

COLOR IMAGE SENSORS

CVS1 Series



Applications



Labels (expiration date, etc.) on box.



Instruction sheet inside package container.



Liquid level in the bottle



Ingredients placed on short cake

(Sensing range : 210 - 270mm)
 • CVS1-N10 / CVS1-P10

(Sensing range : 50 - 100mm)
 • CVS1-N40 / CVS1-P40

(Sensing range : 90 - 150mm)
 • CVS1-N20 / CVS1-P20

(Short distance : 31 - 39mm)
 • CVS1-N21 / CVS1-P21

- **World's First! Palm-size Vision Sensor. The stand-alone design contains Camera, Light, and Controller together.**
- **Ideal for sorting and judging workpiece via color matching.**
- **24 Bit color processor logically capable of identifying 16,770,000 colors.**
- **Additional external and supplemental lights are available (OPDB series lighting system).**

What is the CVS1 Color Identity Sensor useful for?

Any type of colored material can be sorted by the color itself. With Optex FA's custom CPU it is possible to accurately identify the difference between products that have similar colors.

Checking the level of liquid in a bottle can be extremely difficult to setup with a standard color sensor, the CVS1 Color Identity Sensor computes the area of the specified color to determine if the correct level is present. Setting and adjusting the sensor is easily accomplished by using the Teach function. Conventional vision systems can be used in this application, but they require constant attention and adjustment, the CVS1 eliminates this problem.



Yes!
Memorized standard



No
Higher level



No
Lower level



Yes!
Memorized standard



No
Dislocated letters



No
Blurred letters

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CVS1, all-in-one design



Simple Wiring

The stand-alone system does not require confusing wiring. Just connect the Power Cable to the CVS1 main unit.

It's what we call "simplicity". If additional external lighting is needed for better illumination of the product, simply connect the CVS-LW1 external light.


If you would like to set up or monitor the process remotely, connect the CVS1-M1 remote monitor. The display of the CVS1-M1 shows the same view as the sensor and all the control functions can be accessed with the pushbuttons.

- Remark :**
- ① A maximum of three CVS-LW1 external lights can be connected to the main sensor.
 - ② The remote monitor CVS1-M1 can be used up to 15 meters distance from the main unit by using CVS-C3S extension cables. The CVS-C3S is 3 meters in length, a maximum of four cables can be connected in series.
 - ③ Remote monitor CVS1-M1 itself has 3 meter cable.

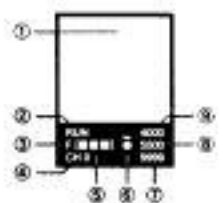


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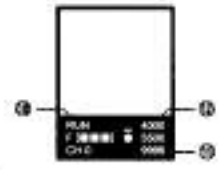
Details of LCD Screen




Normal screen




Set Value Reference screen




- ① **Image screen**
The image taken by the built-in camera is displayed.
- ② **Mode display**
"RUN" is displayed in the Normal screen.
- ③ **Screen display status**
Shows the display status when the display mode is switched with [VIEW] button.
- ④ **Bank number**
Present bank number is displayed. (0~15)
- ⑤ **Detection color**
Detection color is displayed. Indicates "Darkest color", "Middle color", and "Brightest color" from the left.
- ⑥ **Output condition** ●: Output ON x: Output OFF
In the Set Value Reference screen and the Set Value Change screen, the contents of ②, ⑤, and ⑥ will change as required.
- ⑦ **Area upper limit**
Indicates the area upper limit of the detection color.
- ⑧ **Detection color area**
Indicates the present area of the detection color.
Orange: within upper and lower limits
Green: Outside upper and lower limits
(Status with area hysteresis excluded)
- ⑨ **Area lower limit**
Indicates the area lower limit of the detection color.
- ⑩ **Set Item**
- ⑪ **Set value**
- ⑫ **Response time (Unit: 0.1 ms)**




① **UP button**
Use to increase a set value, etc. or change a set item.




② **DOWN button**
Use to decrease a set value, etc. or change a set item.



③ **SET button**
Use to display a set value. Press for 3 sec. or more to enter a revised set value.

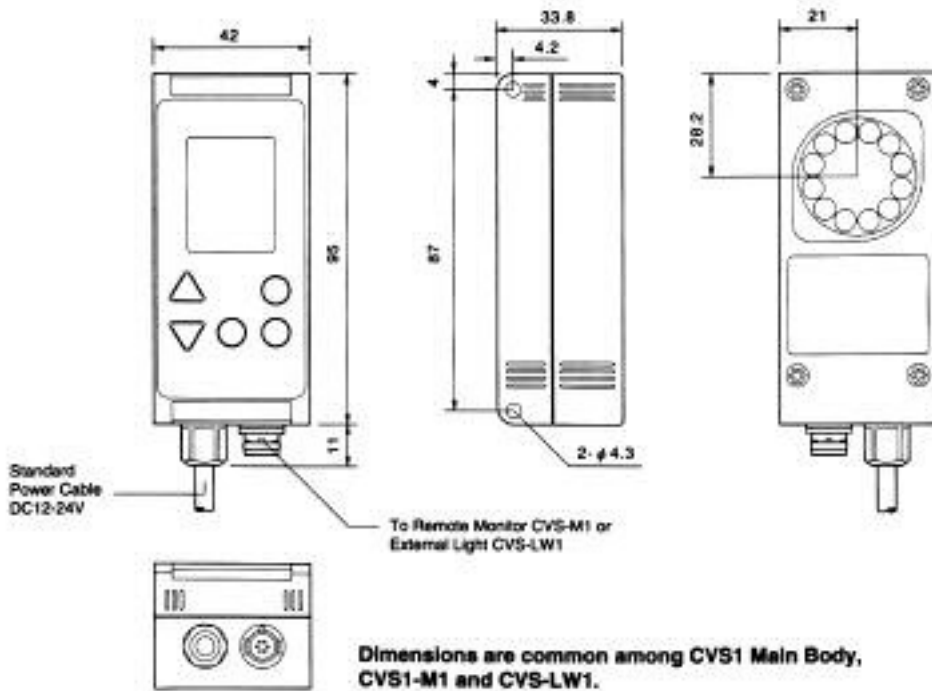


④ **TEACH button**
Press for 3 sec. or more for teaching. Also, used to move the teaching window or change its size.



⑤ **VIEW button**
Use to switch the display mode of the screen.

Dimensions



Set Item List (Patent Applied)

Function name	LCD display	Setting range (Initial value)	Explanation
Area lower limit	AREA LO	0-9999 (5000)	Sets the lower limit of the detection area.
Area upper limit	AREA HI	0-9999 (0)	Sets the upper limit of the detection area.
Bank selection	BANK	0-17 (17)	Sets the method to switch the bank number.
Screen brightness	BRIGHT	0-255 (100)	Sets the brightness of the whole screen.
Color margin	COLOR	0-127 (20)	Sets the margin when the detection color is set as the representative value.
Color filter	COORFIL	0-3 (0)	Sets the color filter. 0: Converts the color ratio per each pixel. 1: Acquire the maximum luminance 2: High sensitivity mode of "0". 3: High sensitivity mode of "1".
Area hysteresis	HYSTRSY	0-200 (10)	Sets the hysteresis (0.1% amt of all pixels) of the area upper and lower limits.
Input constant	IN FILT	0-4 (4)	Sets the time constants of the bank switching signal and the external teaching signal.
Darkness correction factor	KUL BLK	0-31 (27)	Sets the ratio to correct the color darkness.
LCD Up/Down reverse	LCDVIEW	0, 1(0)	0: Normal LCD display 1: Display is up/down reversed.
Area display max. value	MAXAREA	0-9999 (9999)	Sets the area maximum value.
OFF delay time	OFF DLY	0-5000 (0)	Turns OFF the output signal when the condition is not met for over this set time (ms).
ON delay time	ON DLY	0-5000 (0)	Turns ON the output signal when the condition is met for over this set time (ms).
One-shot output	ONESHOT	0, 1(0)	When set to "1", output signal is output by one shot during the OFF delay time after the output signal turns ON.
Outside area range	OUTSIDE	0-3 (0)	0: Turns ON the output signal within the range between the area upper and lower limits. 1: Turns ON the output signal outside the range between the area upper and lower limits. 2: Same as "0". However, the bank switch 1 input becomes the output over the area lower limit value. 3: Same as "1". However, the bank switch 1 input becomes the output over the area lower limit value.
Resolution	RESOLUT	0, 1 (1)	Sets the fineness of the pixels taken out of the image sensor.
Synchronous input delay time	SYNCDLY	0-255 (2)	Sets the delay time of a synchronous input signal.
Synchronous input	SYNCHRO	0-4 (4)	Sets a synchronous input signal.
Teaching function enables	TEACHEN	0-3 (0)	0: Change and movement of window. 1: Prohibits change of image-taking range. 2: Fixes the teaching window and the image-taking range. 3: Prohibits teaching.
Teaching mode	TEACHMD	0-3 (0)	0: Performs normal teaching. 1: Performs the dot and character detection teaching. 2: Similar to "0" under fixed brightness. 3: Similar to "1", under fixed brightness.
Teaching margin	TEACHL	0-30 (15)	Sets the color detection range at teaching.
Temperature compensation level	TEMPCMP	0-255 (30)	The temperature compensation level of the image sensor.

Connection



Options

MODEL	APPLICATION
CVS-M1 Remote Monitor (patent applied)	Remote controller with TFT display.
CVS-LW1 External Lighting (patent applied)	Use this lighting where this sensor is mounted at a dark place, or stable result is not obtained due to insufficient lighting.
CVS-C3S	A maximum of four cables can be connected in series.
Extension Cable (3m)	MAX 15m in total.

Specification

MODEL	CVS1-R10(NPN) CVS1-P10(PNP)	CVS1-R20(NPN) CVS1-P20(PNP)	CVS1-R21(NPN) CVS1-P21(PNP)	CVS1-R40(NPN) CVS1-P40(PNP)
Detection angle	10°	20°	20°	40°
Capture range	210-270mm	90-150mm	31-39mm	50-100mm
Capture area (±10%)	40×50-55×65mm	40×50-55×65mm	17×20-65×70mm	50×65-100×115mm
Light source	White LED, 12 pcs			
Supply Voltage	12-24 V DC ± 10%			
Power consumption	Max. 120 mA/24V DC			
Resolution	6×16 to 208×236			
Lamp duration	Approx. 50000 hrs (In normal temperature and humidity, brightness level down by 1/2 of the initial level)			
Response time	11 ms (Factory setting), 0.5 ms (Min.), 22 ms (Max.)			
Output signal	*NPN/PNP open collector output 2 points, Max. 100 mA, Residual voltage 1.0 V or less.			
Input	Bank selection/Synchronous/External teaching input 4 points			
Operating temperature	0 °C to 40 °C			
Ambient humidity	35 % to 85 %RH			
Storage temperature / humidity	-20 °C to 70 °C, 35 % to 95%RH			
Vibration / shock resistance	10 to 35 Hz Amplitude 1.5 mm, 500 ms/2 (10 times)			
Material	ABS / Acryl / Polycarbonate			
Protection structure	IP67			
Weight	Approx. 180 g			

