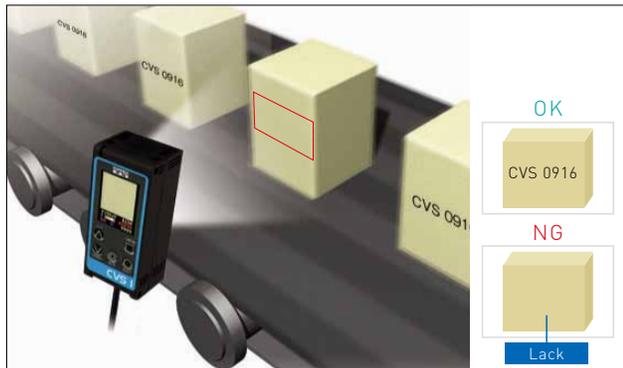


CVS SERIES APPLICATION

1. Checking existence of printing on the box



CVS1-R

Set the extracted color from the printing and check its area in the field of view

2. Checking the lid of instant foods



CVS2-R

Check the color and shape by its pattern matching function

3. Checking existence of cutting tape on the film



CVS1easy-R

Set the extracted color from the cutting tape and check its area in the field of view

4. Checking multiple colors on the box



CVS2-R

Check existence of multiple color on the box registering multiple colors as reference

5. Checking existence of seasoning bag



CVS1-R

Set the extracted color from the seasoning bag and check its area in the field of view

6. Checking shelf life on the packaging film



CVS4-R

Check the date of shelf life on packaging film. It has calendar function so checking overnight is available

7. Checking existence of label on package



CVS1-R

Set the major color on the label and check its area in the field of view

8. Checking existence of label on bottle



CVS1-R + CVS-LU1

Check the color of fluorescent illuminated by UV light utilizing CVS-LU1

9. Checking shelf life on the milk package



CVS4-R

Check the date of shelf life on milk package. It has calendar function so checking overnight is available

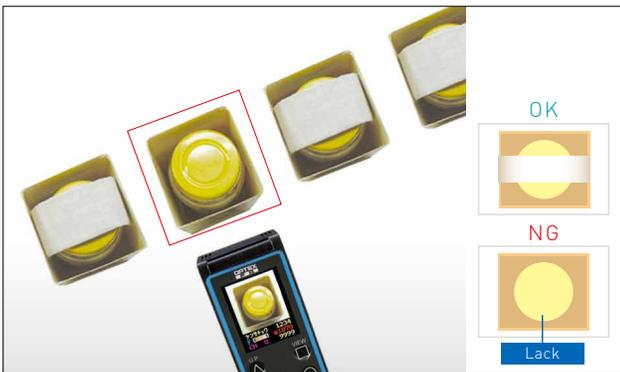
10. Checking expiration date on the package



CVS4-R

Check the expiration date on the package. It can just check number of character as well

11. Checking existence of description of pills



CVS1-R

Set the color area of description of pills in the field of view

12. Checking overlapping of the label



CVS3-R

Check the overlapping label by its edge detection function

13. Checking marking on electric components



CVS1-R

Set the color of the marking and check its area in the field of view. Narrow angle view version can zoom up small area.

14. Checking ON/OFF of LED on PWB



CVS2-R

Check the color and position of LED by its color pattern matching function

15. Checking order of the color of wires



CVS2-R

Check the color and position of wires by its color pattern matching function

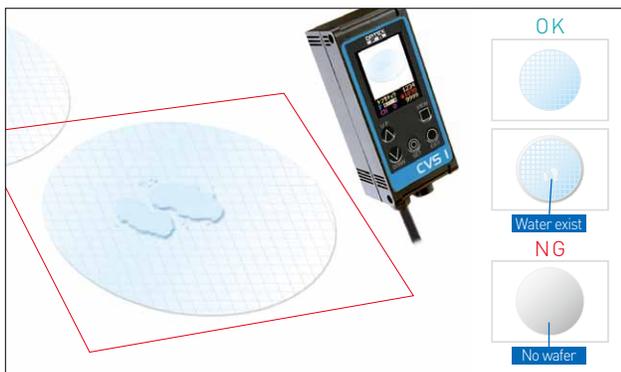
16. Checking existence of bad marking on parts



CVS2-R

Check color of the parts and color of bad marking on the parts to detect existence of bad parts

17. Checking existence of wafer



CVS1-R

Set the color of the wafer as its reference and detect existence of the wafer even there are some water on it

18. Checking direction of the parts



CVS3-R

Check the edge of the marking on the IC package and detect direction of it

19. Checking position of welded part



CVS2-R

Set the color of the pipe and welded part and detect welded part stably by its pattern matching function

20. Checking shape of assembled parts



CVS3-R

Check the shape of the assembled parts by edge detecting function utilizing back lighting

21. Checking direction of the parts on conveyor



CVS2-R

Check the color and position of the surface pattern by its color pattern matching function

22. Checking size of the nut



CVS3-R

Check size of the nut by edge detecting function

23. Checking characters on metal parts



CVS4-R

Check the characters engraved on the metal parts by its OCR function

24. Checking existence of lot number on the spark plugs



CVS1-R

Check the color area of the printed characters on the spark plugs

CVS1easy-R SERIES



Simple & Easy setup Color area sensor

- All in one color vision sensor
- Color resolution : 15,000 colors
- Stable color detection by calculating hue of each pixel



Wide range line-up

- CVS1easy-N20-R Standard type
- CVS1easy-N10-R Long range type
- CVS1easy-N40-R Macro view type
- CVS1easy-N21-R Narrow view type

All in one

The sensor has a built-in Camera, LED Lighting, Display monitor and Controller. This structure enables water resistance IP67.

Quick change over

8 Banks are available. You can remotely select the bank to use by PLC or other equipments.

Three-Step-Teaching

Teaching is easily done by three steps even in 30 seconds just like a color sensor.

Step1 Get into teaching mode



Step2 Set field of view

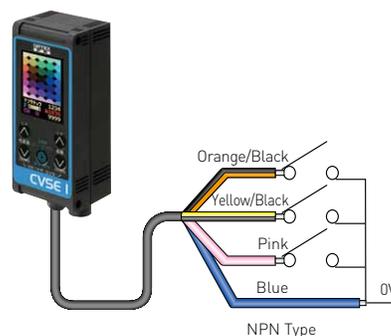
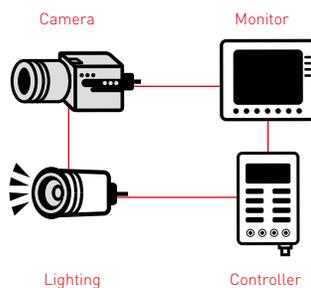


Chose the number to zoom in and zoom out

Step3 Set color



Chose the color from the list shown. You can also use teaching window on the view



Easy Threshold adjustment

Changing sensitivity of color extraction and threshold of inspection is easily done by simple buttons.



Color Resolution

Up to 15,000 colors are available to detect.

Stable inspection

It calculates color hue of each pixel so stable inspection is available.

Wide coverage line-up

You can chose from 4 inspection range/field of view according to inspection target condition.

High performance

Setup Adjustable while line is running

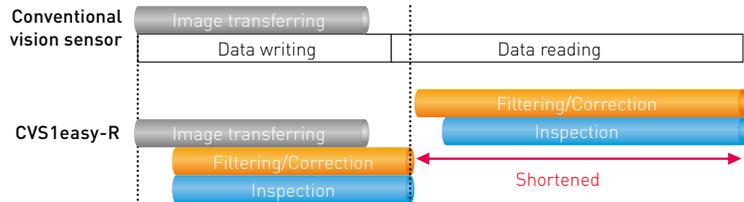
CVS1easy-R provides output with the setup parameters given even while you are adjusting setup. You don't have to stop the line.



CVS1easy-R has two processing unit individually so it can change parameters while vision processing is running without delay.

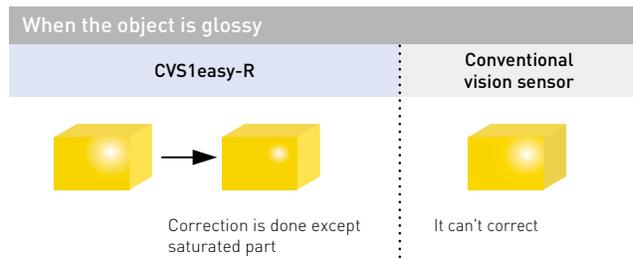
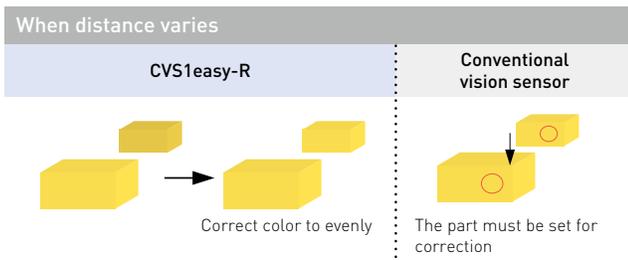
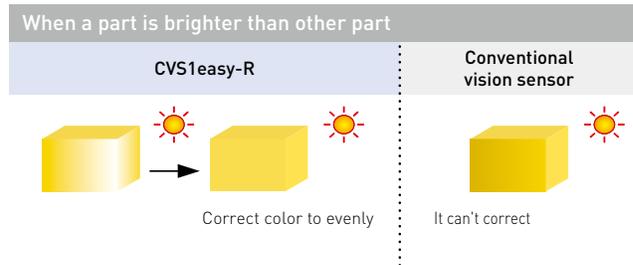
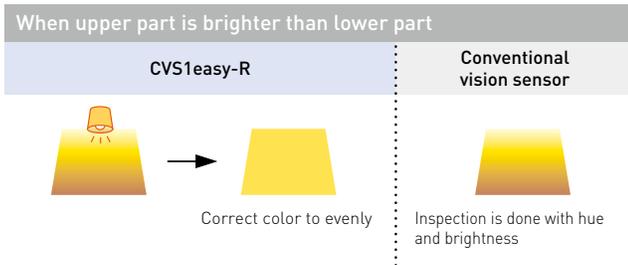
Secret of High speed

Transferring captured data and vision processing are parallelly done utilizing internal memory. It helps to shorten response time.



Stable inspection

It calculates color hue of each pixel that prevents miss-inspection affected by external light and brightness changes of lighting. Stable inspection is available and you can setup CVS1easy-R just like you do for photoelectric sensor.



Display

There are two mode: Normal / Setup

Normal mode

- 1 Captured image**
Image captured by the camera
- 2 Bank No.**
Current Bank No.
- 3 Display mode**
F: Dark Compensated image
2: Shows black except chosen color area
- 4 Registered color**
Min. and Max. color
- 5 Range of color**
Shows range of color. You can adjust by Color Range buttons.
Default : 13
- 6 Output**
● : ON × : OFF
- 7 Color match area**
Shows area that color is in the threshold. Green: In threshold, Red: Out of threshold
- 8 Threshold**
Shows threshold

Switches

▲ UP+1

Increase Color Range

▲ UP+1

Increase Threshold

▼ DOWN-1

Decrease Color Range

▼ DOWN-1

Decrease Threshold

○ SET / VIEW

Teach-in by pressing 3 sec. or more. Chose and set the parameter in Setup mode

* Change the mode to Setup by pressing both "DOWN-1" buttons 3 sec. or more.

Specifications

Model	CVS1easy-N10-R CVS1easy-P10-R	CVS1easy-N20-R CVS1easy-P20-R	CVS1easy-N21-R CVS1easy-P21-R	CVS1easy-N40-R CVS1easy-P40-R
Detection angle	10°	20°		40°
Working distance	210 to 270mm	90 to 150mm	31 to 39mm	50 to 100mm
Field of view	40 x 50mm to 55 x 65mm	40 x 50mm to 65 x 75mm	17 x 20mm (±10%)	50 x 65mm to 100 x 115mm
Light source	White LED 12 pcs built-in			
Image sensor	330,000 Pixel CMOS color image sensor			
Supply Voltage	12 to 24V DC±10%			
Power consumption	Max. 120mA/24V DC			
Resolution	5 x 12 to 200 x 240			
LED light duration	Approx.50,000 hours (In normal temperature and humidity. Brightness level down by 1/2 of the initial level)			
Response time	11ms (Factory setting),5.0ms(min.),22ms(Max.)			
Output signal	NPN or PNP open collector output x 1 max.100mA Residual voltage 1.0V or less			
Input	3 x Bank selection,1 x Synchronous(Totally4)			
Operating temperature	0 to 40°C (No condensation)			
Operating humidity	35 to 85%RH			
Storage temperature/humidity	-20 to 70°C,35 to 95%RH (No condensation)			
Vibration/shock resistance	10 to 55Hz Amplitude 1.5mm/50G (500m/s ²)			
Material	Case:ABS/Display and Lens:Acryl or Polycarbonate			
Protection structure	IP67			
Weight	Approx.180g (including cable)			

Parameters

Function	Setting range (Default)	Description
LCD Disp.		
Brightness BRIGHT	0 to 255 (100)	Specifies the brightness of the screen (shutter time). The optimal value is set at teaching. The shutter time is calculated with "the setting value x 54.5 μs."
Initializing setting value INITIAL	NO, YES (NO)	Initializes all the set values by setting "YES."
Off delay OFF DLY	0 to 5000 (0)	Sets the Off delay time of output. When set to one shot (ONESHOT = ON), the value means period of oneshot output. (Unit: ms)
On delay ON DLY	0 to 5000 (0)	Sets the On delay time of output. (Unit: ms)
One shot ONESHOT	OFF, ON (OFF)	Switches to the oneshot output. The time is specified by the value of OFF DLY .
Output reverse OUTSIDE	LOW, HIGH (LOW)	Switches the relationship between the area and the output. LOW : The output turns on when the area is equal to area threshold or more than that. HIGH : The output turns on when the area is less than area threshold.
Resolution RESOLUT	LOW, HIGH (LOW)	Specifies the resolution of the image to be captured. LOW : Reduces the horizontal resolution and response time to half. Effective for fast moving object that doesn't need higher resolution. HIGH : Doesn't reduce the resolution.
Synchronous input SYNCHRO	OFF, ON (OFF)	OFF : Capture continuously. ON : Capture at the rising point of synchronous input (purple).

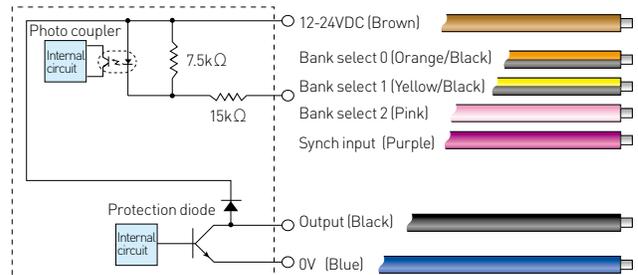
LCD Disp displayed in yellow: the setting item is common to all banks.
LCD Disp displayed in purple: the setting item switches to the specific value of each bank.



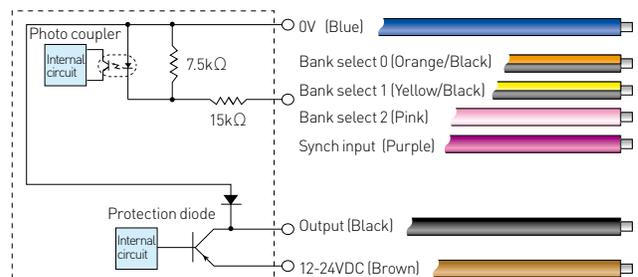
When switching banks changing resolution and zoom rate, the image sensor may take approx. 2 seconds to be stable. Set same resolution and zoom rate when change banks continuously.

Connection diagram

(NPN)



(PNP)



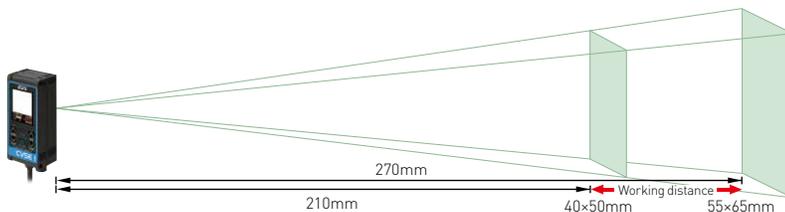
Bank table

Cable Color	Signal	Bank No.							
		0	1	2	3	4	5	6	7
Orange/Black	Bank selection 0 input	OFF	ON	OFF	ON	OFF	ON	OFF	ON
Yellow/Black	Bank selection 1 input	OFF	OFF	ON	ON	OFF	OFF	ON	ON
Pink	Bank selection 2 input	OFF	OFF	OFF	OFF	ON	ON	ON	ON

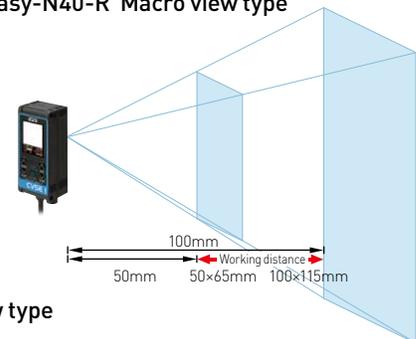
OFF	NPN: OPEN or connect with the brown line. PNP: OPEN or connect with the blue line.
ON	NPN: connect with the blue line. PNP: connect with the brown line.

Field of View

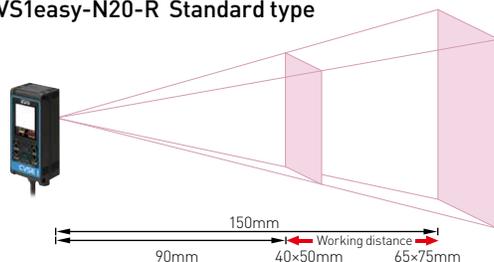
CVS1easy-N10-R Long range type



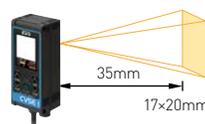
CVS1easy-N40-R Macro view type



CVS1easy-N20-R Standard type



CVS1easy-N21-R Narrow view type





Easy setup Color sensor

- All in one color vision sensor
- High speed : 0.6 - 22ms
- Stable color detection by calculating hue of each pixel



Wide range line-up

- CVS1-N20-R Standard type
- CVS1-N10-R Long range type
- CVS1-N40-R Macro view type
- CVS1-N21-R Narrow view type

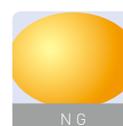
One threshold mode

Determine OK when the area that the color matches exceeds the threshold.



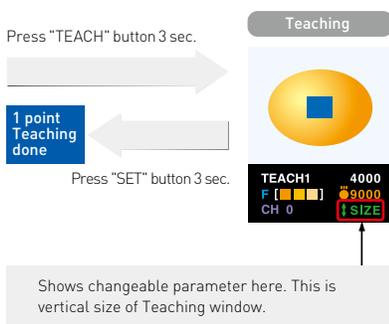
Two threshold mode

Determine OK when the area that the color matches is in two thresholds.



Easy Teaching

Teaching is easily done by moving the teaching cursor on the part that you want to teach the color and just set it.



Setup per application

Set "INITIAL" proper number as following table shows. Parameters will be set automatically for the application.

Application	print	print on glossy surface	fine color difference	glossy surface	black and white	fine dark color difference	print on rough surface
	Shelf life 2005.8.25	2005.8.25					Shelf life 2005.8.25
INITIAL	1	2	3	4	5	6	8

High Speed : 0.6 - 22ms

Newly developed vision processor enables high speed inspection.

Up to 16 Bank

16 Banks are available in small all in one package.

Zoom function

You can zoom in a part of the object. You can inspect 16 parts of the object changing Bank efficiently.

Stable inspection

It calculates color hue of each pixel that prevent miss-inspection.

Wide coverage line-up

You can chose from 4 inspection range/field of view according to inspection target condition.

High performance

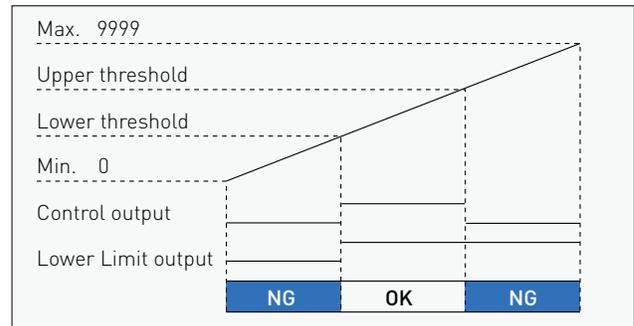
Setup Adjustable while line is running

CVS1-R provides output with the setup parameters given even while you are adjusting setup. You don't have to stop the line.



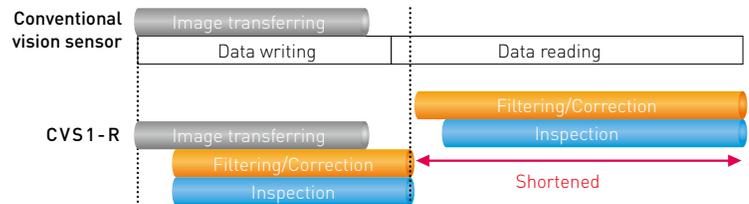
Lower Limit output

You can see which the NG output is lower than lower threshold or higher than upper threshold.



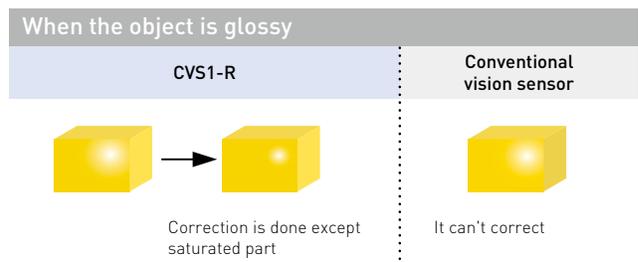
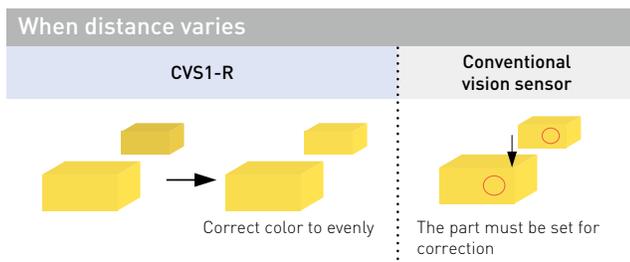
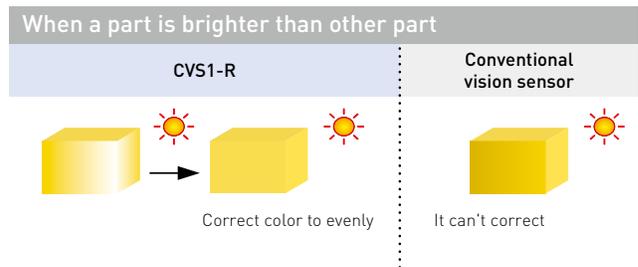
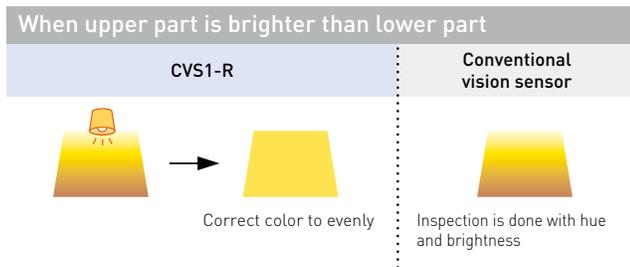
Secret of High speed

Transferring captured data and vision processing are parallelly done utilizing internal memory. It helps to shorten response time.



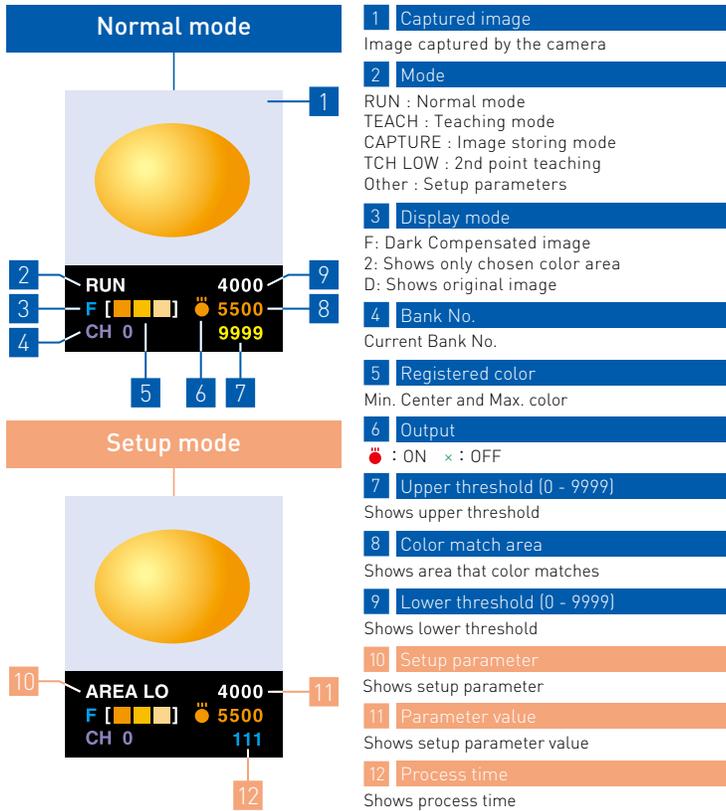
Stable inspection

It calculates color hue of each pixel that prevent miss-inspection affected by external light and brightness changes of lighting. Stable inspection is available and you can setup CVS1-R just like you do for photoelectric sensor.



Display

There are two mode: Normal / Setup



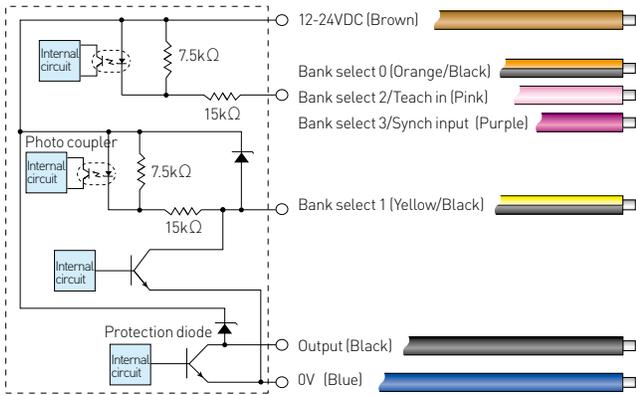
Switches



Specifications

Model	CVS1-N10-R CVS1-P10-R	CVS1-N20-R CVS1-P20-R	CVS1-N21-R CVS1-P21-R	CVS1-N40-R CVS1-P40-R
Detection angle	10°	20°		40°
Working distance	210 to 270mm	90 to 150mm	31 to 39mm	50 to 100mm
Field of view	40 x 50mm to 55 x 65mm	40 x 50mm to 65 x 75mm	17 x 20mm (±10%)	50 x 65mm to 100 x 115mm
Light source	White LED 12 pcs built-in			
Image sensor	330,000 Pixel CMOS color image sensor			
Supply Voltage	12 to 24V DC±10%			
Power consumption	Max. 120mA / 24V DC			
Resolution	8 x 16 to 200 x 240			
LED light duration	Approx.50,000 hours (In normal temperature and humidity. Brightness level down by 1/2 of the initial level)			
Response time	0.6ms to 22ms			
Output signal	NPN or PNP open collector output x 2 [one of them is "Lower limit output"selectable with bank input #1] max.100mA Residual voltage 1.0V or less			
Input	4 x Bank selection / 1 x Synchronous / 1 x External teaching / 1 x Lower limit output (Totally 4)			
Operating temperature	0 to 40°C (No condensation)			
Operating humidity	35 to 85%RH			
Storage temperature/humidity	-20 to 70°C,35 to 95%RH (No condensation)			
Vibration/shock resistance	10 to 55Hz Amplitude 1.5mm / 50G (500m/s ²)			
Material	Case:ABS / Display and Lens:Acryl or Polycarbonate			
Protection structure	IP67			
Weight	Approx.180g (including cable)			

Connection diagram (NPN)

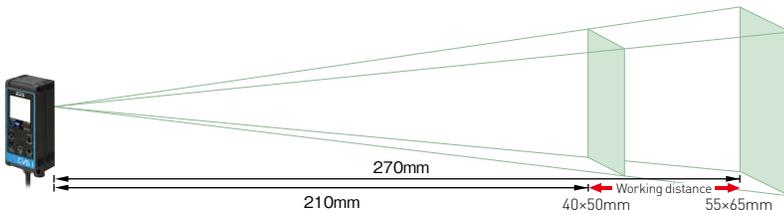


Bank table

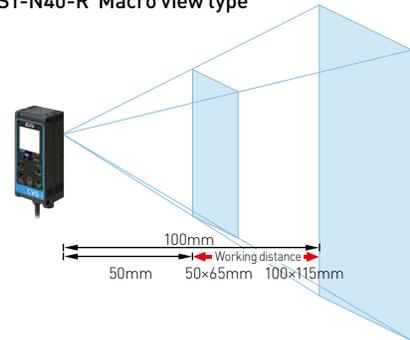
Bank No.	Bank select input			
	3(Purple)	2(Pink)	1(Yellow/Black)	0(Orange/Black)
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON

Field of View

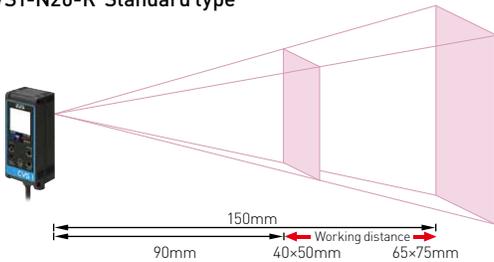
CVS1-N10-R Long range type



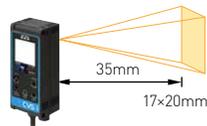
CVS1-N40-R Macro view type



CVS1-N20-R Standard type



CVS1-N21-R Narrow view type





Detect Color and Shape for various inspection

- All in one color vision sensor
- For Pattern matching and Color inspection
- Better sensitivity by Masking function



Wide range line-up

- CVS2-N20-R Standard type
- CVS2-N10-R Long range type
- CVS2-N40-R Macro view type
- CVS2-N21-R Narrow view type

Pattern matching mode and Color inspection mode are available

Inspection of shape and direction of the object is available by pattern matching mode. You can use CVS2-R as simple Color inspection sensor as well. Sorting by color is also available.



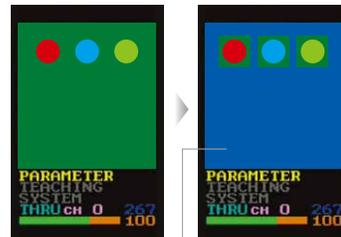
Correct background brightness

CVS2-R has a function that corrects evenness of background brightness. You register just the background for reference.



Masking function

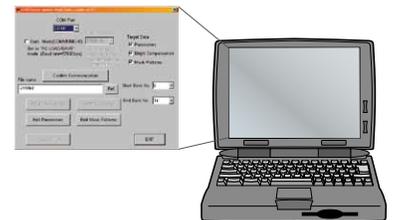
You can mask the area that doesn't have to be checked so that you can get better sensitivity of color inspection.



Masking area

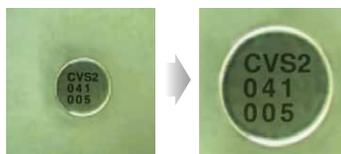
Downloading setup parameters to PC

You can download setup data and image data into PC. You can use the image data on PC and can copy setup to other CVS2-R. Please use I/F cable CVS-C2C.



Zoom function

CVS2-R has Zoom function so you can zoom in up to twice size.



x2

Up to 15 Bank

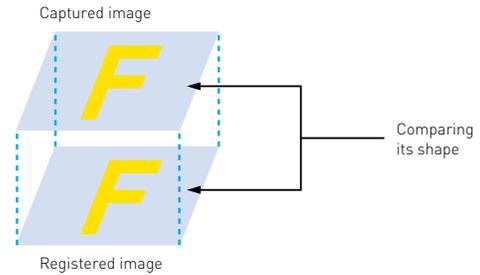
15 Banks are available in small all in one package.

Wide coverage line-up

You can chose from 4 inspection range/field of view according to inspection target condition.

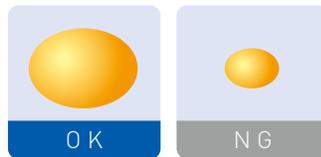
Pattern Matching mode

CVS2-R detects up to 65,536 colors and checks its shape to compare with registered image.

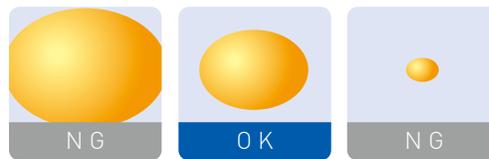


Color Inspection mode

Determine OK when the area that the color matches exceeds the threshold.



Determine OK when the area that the color matches is in two thresholds.



Two Color Inspection at a time

CVS2-R can inspect two colors for one application at a time.

Checking Two Color

You can set Upper and Lower threshold for two colors to inspect. You can chose a logic from 4 combination.



Two bar graphs for two colors

Two threshold for two colors each

Masking function

You can mask the area you don't want to detect the color freely in position.



Blue part is masked area

Sorting function

Sorting is available by utilizing two outputs up to 3. You can also increase the sorting number up to 15 by utilizing RS-232C controlling or external unit TMC-N11-CVS.

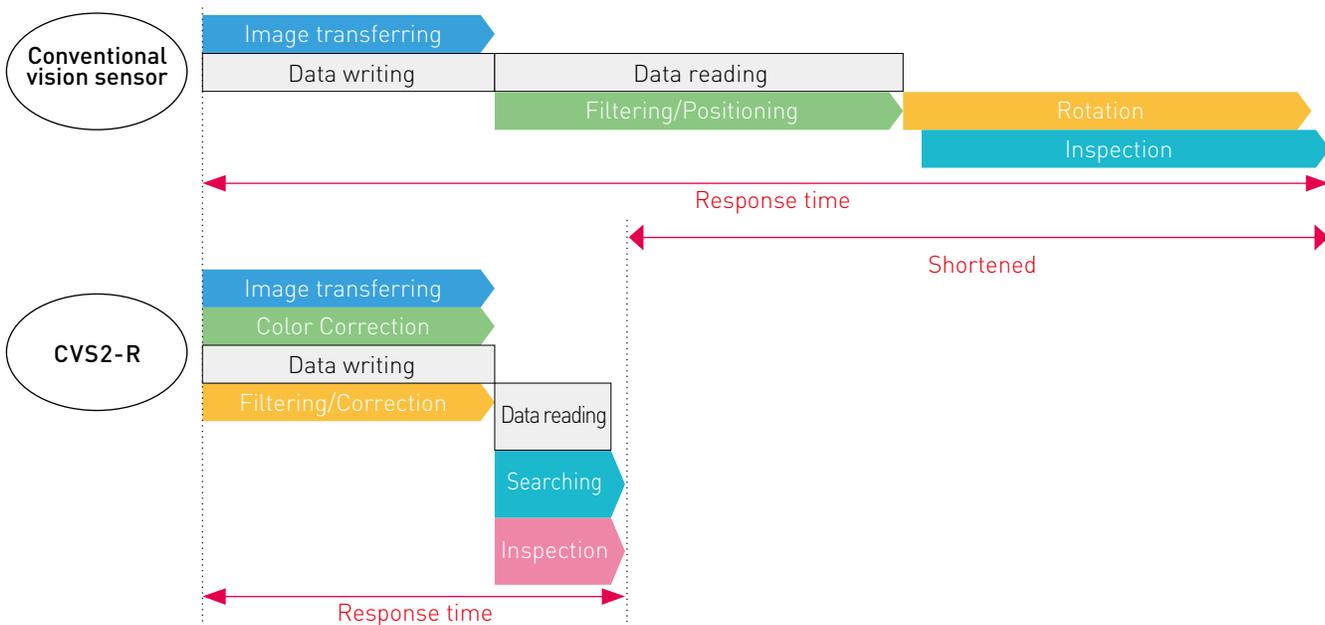


When this parameter is 1, you can sort in two criteria.

Features

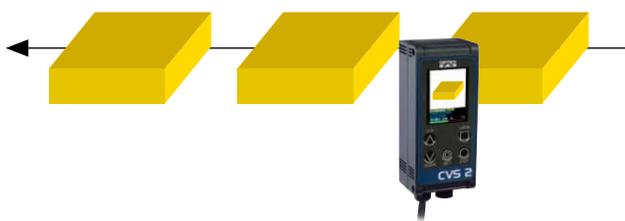
Secret of High speed

Transferring captured data and vision processing are parallelly done utilizing internal memory. It helps to shorten response time.



Setup Adjustable while line is running

CVS2-R provides output with the setup parameters given even while you are adjusting setup. You don't have to stop the line.



CVS2-R has two processing unit individually so it can change parameters while vision processing is running without delay.

Correct background brightness

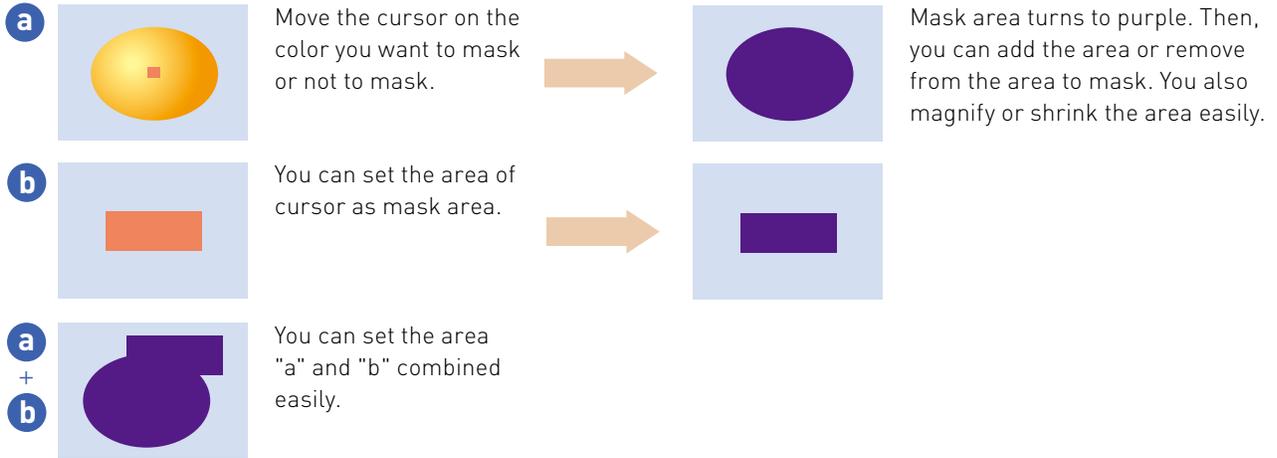
CVS2-R has a function that corrects evenness of background brightness. You register just the background for reference.



Masking

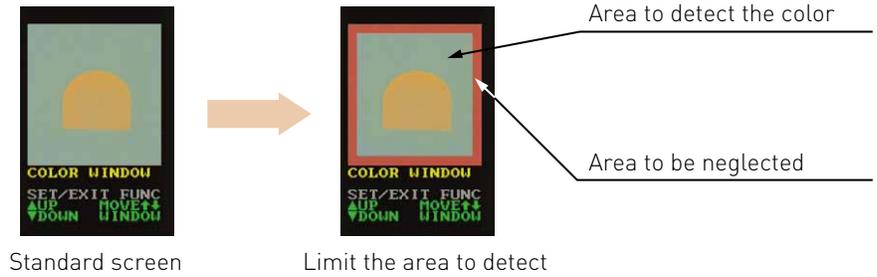
You can mask the area that doesn't have to be checked so that you can get better sensitivity of color inspection.

Setup You can setup the area to mask as follows.

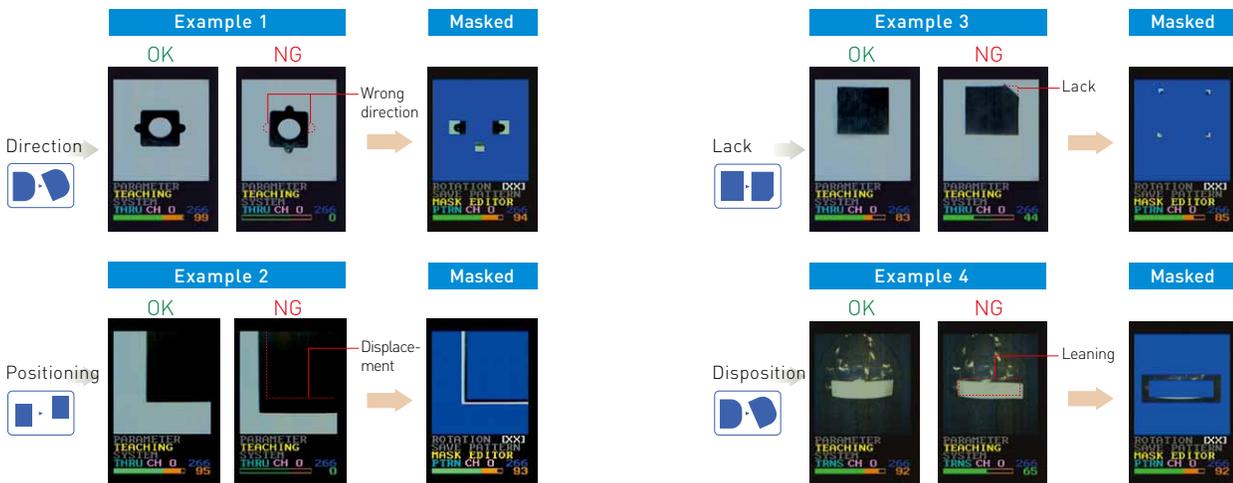


Color inspect area

You can limit the area to inspect color from. This prevents miss-detection of color at the edge of the FOV.



Example of masking



You can get better result by masking the area that doesn't show characteristics of the target object.

Display

Pattern matching mode

- 1 Captured image
Image captured by the camera
- 2 Parameters
Shows parameters
- 3 Display mode
You can change display mode by VIEW button
- 4 Bar graph
Shows how big the area that the color matches. Threshold is at the border of green and orange.
- 5 Bank No.
Shows current Bank.
- 6 Auxiliary output
Status of auxiliary output.
● : means ON
- 7 Response time
Shows response time. Unit : 0.1ms.
Example : 266 = 26.6ms
- 8 Color match area
Shows area that color matches.
Orange : ON, Green : OFF

CVS1 compatible mode

- 1 Captured image
Image captured by the camera
- 2 Parameters
Shows parameters
- 3 Display mode
Shows display mode
- 4 Display mode
Shows how big the area that the color matches.
- 5 Registered color
Min. Center and Max. color
- 6 Bank No.
Shows current Bank.
- 7 Output/Sorting status
Orange: ON, Green: OFF
Shows sorting No. when it's active.
- 8 Monitoring Bank No.
Shows Bank No. for sorting.

When sorting is active

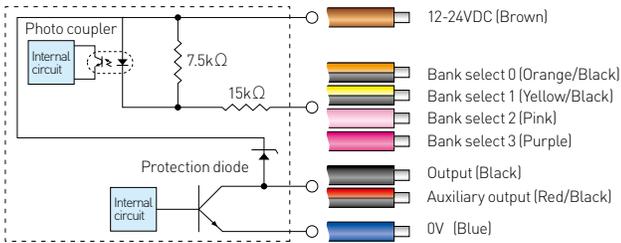
Switches

- UP**: Move cursor up and increase parameter value
- DOWN**: Move cursor down and decrease parameter value
- VIEW**: Change the display mode
F: Dark Compensated image
2: Shows only chosen color area
D: Shows original image
- EXIT**: Use this button when you quit changing parameter and going back to previous menu.
- SET**: Change to setup mode.
Chose the parameter by pressing 3 sec. or more.

Specifications

Model	CVS2-N10-R CVS2-P10-R	CVS2-N20-R CVS2-P20-R	CVS2-N21-R CVS2-P21-R	CVS2-N40-R CVS2-P40-R
Detection angle	10°	20°		40°
Working distance	210 to 270mm	90 to 150mm	31 to 39mm	50 to 100mm
Field of view	40 x 50mm to 55 x 65mm	40 x 50mm to 65 x 75mm	17 x 20mm (±10%)	50 x 65mm to 100 x 115mm
Light source	White LED 12 pcs built-in			
Image sensor	330,000 Pixel CMOS color image sensor			
Supply Voltage	12 to 24V DC±10%			
Power consumption	Max. 140mA/24V DC			
Resolution	8 x16 to 200 x 240			
LED light duration	Approx.50,000 hours(In normal temperature and humidity. Brightness level down by 1/3 of the initial level)			
Response time	4ms to 22ms			
Output signal	NPN or PNP open collector output x 2 max. 100mA Residual voltage 1.0V or less			
Input	4 x Bank selection / 1 x Synchronous / 1 x External teaching (Totally 4)			
Operating temperature	0 to 40°C (No condensation)			
Operating humidity	35 to 85%RH			
Storage temperature/humidity	-20 to 70°C, 35 to 95%RH(No condensation)			
Vibration/shock resistance	10 to 55Hz Amplitude 1.5mm / 50G(500m/s ²)			
Material	Case:ABS / Display and Lens : Acryl or Polycarbonate			
Protection structure	IP67			
Weight	Approx.180g (including cable)			

Connection diagram



Auxiliary output

AUX OUT=0: Ready - Turns OFF after switching Bank.

Turns ON when Output is ready

AUX OUT=1: Judge timing - Turns ON when Judge timing

AUX OUT=2: Light timing - Turns ON when Lighting

AUX OUT=3: Searching result - Turns ON when each search result is in its criteria, MAGNIFY%, POSIT% X, POSIT% Y, ROTATE%.

Bank table

Set up	BANK	0-14		15		16		
	SYNCHRON	4	0-3	4	0-3	4	0-3	
External Input	Bank select 0	NA		Active				
	Bank select 1	NA		Active				
	Bank select 2	External Teach-in						Active
	Bank select 3	NA	Synch.In	Active	Synch.In	Active	Synch.In	

Sorting output

You can get sorting output from following table that shows which bank matches by combination of Output (Black) and Auxiliary output (Red/Black) signals.

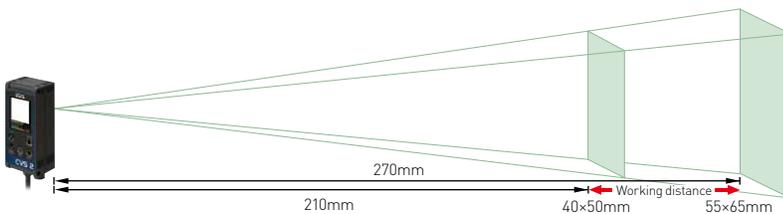
Bank No.	Output(Black)	Auxiliary output(Red/Black)
Current Bank	ON	OFF
+1	OFF	ON
+2	ON	ON

Bank No.	Bank select input			
	3(Purple)	2(Pink)	1(Yellow/Black)	0(Orange/Black)
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
0	ON	ON	ON	ON

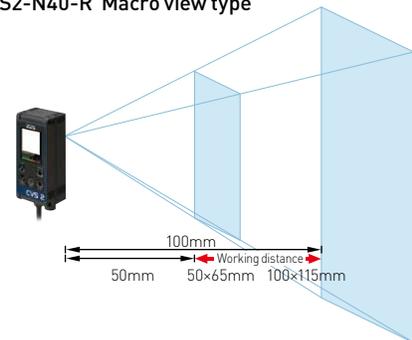
OFF	NPN: OPEN or connect with the brown line. PNP: OPEN or connect with the blue line.
ON	NPN: connect with the blue line. PNP: connect with the brown line.

Field of View

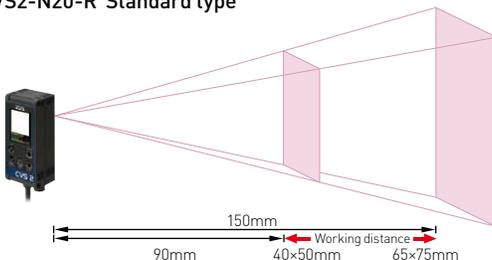
CVS2-N10-R Long range type



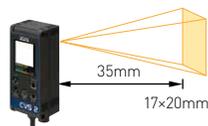
CVS2-N40-R Macro view type



CVS2-N20-R Standard type



CVS2-N21-R Narrow view type





Edge sensor for various applications

- All in one color vision sensor
- Easy setup and High performance
- Useful Zoom-in function



Wide range line-up

- CVS3-N20-R Standard type
- CVS3-N10-R Long range type
- CVS3-N21-R Narrow view type

New inspection mode: Contour mode, Differential mode

New inspection mode, Contour mode and Differential mode have been added up on conventional CVS3-R compatible mode. It has improved search function and improved color/contrast correct function.

Masking function

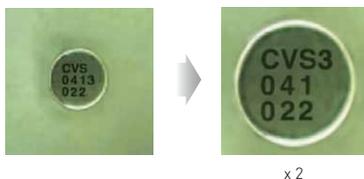
You can mask the area that doesn't have to be checked so that you can get better sensitivity of inspection.



	Compatible mode	Contour mode	Differential mode
Mode			
Application	<p>Metal parts</p>	<p>Metal parts</p> <p>Contour mode+Monochrome mode</p> <p>For flaw with slight color difference</p> <p>Contour mode+Color inspection</p> <p>For slight color difference and shape</p> <p>Contour mode+inspection of entire area</p>	<p>Checking picture</p> <p>Differential mode</p> <p>For low contrast object</p> <p>Differential mode+Color inspection</p>

Zoom function

CVS3-R has Zoom function so you can zoom in up to twice size.



Downloading setup parameters to PC

You can download setup data and reference image data into PC. You can copy the reference image data and the setup data to other CVS3-R. Please use I/F cable CVS-C2C.

Up to 15 Bank

15 Banks are available in small all in one package.

Other FOV type is available

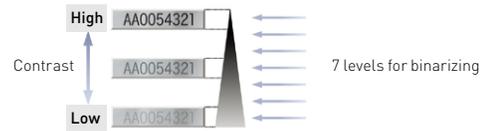
In case you need other FOV type like CVS1-R or CVS2-R, please contact our distributor.

Features

7 binarize level

When it compares binarized image between registered image and captured image, it chooses best binarize level to get best image automatically. This is effective when the lighting is not stable.

Existence of graved mark on metal or glass



Scaling up/down

Correcting size function correct captured image size. This function is effective for inspection of the object on conveyor.

Detecting direction of object



Size of image captured is changed in case the conveyor waves or its speed changes. In this case, this function automatically changes image size when it searches target image.



Rotate correction

Correction of rotation is available up to +/- 6.2degree.

Inspection of chocolate shape



Find out best angle rotating the captured image step by step



Detecting Color edge

Detect edge between different colors and get clear image to inspect.

Inspection of colored label direction



You can detect even red color on green background easily that monochrome camera can't.



Easy Teaching

You can externally teach CVS3-R just by inputting single Teaching signal. Then, CVS3-R updates its image for reference automatically.

Verifying shelf life that changes everyday



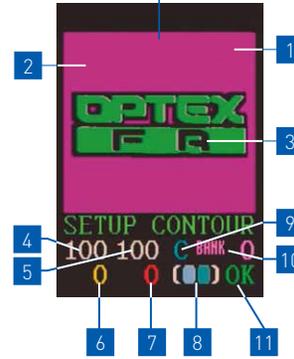
Display

Compatible mode



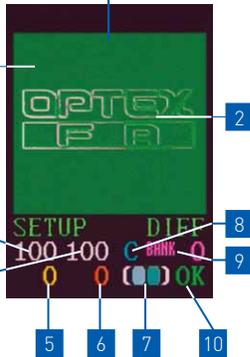
- 1 Captured image
Image captured by the camera
- 2 Parameters
Shows parameters
- 3 Lack/Stain pixels
Shows lack of edge and stain on the background
- 4 Stableness of threshold level
↑: Increase THRESHLD
↓: Decrease THRESHLD
- 5 Display mode
Shows current display mode
- 6 Judge result
Shows judge result
- 7 Bank No./Response time
Shows Bank No. in normal mode. Shows response time while setup mode

Contour mode



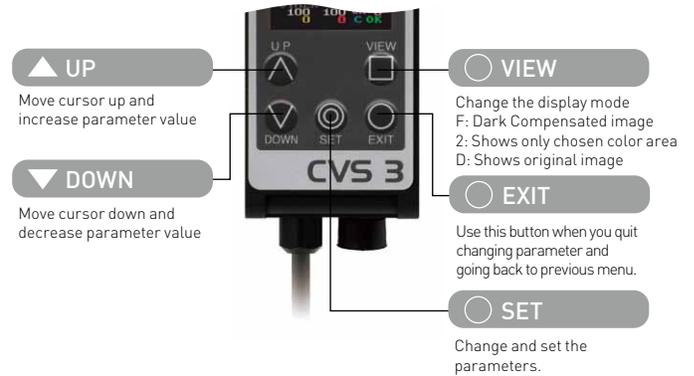
- 1 Area to detect stain
It shows pixel in red when it matches to the contour and Stain pixel No. will be increased
- 2 Area to detect lack of contour
It shows pixel in yellow when it's detected as lack of contour and Lack pixel No. will be increased
- 3 Area to neglect
It doesn't affect anything even if there is contour in this area
- 4 Threshold of lack of contour
- 5 Threshold of stain
- 6 Lack pixel No.
- 7 Stain pixel No.
- 8 Registered color (bright / dark)
- 9 Display mode
- 10 Bank No.
- 11 Judge result

Differential mode



- 1 Area without contour
It shows pixel in yellow or red when it detect contour and differential rate will be increased
- 2 Area with contour should exist
It shows pixel in yellow or red when it doesn't detect contour and differential rate will be increased
- 3 Threshold of differential rate
- 4 Threshold of color area rate
- 5 Differential rate
- 6 Color area rate
- 7 Registered color (bright / dark)
- 8 Display mode
- 9 Bank No.
- 10 Judge result

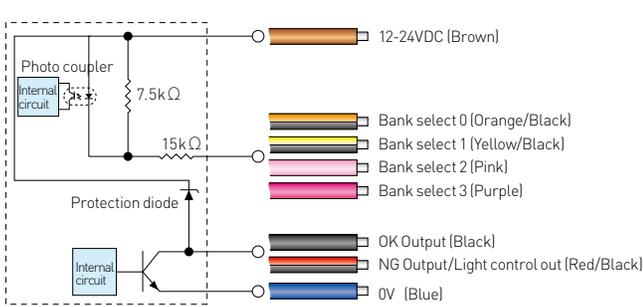
Switches



Specifications

Model	CVS3-N10-R CVS3-P10-R	CVS3-N20-R CVS3-P20-R	CVS3-N21-R CVS3-P21-R
Detection angle	10°	20°	
Working distance	210 to 270mm	90 to 150mm	31 to 39mm
Field of view	40 x 50mm to 55 x 65mm	40 x 50mm to 65 x 75mm	17 x 20mm (±10%)
Light source	White LED 12 pcs built-in		
Image sensor	330,000 Pixel CMOS color image sensor		
Supply Voltage	12 to 24V DC±10%		
Power consumption	Max. 140mA/24V DC		
Resolution	16 x16 to 208 x 236		
LED light duration	Approx.50,000 hours(In normal temperature and humidity. Brightness level down by 1/3 of the initial level)		
Response time	48ms (Factory setting).2.5ms (Min). 518ms (Max)		
Output signal	NPN or PNP open collector output x 2 max. 100mA Residual voltage 1.0V or less		
Input	4 x Bank selection / 1 x Synchronous / 1 x External teaching (Totally 4)		
Operating temperature	0 to 40°C (No condensation)		
Operating humidity	35 to 85%RH		
Storage temperature/humidity	-20 to 70°C, 35 to 95%RH (No condensation)		
Vibration/shock resistance	10 to 55Hz Amplitude 1.5mm / 50G (500m/s ²)		
Material	Case:ABS / Display and Lens : Acryl or Polycarbonate		
Protection structure	IP67		
Weight	Approx.180g (including cable)		

Connection diagram



Bank table

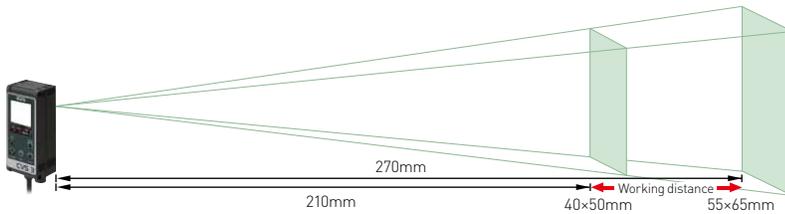
Set up	BANK	0-14		15		16	
	SYNCHRON	4	0-3	4	0-3	4	0-3
External Input	Bank select 0	NA		Active			
	Bank select 1	NA		Active			
	Bank select 2	External Teach-in				Active	
	Bank select 3	NA	Synch.In	Active	Synch.In	Active	Synch.In

Bank No.	Bank select input			
	3(Purple)	2(Pink)	1(Yellow/Black)	0(Orange/Black)
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
0	ON	ON	ON	ON

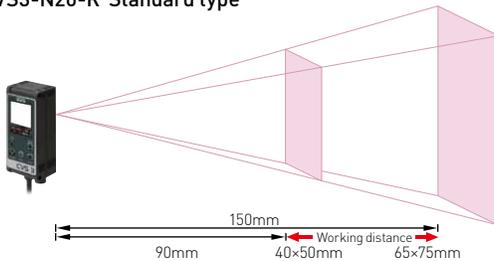
OFF	NPN: OPEN or connect with the brown line . PNP: OPEN or connect with the blue line .
ON	NPN: connect with the blue line . PNP: connect with the brown line .

Field of View

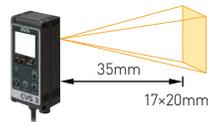
CVS3-N10-R Long range type



CVS3-N20-R Standard type



CVS3-N21-R Narrow view type





Compact OCR sensor

- All in one OCR sensor
- Easy setup and High performance
- Built-in Calendar

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OPTEX FA



Wide range line-up

- CVS4-N23-R Standard type
- CVS4-N21-R Small character type
- CVS4-N20-R Long range type
- CVS4-N40-R Macro view type
- CVS4-N23R-R Standard vertical type

Easy setup

You can setup easily just following the instruction on the screen.

User dictionary

You can make characters utilizing the images captured and transferred to PC.

Up to 16 Bank

16 Banks are available in small all in one package.

Built-in Calendar

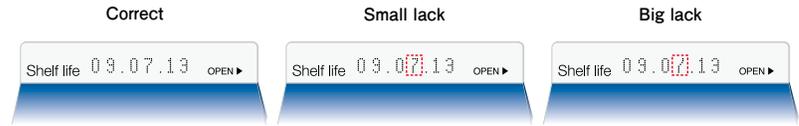
It can check the date continuously overnight referring built-in calendar without error because of its tolerance of time.

All in one OCR sensor

Recognizes Alphabetic, Numeric and Special characters. It can check shelf life, date of manufacture and lot number. It recognizes characters of Thermal printer, Hot printer, Ink-jet printer and Laser marker.



It compares the characters with internal Dictionary. You can setup as it determines NG when single character is wrong. You can also setup as it determines OK when the character has only small lack.



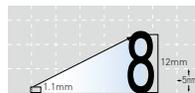
Storing NG image

When judge result changed from OK to NG, it stores NG image into internal memory up to 30 images. You can download the image data from CVS4-R through optional cable CVS-C2C.

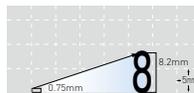
Wide range of line-up

You can chose a range from 4 ranges of line-up.

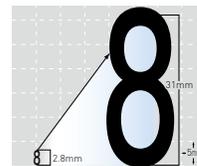
CVS4-N23W-R/
-N23RW-R



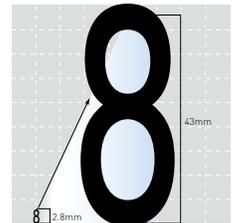
CVS4-N21W-R



CVS4-N20W-R



CVS4-N40W-R



Character direction

CVS4-N23W-R/-N21W-R/
-N20W-R/-N40W-R



A 05 10 17
B 05 10 22

CVS4-N23RW-R



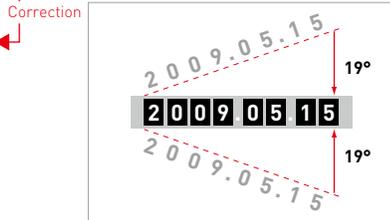
A 05 10 17
B 05 10 22

Features

Rotation search



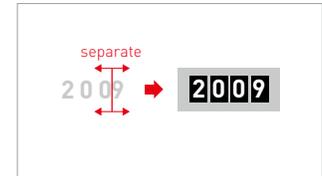
It can search the characters rotating up to +/-19 degree.



Recognize connected characters



Connected characters can be separated by adjusting the character width.



Double shutter



It captures twice by single trigger. If first image or 2nd image is OK, judge result is OK. This function is effective when the trigger timing is not stable and object position is not stable.

Continuous capture



It will automatically capture and check the image continuously from single trigger until it gets OK image. If it gets Time-out before getting OK, it outputs NG.

Expandable FOV



You can expand vertical FOV when the character lines can't be in standard FOV



FOV can be vertically doubled by this function and it can detect the character lines in a FOV.

Mirror capture

It can capture mirror reversed image

Fast capture mode

It has Fast capture mode reducing vertical resolution down to half. This is effective for the objects that move fast.

Delayed Output function

It has timer to delay activating output for the period. This function can be utilized for controlling sorting stage located after the inspection stage.

Check character number

It can just check number of characters to see existence of the printing for example.

Delayed NG mode

It can turn output to NG only when it detect NG certain times continuously. This is effective for detecting ink runs out and some special error that happens rarely.

Wild card for verifying characters

You can use "?" as a wild card to determine a character as OK whatever the character is. This function is effective when the character can be any characters.

Display

Normal mode

- 1 Captured image
You can change by VIEW button. When it's detached mode, background is Green for OK and Red for NG.
- 2 Scale
Scale for adjust character size in FOV
- 3 Display mode
Shows display mode in yellow
- 4 Judge result
OK : Data/Time is in threshold and string matches
NG : Any lines doesn't match
ER : Backup error of calendar timer
- 5 Current Bank No.
- 6 Inspection item on screen
1D : The 1st date 2D : The 2nd date
1T : The 1st time 2T : The 2nd time
CH : Number of characters and character string
- 7 Response time from Synch. input to Judge output
- 8 Recognized Date/Time
- 9 Upper limit of Date/Time
- 10 Lower limit of Date/Time

Switches

- UP**
Move cursor up and increase parameter value
- DOWN**
Move cursor down and decrease parameter value
- SET**
Change the mode. Chose and set the parameters.
- VIEW**
Change the display mode. Press with "UP" and "DOWN" when you change the item to monitor.
- EXIT**
Change the mode from/to Normal mode to/from Teaching mode.

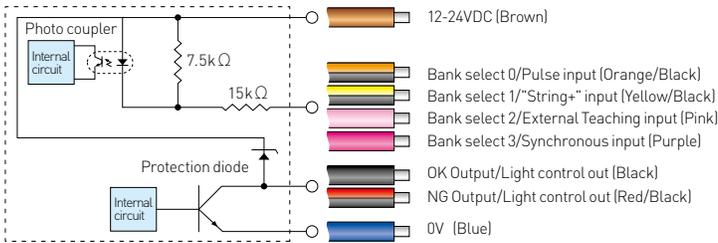
DOWN + SET Set Lock mode, inhibit Teaching and changing parameters of setup.
Press both buttons → 3sec.

UP + SET Releases Lock mode.

Specifications

Model	CVS4-N20W-R CVS4-P20W-R	CVS4-N21W-R CVS4-P21W-R	CVS4-N40W-R CVS4-P40W-R	CVS4-N23W-R CVS4-P23W-R	CVS4-N23RW-R CVS4-P23RW-R
Detection angle	20°		40°	20°	
Working distance	90 to 150mm	31 to 39mm	50 to 100mm	44 to 56mm	44 to 56mm
Field of view	53x25mm to 79x38mm	21x10mm (±10%)	53x25mm to 115x53mm	30x15mm (±10%)	30x15mm (±10%)
Light source	White LED 12 pcs built-in				
Image sensor	330,000 Pixel CMOS monochrome image sensor				
Supply Voltage	12 to 24V DC±10%				
Power consumption	Max. 140mA / 24V DC				
Resolution	512 x 244				244 x 512
LED light duration	Approx.100,000 hours(In normal temperature and humidity. Brightness level down by 1/2 of the initial level)				
Response time	23ms to 48ms (20 characters in 2 lines,Rotation search up to ±10°)				
Output signal	NPN or PNP open collector output x 2 (OK/NGoutput,External light control output) max. 100mA Residual voltage 1.0V or less				
Input	4 x Bank selection / 1 x Synchronous / 1 x External teaching (Totally 4)				
Operating temperature	0 to 40°C (No condensation)				
Operating humidity	35 to 85%RH				
Storage temperature/humidity	-20 to 70°C, 35 to 95%RH(No condensation)				
Vibration/shock resistance	10 to 55Hz Amplitude 1.5mm / 50G(500m/s ²)				
Material	Case:ABS / Display and Lens : Acryl or Polycarbonate				
Protection structure	IP67				
Weight	Approx.200g (including cable)				
Recognizable character number	60 characters / 6 lines				
Character number per line	30 characters				
Number of date/time/string	Up to 2 x Date / 2 x Time / 4 x Strings with 22 characters (up to 4 items)				
User Dictionary	56 characters				
Built-in Timer accuracy	-45 sec. to 75 sec. per month				
Back up period of built-in timer	5 years by built-in non-rechargeable battery / Life of super capacitor : 7.8 years (when its capacity gets down to the level that keep timer 3 days)				

Connection diagram



Bank table

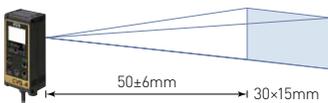
Bank No.	Bank select input			
	3(Purple)	2(Pink)	1(Yellow/Black)	0(Orange/Black)
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

OFF	NPN: OPEN or connect with the brown line. PNP: OPEN or connect with the blue line.
ON	NPN: connect with the blue line. PNP: connect with the brown line.

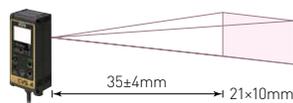
Bank	Parameter			Function of Bank selection input				Selectable range
	Synchron	String+	SyncPlus	Orange/Black	Yellow/Black	Pink	Purple	
BKN	CONT	OFF	Others ON	Bank selection0	Bank slctn 1 String+	Bank slctn 2	Bank slctn 3	0-15
		ON,SCLR	Others ON					0,1,4,5,8,9,12,13
	UP,HIGH DOWN, LOW	OFF	Others ON	Pulse que Bank slctn0	String+	Synchron input	0-7	
		ON,SCLR	Others ON				0,2,4,6 0,1,4,5 0,4	
TCH	CONT	OFF	Others ON	Bank selection0	Bank slctn 1 String+	External Teaching	Bank slctn 3	0-3, 8-11
		ON,SCLR	Others ON					0,1,8,9
	UP,HIGH DOWN, LOW	OFF	Others ON	Pulse que Bank slctn0	String+	Synchron input	0-3	
		ON,SCLR	Others ON				0,2 0,1 0	
0-15, COMM	CONT	OFF	Others ON	NA	NA	NA	NA	0-15 (Bank is set by parameter and through RS232I/F)
		ON,SCLR	Others ON					
	UP,HIGH DOWN, LOW	OFF	Others ON	Pulse que NA	String+	Synchron input		
		ON,SCLR	Others ON					

Field of View

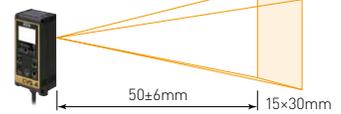
CVS4-N23W-R



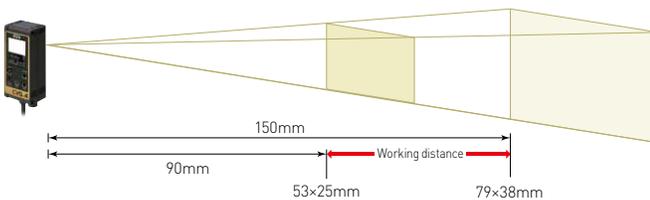
CVS4-N21W-R



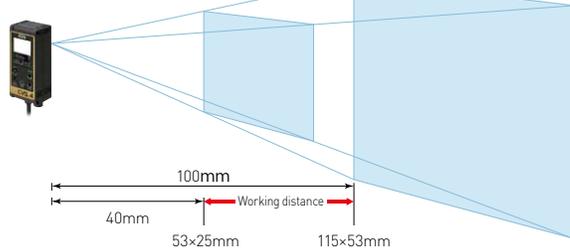
CVS4N23RW-R



CVS4-N20W-R



CVS4-N40W-R



RS232 Communication

Available functions

1. Setup

You can download/modify/upload setup from/to CVS4-R.

2. User DIC

You can make unique character referring the image from CVS4-R.

3. Downloading NG image

You can refer NG image and check what happened.

4. Remote control

You can control CVS4-R through RS232 I/F.

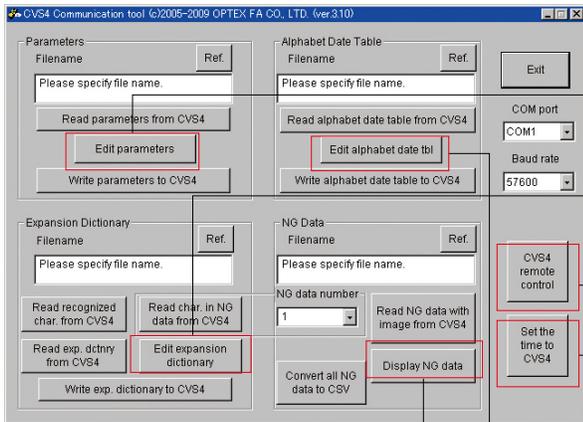
5. Timer setup

You can set the timer of CVS4-R copying from PC.

6. Code recognition

You can modify code table that shows simple codes mean Date/Time.

Main menu



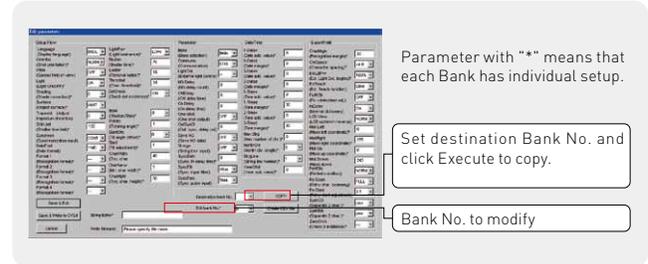
Required PC spec.
 - Microsoft Windows XP, 2000
 - RS232 I/F
 - Cable CVS-C2C

Downloadable from <http://www.optex-fa.com>

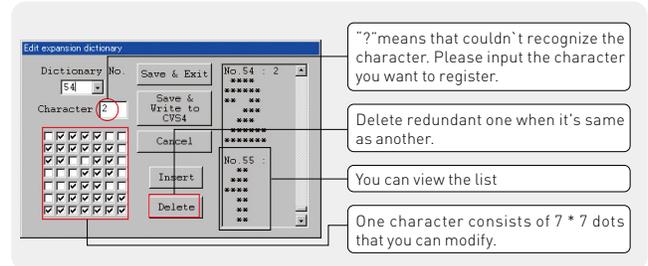


I/F cable
CVS-C2C

1. Setup Modification



2. User Dictionary



3. Downloading NG image



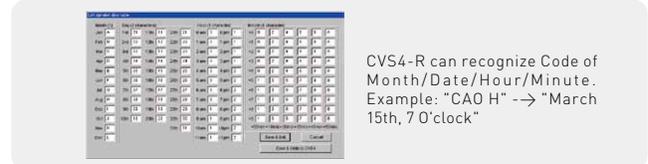
4. Remote control



5. Timer setup



6. Code recognition



Accessories for CVS series

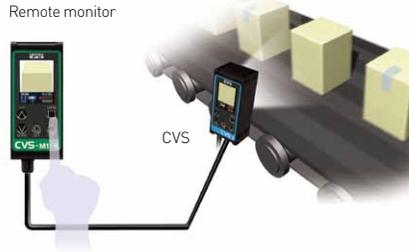
Remote monitor (with 3m cable)



CVS-M1-R
You can use for
CVS1-R, 2-R, 3-R, 4-R



CVSE-M1-R
Only for CVS1easy-R



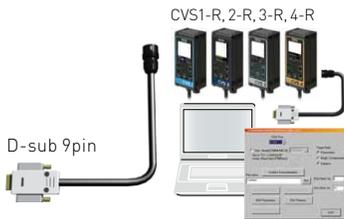
You can control from Remote monitor that has LCD and buttons to control remotely. The buttons work same as CVS series itself.

I/O Expansion unit



TMC-N11-CVS
With CVS2-R (only for color area mode) :
You can get sorting output up to 15 utilizing 4 output from CVS2-R
With CVS3-R and CVS4-R : You can use all Banks even using synchronous input and external teaching input
*You can't use for CVS1-R and CVS1easy-R

PC I/F cable (2m)



CVS-C2C
For CVS1-R, 2-R, 3-R, 4-R
You can download the I/F software from our homepage. You can setup CVS1-R, CVS2-R, CVS3-R and CVS4-R through each software and can get registered image. You can also modify mask area easily on the PC display.

Video cable (3m)



CVS-CN
For CVS series
You can see the display image connecting standard TV monitor (NTSC).

PC I/F cable + I/F cable for Video Out (2m)



CVS-C2Y
For CVS1-R,2-R,3-R,4-R
You can connect PC and CVS-M1-R. You can see the screen image on the CVS-M1-R.
* You can't control through CVS-M1-R.

Extension cable for Remote monitor (3m)



CVS-C3S
For CVS-M1-R, CVSE-M1-R
You can connect Remote monitor through this cable up to 15m (4 CVS-C3S = 12m + 3m cable of Remote monitor)

PC I/F cable + Video cable (2m)



CVS-C2P(2m)
For CVS1-R,2-R,3-R,4-R
You can connect PC and get video signal at a time.

Required PC spec.
- Microsoft Windows XP, 2000
- RS232 I/F
Software is downloadable from
<http://www.optex-fa.com>

When you use TV monitor, please use it vertically



External light in CVS series shape



CVS-LW1(white color LED)
You can connect to CVS series up to 3 serially.

CVS-LU1(UV LED)
This lighting is effective for object with fluorescent printing to detect.

External LED lighting

When you need brighter lighting and/or lighting from other direction to get better image, you can utilize external LED lighting. Please refer Page 54 for other lighting and power supply.

Bar Light



OPDB-50x15WS

OPB-5015W-B
50x15mm

OPB-10015W-B
100x15mm

Power supply

For external LED lighting.



OPP-10-H(10W)

OPP-10-H(10W)
OPP-30-H(30W)
OPPD-15

Bracket for Lighting



2 OPDB-50x15WS and CVS-OPDB-2000

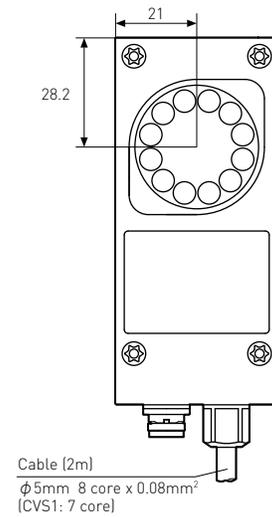
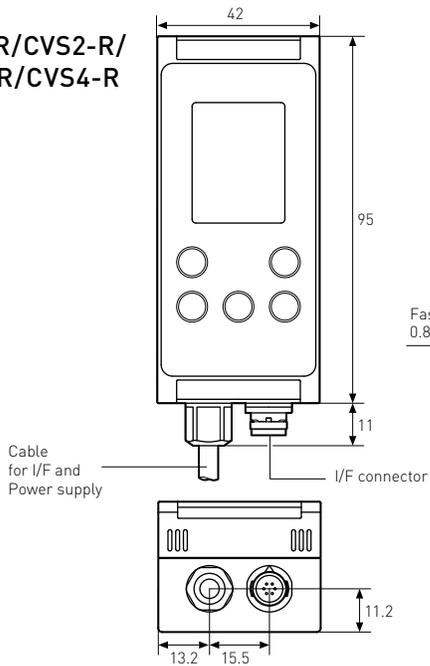
CVS-OPDB-2000
CVS-OPDB-3040
CVS-OPDB-6080



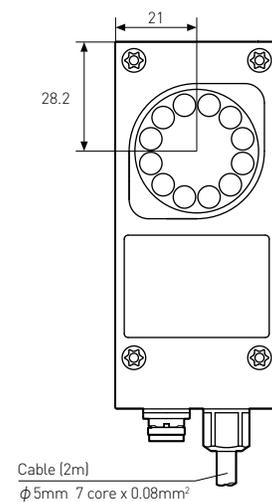
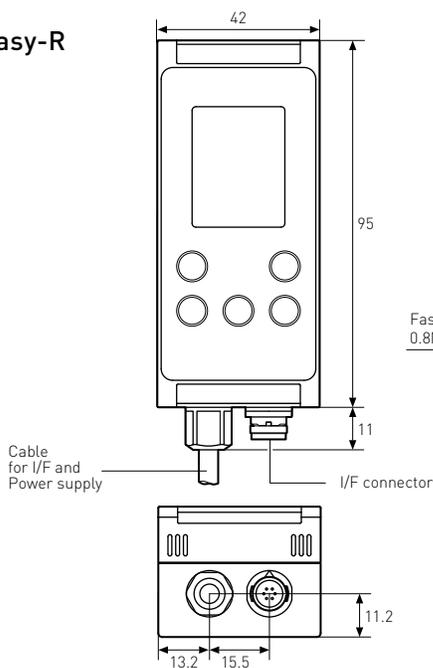
CVS-OP1000L
This is for mounting CVS series and external LED lighting.

Dimensions

CVS1-R/CVS2-R/ CVS3-R/CVS4-R



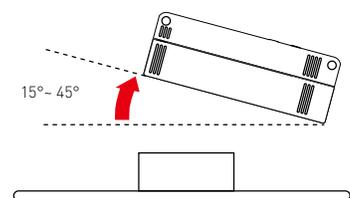
CVS1easy-R



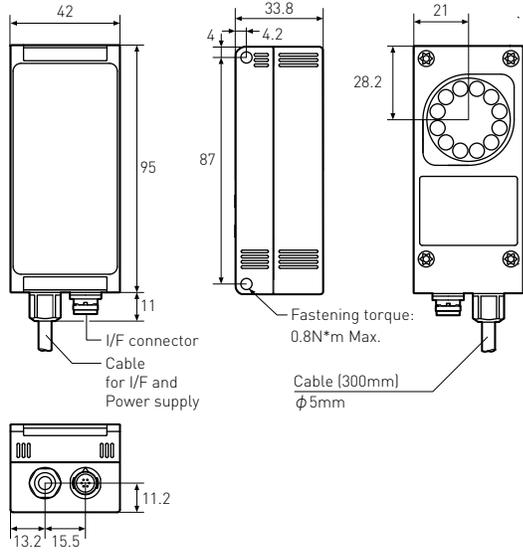
(unit: mm)

Tips for mounting CVS series

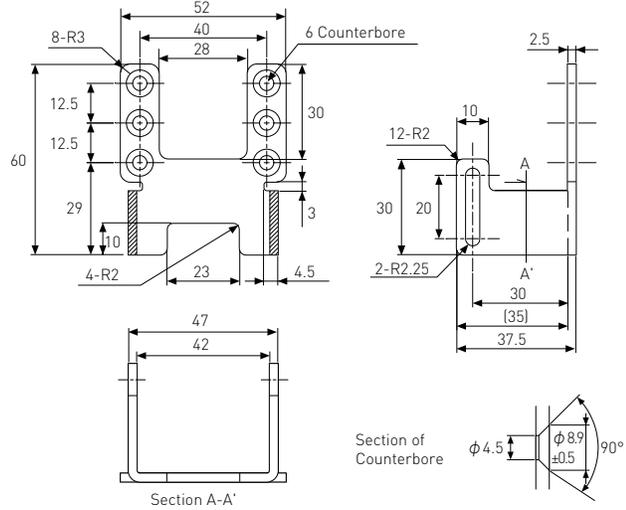
- Please determine Working distance and Field of View so that you chose correct model number of CVS series.
- Please use M4 * 50mm screws to mount CVS series
- Please take care about distance between CVS and target object to get stable size of Field of View.
- Please mount CVS at 15 to 45 degree to prevent specular reflection from the object especially from glossy object.
- When the object moves fast, you have to set shutter speed shorter. Then, you will need brighter lighting to get better image. Please try external lighting in this case.



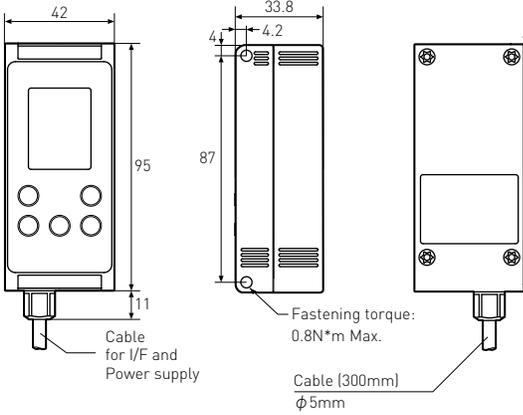
External light in CVS series shape
CVS-LW1(white color LED), CVS-LU1(UV LED)



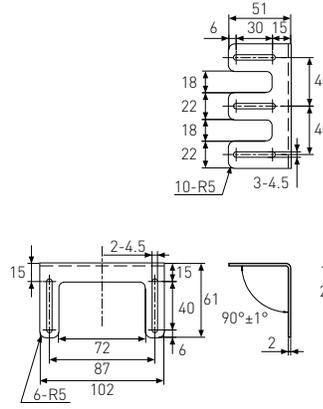
Bracket for Lighting
CVS-OPDB-2000



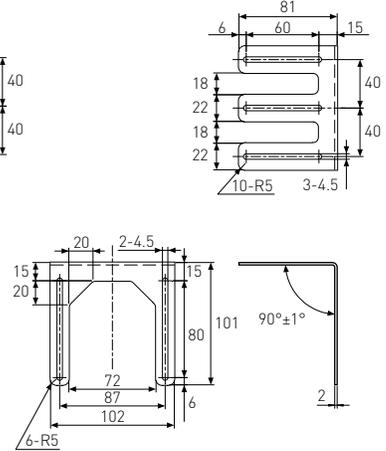
Remote monitor
CVS-M1-R



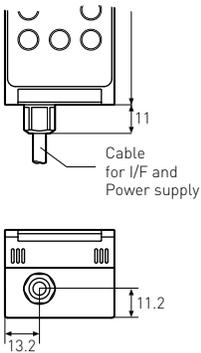
CVS-OPDB-3040



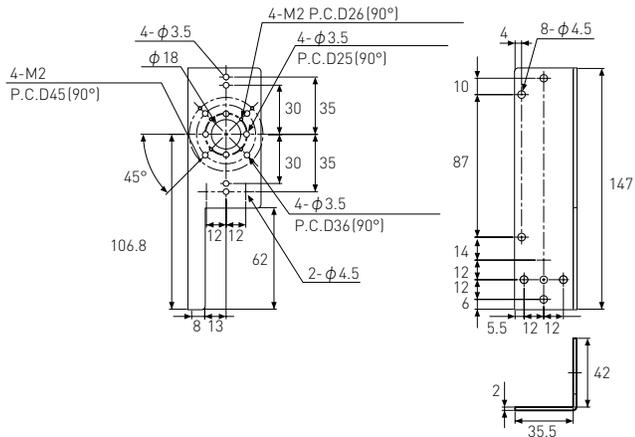
CVS-OPDB-6080



CVSE-M1-R



CVS-OP-1000L



(unit: mm)