OSM47 series Color Sensor

Product features:

Diffused(BGS)

- ※ **Support two-way switch output,NPN/PNP can be set.,**
- ※ **Button setup**
- ※ **OLED digital display, clear and bright**
- ※ **Full Metal Jacket is durable and has better protection performance.**
- ※ **Compact and integrated body design, supporting IO-Link.**
- ※ **Support three detection modes, and detect up to 15 colors at the same time.**

TYPE	Measurement range	Light source	Output	Difference frequency number·	Connection	Wiring
OSM47-CK500C2B6*M	30 ...500mm	White LED	NPN/PNP optional	2	2m Cable	Fig.1
OSM47-CK500C2B6Q12.1	30 ...500mm	White LED	NPN/PNP optional	2	M12 Connector	Fig.2
OSM47-CK500C2B6/IO*M	30 ...500mm	White LED	NPN/PNP optional +IO/Link	2	2m Cable	Fig.1
OSM47-CK500C2B6Q12.1/IO	30 ...500mm	White LED	NPN/PNP optional +IO/Link	2	M12 Connector	Fig.2
OSM47-CK500C2B6/WT	30 ...500mm	White LED	NPN/PNP optional	2	2m Cable	Fig.1

Technical Specification

Power supply	10...30VDC±10% Including pulse fluctuation 0.5V(P-P)
Power Consumption	<1.56W
Light source	White LED
Control output*2	2*NPN/PNP optional
communication mode	IO_Link(model/IO is applicable)
Difference frequency number	Different frequency can be set, Maximum number of two
sample time	200us/1ms/10ms/500ms①
Circuit protection	Short-circuit protection Reverse polarity protection Over-load protection

Input externally	1 channel can be used to trigger external
Beam diameter	Adjustable spot Approx.ϕ3.5mm@100mm; Approx.ϕ9mm@250mm; Approx.ϕ18mm@500mm
Load current	65mA at 24VDC
Switch mode	N.O./N.C. switchable
Connections	M12 Connector/Cable
withstand voltage	650V/AC/ 50/60Hz 60s
Insulation impedance	≥20MΩ（500VDC）

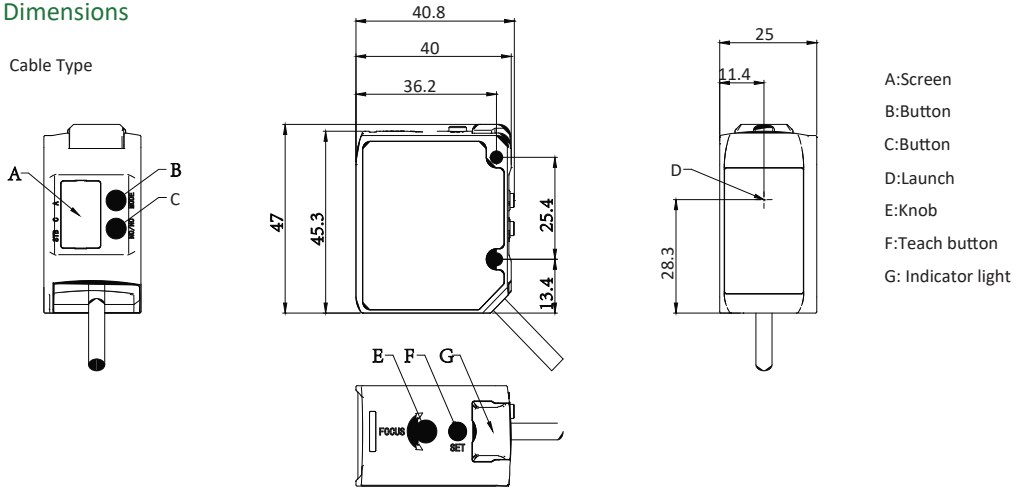
① When setting different frequencies, Response time delayed by approximateiy 20%。siower At 200us, the corresponding switching frequency is 2.5khz 1ms corresponds to a switching frequency of 500Hz, 10ms corresponds to a switching frequency of 50Hz, 100ms corresponds to a switching frequency of 5Hz , ang 500ms corresponds to a switching frequency of 1Hz

OSM47 series Color Sensor

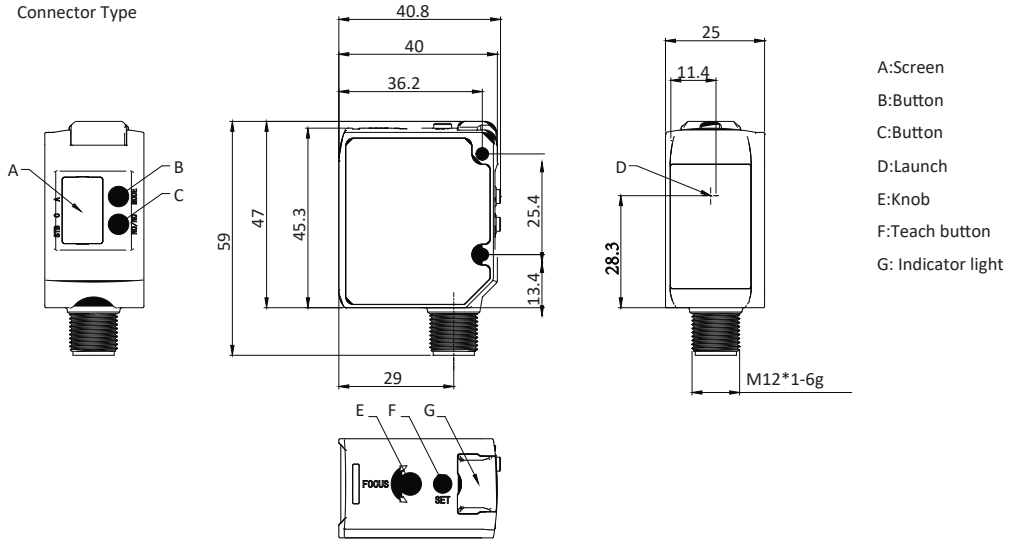
Anti-ambient light ability	Incandescent lamp: below 10000Lux; Sunlight:below 20000Lux	**Vibration resistance**	complex amplitude 1.5mm 10...50Hz (X,Y,Z direction 2 hours each)
Housing material	die-casting zinc	**shock resistance**	500m/s(50G)X,Y,Z three times each
Storage temperature	-40°C...+70°C	**Protection structure**	IP67
Operation temperature	-20°C...+50°C	**Dimensions**	40.8*47*25mm

Dimensions

Cable Type



Connector Type



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1.产品特性:

Diffused(BGS)

- 支持2路开关量输出，PNP/NPN；按键设置
- 支持2种颜色同时检测
- OLED数码显示，清晰明亮
- 紧凑尺寸一体化机身设计，支持IO-Link
- 支持三种检测模式，最多同时检测15种颜色

2.产品型号:

型号	检测距离	光源	输出方式	差频数量	连接方式	接线图
OSM47-CK500C2B6*M	30 ...500mm	白色LED	NPN/PNP可选	2台	线缆	图1
OSM47-CK500C2B6Q12.1	30 ...500mm	白色LED	NPN/PNP可选	2台	M12接插件	图2
OSM47-CK500C2B6/IO*M	30 ...500mm	白色LED	NPN/PNP可选 +IO/Link	2台	线缆	图1
OSM47-CK500C2B6Q12.1/IO	30 ...500mm	白色LED	NPN/PNP可选 +IO/Link	2台	M12接插件	图2
OSM47-CK500C2B6/WT	30 ...500mm	白色LED	NPN/PNP可选	2台	线缆	图1

注1)：*M表示线缆长度，单位米，型号中无*M默认线缆长度为2米。

3.技术参数

供电电压	10...30VDC±10% 包括脉冲波动0.5V(P-P)	**外部输入**	1路可用于外部触发
功率	<1.56W	**光斑直径**	可变光点 约ϕ3.5mm@100mm; 约ϕ9mm@250mm; 约ϕ18mm@500mm
光源	白色LED		
2路控制输出	2*NPN/PNP可选	**负载电流**	24VDC时 65mA
通讯方式	IO_Link(型号/IO适用)	**开关模式**	N.O./N.C.可切换
差频数量	可设定不同频率，最多2台	**连接形式**	M12连接器 /线缆
采样时间	200us/1ms/10ms/500ms ①	**耐电压**	650V/AC/ 50/60Hz 60s
保护回路	反极性保护、短路保护， 过载保护	**绝缘阻抗**	≥20MΩ（500VDC）

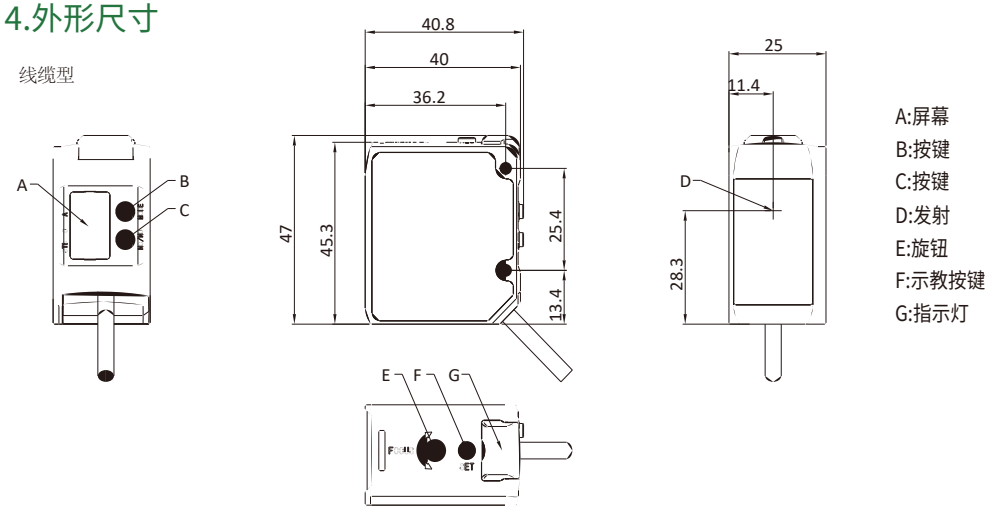
①.设置不同频率时，响应时间大约延迟20%，200us时对应开关频率2.5KHz，1ms时对应开关频率500Hz，10ms时对应开关频率50Hz，100ms时对应开关频率5Hz，500ms时对应开关频率1Hz。

OSM47系列颜色传感器

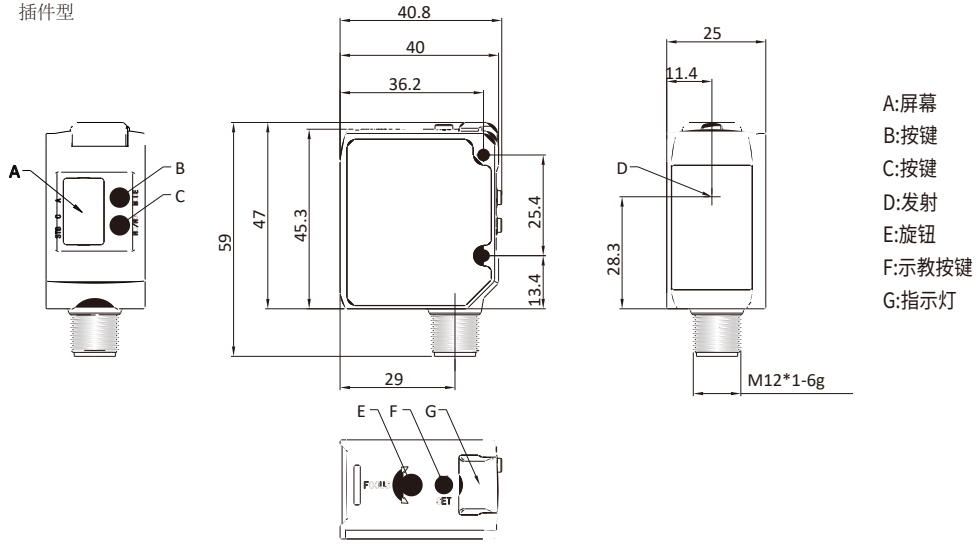
抗环境光能力	白炽灯：10000Lux以下 阳　光：20000Lux以下	**耐振动**	复振幅1.5mm10...50Hz （X,Y,Z方向各2小时）
材质	外壳：　压铸锌	**耐冲击**	500m/s(50G)X,Y,Z各3次
环境温度	-40°C...+70°C	**防护等级**	IP67
工作温度	-20°C...+50°C	**外型尺寸**	40.8*47*25mm

4.外形尺寸

线缆型



插件型



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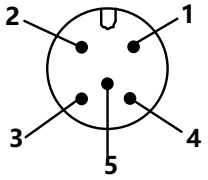
5 .Interface definition and wiring diagram

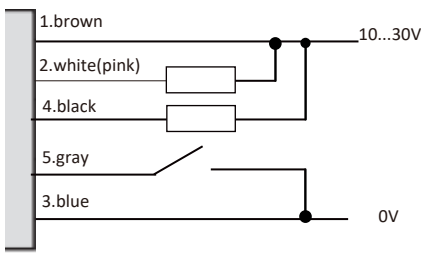
	Function	Cabel product core color	Plug-in product line sequence
1	Positive power supply	Brown	Brown
2	NPN/PNP 1	Pink	White
3	Power negative	Blue	Blue
4	IO/Link	Black	Black
5	External input Settings	Gray	Gray



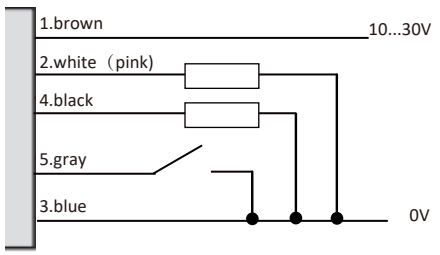
Either an NPN or a PNP output can be selected during the initial setup of this product.
Independently insulate any unused I/O wires.

Load(input device)

When NPN output is selected



When PNP output is selected

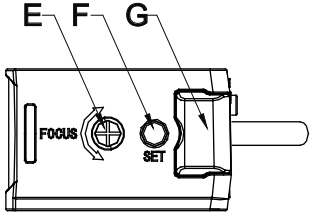


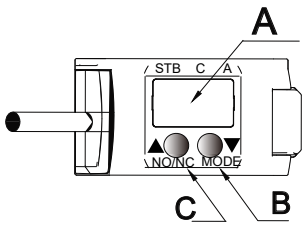
6 .Instructions

6.1 Part Functions

E： Adjust the dot diameter knob, refer to 6.3
F:SET button, adjust the sensitivity of the method is different, the operation method is also different, refer to 6.6

A Function Indicators
STB: Illuminates green when receiving stable light
C: Illuminates green when using C/C+I mode
A: Illuminates green when using C+I/Super I mode





G:status indicator light

C ▲Button
- Press (1s or less) Adjusts setting value
- Hold (3s or more) Switches between N.O./N.C.

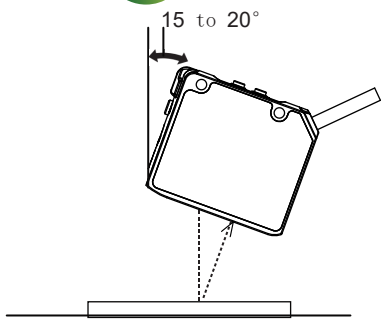
B ▼Button
- Press (1s or less) Adjusts setting value
- Hold (3s or more) witches to the setting screen

OSM47 series Color Sensor

6.2 Installation

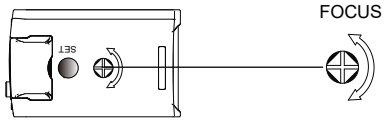
- Tightening torque for the mounting holes: 0.63 N·m (M3 screw)
- If the workpiece contains a glossy surface that could interfere with stable detection, tilt the sensor approx. 15° to 20°. If tilting the sensor does not improve detection.

- High-frequency light, such as that from an inverter fluorescent lamp, entering the receiver directly or after reflecting from the workpiece may lead to malfunctions. In this situation, implement countermeasures such as installing a light shielding plate or changing the product's installation position.



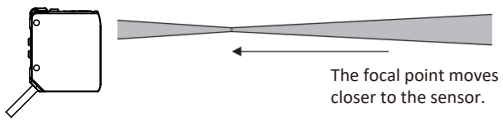
6.3 Adjusting the Spot Diameter

Use the dial on the side of the sensor to adjust the spot diameter.



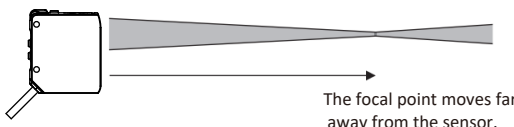
NOTICE:Dial turning torque:0.2 N · m or less

Turn the dial to the right to decrease the focal distance.



The focal point moves closer to the sensor.

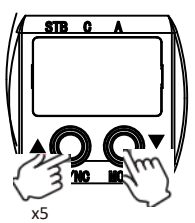
Turn the dial to the left to increase the focal distance.



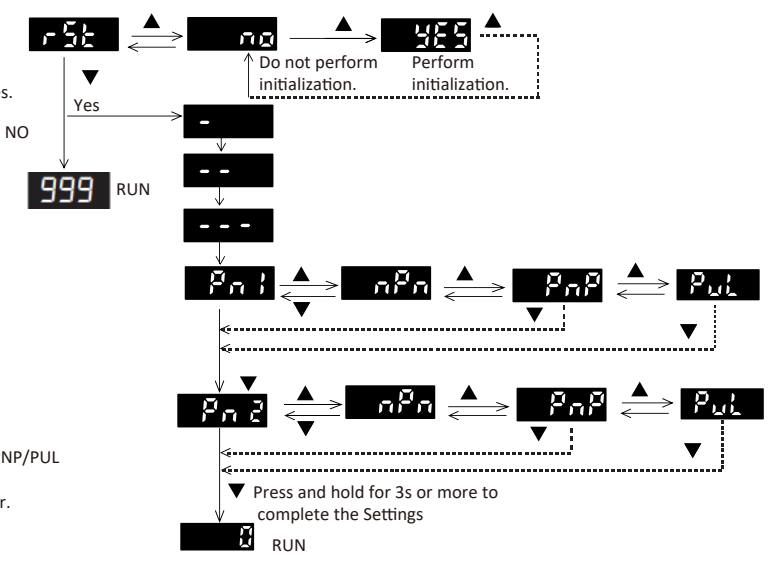
The focal point moves farther away from the sensor.

6.4Initialization&Initial Settings (NPN/PNP/PUL Selection)

When the power is turned on for the first time after purchase, or initialization is performed, the initial setting (NPN/PNP/PUL selection) is required as shown below.



While pressing the [▼]button, press the [ ]▲ button five times.



After the initial setup is complete,"NPN/PNP/PUL selection"setting cannot be changed.
To change this setting, initialize the sensor.

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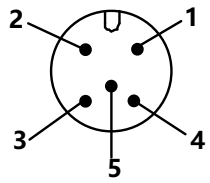
Page 2

5.接口定义和接线图

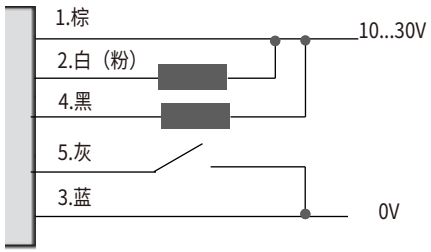
	功能	出线式线芯颜色	插件式线序
1	电源正	棕	棕
2	NPN/PNP 1	粉	白
3	电源负	蓝	蓝
4	IO/Link	黑	黑
5	外部输入设置	灰	灰



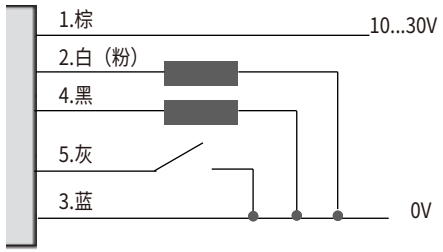
本产品在初始设定时可以选择NPN/PNP输出。请对不使用的输入/输出线单独进行绝缘处理。

负载（输入设备）

选择NPN 输出时



选择PNP 输出时

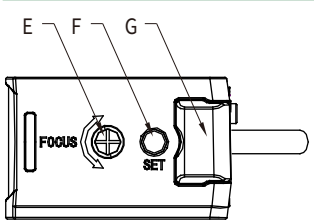


6.使用说明

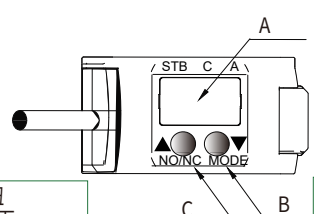
6.1 指示及按键说明

E：调整光点直径旋钮，具体参考6.3
F：SET按钮，调整灵敏度的方法不同，操作方法也不同，具体参考6.6

A：指示灯状态
STB:稳定入光时亮绿灯
C: C/C+I 模式时亮绿灯
A: C+I/超级I模式动作时亮绿灯



G:状态指示灯



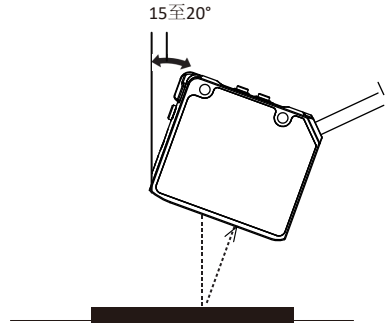
C： ▲ 按钮
- 1s以下 变更设定值
- 3s以上 切换N.O./N.C.

B： ▼ 按钮
- 1s以下 变更设定值
- 3s以上 进入设定画面

OSM47系列颜色传感器

6.2 设置

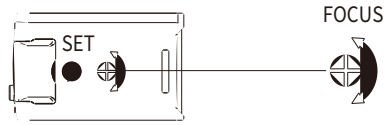
- 安装孔的紧固扭矩：0.63 N.m(M3螺丝)
- 检测不稳定时，可能是检测目标有光泽。这种情况下，请将传感器倾斜斜约15至20°。



- 关于环境光
如果变频器荧光灯等高频亮灯方式的灯光直接进入或反射到检测目标上以后再进入接收部，有可能发生误动作。这种情况下，请采取安装遮光板或更改安装位置等措施。

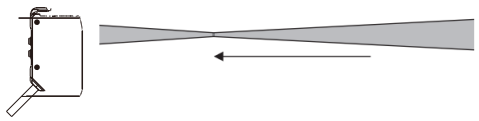
6.3调整光点直径

可以用侧面的旋钮调整光点直径

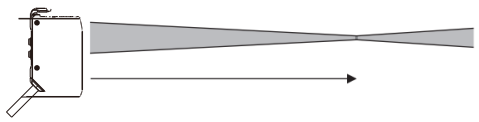


注意：调整旋钮时的扭矩：0.2N.m以下

向右侧转动则焦点距离变近。

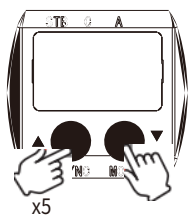


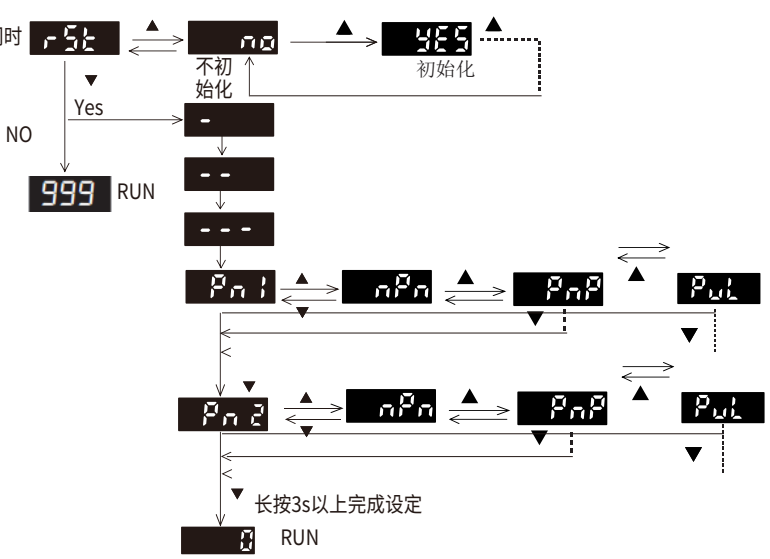
向左侧转动则焦点距变远。



6.4初始化和初始设定（NPN/PNP/PUL选择）

购买本产品后首次接通电源时及执行初始化时，应进行初始设定（NPN/PNP/PUL选择）





初始设定完成后，将无法再变更“NPN/PNP/PUL选择”的设定。
若要变更，需再次执行初始化。

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第2页

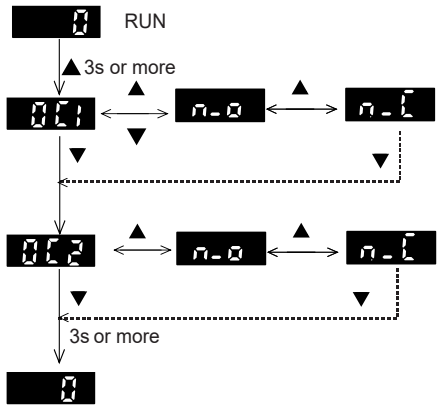
6.5 Basic Settings

6.5.1 Output Logic Selection(N.O./N.C. Selection)

Set the output logic to N.O. or N.C..

- n_o (Lon) Turns the output on when the registered condition is met (turns the output on when light is received)
- n_C (doN) Turns the output on when a condition other than the registered condition is met (turns the output on when light is not received)

* The condition within parentheses indicates the condition when super I mode is selected.



6.5.2 Detection Mode

This sensor contains four detection modes.

Detection mode	Explanation
Auto(default)	When adjusting the sensitivity, the optimal mode is automatically selected between C+I or C.
C+I mode	Detection is performed according to the color components (R, G, B) and illumination (the received light intensity).
C mode	Detection is performed according to the color components (R, G, B) only.
Super I mode	Detection is performed according to the illumination (the received light intensity) only.

6.6 Sensitivity Adjustment

6.6.1 Auto/C+I/C Mode

About the display value

*Conformity

The level of conformity of the current detected workpiece to the registered reference workpiece.

Display range: 0 to 999 (The more the workpiece conform to reference workpiece, the higher the value.)

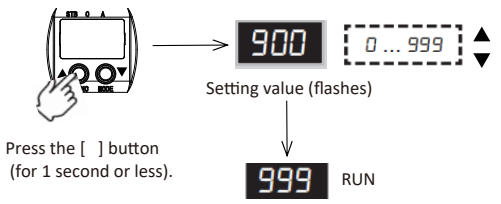
* Setting value

The threshold of conformity at which a workpiece is judged to be the same as the registered workpiece.

To check or manually make fine adjustments to the setting value,see “Checking and adjusting the setting value”.

Checking and adjusting the setting value

When a larger setting value is in place, the detection tolerance is tight.



※The blinking numeric value that appears after calibration is the setting value.

※ After master calibration or master addition calibration has been executed, the setting value cannot be increased.

OSM47 series Color Sensor

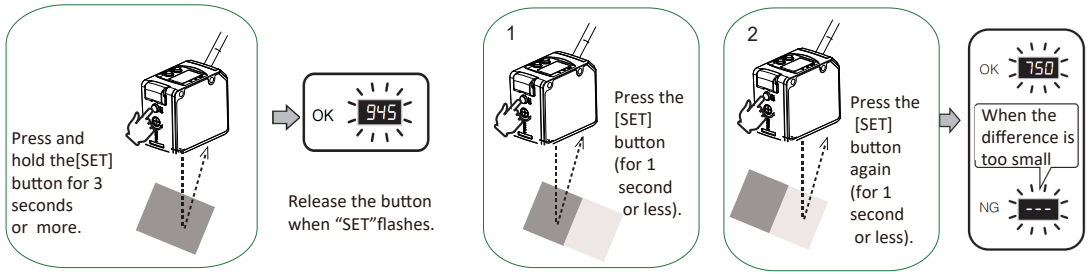
Setting the sensitivity (apply one of the following three methods)

1-point calibration (use to detect 1 specific color)

Register the color of the workpiece to be detected.
(When Auto mode is used, this function operates in C+I.)

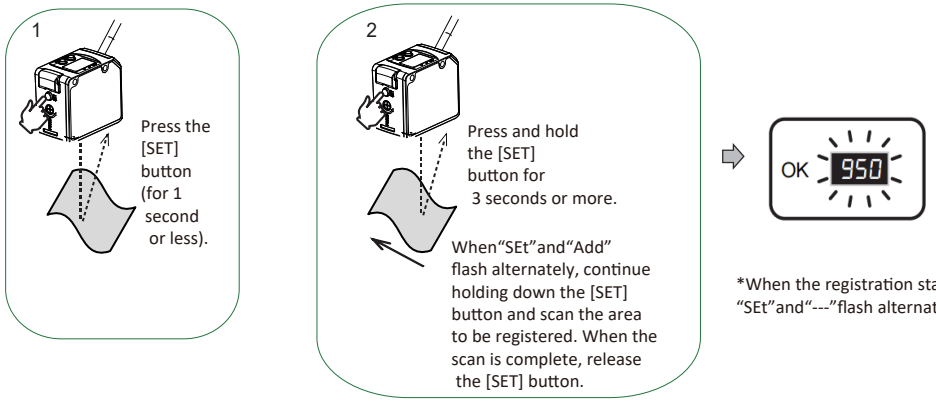
2-point calibration (use to differentiate between 2 colors)

Register the color of the reference workpiece and the color to be differentiated.
(The first point is used as the reference color.)



Master calibration (use to permit color variations within the same workpiece)

Press the [SET] button to register the reference color. Then, press and hold the [SET] button to perform sampling. During sampling, references are added and are set to be judged as the same color. When a reference is added, the indicator flashes (once) in green.When master calibration is executed, the setting value becomes 950(default). To change this value, see “7.8 Master Calibration Set Value” . (When Auto mode is used, this function operates in C+I.)



*When the registration state is saturated, “SEt”and“---”flash alternately.

< Precautions for master calibration>

- Continue calibration until the green light that indicates reference addition does not turn on any more.
- If the master calibration is performed again, the registered contents from the first master calibration will be overwritten. To add an allowable range after the master calibration, perform the master addition calibration.
- If the registration status is saturated and“---”is displayed. Perform the master calibration again after lowering the “7.8 Master Calibration Set Value” .
- Changing the master calibration set value after a master calibration has been performed, does not affect the current setting value, only subsequent calibrations.

We reserve the right to make technical changes without prior notice.EN&CN Creation Date: 26.3.18.UM_SP_OSM47-CK500-V1.0_EN&CN

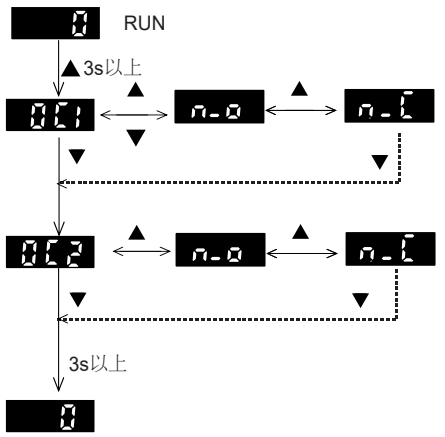
6.5 基本设定

6.5.1 切换输出逻辑（切换N.O./N.C.）

设定 N.O./N.C.。

- n-o（Lon）：符合设定的条件则输出 ON（入光时 ON）
- n-C（don）：不符合设定的条件则输出 ON（非入光时 ON）

()表示的是超级 I 模式，显示Lon和Don。



6.5.2 检测模式

本产品有四个检测模式，变更检测模式时，请参照详细设定

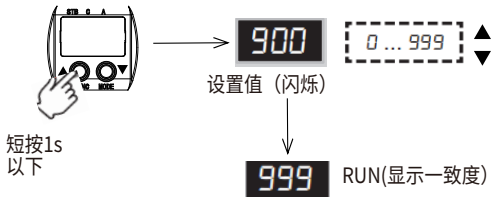
检测模式	说明
Auto(初始值)	调整灵敏度时，自动从C+I模式或C模式中选择最适合的模式
C+I模式	用颜色成分（R,G,B)和明暗（受光量）来检测。
C模式	用颜色成分（R,G,B)来检测。
超级I模式	用明暗（受光量）来检测。

6.6 调整灵敏度

6.6.1 Auto/C+I/C模式

关于显示值
*一致度
显示作为基准设定的检测目标的 “颜色” 和当前正在检测的检测目标的 “颜色”的一致程度。
显示范围：0 至 999（越一致值越大。）
* 设定值
在多大程度上与作为基准设定的检测目标的 “颜色” 一致就判定为相同“颜色” ，这种程度显示为阈值。
确认或手动微调设定值时，请参照“ 确认、调整设定值”。

确认、调整设定值
设定值的数值越大，检测越严格，越小则越松。



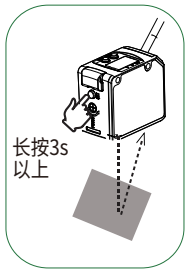
※实施调谐后闪烁显示的数值即为设定值。
※执行标样调谐及标样追加调谐后，无法加大设定值。

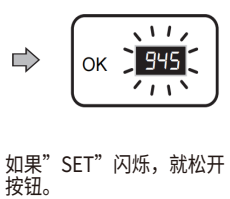
OSM47系列颜色传感器

设定灵敏度（从以下 3 个方法中选择一个）

1 点调谐（检测指定的1个“颜色”时）

设定要作为基准的检测目标的“颜色”。选择 [Auto] 时，作为 [C+I 模式] 动作。
“6.5.2 检测模式”

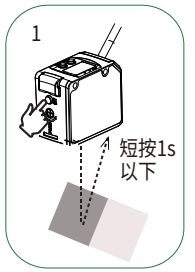


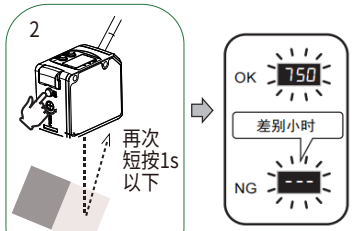


如果”SET”闪烁，就松开按钮。

2 点调谐（进行 2 个 “颜色” 的判别时）

设定要作为基准的检测目标的“颜色”和要判别的检测目标的“颜色” 。（第 1 点是基准颜色）

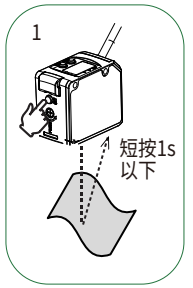


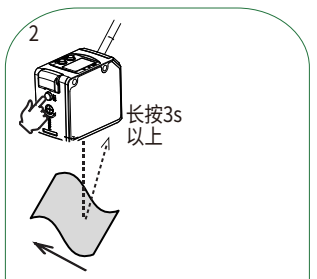


标样调谐（容许相同检测目标内的偏差时）

①单一颜色检测调谐

容许设定的检测目标的 “颜色” 不均匀及检测目标的偏差等。
短按 [SET] 按钮时，注册基准的 “颜色”，长按时持续采样。设定为在采样中 追加基准，判定为相同 “颜色”。
追加了基准时，指示灯绿色闪烁（1次）。执行标样调谐时，设定值变为 950（初始值）。变更这个值时，请参照 “7.8标样调谐设定值”。另外，选择 [Auto] 时，作为 [C+I 模式]动作。 “6.5.2检测模式”





如果 “SET” 和 “Add” 交互闪烁，持续按着按钮扫描要设定的区域。
扫描后松开按钮。

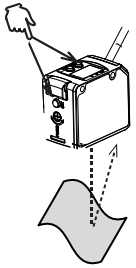
*设定状态已饱和时，“SET” 和 “---” 交互闪烁显示。

＜标样调谐时的注意事项＞
- 持续到表示追加基准的绿灯不再点亮。
- 标样调谐后如果再次进行标样调谐，则最早进行标样调谐时的设定内容被覆盖。
  标样调谐后还要追加容许范围时，请进行标样追加调谐。
- 设定状态已饱和时显示 “---”。还要追加容许范围时，请降低 “7.8 标样调谐设定值” 重新执行标样调谐。
- 标样调谐后，即使变更标样调谐设定值，设定值也不会生效。

②Two colors detect calibration

When you press the SET+UP or SET+DOWN key, the software automatically adjusts the tuning mode according to the two colors.
When you press the SET+UP key, the screen displays SE1 blinking three times. Then blink the threshold of the first color three times, indicating that the setting is complete.
When you press the SET+DOWN key, the SE2 screen blinks three times, and blinks the threshold of the second color three times, indicating that the setting is complete

1

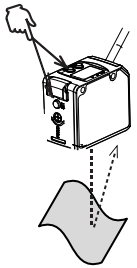


When you press the SET+UP key, the screen is displayed"SE1" flashes 3 times,
Release the button after scanning。

*SE1 blink 3 times

* The threshold of the first color flashes 3 times

2



When you press the SET+DOWN key, the screen is displayed"SE2" flashes 3 times,
Release the button after scannin。

*SE2 blink 3 times

*The threshold of the second color flashes 3 times

The threshold for both color modes is set using the program's default calculation threshold (usually 965).
The setting method of the threshold is referred to the single point tuning method.
In the two color modes, because there are two thresholds, the user presses the UP key to change the threshold of the first color.
If the user presses the DOWN key, yes is displayed
The threshold for the second color is modified. As shown in the following picture

Display of the current main interface

Press the UP key to set the threshold for color 1

Press the DOWN key to set the threshold for color 2

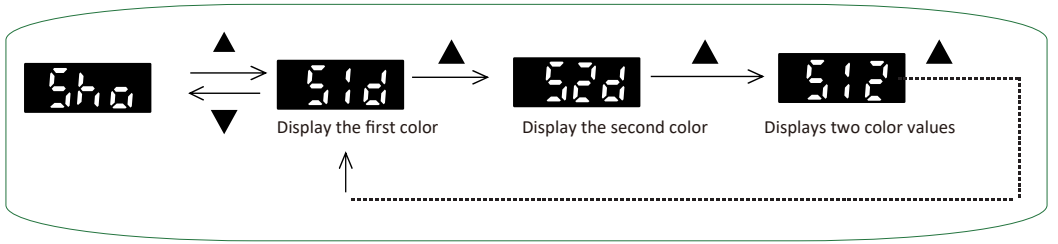
The user does not perform any operation, and the value blinks six times to return to the main screen

The user does not perform any operation, and the value blinks six times to return to the main screen

Press the UP key to increase the value by 1
Press UP+DOWN to reduce the value by 1

Long-press acceleration
Long-press acceleration

For the case of two calibration colors, it is necessary to enter the Sho interface (refer to 7 instructions for specific access to the page), and select the required color value display.
The first color can be displayed, the second color can be displayed, and the two colors can be displayed in three cases.
The specific operations are as follows



If the user chooses to display both, it will be displayed as follows:
Use the first 2 digits to display the value, that is, if the actual value is 983, then 98 is displayed. The next 1 bit is used to mark which color is currently displayed. Color 1 is represented by "一",Color 2 is represented by "二"

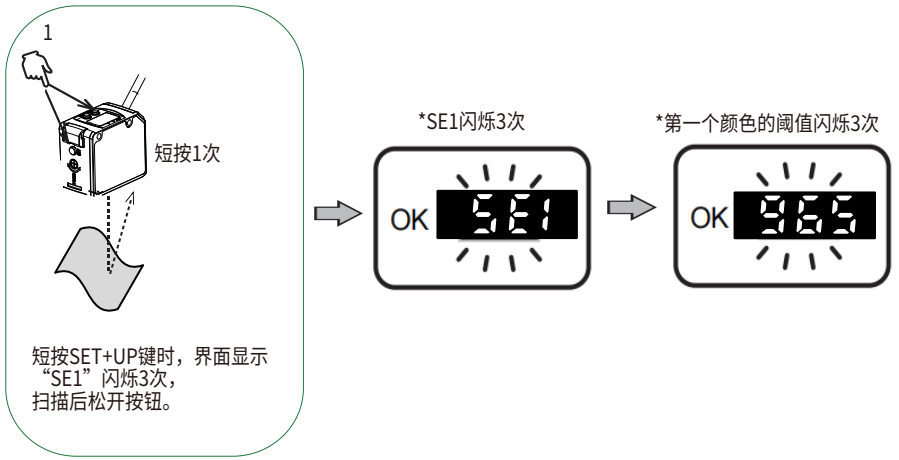
The display value of color 1, only 2 digits,
The suffix is "一"

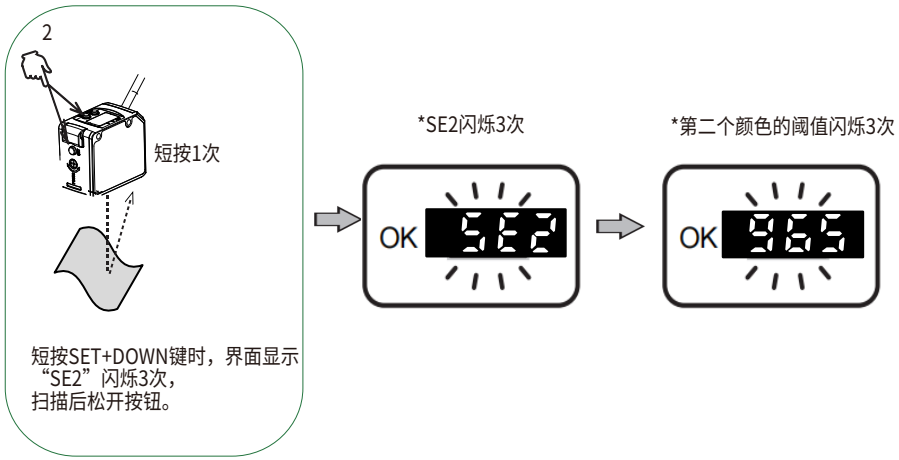
The display value of color 2, only 2 digits,
The suffix is "二"

Each color value is displayed for 3 seconds and then switched to another color value

②两种颜色检测调谐

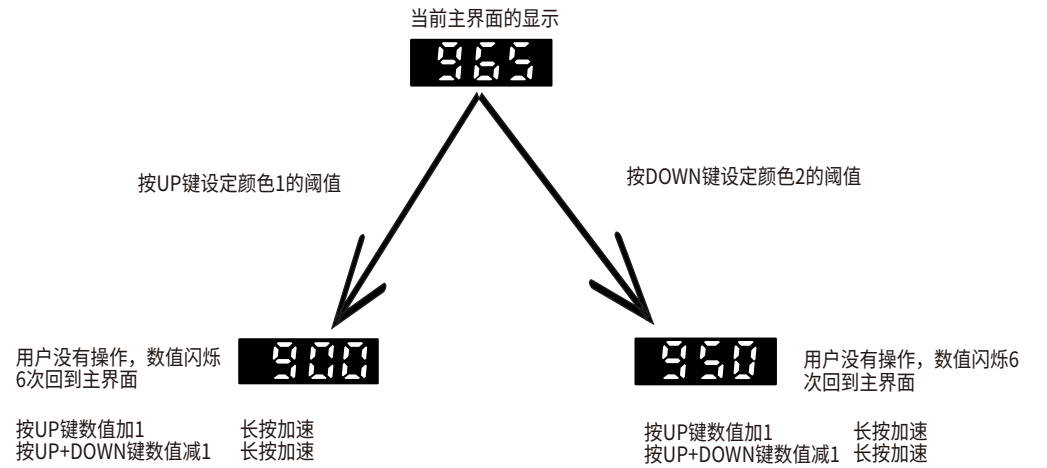
在短按SET+UP或者短按SET+DOWN键时，软件自动调整为按照两种颜色识别的调谐方式。
短按SET+UP键时，界面显示“SE1”闪烁3次，再将当前第一个颜色的阈值闪烁3次，表示设定完成；
短按SET+DOWN键时，界面显示“SE2”闪烁3次，再将当前第二个颜色的阈值闪烁3次，表示设定完成



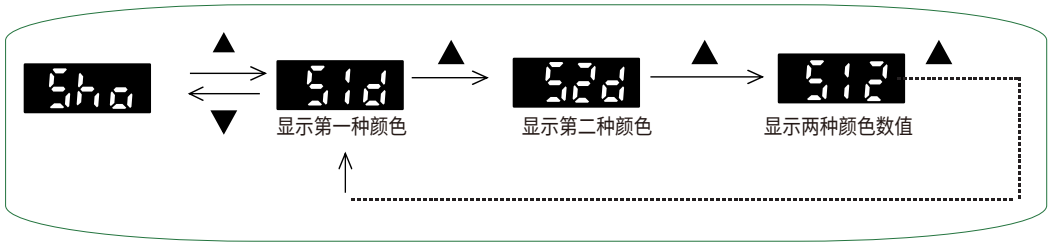


两种颜色模式的阈值，采用程序默认的计算阈值（通常情况下为965）进行设定时的阈值。
阈值的设定方法参考单点调谐方法。
在两种颜色模式中，由于有两个阈值，用户按UP键，表示对第一个颜色的阈值进行修改；用户按DOWN键，表示对第二个颜色的阈值进行修改。如下图所示

OSM47系列颜色传感器



对于两个标定颜色的情况，需要进入Sh0界面（具体进入页面方式参照7 使用说明），对要求的颜色数值显示进行选择，
分别可对第一种颜色显示，第二种颜色显示，两种颜色均显示三种情况进行选择，具体操作如下



如果用户选择两个都显示，则显示的方式如下：
使用前2位数字显示数值，即如果实际数值为983，则显示98。后面的1位用于标记当前显示的是哪个颜色。颜色1用“一”表示，
颜色2用“二”表示

颜色1的显示数值，只有2位数字，
后缀使用“一”表示

颜色2的显示数值，只有2位数字，
后缀使用“二”表示

每个颜色数值显示3秒，然后切换到另外一个颜色数值

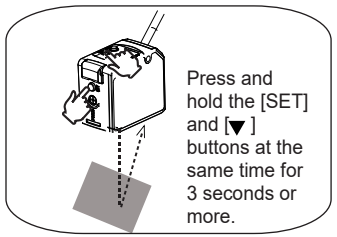
我们保留在不事先通知的情况下进行技术更改的权利。EN&CN 创建日期:26.3.18 UM-SP-OSM47-CK500-V1.0-EN&CN

第4页

Permitting color variations between different workpieces

Master addition calibration (when adding workpieces to be permitted)

Position a workpiece which is to be judged the same as the current registered color. Then press and hold the [SET] button and the [▼] button. When the added registration is successful, the "setting value" flashes three times, and the sensor returns to the normal screen (the setting value is not changed at this point in time).In this case, references are added to permit colors between "the current registered color" and "the additional registered color".



< Precautions for master addition calibration>

- To clear the master addition calibration, perform another calibration.
- If the setting fails or the registration state is saturated, "---"is displayed. To add an allowable range, lower the setting value, and perform the master addition calibration again.

6.6.2 Super I Mode

About the display value

•Received light intensity

The current received light intensity is displayed.

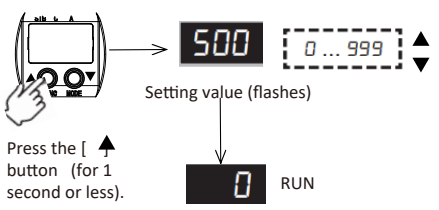
Display range: 0 to 999 (The greater the received light intensity, the higher the value.)

• Setting value

The threshold at which the received light intensity is judged to indicate that a workpiece is present.To check or manually make fine adjustments to the value, see "Checking and adjusting the setting value"

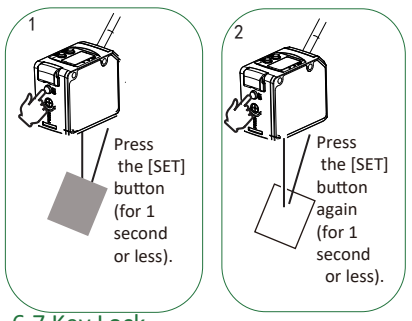
* The blinking numeric value that appears after calibration is the setting value.

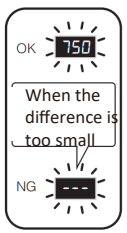
Checking and adjusting the setting value



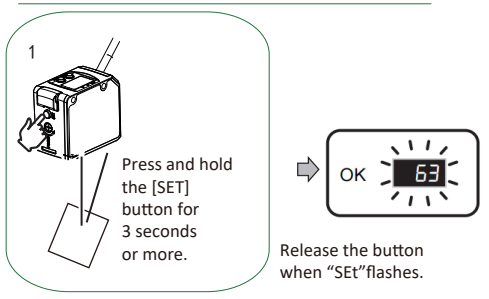
Setting the sensitivity (apply one of the following three methods)

•2-point calibration (basic intensity differentiation)



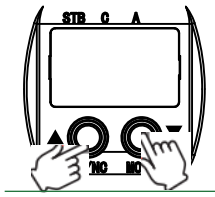


•Maximum sensitivity calibration (use to increase the sensitivity of the sensor to detect small changes)



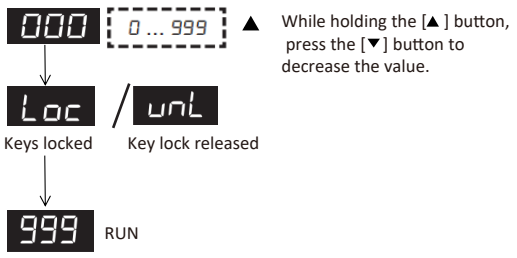
6.7 Key Lock

This function prevents operation mistakes, or the inadvertent changing of settings, by locking/disabling key operations. To require a password to release the key lock,set a password in advance. "7.9 Password"



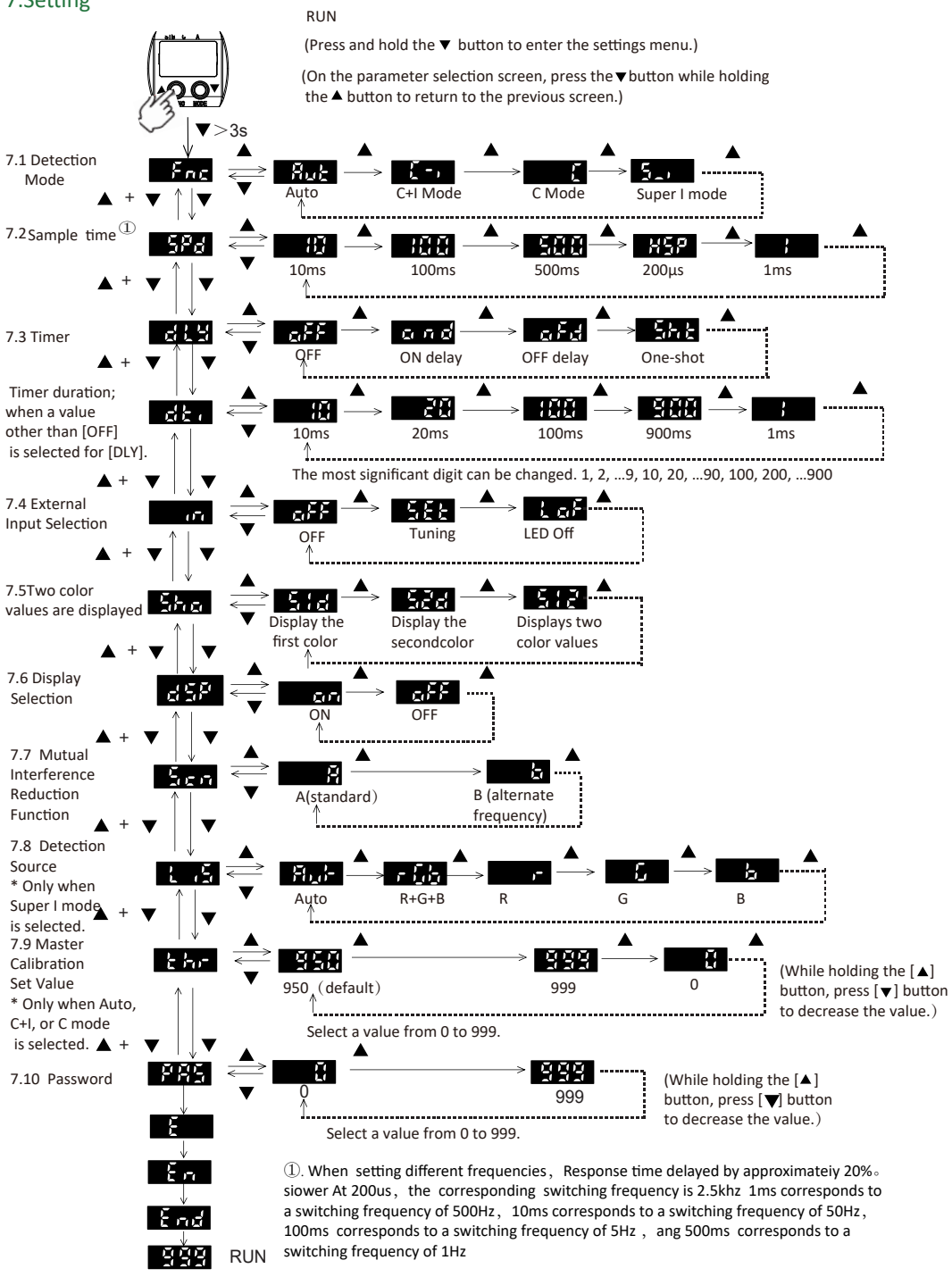
Press and hold the[▲] button and [▼] button at the same time for 3 s or more.

If necessary, enter the password to release the lock.



OSM47 series Color Sensor

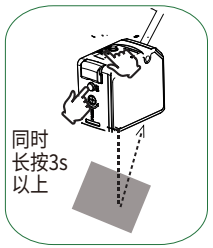
7.Setting



① . When setting different frequencies, Response time delayed by approximateiy 20%。siower At 200us, the corresponding switching frequency is 2.5khz 1ms corresponds to a switching frequency of 500Hz, 10ms corresponds to a switching frequency of 50Hz, 100ms corresponds to a switching frequency of 5Hz , ang 500ms corresponds to a switching frequency of 1Hz

容许工件个体间的偏差

标样追加调谐（追加要容许的工件时）
设置已用其它调谐方法设定的“颜色”和要判定为相同“颜色”的检测目标，长按 [SET]按钮+ [▼]按钮。
如果追加设定成功，“设定值”就闪烁3次，返回通常画面（此时，设定值不改变）。
最初设定过的“颜色”和已追加设定的“颜色”之间的“颜色”也补充设定。



如果”Add”闪烁，就松开按钮。

＜标样追加调谐时的注意事项＞
- 清空标样追加调谐时，请进行其它调谐。
- 设定失败或设定状态已饱和时，显示“---”。
还要追加容许范围时，请减小设定值，重新执行标样追加调谐。

6.6.2超级I模式

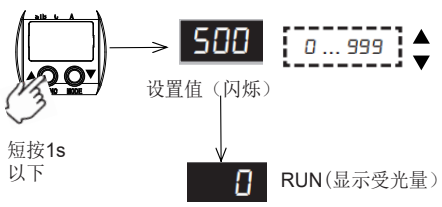
关于显示值

•受光量
显示当前的受光量。显示范围：0 至 999（受光量越多值越大。）

•设定值
到多大程度的受光量就判定为有检测目标，这个显示为阈值。
确认或手动微调数值时，请参照“确认、调整设定值”。

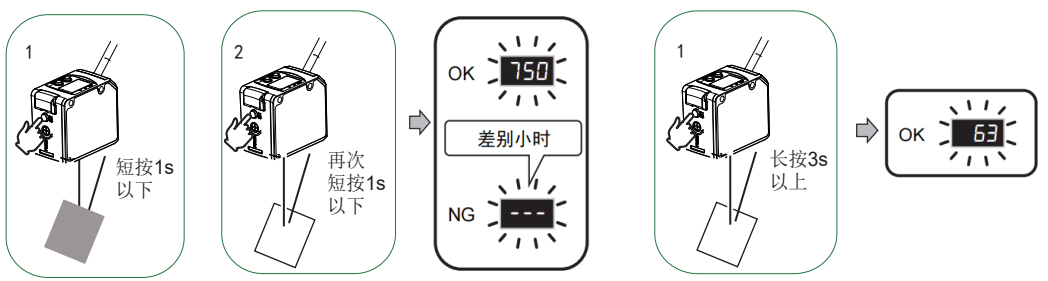
※实施调谐后闪烁显示的数值即为设定值。

确认、调整设定值



设定灵敏度（从以下2个方法中选择一个）

•2点调谐（基本）

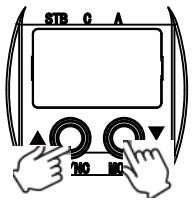


•最大灵敏度调谐（要将灵敏度调到最大时）

如果“SEt”闪烁，就松开按钮。

6.7 锁键

若需输入密码才能解除锁键，则应事先设定密码。
参照“7.9 密码”

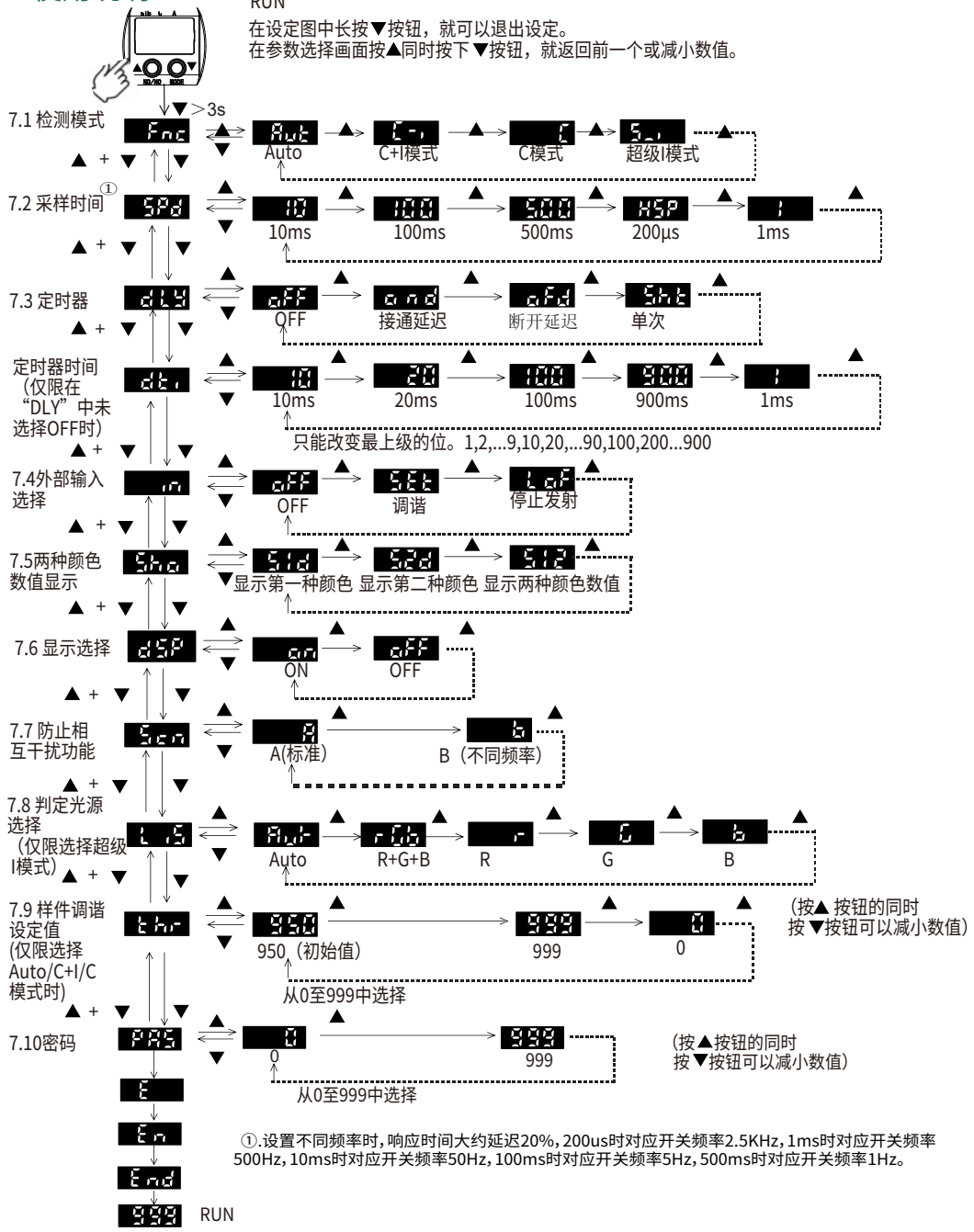


▲▼按钮同时
长按3s以上

若设定有密码，则在解锁时输入密码

7.使用说明

RUN
在设定图中长按▼按钮，就可以退出设定。
在参数选择画面按▲同时按下▼按钮，就返回前一个或减小数值。



①.设置不同频率时，响应时间大约延迟20%，200us时对应开关频率2.5KHz，1ms时对应开关频率500Hz，10ms时对应开关频率50Hz，100ms时对应开关频率5Hz，500ms时对应开关频率1Hz。

7.1 Detection Mode

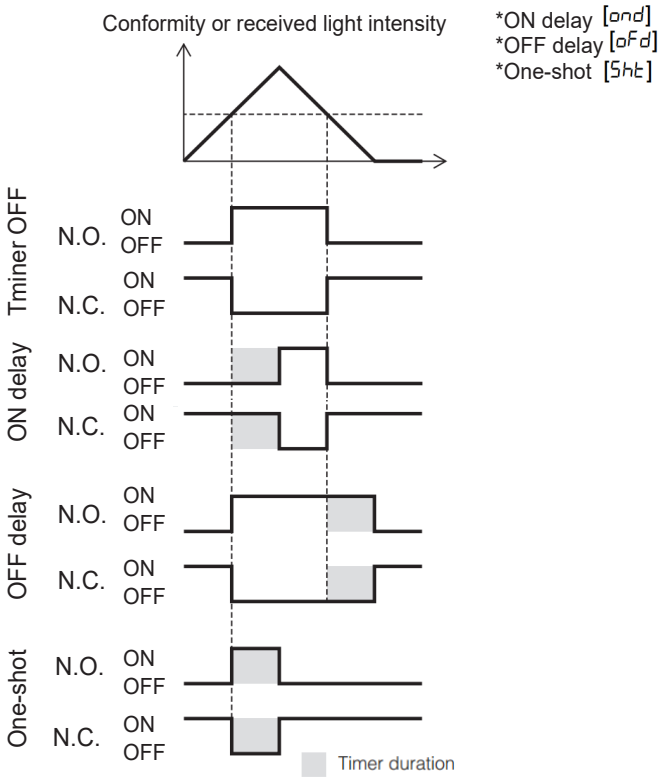
Select the desired detection mode. See"6.5.2 Detection Mode".

7.2 Response Time

The longer the response time, the more reliable and stable the detection.
When detection is unstable due to the workpieces moving at a high speed, set the response time to a smaller value.

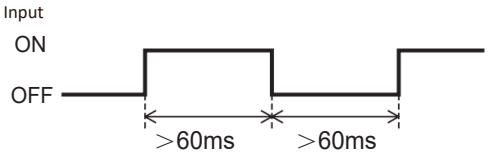
7.3 Timer

This function can be used to delay the timing of the sensor output switching.

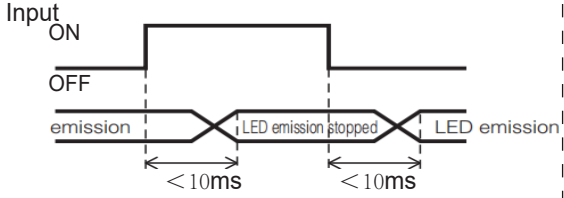


7.4 External Input Selection

*Calibration [SEt]
This external input performs the same function as pressing the [SET] button.



*Transmission OFF [LoF]
This external input stops the emission of the LED.



7.5.Display Selection

Select a value display mode. Please refer to 6.6.1 two color tuning Settings.。

7.6.Display Selection

The display can be turned off by selecting [OFF].

7.7.Mutual Interference Reduction Function

The effect of mutual interference can be reduced by changing the light emission period. When using multiple OSM47 Series units in close proximity, set each unit to a different light emission period. When selecting frequency B (alternate frequency), the response time becomes approximately 20% slower.

7.8.Detection Light Source

When using Super I mode, the light source used for detection is automatically selected to provide optimal performance. To require the sensor to use a specific light source, adjust this setting to Red, Green, Blue, or RGB.

7.8.Master Calibration Set Value

When using Auto/C+I/C mode, a predetermined set value is used when master calibration is executed. The predetermined set value can be changed using this menu. When a larger setting value is used, the detection tolerance is tighter. In contrast, when the setting value is reduced, a wider detection tolerance is enabled.
With a higher setting value, there is a higher possibility of saturation or "---" occurring after Master calibration.
If Master calibration results in"---", perform Master calibration again after lowering this value.

7.9.Password

An optional password can be set to further prohibit unauthorized releasing of the "6-1 Key Lock".
Select a value from 1 to 999 for this setting. If"0"is selected, the password will not be required.

8.Troubleshooting

8.1 Non-numeric display

Display	Cause	Solution
UUU	Displayed when excessive light is received by the sensor (Auto/C+I/C modes)	Adjust the sensor's installation angle so that specular reflections do not enter thereceiver.
nnn	Displayed when insufficient light is received by the sensor (Auto/C+I/C modes)	Check whether the detection distance is within specified range.
Loc	The key lock function is enabled.	Release the key lock.
- (The bar pulses across the display.)	The display selection is set to OFF.	Set the display selection to ON.
E XX	XX is a number. EXX is displayed when the system is powered on, indicating that the system is abnormal. In most cases, the data storage module is abnormal.	
Er1	There is an overcurrent on line 1	Please check if Output Line 1 is properly connected. • Please check if Output Line 1 is not touching other wires.
Er2	There is an overcurrent on line 2	Please check if Output Line 2 is properly connected. • Please check if Output Line 2 is not touching other wires.

8.2 Outpat ofnon-nameric display

Display	Output Condition		Indicator Condition
	N.O.	N.C.	
UUU	OFF	ON	OFF
nnn	OFF	ON	OFF
Loc	Normal operation		Normal operation
- (The bar pulses across the display.)	Normal operation		Normal operation

8.3 Inital value summary Table

Item	Initial value
NPN/PNP/PUL selection	NPN
N.O./N.C. selection	N.O.
Detection mode	Auto
Response time	10ms
Timer	OFF
Timer duration	10ms
External input	OFF
Display selection	ON
Mutual Interference Reduction Function	Auto
Detection light source	A(standard)
Master calibrationsetting value	950

7.1 检测模式

选择检测模式。请参照6.5.2检测模式

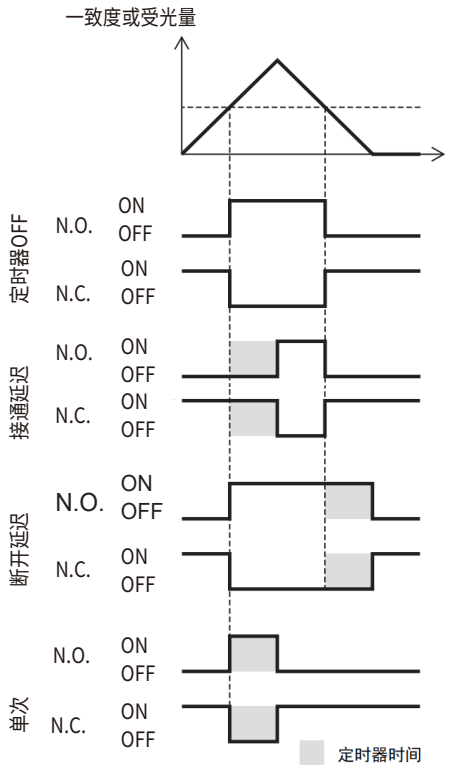
7.2 响应时间

响应时间设定得越长，检测精度越高、越准确。
检测目标高速移动、检测不稳定时，要将响应时间设定得较短。

7.3 定时器

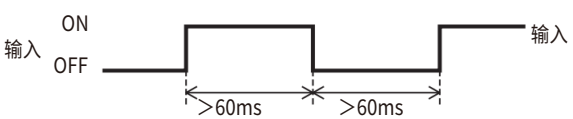
通过该功能，可延迟传感器的输出切换。

*接通延迟 [ond]
*断开延迟 [ofd]
*单次 [Sht]

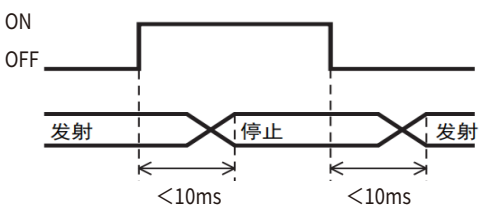


7.4 外部输入选择

*调谐 [SEt]
执行与[SET]按钮相同的功能。



*停止发射 [LoF]
停止LED 发射。



7.5.两种颜色数值显示

选择数值显示模式。请参照6.6.1两种颜色调谐设定。

7.6.显示选择

选择[OFF]就可以使显示熄灭。

7.7.防止相互干扰功能

本产品通过变更发光周期，可以降低相互干涉的影响。在相近使用多台OSM47系列产品时，请设为互不相同的发光周期。但是，选择 [B（不同频率）]时，响应时间延迟约20%。

7.8.判断光源选择

选择超级I模式时，判定使用到的RGB的光源，在选择[Auto]时，是由传感器在设定灵敏度时自动选择最适合的。选择[R+G+B]、[R]、[G]、[B]就可以固定

7.9.标样调谐设定值

使用 [Auto/C+I/C 模式] 时，在执行标样调谐时设定的值变为固定值。可以在详细 设定中变更该值。数值越大检测越严格，但设定标样调谐时，容易显示 “---”。显 示 “---” 时，请减小该值，重新进行标样调谐。

7.10.密码

可以设定密码用“6-7锁键”的解除。请从“1 至 999”中选择设定。 选择“0”时不要求密码。

8.其它

8.1 非数值的显示

显示	内容	确认事项和对策
uuu	Auto/C+I/C模式下， 反射光量过多时显示。 当作一致度0动作。	请调整传感器设置角度， 避免正反射光进入。
nnn	Auto/C+I/C模式下， 反射光量不足时显示。 当作一致度0动作。	请确认检测距离是否在规 格范围内。
Loc	锁键功能已启用	请解除锁键。
- (显示条移动点亮)	显示选择已OFF	请将显示选择设为ON。
EXX	XX为数字，开机显示”EXX”,表示异常状态。 该异常绝大多数情况下均为数据存储模块存在异常	
Er1	输出线1上面有过电流通过	请确认输出线1是否以正确链接。 请确认输出线1是否未接触其他线。
Er2	输出线2上面有过电流通过	请确认输出线2是否以正确链接。 请确认输出线2是否未接触其他线。

8.2 非数值显示的输出

显示	ON/OFF输出		指示灯
	N.O.	N.C.	
uuu	OFF	ON	熄灭
nnn	OFF	ON	熄灭
Loc	照常		照常
- (显示条移动点亮)	照常		照常

8.3 初始值一览表

项目	初始值
NPN/PNP/PUL	NPN
N.O./N.C.	N.O.
检测模式	Auto
响应时间	10ms
定时器	OFF
定时器时间	10ms
外部输入	OFF
显示选择	ON
判断光源选择	Auto
防止相互干扰功能	A(标准)
标样调谐设定值	950

9.IOLink protocol

9.1 Physical Layer

SIO pattern	nothing.
Minimum cycle time	3.5ms
Baud rate	COM2
Process data length	4 byte
IODD version	V1.1
Support IO-Link version	1.1.2

9.2 Process data

Record: 4 bytes

bit	31-27	26	25-16	10	9-0
type	UInteger5	Boolean	UInteger10	Boolean	type
Character Index	5	4	3	2	1

Concentrate:
PDin Data Format:
bit27-31:
The current color is closest to which color in the record is closest (this field only makes sense in standard tuning mode)
bit26:
The status indication of the current second output, 0: the color detection fails; 1: The color detection is passed
bit25-16:
Color comparison value of the current second output (value range 0-999)
bit10:
The status indication of the current first output, 0: the color detection fails; 1: The color detection is passed
bit9-0:
The color comparison value of the current first output (value range: 0-999)

9.3. ISDU (Index Service Data Unit)

Index dec(hex)	Name	Format (Offset)	Length	Read	Default value	Numeric/Range	Remarks (Unit)
16(0x10)	VendorName	String	4Byte	ro	ELCO		
17(0x11)	VendorText	String	20Byte	ro			
18(0x12)	ProductName	String	18Byte	ro			
19(0x13)	ProductID	String	18Byte				
20(0x14)	ProductText	String	12Byte	ro			
21(0x15)	SerialNumber	String	4Byte	ro			
22(0x16)	HardwareRevision	String	6Byte	ro			
23(0x17)	FirmwareRevision	String	6Byte	ro			
101(0x65)	TI_NPNPNP_1	UInteger	1Byte	rw	0	value: 0 name: NPN value: 1 name: PNP value: 2 name: PUL	NPN/PNP/PUL settings for the first output
102(0x66)	TI_ResponseTime	UInteger	1Byte	rw	2	value: 0 name: 200us value: 1 name: 1ms value: 2 name: 10ms value: 3 name: 100ms value: 4 name: 500ms	Sensor response time, equivalent to the "SPd" item in the settings menu (response time)

OSM47 series Color Sensor

104(0x68)	TI_Tuning	UInteger	1Byte	wo	2	value: 1 name: Single Point Start value: 2 name: Two Points-One value: 3 name: Two Points-Two value: 4 name: More Points Start value: 5 name: More Points End value: 6 name: Add One Point value: 7 name: TwoColor Point One value: 8 name: TwoColor Point Two	Tuning controls
110(0x6E)	TI_OutputLogic Selection_1	UInteger	1Byte	rw	0	value: 0 name: N.O. value: 1 name: N.C.	N.O./N.C. settings for the first output
112(0x70)	TI_Setting Value	UInteger	2Byte	rw	999	ValueRange: value: 0...999	The currently set threshold, that is, the value displayed by pressing the "Up/Down" button on the main interface
113(0x71)	TI_Master Calibration SetValue	UInteger	2Byte	rw	950	ValueRange: value: 0...999	The threshold value for standard tuning, i.e., the "tHr" item in the settings menu
115(0x73)	TI_Timer	UInteger	1Byte	rw	0	value: 0 name: Off value: 1 name: On Delay value: 2 name: Off Delay value: 3 name: One-shot	The sensor timer mode is equivalent to the "dLy" item in the settings menu
116(0x74)	TI_Timer Duration	UInteger	2Byte	rw	10	ValueRange: value: 1...999	The sensor timer time is equivalent to the "DTI" item in the setting menu, in ms
129(0x81)	TI_ExtemalInput Selection	UInteger	1Byte	rw	0	value: 0 name: Off value: 1 name: Tuning value: 2 name: LED off	The function setting of the input interface is equivalent to the "in" item in the setting menu
138(0x8A)	TI_Display Selection	UInteger	1Byte	rw	0	value: 0 name: On value: 1 name: Off	The sensor display switch is equivalent to the "dSP" item in the settings menu
139(0x8B)	TI_KeyLock	UInteger	1Byte	rw	0	value: 0 name: Unlock value: 1 name: Lock	The sensor lock key function switch is equivalent to the key lock function of pressing and holding the upper and lower keys on the main interface for more than 3 seconds at the same time
141(0x8D)	TI_KeyLock	UInteger	2Byte	rw	0	ValueRange: value: 0...999	The sensor password function is equivalent to the "PAS" item in the settings menu

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Page 7

9.IOLink 协议

9.1 物理层

SIO模式	无
最小循环时间	3.5ms
波特率	COM2
过程数据长度	4字节
IODD版本	V1.1
支持IO-Link版本	1.1.2

9.2 过程数据

Record:4字节

位	31-27	26	25-16	10	9-0
类型	UInteger5	Boolean	UInteger10	Boolean	类型
字索引	5	4	3	2	1

注：
PDin数据格式：
bit27-31：
当前的颜色和记录中的哪种颜色最接近(标样调谐模式下，该字段才有意义)
bit26：
当前第二路输出的状态指示，0：颜色检测不通过；1：颜色检测通过
bit25-16：
当前第二路输出的颜色比较数值(取值范围0-999)
bit10：
当前第一路输出的状态指示，0：颜色检测不通过；1：颜色检测通过
bit9-0：
当前第一路输出的颜色比较数值(取值范围0-999)

9.3 ISDU(索引服务数据单元)

索引dec(hex)	名称	格式(Offset)	长度	读取	默认值	数值/范围	备注(Unit)
16(0x10)	VendorName	String	4Byte	ro	ELCO		
17(0x11)	VendorText	String	20Byte	ro			
18(0x12)	ProductName	String	18Byte	ro			
19(0x13)	ProductID	String	18Byte				
20(0x14)	ProductText	String	12Byte	ro			
21(0x15)	SerialNumber	String	4Byte	ro			
22(0x16)	HardwareRevision	String	6Byte	ro			
23(0x17)	FirmwareRevision	String	6Byte	ro			
101(0x65)	TI_NPNPNP_1	UInteger	1Byte	rw	0	value: 0 name: NPN value: 1 name: PNP value: 2 name: PUL	第一个输出接口的NPN/PNP/PUL设置
102(0x66)	TI_ResponseTime	UInteger	1Byte	rw	2	value: 0 name: 200us value: 1 name: 1ms value: 2 name: 10ms value: 3 name: 100ms value: 4 name: 500ms	传感器响应时间，相当于设置菜单里面的"SPd"一项(响应时间)

OSM47系列颜色传感器

104(0x68)	TI_Tuning	UInteger	1Byte	wo	2	value: 1 name: Single Point Start value: 2 name: Two Points-One value: 3 name: Two Points-Two value: 4 name: More Points Start value: 5 name: More Points End value: 6 name: Add One Point value: 7 name: TwoColor Point One value: 8 name: TwoColor Point Two	调谐控制
110(0x6E)	TI_OutputLogic Selection_1	UInteger	1Byte	rw	0	value: 0 name: N.O. value: 1 name: N.C.	第一个输出接口的N.O./N.C.设置
112(0x70)	TI_Setting Value	UInteger	2Byte	rw	999	ValueRange: value: 0...999	当前设定的阈值，即主界面短按"上/下"键，显示的数值
113(0x71)	TI_Master Calibration SetValue	UInteger	2Byte	rw	950	ValueRange: value: 0...999	标样调谐时的阈值，即设置菜单里面"tHr"一项
115(0x73)	TI_Timer	UInteger	1Byte	rw	0	value: 0 name: Off value: 1 name: On Delay value: 2 name: Off Delay value: 3 name: One-shot	传感器定时器模式，相当于设置菜单里面的"dLy"一项
116(0x74)	TI_Timer Duration	UInteger	2Byte	rw	10	ValueRange: value: 1...999	传感器定时器时间，相当于设置菜单里面的"dti"一项，单位ms
129(0x81)	TI_ExtemalInput Selection	UInteger	1Byte	rw	0	value: 0 name: Off value: 1 name: Tuning value: 2 name: LED off	输入接口的功能设置，相当于设置菜单里面"in"一项
138(0x8A)	TI_Display Selection	UInteger	1Byte	rw	0	value: 0 name: On value: 1 name: Off	传感器显示开关，相当于设置菜单里面的"dSP"一项
139(0x8B)	TI_KeyLock	UInteger	1Byte	rw	0	value: 0 name: Unlock value: 1 name: Lock	传感器锁键功能开关，相当于主界面上下键同时长按3秒以上锁键功能
141(0x8D)	TI_KeyLock	UInteger	2Byte	rw	0	ValueRange: value: 0...999	传感器密码功能，相当于设置菜单里面的"PAS"一项

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第7页

Index dec(hex)	Name	Format (Offset)	Length	Read	Default value	Numeric/Range	Remarks (Unit)
143(0x8F)	TI_MutualInterference	UInteger	1Byte	rw	0	value: 0 name: A value: 1 name: B	The sensor prevents mutual interference function settings, which is equivalent to the "Scn" item in the setting menu
145(0x91)	TI_NPNPNP_2	UInteger	1Byte	rw	0	value: 0 name: NPN value: 1 name: PNP value: 2 name: PUL	NPN/PNP/PUL settings for the second output
146(0x92)	TI_OutputLogic Selection_2	UInteger	1Byte	rw	0	value: 0 name: N.O. value: 1 name: N.C.	N.O./N.C. settings for the second output
147(0x93)	TI_TwoColorShow	UInteger	1Byte	rw	0	value: 0 name: Show First Color value: 1 name: Show Second Color value: 2 name: Show Both of	The display mode of the main interface in dual-color mode
148(0x94)	TI_CurrentValue_1	UInteger	2Byte	ro		ValueRange: value: 0...999	The currently calculated value, that is, the value displayed on the top screen of the main interface (the value corresponding to the first color in the dual color tuning mode)
199(0xC7)	TI_DetectionMode	UInteger	1Byte	rw	0	value: 0 name: Auto value: 1 name: C+I value: 2 name: C value: 3 name: Super I	The setting of the sensor's operating mode is equivalent to the "Fnc" item in the setting menu
200(0xC8)	TI_SpotMode Selection	UInteger	1Byte	rw	0	value: 0 name: Single Point value: 1 name: Two Points value: 2 name: More Points value: 3 name: Two Color Mode	Current tuning mode
202(0xCA)	TI_DetectionLight Source	UInteger	1Byte	rw	0	value: 0 name: Auto value: 1 name: RGB value: 2 name: R value: 3 name: G value: 4 name: B	The selection of the judgment light source in the S+I mode of the sensor is equivalent to the "LiS" item in the setting menu
203(0xCB)	TI_ResetPara	UInteger	1Byte	wo		value: 1 name: Reset-Except Calibration value: 2 name: Reset-All	Reset control
204(0xCC)	TI_CurrentValue_2	UInteger	2Byte	ro		ValueRange: value: 0...999	The currently calculated value, that is, the value displayed on the screen of the main interface - the value corresponding to the second color in the double color mode, and the value in other modes is the same as the value in the TI_CurrentValue_1
205(0xCD)	TI_Color2Value_1	UInteger	2Byte	rw	0	ValueRange: value: 0...999	The threshold for the first color in dual-color mode
206(0xCE)	TI_Color2Value_2	UInteger	2Byte	rw	0	ValueRange: value: 0...999	The threshold for the second color in two-color mode

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Page 8

索引dec(hex)	名称	格式(Offset)	长度	读取	默认值	数值/范围	备注(Unit)
143(0x8F)	TI_MutualInterference	UInteger	1Byte	rw	0	value: 0 name: A value: 1 name: B	传感器防止相互干扰功能设置，相当于设置菜单里面的"Scn"一项
145(0x91)	TI_NPNPNP_2	UInteger	1Byte	rw	0	value: 0 name: NPN value: 1 name: PNP value: 2 name: PUL	第二个输出接口的NPN/PNP/PUL设置
146(0x92)	TI_OutputLogicSelection_2	UInteger	1Byte	rw	0	value: 0 name: N.O. value: 1 name: N.C.	第二个输出接口的N.O./N.C.设置
147(0x93)	TI_TwoColorShow	UInteger	1Byte	rw	0	value: 0 name: Show First Color value: 1 name: Show Second Color value: 2 name: Show Both of	双颜色模式下主界面的显示模式
148(0x94)	TI_CurrentValue_1	UInteger	2Byte	ro		ValueRange: value: 0...999	当前计算的数值，即主界面屏幕上面显示的数值(双颜色调谐模式下为第一个颜色对应的数值)
199(0xC7)	TI_DetectionMode	UInteger	1Byte	rw	0	value: 0 name: Auto value: 1 name: C+I value: 2 name: C value: 3 name: Super I	传感器工作模式的设定，相当于设置菜单里面"Fnc"一项
200(0xC8)	TI_SpotModeSelection	UInteger	1Byte	rw	0	value: 0 name: Single Point value: 1 name: Two Points value: 2 name: More Points value: 3 name: Two Color Mode	当前调谐模式
202(0xCA)	TI_DetectionLightSource	UInteger	1Byte	rw	0	value: 0 name: Auto value: 1 name: RGB value: 2 name: R value: 3 name: G value: 4 name: B	传感器S+I模式时的判定光源选择，相当于设置菜单里面的"LiS"一项
203(0xCB)	TI_ResetPara	UInteger	1Byte	wo		value: 1 name: Reset-Except Calibration value: 2 name: Reset-All	复位控制
204(0xCC)	TI_CurrentValue_2	UInteger	2Byte	ro		ValueRange: value: 0...999	当前计算的数值，即主界面屏幕上面显示的数值-双颜色模式下为第二个颜色对应的数值，其他模式下和TI_CurrentValue_1的数值一样
205(0xCD)	TI_Color2Value_1	UInteger	2Byte	rw	0	ValueRange: value: 0...999	双颜色模式下第一个颜色的阈值
206(0xCE)	TI_Color2Value_2	UInteger	2Byte	rw	0	ValueRange: value: 0...999	双颜色模式下第二个颜色的阈值

OSM47系列颜色传感器

我们保留在不事先通知的情况下进行技术更改的权利。EN&CN 创建日期:26.3.18 UM-SP-OSM47-CK500-V1.0-EN&CN

第8页