# Panasonic<sup>®</sup> 使用说明书

# 简易式色标传感器 LX-111系列

执行标准号: Q/320500 SUNX 07

MCE-LX111C No.0047-72V

非常感谢您购买Panasonic产品。

请仔细、完整地阅读此使用说明书以便正确、合理地使用此产品。 请把此使用说明书放在随手可得之处以便快速查找。

## ⚠ 警告

- ●请勿将本产品作为人体保护用的检测装置。
- ●如以人体保护为目的,请使用OSHA、ANSI及IEC等各国适用于人体保

电缆型

## 1 主要规格

类

ተዛ			3	è	电规型	连接空	
型号		NPN输出		前出	LX-111	LX-111-Z	
项目 PNP输出		斯	LX-111-P-Z				
检	测	跙	i	离	10 ± 3 mm		
电	源	电	Į.	压	12~24V DC±10%	脉动 P-P 10%以下	
消耗电量			1	量		)mW以下 消耗电流 35mA以下)	
模式切换输入				λ	<npn输出型> 色标模式 Low(ON): 0~2V DC 流出电流 0.5mA以下 输入阻抗 约10kΩ 彩色模式</npn输出型>	<pnp輸出型> 彩色模式 High(ON): 5V~+V DC 流入电流 3mA以下 輸入阻抗 约10kΩ 色标模式</pnp輸出型>	
						Low(OFF): 0~0.6V DC 或 开放	
输 出			i	田	<npn輸出型> NPN开路集电极晶体管 *最大流入电流:50mA •外加电压:30V DC以下 (输出和0V之间) •剩余电压:1.5V以下 [流入电流50mA时](注1)</npn輸出型>	(输出和+V之间)	
输 出 操 作		作	色标模式:色标检出时ON 彩色模式:一致时ON				
Ī	短	路	保	护	配备(自	动恢复)	
反	应	时	t	间	色标模式: 45µs以下、	彩色模式:150µs以下	
エ イ		态 指	示	灯	橙色LED (输出ON时灯亮)		
保	护	构	]	造	IP67(IEC)		
使	用环	境	温	度	-10~+55°C(不可结露,结次	k)、保存时: -20~+70℃	
使	用环	境	湿	度	35 ~ 85%RH、保存	时: 35~85%RH	
投	光	元	;	件	红色/绿色/蓝色 复合LED (投光波峰波长: 640nm/525nm/470nm)		
材				质	外壳: PBT 操作按钮: 硅胶	操作面板: PC 透镜: PC	
					0.2mm <sup>2</sup> 4芯橡皮电缆 标准长 2m	(注2)	
电	缆		缆	区分(配色) 褐色:+V 蓝色:0V 黒色:输出 粉红色:模式转换输入	区分(连接器针号) 1:+V 2:模式转换输入 3:0V 4:输出		
					延长0.3mm² 以上的电缆	t,全长可延长至100m	
				量	本体重量: 约110g	本体重量:约50g	

(注1): 指定的测量条件: 周围使用温度+23℃。

(注2): 连接器型不附带电缆。请务必另行订购连接器型用连接电缆。 CN-24B-C2(直线型、4芯、电缆长2m) CN-24BL-C2(弯曲型、4芯、电缆长2m) CN-24B-C5 (直线型、4芯、电缆长5m) CN-24BL-C5 (弯曲型、4芯、电缆长5m)

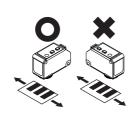
# 2 注意事项

- 本产品是以工业环境使用为目的所开发、制造的产品。
- 请确认在电源关闭状态下进行接线。
- 注意错误接线可能损坏传感器。
- 请确认电源电压在额定范围内变化。
- 请勿附加超过额定范围的电压或直接连接到交流电源,可能会损坏或 烧毁传感器。
- 如果该产品附近使用产生噪音的设备,如开关调节器、转换发动机等, 请将设备机架接地端子(F.G)接地。
- 如果电源由一商用开关调节器提供,请确保电源机架接地端子(F.G)接地。
- 电源接诵后的短时间0.5s内, 请勿使用。
- 负荷的短路或配线连接错误可能会导致机器的损坏或烧毁,请注意。
- 请勿与高压线或电源线一起或在同一电线管内运行线路,这可能会由于 感应引起失灵。

- 请勿将传感器直接暴露于快速启动灯或高频照明设备的受光及太阳光等 的下面,这样会影响检测性能。
- 请勿用手直接触摸传感器的透镜,如果透镜弄脏,要用柔软的布轻轻地 擦拭。
- 当透镜内部不清晰时,请把透镜取下加以清扫。
- 用于连接器型为LX-111□-Z的电缆,请务必使用另售的带连接器电缆。
- 延长电缆(0.3mm<sup>2</sup>以上)总长不超过100m。为减少噪音,使接线尽 可能短.
- 本传感器仅适用于室内使用。
- 避免灰尘、污垢、水蒸气或腐蚀性气体。
- 请勿将传感器与水、油、油脂或有机溶液, 如稀释剂等直接接触。
- 请勿在电缆根部分勉强弯曲或加上压力,如76N以上的张力等。
- 本传感器不可在有易燃性易爆气体的环境下使用。
- 不可拆卸或改造传感器。

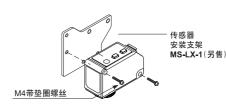
## 3 安装

● 对检测物体的移动方向,请注意传感器的安装方向。

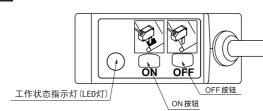


如图方向的检测方 法,动作会变得不 稳定, 所以要尽量 避免。

● 紧固扭矩应在0.8N·m以下。

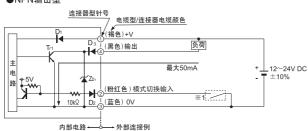


# 4 部件名称



# 5 1/0电路图

●NPN输出型



●PNP输出型 连接器型针号 电缆型/连接器电缆颜色 (褐色)+V (粉红色) 模式切换输入







D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub>, D<sub>4</sub>, D<sub>5</sub>, D<sub>6</sub>: 反向电源极性保护二极管 Z<sub>D1</sub>, Z<sub>D2</sub>: 电流吸收齐纳二极管 PNP输出晶体管

#### ●连接器型LX-111□-Z的连接器针位置



## 6 教导方法

在进行教导设定之前,一定要确认色标模式或彩色模式的设定。



GOOD → ● 売约 2s后 RUN

ERR ——▶ ■ LED 灯快速闪烁,约5s后熄灭 RUN

(注):当ERR时,请再次进行教导操作。如果没有重新教导, 将使用上一次教导的结果运行



② 能稳定的检测时GOOD,不能稳定的检测时ERR。



## 将使用上一次教导的结果运行。 7 色标模式感度调节

当检测不稳定时通过感度调节功能

可改变产品内部对入光量的判断(即阈值调节)。

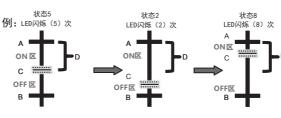
◆ 感度调节功能的几种状态

状态	数值	LED灯(闪灯次数X)
1	C = C - D*80%	1
2	C = C - D*60%	2
3	C = C - D*40%	3
4	C = C - D*20%	4
5(注1)	C = C	5
6	C = C + D*20%	6
7	C = C + D*40%	7
8	C = C + D*60%	8
9	C = C + D*80%	9

注1:产品出厂设定状态、即教导后LX-111产品的状态。

- 注2: C 值为阈值;
- D 值为色标(A)与背景标(B)入光量的计算值。
- ◆ 感度调节功能示意图

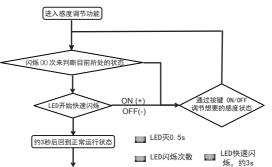
进入感度调节功能后,如不进行任何操作,LED灭0.5S后, 闪烁(X)次,闪灯次数,表示当前产品所处的状态。



• A、B、C、D 为入光量

- 注: A 值为色标的入光量 B 值为背景标的入光量
- ◆ 感度调节功能进入及操作方法
- ·在正常运行状态下,为了便于观察,请在LED灭的状态下, 先按一次OFF键,再长按ON键不放,约6秒后,LED灯亮, 松开ON键,即可进入感度调节功能。
- 进入感度调节功能后,按ON键(+)和OFF键(-)可以调节感度
- 调整完后, 无需再导教, 可直接开始检测。

◆ 感度调节功能的操作和 LED 的表示



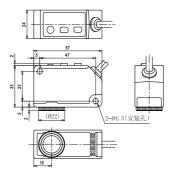
## 8 关于错误信息提示

● 出现错误信息时,按如下方法来处理。

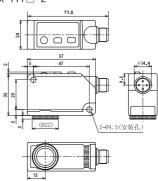
工作状态指示灯(LED灯)	错误信息内容	处理
LED灯一直快速闪烁,	负荷发生了短路,	关闭电源后,
不会自动熄灭。	过电流通过。	检查负荷。

# 9 外形尺寸图(单位: mm)

● 电缆器型/LX-111□



● 连接器型/LX-111□-Z



## 10 产品中的有毒有害物质或元素的名称及含有量 (电子信息产品污染控制要求)

	有毒有害物质或元素					
部件名称	铅 (Pb)	镉 (Cd)	6价铬 (Cr6+)	水银 (Hg)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
实装电路板	×	0	0	0	0	0
外装部件(※)	×	0	0	0	0	0
其他	0	0	0	0	0	0
○:表示该有毒有害物质在该部件所有均质材料中的含量均在《电子信息产品中有毒有害物质度要求》标准规定的限量要求以下。 ×:表示该有毒有害物质至少在该部件的某一均质材料中的含量超出《电子信息 产品中有毒有害物质限度要求》标准规定的限量要求。						

(10)

配线用螺丝、端子、安装支架等零件。 <批号含义> AC1N(2010年3月生产) - 月[A(1月)、B(2月)、C(3月)・・・・・L(12月)]

— 西历[A(\*0年)、B(\*1年)、C(\*2年)・・・・・J(\*9年)]

制造商: 松下神视电子(苏州)有限公司

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My Thip/nevice-parasonic.clinactor 地址:中国(上海)自由贸易试验区马吉路88号7、8号楼二层全部位 客服中心 客服热线:400-920-9200 传真:800-820-7185 在中国印刷 © Panasonic Industrial Devices SUNX Suzhou Co., Ltd. 2014

# Panasonic® INSTRUCTION MANUAL

## **Basic Mark Sensor LX-111 Series**

### **⚠** WARNING

 Never use this product as a sensing device for personnel protection. ■ In case of using sensing devices for personnel protection, use products which meet standards, such as OSHA, ANSI or IEC etc., for personnel

protection applicable in each region or country

## 1 SPECIFICATIONS

	Type	Cable type	Connector type	
	NPN output	LX-111 LX-111-Z		
Item No.	PNP output	LX-111-P	LX-111-P-Z	
Sensing dist	ance	10 ± 3mm		
Supply volta	ge	12 to 24V DC±10% Ripple P-P10% or less		
Power consu	umption	850mW or less (Power voltage 24V, Current consumption 35mA or less)		
Mode switch	ing input	NPN output type> Color Mode Low (ON): 0 to 2V DC Source current 0.5mA or less Input impedance 10kΩ approx. Mark mode High (OFF): 5V to +V DC, or oper		
Output		<npn output="" type=""> NPN open-collector transistor Max. sink current: 50mA (Note 1) Applied voltage: 30V DC or less (between output and 0V) Pesidual voltage: 1.5V or less [at 50mA (Note 1) sink current]</npn>	<pnp output="" type=""> PNP open-collector transistor Max. source current: 50mA (Note 1) Applied voltage: 30V DC or less (between output and +V) Residual voltage: 1.5V or less [at 50mA (Note 1) source current]</pnp>	
Output operation		Mark mode: When mark detection ,ON. Color mode: Coincidence-ON		
Short-circuit protection		Incorporated(Auto reset)		
Response tir	ne	Mark mode: 45 μ s or less, Color mode: 150 μ s or less		
Operation in	dicator	Orange LED(Light on when output is ON)		
Protection		IP67 (IEC)		
Ambient tem	perature	-10 to +55°C (No dew condensation or icing allowed), Storage: -20 to +70°C		
Ambient hun	nidity	35 to 85% RH, Storage: 35 to 85% RH		
Emitting eler	nent	Red / green / blue LED (Emitting wavelength : 640nm / 525nm / 470nm)		
Material		Enclosure: PBT		
Cable		0.2 mm² 4-core cabtyre cable, 2m long	(Note 2)	
		Division: Color code of cable Brown: +V Blue: 0V Black: Output Pink: Mode switching input	Division: Terminal No. of Connector 1:+V 2: Mode Switching input 3:0V 4:Output	
Weight		Net weight : Approx.110g Packing weight: Approx.120g	Net weight : Approx.50g Packing weight: Approx.55g	

Notes: 1) Measurement conditions ,around Using temperature +23°C

2) The connecting cable is not supplied as an accessory for the connector type LX-111 □-Z. Make sure to use the optional cables with connector below: CN-24B-C2 (Straight type, 4-core, Cable length: 2m) CN-24BL-C2 (Elbow type, 4-core, Cable length: 2m) CN-24BL-C5 (Straight type, 4-core, Cable length: 5m) CN-24BL-C5 (Elbow type, 4-core, Cable length: 5m)

# 2 CAUTIONS

- This product has been developed / produced for industrial use only.
- Make sure to carry out wiring in the power supply off condition.
- Take care that wrong wiring will damage the sensor
- Verify that the supply voltage variation is within the rating.
- Take care that if a voltage exceeding the rated range is applied, or if an AC
- power supply is directly connected, the sensor may get burnt or damaged. • In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- Do not use during the initial transient time (0.5 sec.) after the power supply is switched on.
- Take care that short-circuit of the load or wrong wiring may burn or damage the sensor. • Do not run the wires together with high-voltage lines or power lines or put
- them in the same raceway. This can cause malfunction due to induction. • Take care that the sensor is not directly exposed to fluorescent light from a rapid-starter lamp or a high frequency light device or sunlight
- etc., as it may affect the sensing performance. Do not touch the lens of the sensor by hand directly. If the lens becomes dirty, wipe it off with a soft cloth gently.
- When the inside lens is steamed up, unscrew the lens to get rid of the condensation. ● For **LX-111** □ **-Z**, be sure to use the optional cable with connector.
- Extension up to total 100m is possible with 0.3mm<sup>2</sup>, or more, cable.
- However, in order to reduce noise, make the wiring as short as possible.
- This sensor is suitable for indoor use only. Do not use this sensor in places having excessive vapor, dust, etc., or
- where it may come in direct contact with water, or corrosive gas. • Take care that the product does not come in contact with water, oil, grease, or organic solvents, such as, thinner, etc.

- Make sure that stress by forcible bend or pulling with 76N, or more, force is not applied to the sensor cable joint.
  - This sensor cannot be used in an environment containing inflammable or explosive gases.
  - Never disassemble or modify the sensor.

## 3 MOUNTING

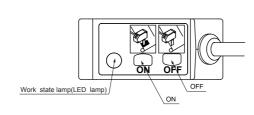
 Care must be taken regarding the sensor mounting directrion with respect to the object's direction of



The tightening torque should be 0.8N m or less.

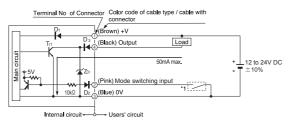


## **4** PART DESCRIPTION

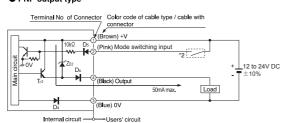


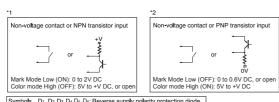
# 5 I/O CIRCUIT DIAGRAMS

#### NPN output type

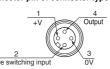


#### ● PNP output type



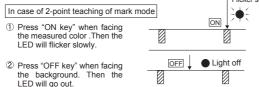


#### ● Layout of connector pin of connector type LX-111 □-Z



# 6 TEACHING METHODS

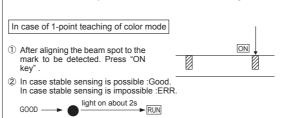
Before performing the Teaching, be sure to confirm the setting of Flicker slowly



3 The threshold value is set at the mid-value between the step 1 and 2 In case stable sensing is possible : Good. In case stable sensing is impossible : ERR



Note: When the system is in the state of ERR, please run Teaching again otherwise the system will use the last results of teaching.



Note: When the system is in the state of ERR, please run Adjust Mode again. otherwise, the system will use the last results of adjusting

The LED will flicker quickly

### The Make Mode 'Gain' Function

ERR About 5s later,go out.

While sensing is unstable, the judgments to the reflected light variation

#### ◆Several conditions of the 'Gain' function

Conditions	Values	LED's twinkle times
1	C = C - D*80%	1
2	C = C - D*60%	2
3	C = C - D*40%	3
4	C = C - D*20%	4
5(Note1)	C = C	5
6	C = C + D*20%	6
7	C = C + D*40%	7
8	C = C + D*60%	8
9	C = C + D*80%	9

Note 1 : Factory Setting Condition (Which is the condition before

the adjustment of the 'Gain' function.)

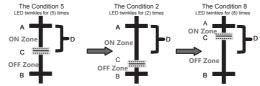
Note 2: Value C stands for the threshold value;

Value D stands for the reflected light variation between the mark(A) and the base(B).

#### ◆ The 'Gain' Function

When the 'Gain' begins, the sensor is in the corresponding condition with the LED's twinkle times(X) after the LED is off for 0.5s without any operations.

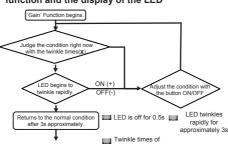
#### Example:



A. B. C. D mean the value of the reflected light variation Note: Value A stands for the reflected light variation of the mark; Value B stands for the reflected light variation of the base.

#### ◆ The operation of the 'Gain' function

- $\cdot$  For a better observation, please press the button OFF for one time at the normal condition when the LED is off, and then press the button ON along for approximately 6s until the LED is on. And now, the 'Gain' function
- After the 'Gain' function begins, you may adjust the conditions of the 'Gain' by the button ON/OFF.
- · It is not necessary to teach again after the adjustment and the sensor can be used immediately
- ◆ The adjustment of the 'Gain' function and the display of the LED

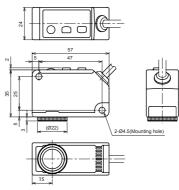


## 8 ERROR DISPLAY

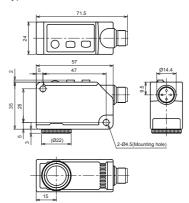
- 1	Take measurment for the error as shown below.								
	Work state lamp (LED lamp)	Error content	Remedy						
	LED lamp have been fast scintillation,will not be put out	Shorten the load and flows overcurrent	Turn off the power supply and check the load.						

# 9 DIMENSIONS (Unit: mm)

● Cable type / LX-111□



■ Connector type / LX-111 □-Z



# **10** INTENDED PRODUCTS FOR CE MARKING

● The models listed under "1 SPECIFI-CATIONS" come with CE Marking. As for all other models, please contact our office.

#### Contact infomation for CE

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