Guangzhou FUWEI Electronic Technology Co.,Ltd

FW-V21N Series

HIGH PRECISION INTELLIGENT RGB DIGITAL COLOR SENSOR

Safety Warning

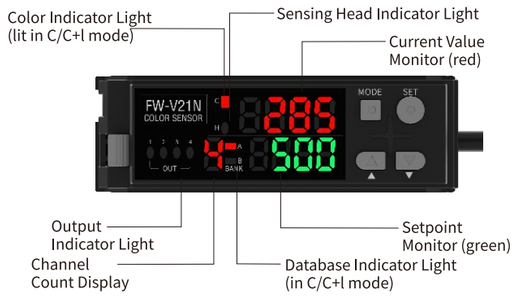
- Do not use in an environment with flammable, explosive or corrosive gases.
- Do not use in an environment with oil or chemicals.
- Do not use in an environment with high humidity.
- Do not use in direct sunlight.
- Do not use under other environmental conditions that exceed the rated value.
- Do not disassemble, repair or modify the product without permission.

End-of-life Disposal

When the product is disposed of, please dispose of it as industrial waste.

Amplifier Module

Panel Introduction

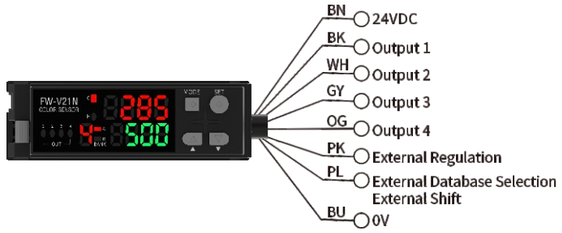


Specification

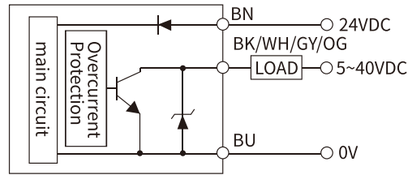
Amplifier		
Model	FW-V21N	FW-V21P
	NPN	PNP
Response Sime	200μS(HSP)/1ms(FINE)/4ms(TURBO)/8ms(SUPER)	
Control Output	NPN (PNP) collector open circuit X4 channel, maximum 40VDC (30VDC), 1 output reaching 100mA, total of 4 outputs reaching 200mA, residual voltage, maximum 1V	
Protection Circuit	Reverse electrode protection, overcurrent protection, overvoltage protection	
External Calibration Input	Input time: minimum 20ms	
External Calibration Input (C/C+I mode) External Offset Input (Super I mode)	Input time: minimum 20ms	
t PI DAR	Timer OFF/OFF delay/ON delay/single shot Timer time: adjustable from 1 to 1.000ms (for each domain)	
Power Supply	24VDC, fluctuation (P-P): maximum 10%	
Light Source	Red LED (665nm)/Green LED (520nm)/Blue LED (465nm)	
Consumption Current	Normal mode: 1.5W (maximum 62.5mA) Eco mode: 1W (maximum 42.0mA)	
Ambient Temperature	-10 to+55 ° C, no condensation	
Vibration Resistance	10 to 55Hz, 1.5mm dual amplitude, in X, Y, and Z directions, for 2 hours each	
Material	Shell and cover: PC	

inductive head		
Type	Long distance of large light points	Eliminating gloss, small beam points
Model	FW-H35	FW-H37
Detection Range	28~52mm	11~20mm
Minimum Light Spot Diameter	40mm reference distance 4.5mm diameter	16mm reference distance 1mm diameter
Minimum Bending Radius of Fibers	25mm	15mm
Environmental Luminosity	Incandescent lamp: maximum 10000lux daylight: maximum 20000lux	
Ambient Temperature	-10~+55 ° C, no condensation	
Vibration Resistance	10~55Hz, 1.5mm dual amplitude, in X, Y, and Z directions, for 2 hours each	
Protection Grade	IP40	
Material: Casing	PC	
Material: Lens Cap	PAR	PC and 304 type stainless steel
Weight (with 2m cable)	About 40g	About 45g

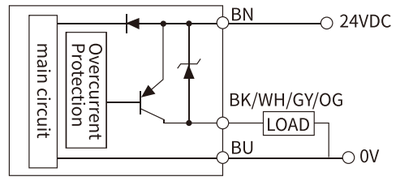
Wiring Diagram



Input

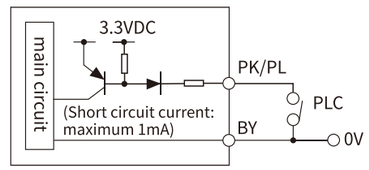


NPN

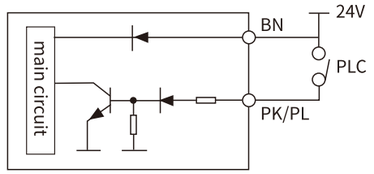


PNP

Output



NPN



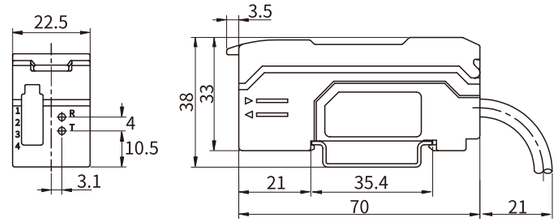
PNP

External Adjustment (Pink) External Database Selection/External Shift (Purple)

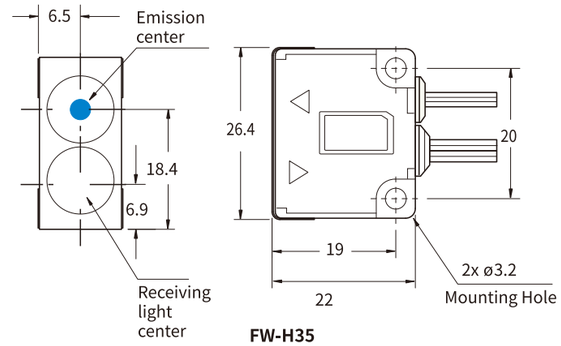
Detection Mode

Mode	Calibration standards	Advantage	Disadvantage
C	RGB Comparison	Good handling of workpiece movement and vibration	Not suitable for recognizing neutral colors such as white, black, or gray
C+I	RGB contrast +brightness contrast (receiving brightness)	Detect subtle differences	Affected by workpiece vibration
Super I	Light to dark contrast (receiving brightness)	Can recognize neutral colors (black and white)	

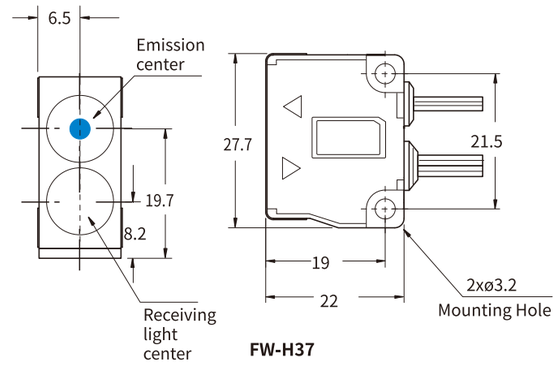
Dimensions



FW-V21N

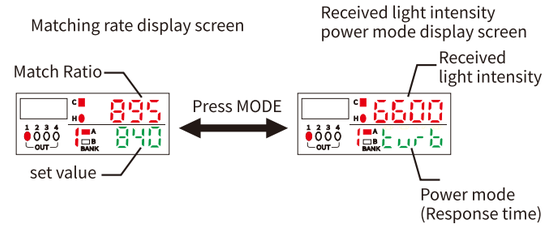


FW-H35



FW-H37

C/C+I mode Operating Steps



Matching rate: displays the degree of consistency between the color of the target tuned as a reference and the color of the target currently being detected.

Setting range: 0 to 999 (the larger the value, the higher the matching rate)

Set value: Display the threshold at which the consistency between the current target color and the target color tuned as a reference can be determined to be the same color.

Received light intensity: displays the current amount of light received

Power mode (response time): Display the currently selected power mode.

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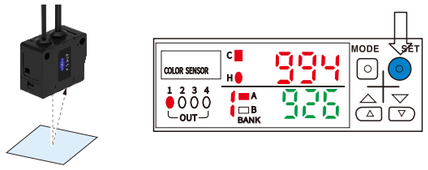
Set sensitivity

Single point tuning (detecting a specified single color)

Place the target object whose color is used as a reference at the focal point of the sensing emitted spotlight. Press the SET button once.

·The set value is displayed in green



Fine tuning (single point tuning with stricter standards)

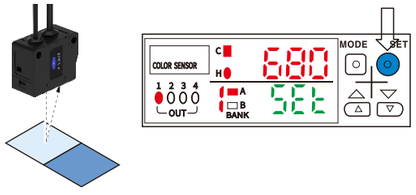
This is used for stricter detection than single point tuning, and the setting method is the same as single point tuning.

·Even if the target used for tuning is the same, the set value is larger than that for single point tuning.

2-point tuning (used to distinguish between two colors)

1. Place its color as a reference object at the focal point of the spotlight emitted by the sensor. Press the SET button once.

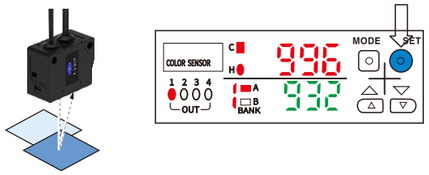
·On the setpoint monitor, SET is displayed in green.



2. Place the subject matter whose color needs to be distinguished. Press the SET button once.

·On the setpoint monitor, SET is displayed in green.

(If the sensitivity differentiation is insufficient, the set point monitor will display a green "- - -")

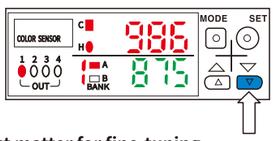


Fine tune sensitivity

Fine tune sensitivity by changing the set value

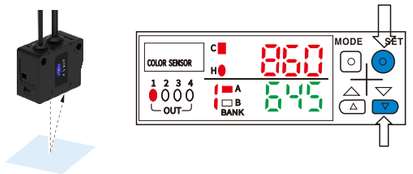
The larger the set value, the stricter the detection. The smaller the set value, the rougher the detection.

To change the set value (displayed in green digits), press the UP or DOWN button.



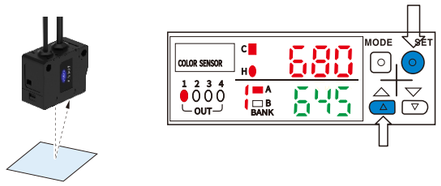
Use the subject matter for fine-tuning

You can add or remove tuning and fine tune the set value.



Remove tuning (set value increases tuning)

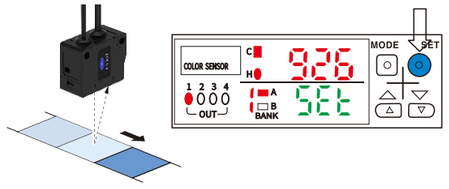
Set targets without judgment to the same color. While holding down the SET button, press the UP button.



Allow uneven color distribution

In single point tuning or fine tuning, while holding down the SET button, the sensor continues to sample.

·The sampling color setting is determined to be the same color.



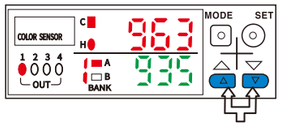
Set Value

When setting sensitivity, the sensor automatically determines the set value. You can also manually preset the set value to a fixed value. In this case, perform the following actions.

Press and hold the UP and DOWN buttons simultaneously for at least three seconds.

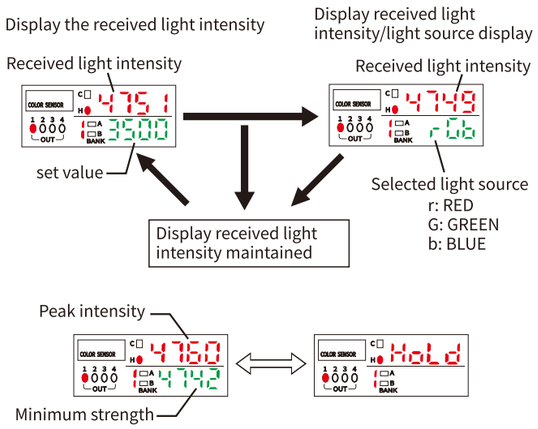
·On the left side of the setpoint monitor, "F" is displayed in green

The message method is the same as the fixed setting method.



When 'F' is displayed on the screen, even if sensitivity is set, the set value remains fixed and will not change.

SUPER I Mode Operating Steps



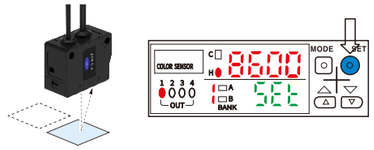
Select the display channel: While holding down the MODE button, press the UP or DOWN button.

Set sensitivity

2-point tuning (basic)

1. Place the target object at the focal point of the spotlight emitted by the sensor. Press the SET button once.

·On the setpoint monitor, SET is displayed in green.



2. Place the target object at the focal point of the spotlight emitted by the sensor. Press the SET button once.

·On the setpoint monitor, SET is displayed in green.

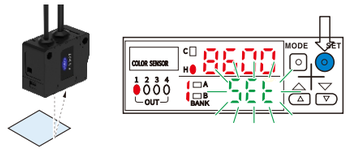
Positioning tuning (when positioning the target)

1. Press the SET button when there is no target.

·On the setpoint monitor, SET is displayed in green.

2. Place the subject matter in the desired position. Then press and hold the SET button for at least three seconds.

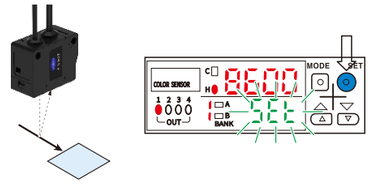
3. After checking that "SET" flashes, release the SET button.



When pressing and holding the SET button, the target passes through the optical axis.

1. When pressing and holding the SET button, the target passes through the optical axis

2. After checking that "SET" flashes, release the SET button.



Set maximum sensitivity (maximize sensitivity)

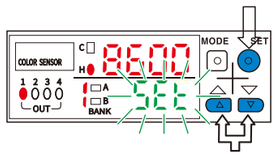
1. When there is no target, continue to press and hold the SET button for at least three seconds.

2. When checking the "SET" button, the target passes through the optical axis.

Fine tune sensitivity

Fine tune sensitivity by changing the set value

To change the set value (displayed in green digits), press the UP or DOWN button.



Shift Function

Force the received light intensity to synchronize with the predetermined value

·The fixed shift input of PLC or other devices can stabilize the detection of targets with small light intensity differences.

·When the displacement function selection is set to ON, the synchronization function can be used.

After the power is turned off, the updated value after the zero shift input is taken apart.

Select light source

When setting sensitivity, the sensor automatically selects the optimal light source for detecting RGB light. You can select a light source for each channel.

(Regardless of the selected light source, the actual emitted light is displayed as pale white.)

Manually selecting a light source

1. When the received light intensity/light source is displayed, press and hold the UP and DOWN buttons simultaneously for at least three seconds.

·"F" appears on the left side of the setpoint monitor.

2. Select the light source by pressing the UP or DOWN button.

After manually selecting the light source, even if the sensitivity value changes, the light source remains fixed.

·To return to automatic light source selection, simultaneously press and hold the UP and DOWN buttons for at least three seconds.

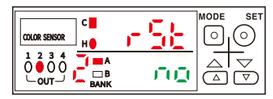
Default mode setting (initialization)

Access mode	EASY
Function (detection function)	C Mode
Tuning mode	Single point tuning
Power mode (response time)	TURBO
output mode	no(L-on)
Timer mode	OFF (timer value 20ms)
Energy saving function (Eco mode)	OFF
shift function	FF (shift value 0)

Restore to default settings

1. While holding down the MODE button, press the SET button five times.

·The monitor displays' rSt/no'



2. Press the UP button.

·The monitor displays' rSt/YES'.

3. Press the MODE button

·The sensor returns to the default state.

To undo the reset operation, select "no" in step 2 and press the MODE button.

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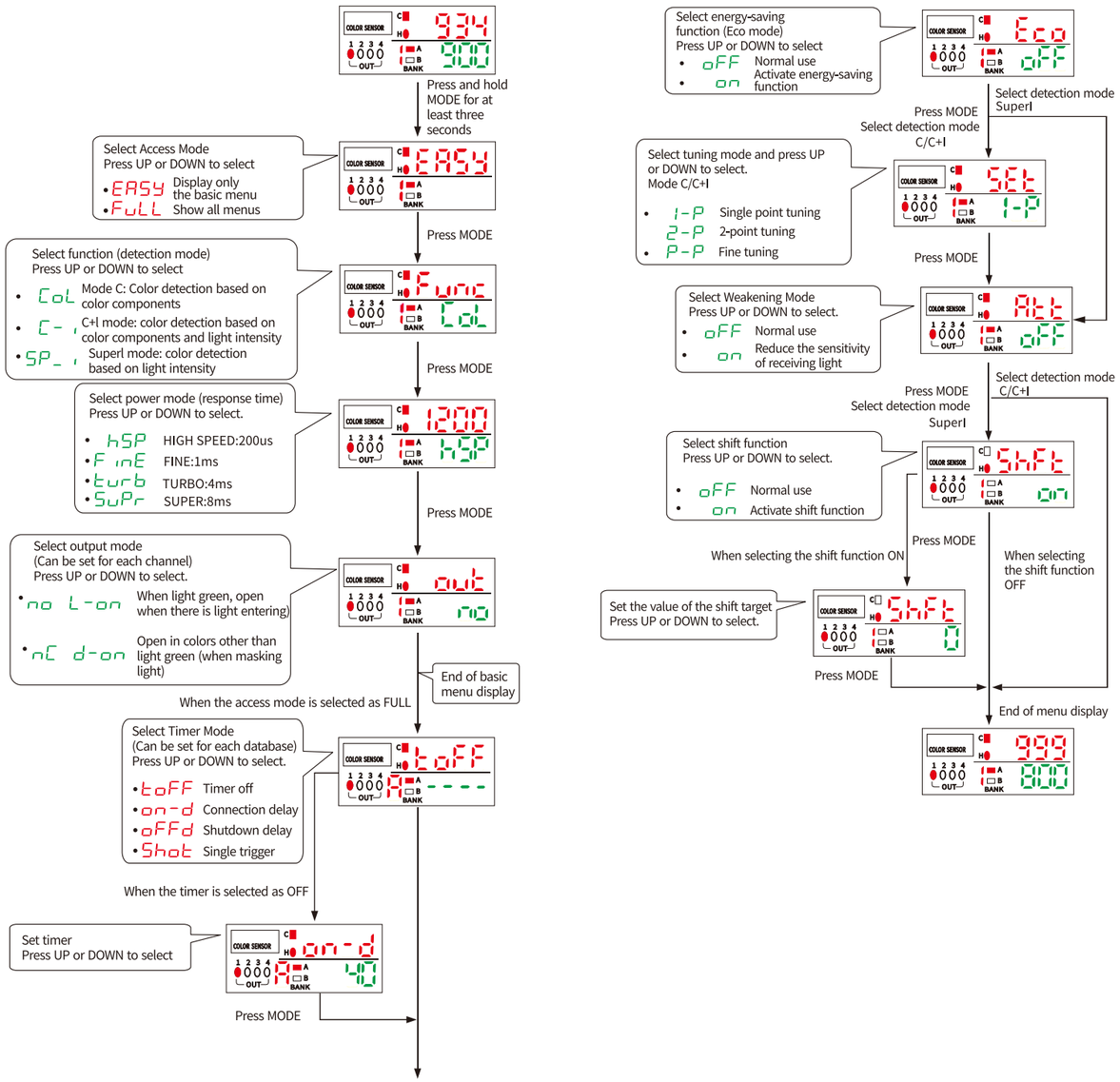
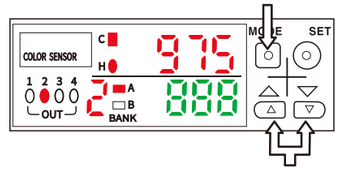
Menu selection

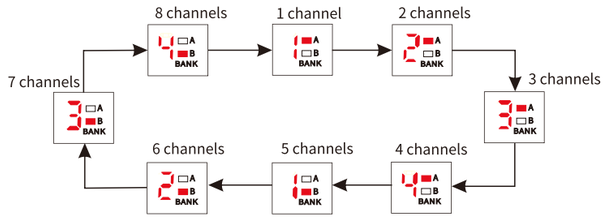
Press and hold the MODE button for at least three seconds to display the menu. Each mode can be configured from the menu.
To exit the menu during the setting process, press and hold the MODE button again for at least three seconds.



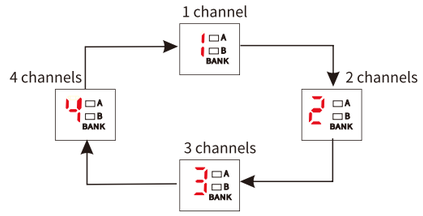
Channel Setting Function

According to the detection mode, sensitivity can be set for each of the following number of channels.
C/C+I mode: 8 channels (4 channels × 2 databases)
SUPER I mode: 4 channels (no database selection)
The steps to select a display channel are as follows.
While holding down the MODE button, press the UP or DOWN button.





C/C+I Mode

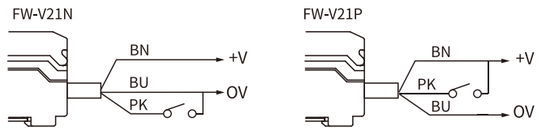


Super I Mode

External Input Settings

Setting sensitivity through external input (external tuning)

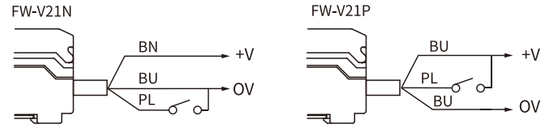
1. Activate the button lock function.
2. Connect the pink wire to an external device, such as a switch or PLC.
3. As shown in the figure below, short-circuit the pink wire, as each model is
equivalent to pressing the SET button.



The minimum input time is 20ms.

Selecting a database through external input (in C/C+I mode)

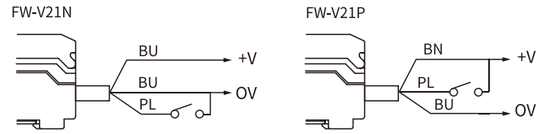
1. Enable button locking capability.
2. Connect the purple line to external devices such as switches or PLCs.
3. Short circuit the purple line as shown in the figure below to switch the database from A to B for each model. When the input signal is ON, the database is set to B.



The minimum input time is 20ms.

External input shift input (in Super I mode setting)

1. Connect the purple line to external devices such as switches or PLCs.
2. Short circuit the purple line as shown in the figure below to activate the shift input for each model. (The rising edge of the input signal performs a shift input).



The minimum input time is 20ms.

Product specifications are subject to change without notice.
For more information or if you have any questions or suggestions about this product, please feel free to contact us.

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