a.S.K. TECHNOLOGIES
MP-System

POWER

ON

OFF

2 AMP

a.S.K TECHNOLOGIES
MP SYSTEM

INTERFACE
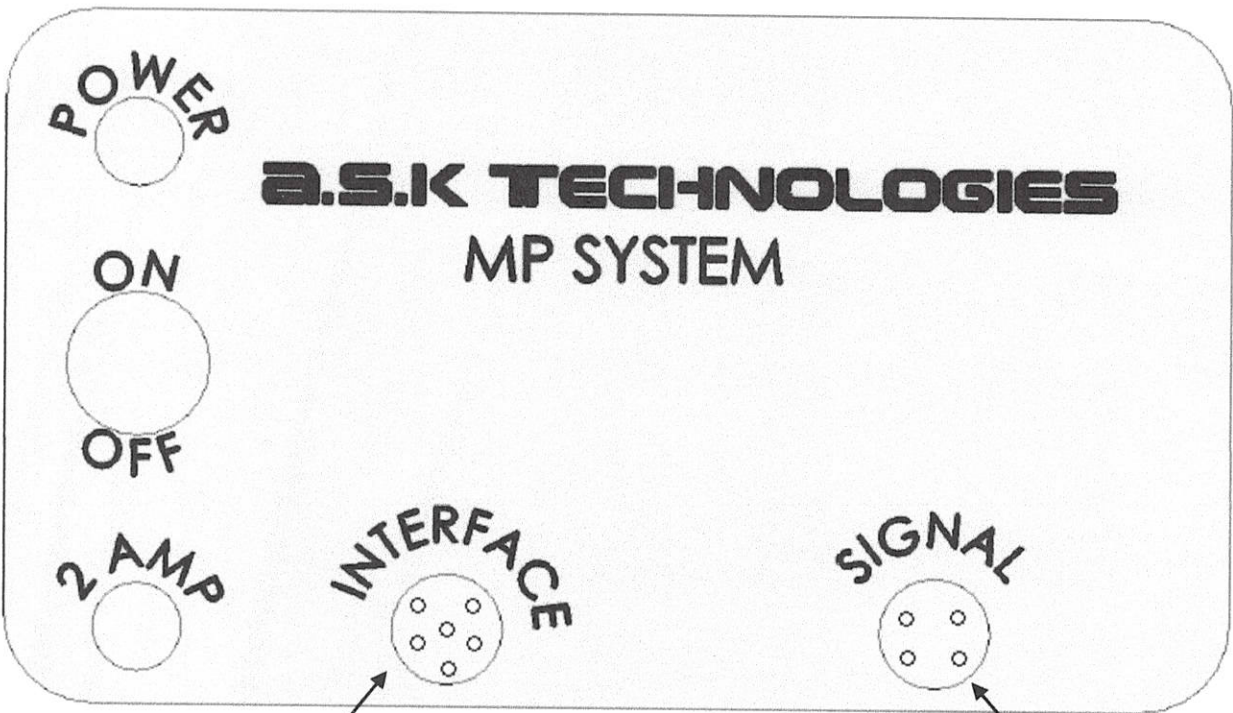
SIGNAL
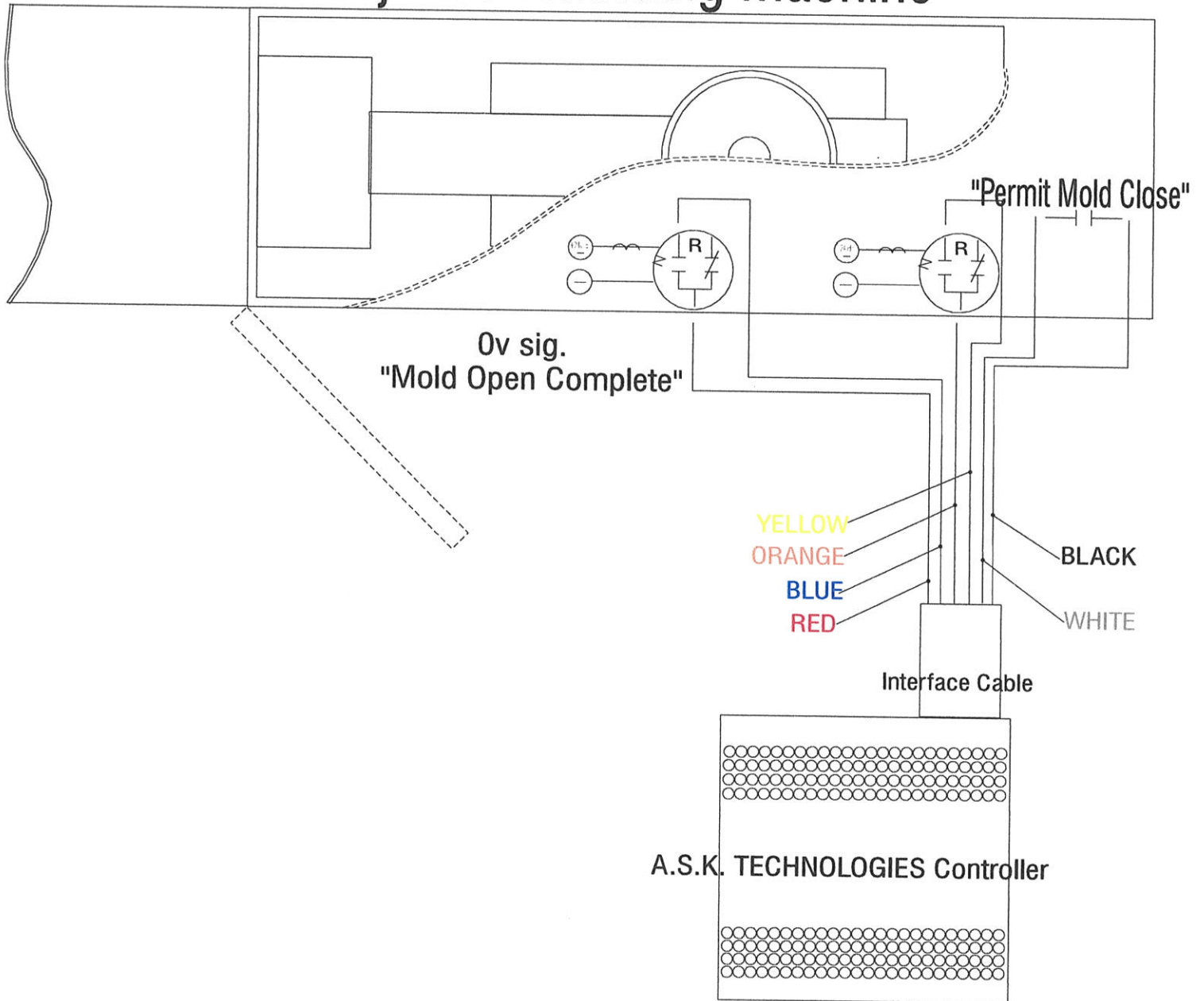
This is where you plug the cable labeled "Interface" (6 Pin)

This is where you plug the cable labeled "signal" (4 Pin)

Injection Molding Machine

"Permit Mold Close"

R

R

0v sig.
"Mold Open Complete"

YELLOW
ORANGE
BLUE
RED

BLACK
WHITE

Interface Cable

A.S.K. TECHNOLOGIES Controller

YELLOW - Unused
ORANGE - Unused

BLUE - Signal (trigger signal)
RED - Mold open complete

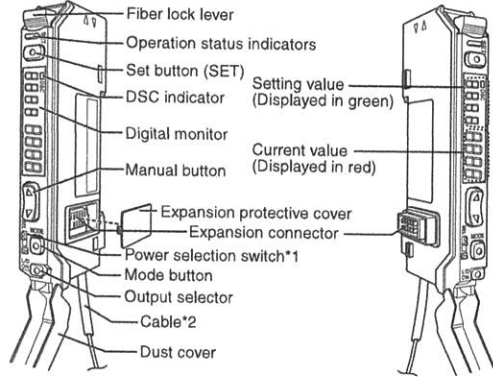BLACK & WHITE - Mold Close Interlock (Interrupt). Replace Mold Close
Interlock Jumper

NOTE - USE DRY CONTACTS FOR INPUTS, MOLD OPEN COMPLETE AND SAFETY GATE.

DIGITAL FIBER SENSOR
FS-V30/31(P)/31C(P)/31M/32(P)/32C(P)
Instruction Manual

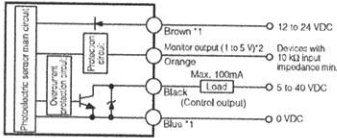| ⚠ Warning	• This product is used to detect targets. Do not apply the product to safety circuits for human protection. • This product is not of explosion-proof construction. Do not use the products in places with flammable gas, liquid, or dust. • This product is a sensor of DC power supply type. Do not apply AC power. The product may explode or burn if an AC voltage is applied.

Part Names

- Fiber lock lever
- Operation status indicators
- Set button (SET)
- DSC indicator
- Digital monitor
- Manual button
- Setting value (Displayed in green)
- Current value (Displayed in red)
- Expansion protective cover
- Expansion connector
- Power selection switch*1
- Mode button
- Output selector
- Cable*2
- Dust cover

*1 When set to "M", the power mode is fixed to Mega Turbo.
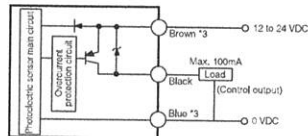*2 FS-V30 does not have the cable. M8 connector for FS-V31C(P)/32C(P)
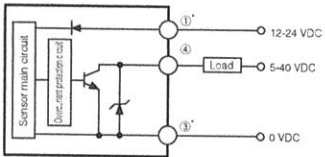
I/O Circuit

■ FS-V31/32/31M

- Brown *1 — 12 to 24 VDC
- Monitor output (1 to 5 V)*2 Orange — Devices with 10 kΩ input impedance min.
- Max. 100mA
- Black [Load] (Control output) — 5 to 40 VDC
- Blue *1 — 0 VDC

*1 FS-V31/31M only   *2 FS-31M only

■ FS-V31P/32P

- Brown *3 — 12 to 24 VDC
- Max. 100mA
- Black [Load] (Control output)
- Blue *3 — 0 VDC

*3 FS-V31P only

■ FS-V31C/32C

Output Circuit Diagram

- ① — 12-24 VDC
- ④ [Load] — 5-40 VDC
- ③ — 0 VDC

Input Circuit Diagram

- DC3.3 V
- ② — PLC, etc.
- (Short-circuit current 1 mA or less)
- ③ — 0 VDC
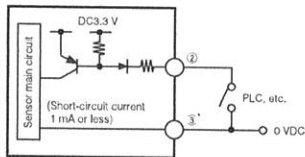
* FS-V31C only

Pin assignment

■ FS-V31CP/32CP

Output Circuit Diagram

- ①' — 12-24 VDC
- ④ [Load]
- ③' — 0 VDC

Input Circuit Diagram

- ①' — 12-24 VDC
- ② — PLC, etc.
- (Short-circuit current 2 mA or less)
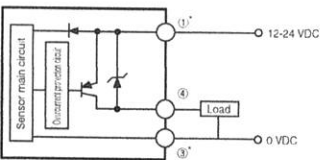
* FS-V31CP only

Pin assignment
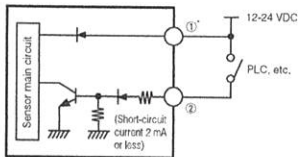
■ Socket Cable (Sold Separately)

For FS-V31C(P)/32C(P)

OP-73864 (cable length:2 m)
OP-73865 (cable length:10 m)

Pin and wire color table

Connected pin No.	Core wire cover color
①	Brown
②	White
③	Blue

Mounting Unit

■ Mounting on a DIN Rail

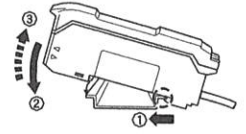**1** Align the claw at the bottom of the main body with the DIN rail. While pushing the main body in the direction of the arrow 1, slant it in the direction of the arrow 2.

2 To dismount the sensor, raise the main body in the direction of the arrow 3 while pushing the main body in the direction of the arrow 1.

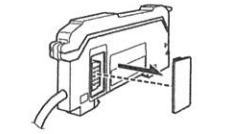### ■ Installation on a Wall (Main Unit Only)

Attach the unit to the optional mounting bracket (OP-73880), mount them together, and secure them with two M3 screws as shown in the illustration.
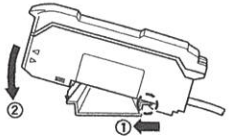

OP-73880
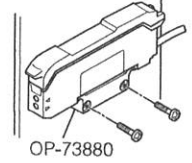
Connecting Multiple Amplifiers

Up to 16 sub units can be connected to one main unit.

1 Remove the protection cover on the side of the main unit.

2 Install the amplifier one by one on the DIN rail.

3 Engage the two claws of the child unit with the recesses on the main unit side until you hear a click sound.
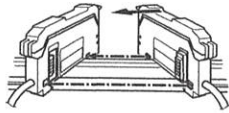
4 Attach the end units (option: OP-26751) to the both ends of the connected amplifiers in the same way as in step (2).
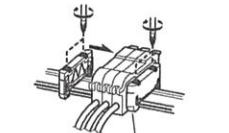
5 Sandwich the amplifiers between the end units. Tighten the screws at the top (two screws x two units) with a Phillips screwdriver to fix the end units.

OP-26751 (a set of two)

Connecting Fiber Unit

1 Open the dust cover in the direction shown by arrow 1.

2 Move down the fiber lock lever in the direction shown by arrow 2.

3 Insert a fiber unit into the fiber insertion holes to a length of the fiber insertion sign (i.e., approximately 14 mm).

4 Move down the fiber lock lever in the direction shown by arrow 4.

Fiber insertion sign
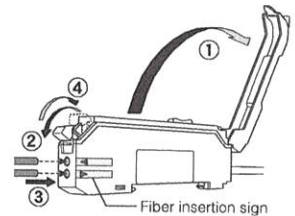
Note

If a thin fiber unit is used, an adapter provided with the thin fiber unit will be required. Unless the right adapter is connected, the thin fiber unit will not detect targets correctly. (The adapter is supplied with the fiber unit.)

Cable outer dia.	Adapter	Appearance
ø1.3	Adapter A (OP-26500)	
ø1.0	Adapter B (OP-26501)	

• To connect the coaxial reflective type fiber unit to the amplifier, connect the single-core fiber to the transmitter side, and connect the multiple-core fiber to the receiver side.

- Single-core fiber — Transmitter
- Multi-core fiber
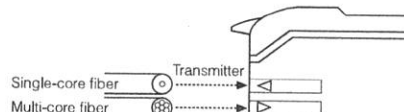
Making Sensitivity Settings

■ Two-point Calibration

In this mode, the PV used will be the mean value of two sensing values obtained with and without a workpiece.

1 Press the SET button without any workpiece placed in front of the fiber unit.
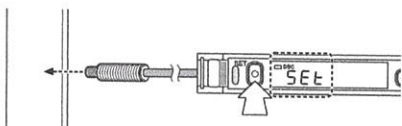
2 Place a workpiece placed in front of the fiber unit, and press the SET button.

When the setting is completed, the setting value is displayed.
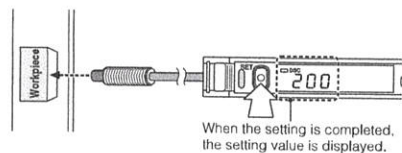
If the sensitivity difference does not have enough room, "----" flashes for about two seconds after the calibration is complete. The set value is stored in memory even in that case.

■ Maximum Sensitivity Setting

Set the sensitivity without a workpiece in the case of the reflective type, and with a workpiece in the case of the through-beam or retro-reflective type.

"Reflective model"

"Through-beam model"

3 sec or longer
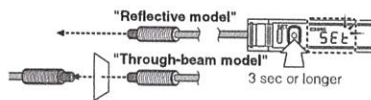
Press the SET button for three seconds in the state as shown in the above figure. (Release the button when SET flashes.)
When setting the sensitivity, set the value slightly higher than the received light intensity.

■ Full Auto Calibration

In this mode, the PV will be set to the mean value of the maximum and minimum incident values obtained within a certain period. Use this mode to detect moving workpieces.

1 Press the set button for a minimum of three seconds while the target workpiece is passing the sensing area of the fiber unit.

- While the SET button is pressed, the sensitivity of the sensor will be set according to the incident values.

- After the setting is completed, the setting value is displayed on the digital monitor.

■ Positioning Calibration

1 Press the SET button without any workpiece placed in front of the fiber unit.

2 Place a workpiece on the position where you want to perform positioning.

When the setting is completed, the setting value is displayed.

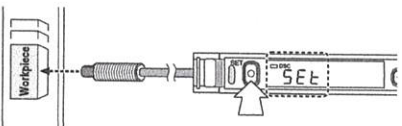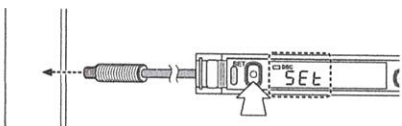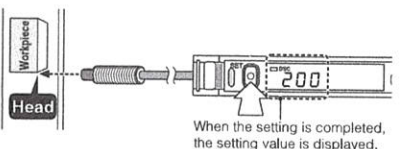Press the SET button for 3 seconds or longer until the display flashes.

Fine-adjusting Sensitivity

The setting value can be directly changed by pressing the manual button.
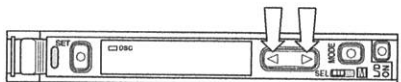
When extension display (page 5, No.8) is set for the number of digits to be displayed for the received light intensity

1 Press the manual button quickly once, and check that the setting value flashes.

Percentage (%) Calibration

This is a calibration method that can set the setting value by percentage with reference to the received light intensity at the time of sensitivity setting.
For example, if the target value is set to –10P, the setting value is determined 10% lower than the received light intensity when the SET button is pressed.

1 When selecting the sensitivity setting method (page 4, No. 2), select the % calibration, and set the target value of calibration.

2 Taking the desired light intensity as a reference (normally without a workpiece), press the SET button.
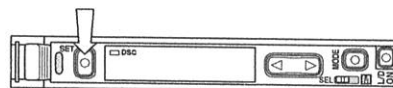
* While the % calibration is in use, other calibrations (sensitivity setting) cannot be used.
* With FS-V31C(P)/32C(P), by periodically performing external calibration from PLC or other devices, stable detection can be performed even with a small sensitivity difference.

Output Selection

Either light-ON mode or dark-ON mode is selectable.

①Press

d-on

When the area detection mode is selected, the selection options are NO and NC.

Press ② within five seconds after pressing ①.

Dynamic Sensitivity Correction (DSC) Function

DSC automatically corrects the setting value according to the changes in the received light intensity when there is no workpiece (output OFF).
This function is effective when the light intensity difference is small when judging whether or not there is a workpiece.
At Detection mode selection (page 4, No.4), select "Dynamic sensitivity correction mode" beforehand.*
How to set the sensitivity is the same as in the normal mode.

The DSC indicator illuminates when the DSC function is set.

DSC indicator

500 1000
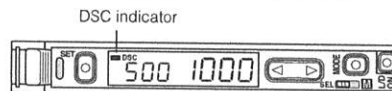
* When Light ON is selected, the upper limit of the correctable range is twice as much as the initial setting value.
* The value is stored in memory even after the power is turned off.
* The DSC indicator flashes when the light intensity during output OFF greatly fluctuates or the L/D ON selection is inappropriate. In such a case, check the setting again.

Edge Detection Mode

This mode detects the change in the received light intensity during a given period of time.

_r-d	Rising edge detection	Detects the increase (rising edge) of the received light intensity
¯L_d	Falling edge detection	Detects the decrease (falling edge) of the received light intensity

■ Filter Setting

Basically, leave this setting as its initial value. If the passage interval of workpieces is too short for the unit to respond, strengthen the level and try again.
The selectable filter level differs depending on the power modes.

Filter level	HSP*	FINE	TURBO	SUPER	ULTRA	MEGA
Default state	5	8	9	9	9	9
Setting range	1 to 5	4 to 8	5 to 9	6 to 9	8 to 9	9 only

*HSP: HIGH SPEED
As the number becomes smaller, the filter becomes stronger, which makes the unit difficult to respond to gradual changes in light intensity.

■ Making Sensitivity Settings

The sensitivity is set to maximum when the SET button is pressed quickly once.
When the setting value is too low and the unit detects objects other than the workpiece, fine-adjust the setting value to a higher number.

■ Operation When Switching Outputs

Setting	Operation
L-ON	Normally OFF. Turns ON only when the light intensity changes.

Area Detection Mode

This mode is suited to detecting the received light intensity only of a certain range.
To set this mode, select the area detection mode at Detection mode selection (page 4, No.4).

Set the value so that the upper limit setting value is larger than the lower limit setting value.
The unit does not respond when the upper limit setting value is less than or equal to the lower limit setting value.

Even when the above condition is satisfied, the unit may not respond when the HI and LO values are close to each other because of hysteresis. Be sure to operate the unit to check whether the values are valid.

■ How to switch the upper limit setting value (HI) and the lower limit setting value (LO)

When the ◄► button is pressed, "HI" or "LO" and the setting value alternately flash. When the MODE button is pressed while the display alternately flashes, the "HI" or "LO" display changes. How to configure the sensitivity setting is the same as when in the normal detection mode.

Setting the Display Scaling

This is the function to adjust the current received light intensity to the iscaling target value.

1 When selecting a display value correction function (page 5, No. 6), select the display scaling function, and set the target value.

2 During the normal display, press the SET button while pressing the MODE button. (Scaling is performed for the current light intensity at this time.)

The reference light intensity can be set in the following range in reference with the currently received light intensity:

Power mode	Minimum value	Maximum value
HIGH SPEED/FINE/TURBO	Approx. 1/20 times	Approx. 16 times
SUPER	Approx. 1/40 times	Approx. 8 times
ULTRA	Approx. 1/160 times	Approx. 2 times
MEGA	Approx. 1/320 times	Approx. 1 time

If the value exceeds the range, Err is displayed and scaling is performed up to the possilbe range.

- No value can be set when the Edge detection mode is selected.
- The value is stored in memory even after the power is turned off.
- The value is not reflected to the analog output of the FS-V31M.
- When using FS-V31C(P)/32C(P), external inputs can be used.

Zero-shift Function

The Zero-shift function is used to forcibly set the current light intensity to zero.

1 At Display value correction function selection (page 5, No.6), select "Zero-shift function".

2 When the SET button is pressed while the MODE button is pressed, the current light intensity is forcibly set to zero.

- This function cannot be used when the Dynamic sensitivity correction (DSC) or Edge detection mode is selected.
- The value is stored in memory even after the power is turned off.
- The value is not reflected to the analog output of the FS-V31M.
- When using FS-V31C(P)/32C(P), external inputs can be used.

External Input [Function only for FS-V31C(P)/V32C(P)]

1 Signals can be input externally by selecting an external input function (page 4, No. 4-C).

2 The signal can be accepted by short-circuiting the pin (2) for 2 ms or more as shown below for each model (20 ms for OFF).
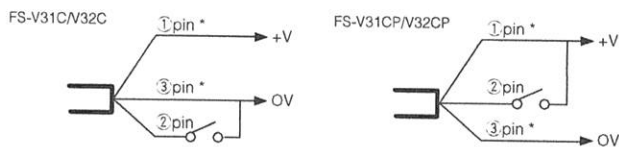
* For FS-V31C/31CP only.
- Setting using an external input is up to 1 million times.
- No inputs are accepted while setting each mode.

When external calibration is selected, the operation is the same as with the SET button.

■ Special Function

By performing the following operation, both sensitivity setting and scaling can be performed using external input. Select external calibration (page 4, No. 4-C) and display scaling. The following is the example when using the % calibration.

Display Selection

The factory default value is "1" only. Other items can be displayed only after being selected at Display customization selection (page 5, No.8).
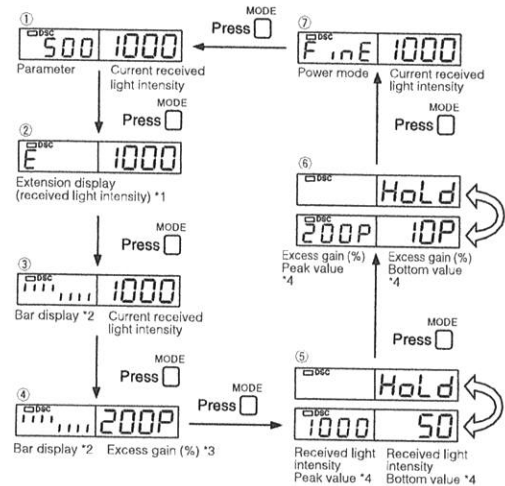
*1 When ULTRA/MEGA mode is selected, the current received light intensity can be displayed up to 5 digits.
The setting value flashes when the ◄► button is pressed once.
The setting can be changed by pressing the ◄► button while flashing.
*2 The excess gain is displayed in a 5% increment from 85 to 115%.
*3 The current light intensity for the setting value is displayed in percentage.
*4 Holds and displays the peak value and the bottom value.

How to reset the peak and bottom values (with the 5/6 display)

While pressing the MODE button, press the SET button for 3 seconds or longer to reset the peak and bottom values. Turning the power off also resets the values.
With FS-V31C(P)/32C(P), the value can be reset externally by selecting Reset at External input function selection (page 4, No.4-C).

■ User-friendly Functions (Direct Access Menu)

The hold display (5/6) can be set in detail by pressing the ► button for 2 seconds or longer.
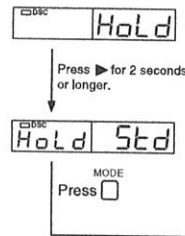
Hold display selection
Select the setting by pressing the ◄► button.

- **Std** Updates every time the current light intensity is less (or more) than the specified peak and bottom values.
- **P¯P_** Displays the maximum and minimum peak values since the power is turned on (total number).
- **b¯b_** Displays the maximum and minimum bottom values since the power is turned on (total number).
- **P_b** Displays the minimum peak value and the maximum bottom value since the power is turned on (total number).
- **P¯b_** Displays the maximum peak value and the minimum bottom value since the power is turned on (total number).

The power mode and attenuation function for the power mode display (3) can be set by pressing the ► button for 2 seconds or longer.
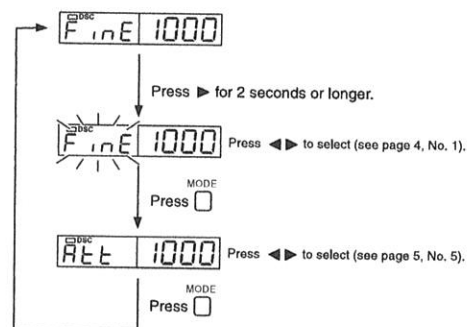
Key Lock Function

The key lock function disables the operation of all keys.

1 While pressing the MODE button, press the ◄ (►) button for at least three seconds.
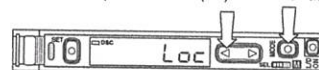
The same steps can be taken to deactivate key lock.
For more information on the key lock levels and the PIN number key lock function,

Operation Configuration

Normally, this unit can be used in the basic settings.
Set other functions as necessary.

Pressing $\overset{MODE}{\square}$ for 3 seconds or longer displays the basic menu.

Select a function with the ◀▶ button, and press $\overset{MODE}{\square}$ to confirm.

The setting for each item is confirmed when selecting END and pressing $\overset{MODE}{\square}$.

Basic setting menu	1. Power mode selection 2. Sensitivity setting method selection
Detection setting menu	3. Timer mode selection 4. Detection mode selection 4-C. External input function selection 5. Light emission power selection
Display setting menu	6. Display value correction function selection 7. Display reverse selection 8. Display customization selection
System setting menu	9. APC function setting 10. Power save mode setting 11. Key lock level setting 12. Interference prevention function setting

Basic Setting Menu

Press $\overset{MODE}{\square}$ for 3 seconds or longer

FinE 1500

Press $\overset{MODE}{\square}$

1 Power mode (response time) selection

Select the setting by pressing the ◀▶ button.
- hSP   HIGH SPEED: 33 μs
- FinE   FINE: 250 μs
- turb   TURBO: 500 μs
- SuPr   SUPER: 1 ms
- ULtr   ULTRA: 4 ms
- MEGA   MEGA: 16 ms

(Can be switched when the power selection switch is set to SEL.)

SEt Std

Press $\overset{MODE}{\square}$

When Std is selected / When SEtP is selected

2 Sensitivity setting method selection

Select the setting by pressing the ◀▶ button.
- Std   Normal sensitivity setting (see page 2)
- SEtP   Percentage(%) calibration (see page 2)

SEtP - 10P

Ⓐ

Press $\overset{MODE}{\square}$

Percentage calibration target value setting

Select the setting by pressing the ◀▶ button.
Can be set between −99 and +99%.

End

Press $\overset{MODE}{\square}$

When StG-Func is selected → **Detection setting menu**
When StG-diSP is selected → **Display setting menu**
When StG-SYS is selected → **System setting menu**
When End is selected

Menu end/continue selection

Select the setting by pressing the ◀▶ button.
- End   Ends the menu.
- StG-Func Configures detection settings. (Timer, DSC, etc.)
- StG-diSP Configures display settings. (Scaling, inversion, etc.)
- StG-SYS   Configures system settings. (APC, Power Save, etc.)

End of basic menu display

Detection Setting Menu

From the basic menu

StG-Func

Press $\overset{MODE}{\square}$

toFF ----

Press $\overset{MODE}{\square}$

When Timer OFF is selected / When other than Timer OFF is selected

3 Timer mode selection

Select the setting by pressing the ◀▶ button.
- toFF   Timer OFF
- oFFd   Off-delay
- on-d   On-delay
- Shot   One-shot
- on-doFFd   On-delay Off-delay *1
- on-dShot   On-delay One-shot *1

oFFd 10

Press $\overset{MODE}{\square}$

Timer setting

Configure setting by pressing the ◀▶ button.
Can be set between 0.1 and 9999 ms.
When 1 is selected, On-delay timer is set.

At Timer mode selection.
* other than 1 is selected → a
* 1 is selected → b

oFFd 10
or
Shot 10

Press $\overset{MODE}{\square}$

Timer setting 2

Sets the time of Off-delay (One-shot).
Configure setting by pressing the ◀▶ button.
Can be set between 0.1 and 9999 ms.

dEtc Std

Press $\overset{MODE}{\square}$

When Std or ArEA is selected / When dSc is selected

4 Detection mode selection

Select the setting by pressing the ◀▶ button.
- Std   Normal (light intensity) detection mode
- dSc   Dynamic sensitivity correction mode (see page 2)
- ArEA   Area detection mode (see page 3)
- _⌐‾d   Detects the rising edge of the received light intensity (Edge detection mode) (see page 2)
- ‾L_d   Detects the falling edge of the received light intensity (Edge detection mode) (see page 2)

L-on

Press $\overset{MODE}{\square}$

Detection operation selection

Select the setting by pressing the ◀▶ button.
- L-on   Mainly reflective type
  [Light intensity with workpiece > Light intensity without workpiece]
  (The output is ON when the light enters.)
- d-on   Mainly transmission type
  [Light intensity with workpiece < Light intensity without workpiece]
  (The output is ON when the light is blocked.)

dSc LEu1

Press $\overset{MODE}{\square}$

Correction speed selection

Select the setting by pressing the ◀▶ button.
1 to 3
The correction is made faster as the number becomes larger. (Select 1 in normal cases.)

Power mode	Level 1	Level 2	Level 3
hSP	7.34s	114.7ms	1.8ms
FinE	52.43s	819.2ms	12.8ms
Turb/SuPr/Ultr/MEGA	104.86s	1.64s	25.6ms

When Edge detection is selected

_⌐-d LEu8

Press $\overset{MODE}{\square}$

Filter time selection

Select the setting by pressing the ◀▶ button.
Select larger number (initial state) in normal cases. The selectable level depends on the power modes. (see page 2)

When using FS-V31(P) FS-V32(P) FS-V31M FS-V30 / When using FS-V31C(P) FS-V32C(P)

in oFF

Press $\overset{MODE}{\square}$

When other than SCAL is selected / When SCAL is selected

4-C External input function selection (for the connector type only)

Select the setting by pressing the ◀▶ button.
- oFF   Does not use external input.
- SEt   External calibration
- SCAL   Display scaling
- SAFt   Zero shift
- nSt   Hold display reset
- CuLL   Light emission stop

SCAL 2000

Press $\overset{MODE}{\square}$

Display scaling target value setting

Select the setting by pressing the ◀▶ button.
The value can be set between 100 and 10000

Att 100 ⟷ ||||||| 100

Press ☐ MODE

5 Light emission power selection

Select the setting by pressing the ◄ ► button.

Display	Power mode		
	hSP	FinE	Turb/SuPr/ uLtr/MEGA
|||||||	Normal		
||||	Approx. 15% of the normal time		
||	Approx. 11% of the normal time	Approx. 3% of the normal time	Approx. 1.5% of the normal time

Back to Ⓐ of the basic setting.

Display Setting Menu

From the basic menu

StG-d iSP

When SCAL or ShFt is selected on page 4, No.4-C

Press ☐ MODE

Ad J oFF

Press ☐ MODE

When oFF or ShFt is selected

When SCAL is selected

SCAL 2000

Press ☐ MODE

6 Display value correction function selection

Select the setting by pressing the ◄ ► button.
- oFF   Not to be used.
- SCAL   Uses the display scaling function.
- ShFt   Uses the zero-shift function.

Display scaling target value setting

Configure setting by pressing the ◄ ► button.
The value can be set between 100 and 10000 in unit of 100.
10000 is displayed as FuLL.

rEu oFF

Press ☐ MODE

7 Display reverse selection

Select the setting by pressing the ◄ ► button.
- oFF   Normal display
- on   Reverses the display.
         Even when the display is reversed, the green light indicates setting values, and the red light indicates received light intensity.

CuSt no

Press ☐ MODE

8 Display customization selection

Select the setting by pressing the ◄ ► button.
- no   Does not customize the display.
- YES   Customizes the display.

When no is selected

When no is selected

① Std on
Normal

Press ☐ MODE

② StdE oFF
Extension

Press ☐ MODE

③ bAr oFF
Bar

Press ☐ MODE

④ PEr oFF
Excess gain (%)

Press ☐ MODE

⑤ HLd oFF
HOLD

Press ☐ MODE

⑥ HLdP oFF
HOLD Excess gain (%)

Press ☐ MODE

⑦ Poɥr oFF
Power mode

Press ☐ MODE

Back to Ⓐ of the basic setting.

Selectable display setting

The items shown left are displayed in order every time the MODE button is pressed. (see page 3)
Select the setting by pressing the ◄ ► button.
- on   Adds the item to the selectable display.
- oFF   Deletes the item from the selectable display.

▣ Reference

When setting each mode, the display returns normal by pressing the MODE button for 3 seconds or longer.

System Setting Menu

From the basic menu

StG- SYS

Press ☐ MODE

APC oFF

Press ☐ MODE

9 S-APC setting

Configure setting by pressing the ◄ ► button.
- on   APC is enabled.
- oFF   APC is disabled.

About APC (Auto Power Control)
In normal cases, use the sensor with APC disabled.
When APC is enabled, the light intensity is monitored and corrected in order to maintain regular light transmission. If the environment is sufficiently clean, a highly accurate detection can constantly be performed.
Note: Long-term use of APC imposes heavier load on the LED than when disabled.

Eco oFF

Press ☐ MODE

10 Power save mode setting

Configure setting by pressing the ◄ ► button.
- on   Saves power (Turns off the display). While the power save mode is activated, only one segment on the digital monitor remains displayed.
- oFF   Normal display

To turn all the displays OFF (both digital monitor and operation status indicators)
ALL can be selected when ◄ is pressed for 3 seconds or longer while "on" is selected.
To restore the display from Display OFF, press MODE and L/D ON buttons simultaneously for 3 seconds or longer.

LocLEu I

Press ☐ MODE

11 Key lock level setting (see page 6)

Select the setting by pressing the ◄ ► button.
- LEu I   Level 1
- LEu2   Level 2
- LEu3   Level 3

intF Std

Press ☐ MODE

12 Selecting the number of units of interference prevention

Select the setting by pressing the ◄ ► button.
- Std   Normal
- dobL   The number of units of interference prevention is twice as many as in the normal time. (The response time is also twice as long as in the normal time. The detection distance is the same as in the normal time.)

Back to Ⓐ of the basic setting.

Initializing, Saving and Loading the Settings

▣ Initializing the settings

1 While pressing L/D ON, press SET for 5 seconds or longer.

2 Select "rSt" with the ◄ ► button, and press MODE.

3 Select "init" with the ◄ ► button, and press MODE to initialize.

Default setting

Power mode:	FINE
Detection mode:	Normal
Setting value:	50
Output selection:	L ON

▣ Saving the settings

1 While pressing L/D ON, press SET for 5 seconds or longer.

2 Select "SAuE" with the ◄ ► button, and press MODE.

3 Select "YES" with the ◄ ► button, and press MODE to save.

▣ Loading the setting

1 While pressing L/D ON, press SET for 5 seconds or longer.

2 Select "rSt" with the ◄ ► button, and press MODE.

3 Select "CuSt" with the ◄ ► button, and press MODE to load.

Key Lock Level Details

By selecting the key lock (page 5, No.11) level (1-3), key operations to be disabled can be changed.
(The default value is level 1.)

Basic Operations	Button	Level 1	Level 2	Level 3
Sensitivity settings (p.2)	SET	×	○	○
Sensitivity fine-adjustment (p.2)	◄ ►	△	○	○
Power selection (p.1)	Power selection switch	×	×	×
Output selection (p.2)	L/D ON	×	×	×
Menu selection (p.4)	Press and hold MODE	×	×	△

| Advanced Operations	Button	Level 1	Level 2	Level 3
Initialization (p.3)	L/D ON + press and hold SET	×	×	×
Display scaling (p.3)	MODE + quickly press SET	×	○	○
Zero shift (p.3)	MODE + quickly press SET	×	○	○
Direct access menu (p.3)	Press and hold ◄	×	×	△
Display OFF/ ON (p.5, No.10)	L/D.ON + press and hold MODE	○	○	○

○: Normal operation is possible.　×: Operation is not possible.
△: The settings can be checked but cannot be changed.

Specifications

PIN Number Key Lock Function

The unit can be locked using a PIN number to ensure securer locking effect.

1 While pressing the MODE button, press the ◄ (►) button 10 times.

81-6-6379-2211 Fax: 81-6-6379-2431
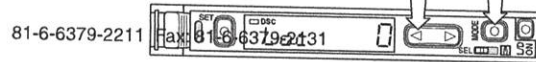
2 Select a PIN number between 0 and 9999 using the button.

3 Press the MODE button to activate key lock.

Follow the same step to disable the key lock. Use the same PIN number used for locking.

Note
Write down the PIN number in case it is forgotten.
The key lock cannot be disabled unless the correct PIN number is used.