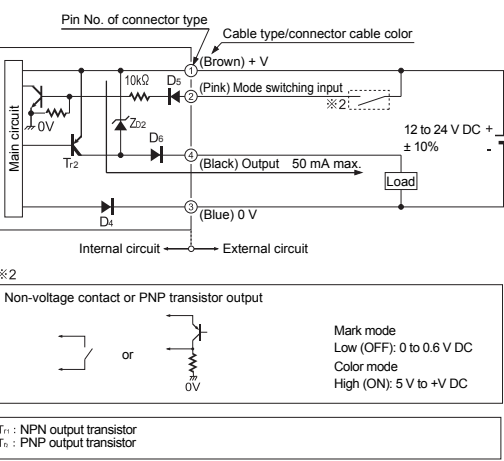
(Note 1): The ambient temperature is + 23 °C where the detection conditions are not specified precisely.
(Note 2): Mating cable is not provided with the connector type. Please order it separately.
CN-24B-C2 (Straight type, 4-core, Cable length: 2 m), CN-24BL-C2 (Elbow type, 4-core, Cable length: 2 m)
CN-24B-C5 (Straight type, 4-core, Cable length: 5m), CN-24BL-C5 (Elbow type, 4-core, Cable length: 5m)

• I/O CIRCUIT DIAGRAMS

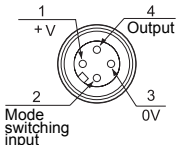
NPN output type



PNP output type



Layout of connector pin for connector type LX-111□-Z



Please contact.....

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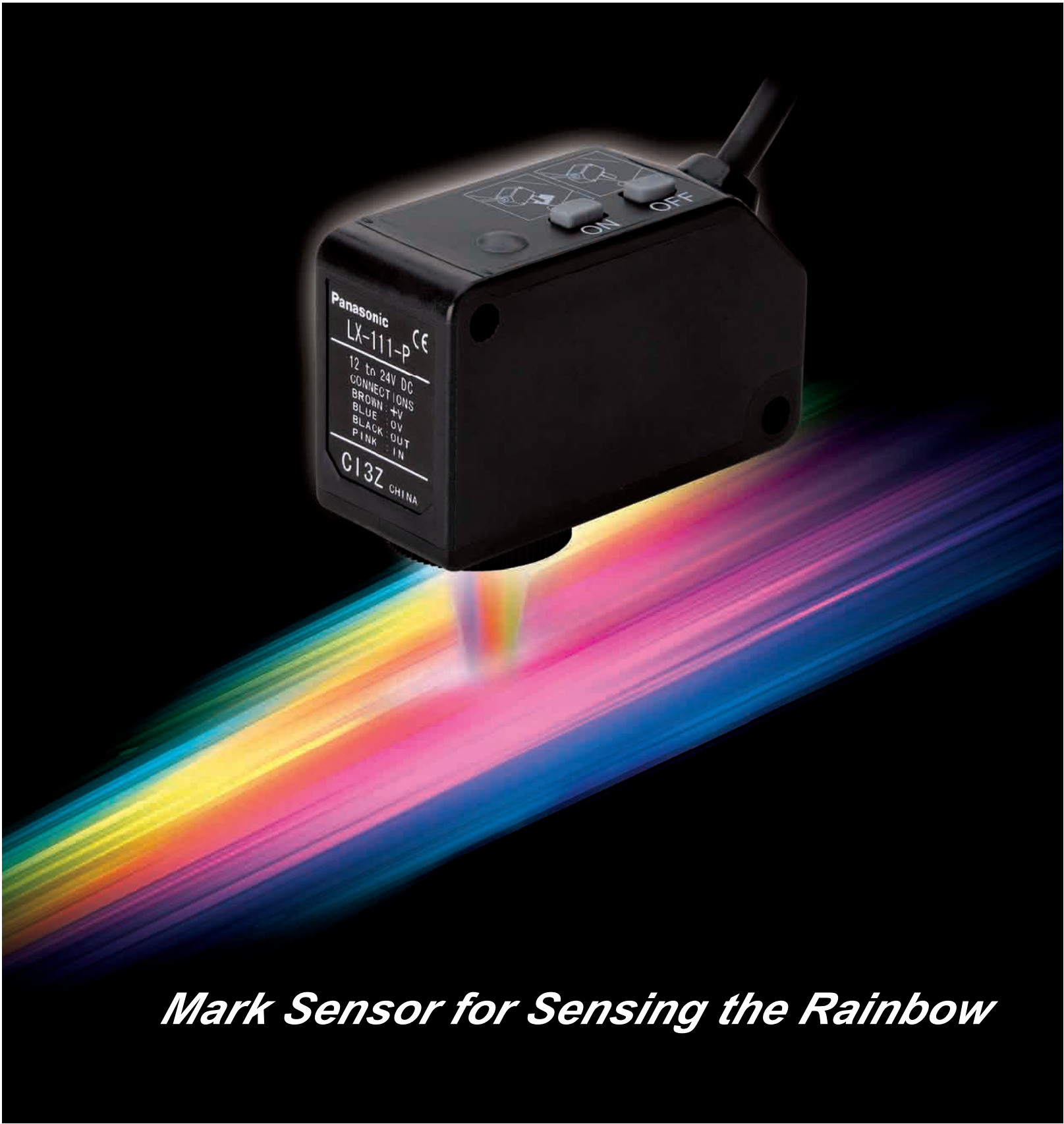
No.CE-LX111 February, 2013

Specifications are subject to change without notice.

Panasonic
ideas for life

NEW
Simple 3 LED Mark Sensor

LX-111



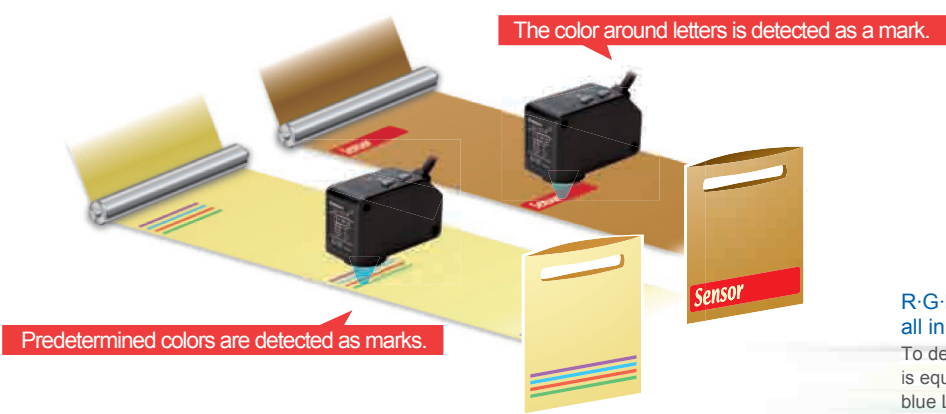
Mark Sensor for Sensing the Rainbow

High - Speed and Ultra - Simple Mark Detection with Two Modes

High Precision

Color mode **High precision discrimination**

Utilizing 3-color (R·G·B) LEDs simultaneously, this mode realizes high precision mark color discrimination by the R·G·B reflective light ratio. This mode also enables effective detection of films with patterns around the mark.



Meeting various requirements of mark detection

Coaxial reflective optical system combined with ultra-slim spot of approximately. 1 mm × 5 mm enables high precision detection.



R·G·B light emitting elements all in one
To detect any marking, this unit is equipped with red, green and blue LED light emitting elements all in one.



A/D converter
Its high resolution ensures high precision mark detection.

Receiving element

Total reflection mirror

Half reflection mirror

Large-diameter lens

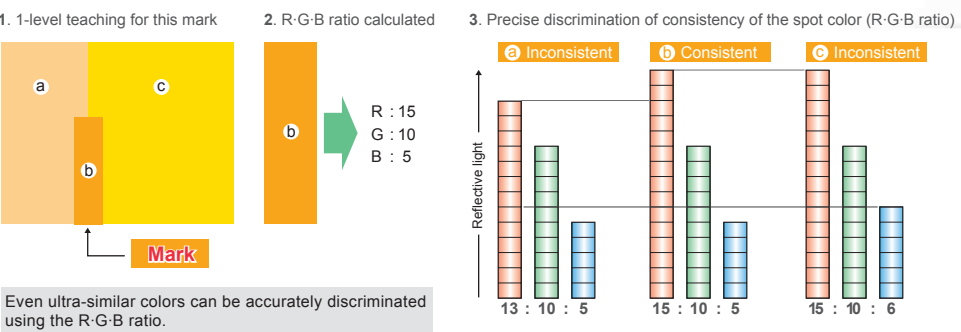
High precision coaxial reflective optical system
Besides the unique coaxial reflective optics technology ensuring high precision detection, it also adopts a superior large-diameter scratchproof lens.

Schematic image

Spot size of approx. 1 mm × 5 mm

High precision mark color discrimination

The color mode on the LX-111 series utilizes all 3-color (R·G·B) LEDs to discriminate the mark color by the R·G·B ratio, which enables high precision judgments. The graphic figure below shows the above-mentioned process.



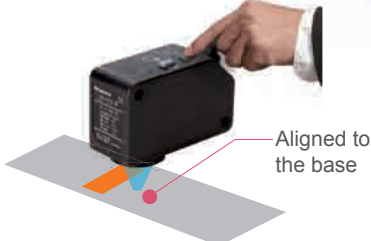
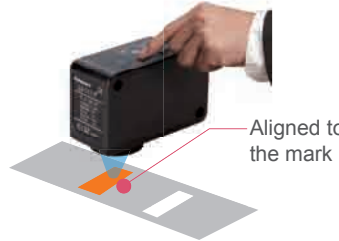
Easy Setting

The setting can be completed easily just by pressing the ON key with the light source aligned to the color to be detected.



Operation indicator ON key OFF key

- 1 Press the ON key with the light source aligned to the mark to be detected
- 2 Press the OFF key with the light source moved away from the set color



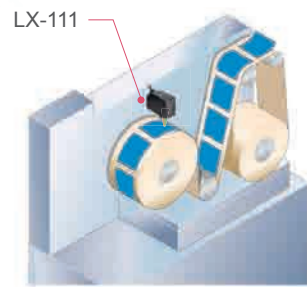
Environment-resistant IP67 Protection Construction

The sensor will not be affected by the water during washing the machines and production line.

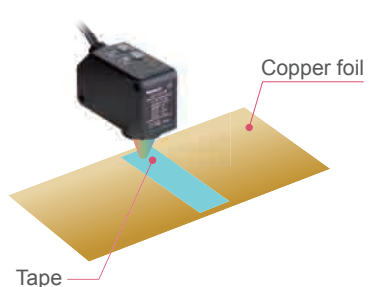


Application

Detection of mark on packaging machine tapes



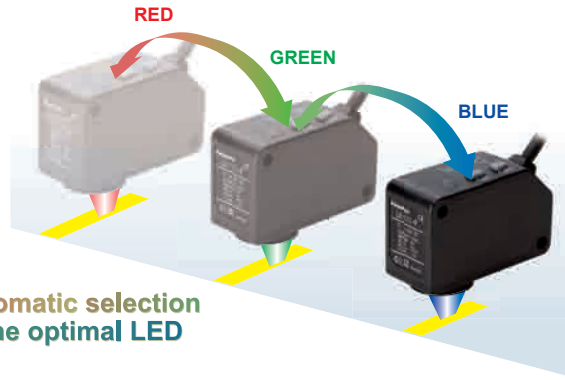
Detection of tapes stuck on copper foils



High Speed

Mark mode **Ultra high-speed response**

This sensing mode enables an ultra high-speed response time of 45 μs by automatically selecting a single color from the 3-color (R·G·B) LEDs, and automatically selects the optimal LED that is most suitable for the sensing by its automatic optimal LED selection function, which is perfect for ultra quick sensing.



Automatic selection of the optimal LED

Automatic optimal LED selection function

This function selects the optimal color from the 3-color (R·G·B) LEDs. Incorporating the "Automatic optimal LED selection function", the mark mode on LX-111 series enables optimal sensing by automatically selecting the LED coming with the largest contrast between the mark and the base (S/N ratio). As this mode automatically selects the LED according to the contrast of reflection of the mark and base instead of the difference between their reflected light amounts, a more stable sensing is ensured.

For the packaging film below, the blue LED will be used to detect the mark for its optimal light amount ratio to ensure a more stable sensing.

Eg. A piece of packaging film

