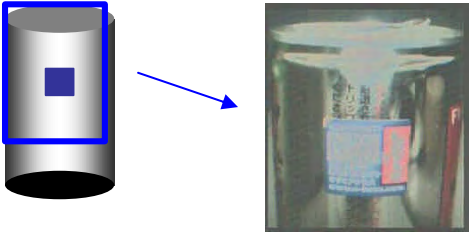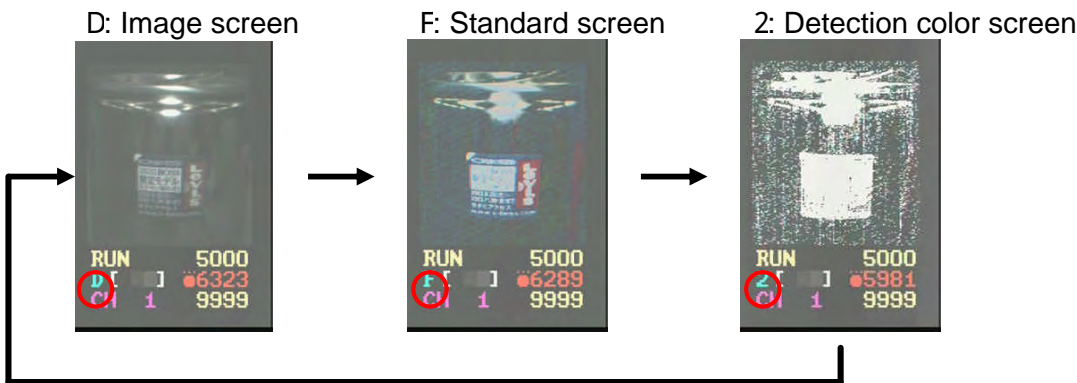## Inspection of Campaign Seal

The following example detects the absence of a campaign seal on a juice can.
In this example, output is to turn ON only when the seal is detected.

(1) Examine which color is to be used for the detection of the seal.
   The seal color consists of blue, white and red.
   Let us think about detecting the seal by respective color.
      Detection by white: NG, for it is the color same as the can's reflected light.
      Detection by red: NG, for the can has the portions in red.
      Detection by blue: OK, for only the seal has blue part.
   Therefore, use blue for the detection of the seal.

(2) Examine the imaging direction.
   Detect the can so as to image the blue area as big as possible.
   Detect a can with a slight angle because reflection makes the image whitish.

(3) Check the seal color in the screen before teaching.
(3-1) Press the VIEW button several times to display the standard screen.
   "F" is indicated in the standard screen.

: Image screen	: Standard screen	: Detection color screen

| RUN   5000 | RUN   5000 | RUN   5000 |
| D   ] ●6323 | F   ] ●6289 | ●5981 |
| CH   1   9999 | CH   1   9999 | CH   1   9999 |

   The standard screen displays the image after correcting the raw detection image (the image
   in the image screen) by means of a color filter, etc.
   Display the standard screen since CVS1 judges the colors in the standard screen.

(3-2) Confirm that blue part of the seal is stable, observing the standard screen.
   Although we adjusted the darkness correction (KIL BLK) this time since the image is a bit dark,
   the detection result did not improve. Therefore, we set KIL BLK to its initial value as is.

(4) Next, perform teaching.

(4-1) Press "TEACH" button for 3 seconds or more to enter the teaching mode.
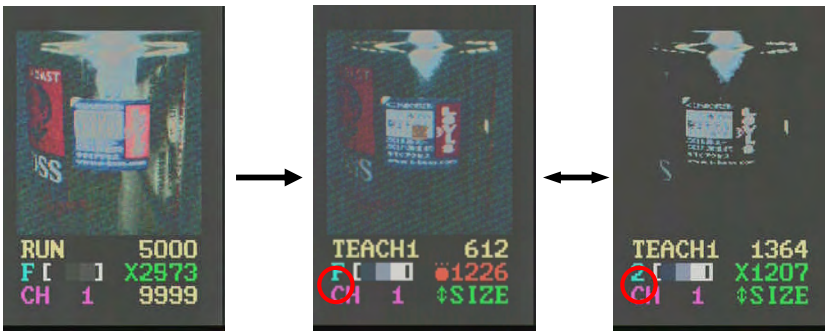
The standard screen and the detection color screen are
displayed alternately.
The teaching window is displayed at the center of the standard screen
to teach the color inside the window.
In the detection color screen, you can verify
If the intended color is exclusively extracted.

(4-2) Confirm that TEACH1 screen is being displayed.
Every pressing the SET button switches over the TEACH1screen and the TCH LOW screen
alternately. Display the TEACH1setting screen.
The TCH LOW setting is used when performing the 2-point teaching or the upper/lower limit teaching.
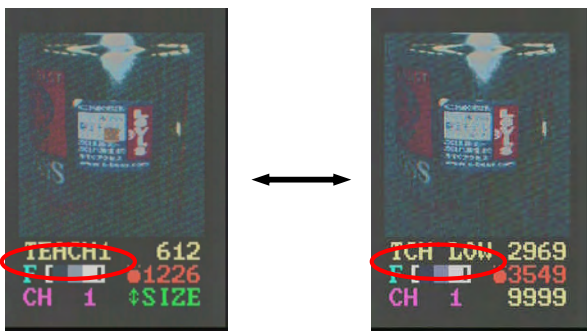
(4-3) Adjust the position of the teaching window to the blue part of the seal.

(4-3-1) Confirm that the screen modes, such as the size change mode, the move mode,
and the zoom mode, change over by turns by pressing the TEACH button.
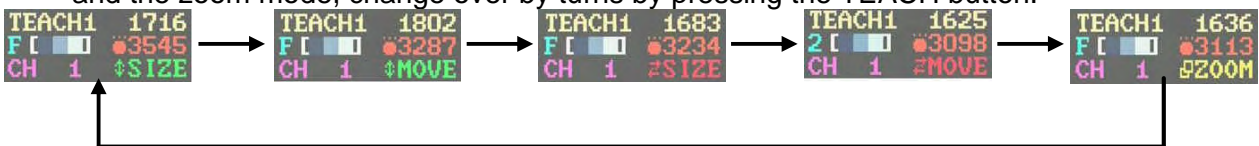
(4-3-2) Adjust the size of the teaching window to match the blue part.
First, decrease the size in the vertical direction. Select the vertical size by pressing the TEACH
button several times, and then decrease the window size by pressing the DOWN key.
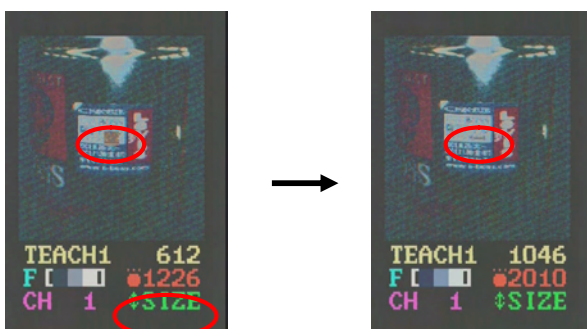
(4-3-3) Move the teaching window upward. Select the MOVE mode in the vertical direction by pressing the TEACH button, and then move the teaching window upward by pressing the UP key.
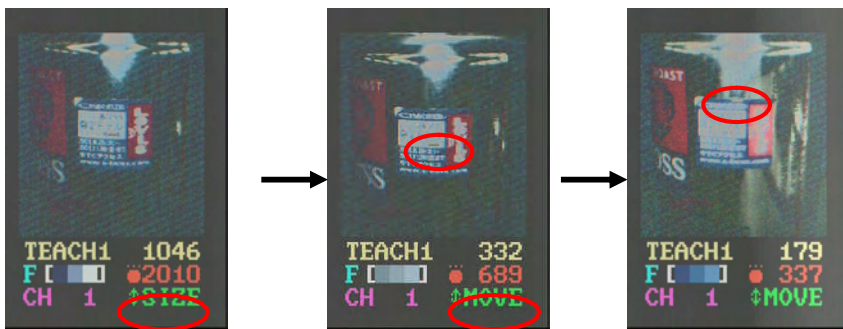

(4-3-4) Move the teaching window to the right. Select the MOVE mode in the horizontal direction by pressing the TEACH button several times, and then move the teaching window to the right by pressing the UP key.
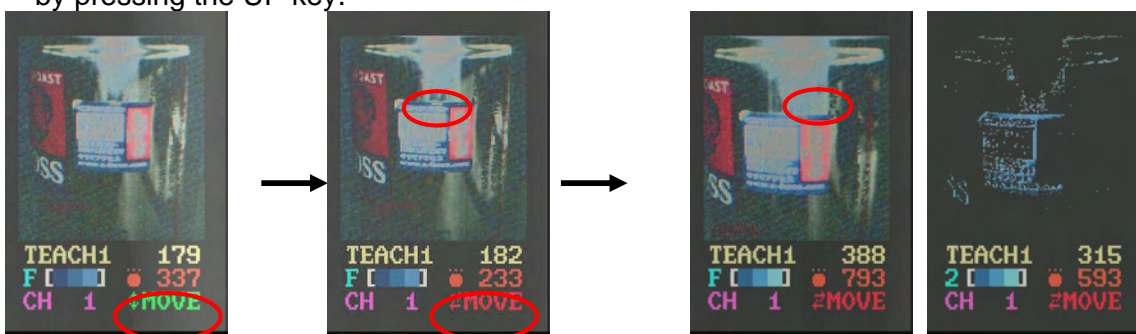
(4-3-5) Leave the size in the horizontal direction as is since there is no need of adjustment. Make this adjustment as necessary.
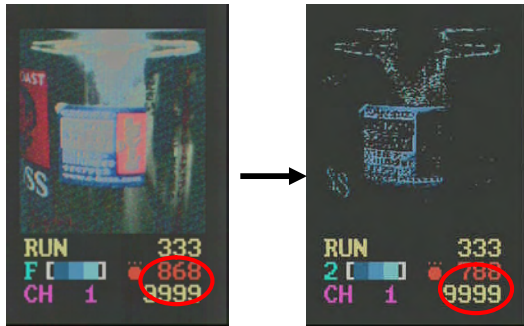
(4-4) If only the intended color is extracted, press the SET button for 3 seconds or more to determine the teaching.
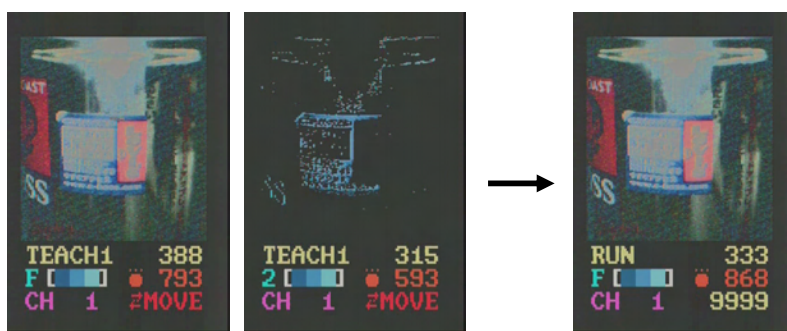
(5) Confirm if the seal is detected.
   When the seal is present:
      Display the detection color screen to check the image by pressing
      the VIEW button several times.

      Confirm that the blue part of the seal is detected.
      Confirm that the detection is successfully done when the detecting distance or angle is changed.
      In this example, other parts are also detected while the seal is detected.
      Also, check the detection area. (It is indicated at the right end on the second line.)
      In this example, the detection area is 600 to 900.

   Also, check the image condition when the seal is absent.

   Detection is done due to external disturbance such as reflection, etc. even when there is no seal.
   In this example, the detection area was 420.
   Since there is a difference in the detection area between the image when there is a seal and
   that when there is no seal, presence/absence of a seal can be detected in this case.
   When detection is done even when there is no seal, but not to the extent when there is a seal, 2-point
   teaching can be used, in which the detection area can be taught. In case of using the 2-point teaching,
   the middle detection area between when there is a seal and when there is no seal is set as the lower
   limit of the detection area.

(6) Perform the 2-point teaching.
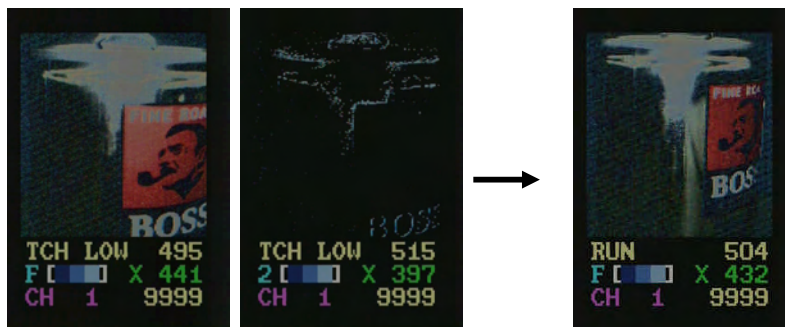   (6-1) Enter the TEACH mode by pressing the TEACH button.
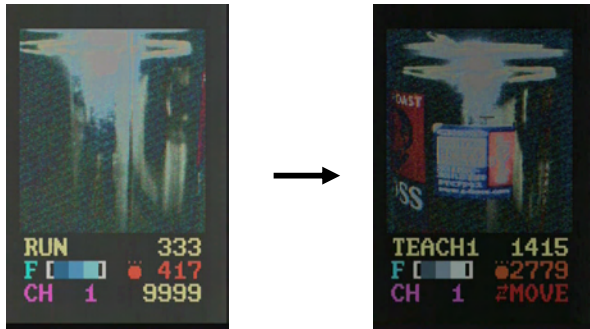
   (6-2) Adjust the position and the size of teach window to the intended color on TEAHC1 mode.
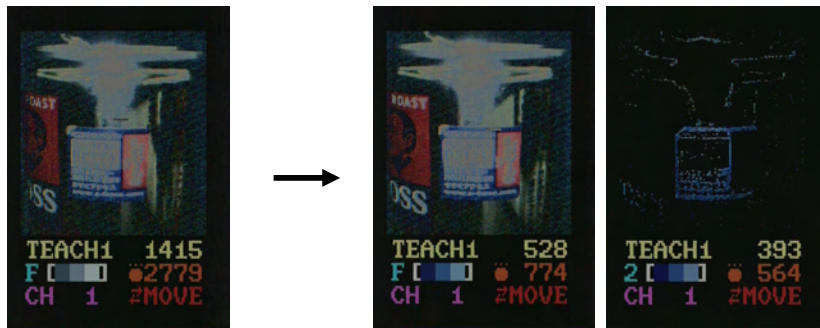
   (6-3) Enter the TCH LOW mode by pressing the SET button.
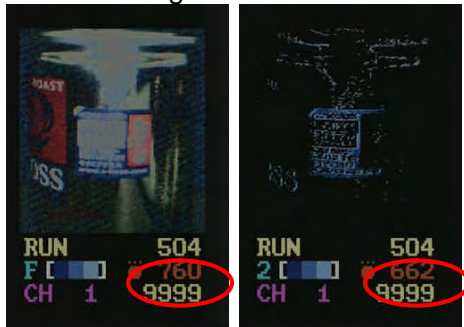   Place a work without any seal.

   (6-4) Press the SET button for 3 seconds or more to determine this teaching.

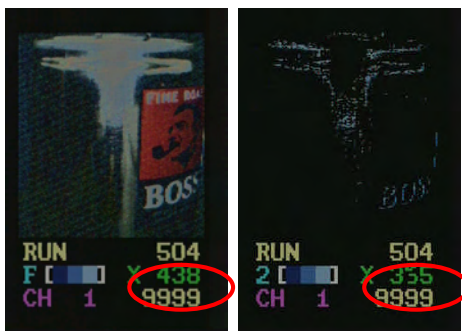(7) Confirm whether or not the seal is detected.
 Check the image condition when the seal is present.

 Confirm that the seal is detected as done before.
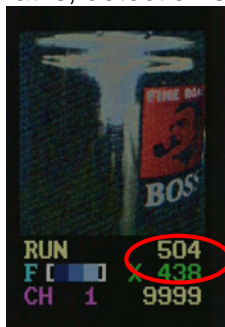 Also, confirm the detection area.

 Also, check the image condition when there is no seal.

(8) Confirm the area lower limit.
 (The area lower limit represents the lower threshold value.
 That is, detection signal is output when the detection area is above the area lower limit.)

 Since the 2-point teaching is performed, confirm that the area in the middle between when there is a seal and when there is no seal is set as the area lower limit.
 The detection area with the seal confirmed before was 600 to 900 while the one without the seal was 450 or less.
 Since the area lower limit (indicated at the right end of the first line) is set to 504, it is considered to be around the middle.

(9) Confirm the area upper limit.
 (The area upper limit represents the upper threshold value.
 That is, detection signal is output when the detection area is below the area upper limit.)

In this example, no upper limit value is set since output is to be ON when the detection area is above the lower limit value.
Therefore, no setting was made for the upper limit value, leaving its initial setting as is.
(Initial value: When the set value of the area upper limit (AREA HI) is "0", the area maximum value (MAX AREA) will be the area upper limit.)

By the above setting, absence of seal can be distinguished by turning ON the output signal only when there is a seal.