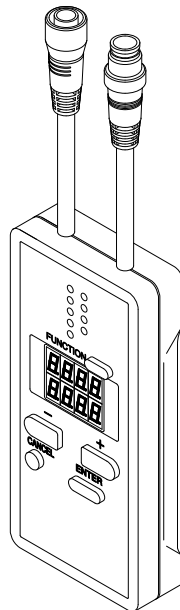


## INSTRUCTION MANUAL

Handy Controller Exclusive for **SF4B** / **SF4B<V2>** Series

**SFB-HC**

Ver.2.1



**(MEMO)**

Thank you for purchasing Panasonic Industrial Devices SUNX's Handy Controller **SFB-HC** (Ver. 2.1) exclusive for **SF4B / SF4B<V2>** series.

Please read both the instruction manual of this manual and **SF4B / SF4B<V2>** series or **SF-C14EX** carefully and thoroughly for the correct and optimum use of this device.

Kindly keep this manual in a convenient place for quick reference.

This manual has been written for the following personnel who have undergone suitable training and have knowledge of light curtains, as well as, safety systems and standards (ANSI, etc.).

- who are responsible for the introduction of this device
- who design a system using this device
- who install and connect this device
- who manage and operate a plant using this device

#### NOTICE



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# CHAPTER 1 INTRODUCTION

## 1-1 Attention Marks

This instruction manual employs the following attention marks  **WARNING**,  **CAUTION** depending on the degree of the danger to call operator's attention to each particular action. Read the following explanation of these marks thoroughly and observe these notices without fail.

Besides, the attention mark is prepared for the helpful information, detail instruction related to each part, and reference item or page.




If you ignore the advice with this mark, death or serious injury could result.



If you ignore the advice with this mark, injury or material damage could result.



The supplementary content is described with this mark.

REFERENCE  The related content is described with this mark.

## 1-2 Safety Precautions

- Use this device as per its specifications. Do not modify this device since its functions and capabilities may not be maintained and it may malfunction.
- This device has been developed / produced for industrial use only.
- Before using this device, check whether the device performs properly with the functions and capabilities as per the design specifications.
- In case of disposal, dispose this device as industrial waste.



### ◆ User in charge

- The user in charge has responsible to indicate the person to take the training required for the safety system, using method, installation, operation, and maintenance.
- This device is used and managed by the specialist, never use this device by other operator.

### ◆ Specialist

- A person who is appropriately educated, has widespread knowledge and experience, and can solve various problems which may arise during work.

### ◆ Operator

- The operator should read this instruction manual thoroughly, understand its contents, and perform operations following the procedures described in this manual, for the correct operation of this device.
- In case this device does not perform properly, the operator should report this to the person in charge and stop the machine operation immediately. The machine must not be operated until correct performance of this device has been confirmed.

### **WARNING**

#### ◆ **Fixed blanking function, floating blanking function**

- With the fixed blanking function, this device prevents the person or object from entering into the dangerous parts of the machine through the invalid sensing area. However, even though this device can prevent the interference of the person or object into the invalid sensing area with the fixed blanking function, there might exist the more space between the **SF4B** / **SF4B<V2>** series and already-existence object. Therefore, set the protecting structure so as not to exist any space in the dangerous sensing area. Detecting human body in the sensing area could result in death or serious injury.
- With the floating blanking function, this device changes the size of the minimum sensing object of the **SF4B** / **SF4B<V2>** series that is pre-set the function. When setting or changing the function, calculate and measure the safety distance again, and check that the device has the wider space than the safety distance between the dangerous parts of the machine and the sensing area of the **SF4B** / **SF4B<V2>** series. If the sufficient distance is not maintained, the machine will not stop before its dangerous parts are reached, which can result in death or serious injury.
- Set and change the function of the device following the relative laws, regulation, and standard without fail.

#### ◆ **Muting setting changing function**

- The muting setting changing function temporarily invalidates safety function of the connected devices. Confirm all of the applied laws and standards, and install or operate this device and peripheral devices correctly. Failure to do so, the operator may suffer a serious injury.

#### ◆ **Environment**

- Do not use a mobile phone or a radio phone near this device.
- Do not use this device in the following environments.
  - 1) Areas with high humidity where condensation is likely to occur
  - 2) Areas exposed to corrosive or explosive gases
  - 3) Areas exposed to vibration or shock of levels higher than that specified
  - 4) Areas exposed to contact with water
  - 5) Areas exposed to too much steam or dust

#### ◆ **Wiring**

- Be sure to carry out the wiring in the power supply OFF condition.
- All electrical wiring should conform to the regional electrical regulations and laws. The wiring should be done by engineer(s) having the special electrical knowledge.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.

#### ◆ **Maintenance**

- Clean this device with a clean cloth. Do not use any volatile chemicals.

#### ◆ **Other**

- Never reassemble or remodel this device.

# CHAPTER 2 GENERAL OUTLINE

This chapter gives the system construction, part description, etc. of this device.

## 2-1 Features

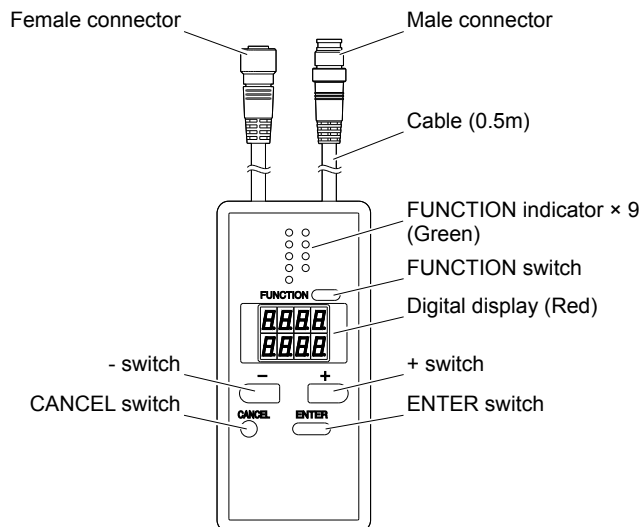
This device is the handy controller for setting each function of the light curtain **SF4B** / **SF4B<V2>** series and the application expansion unit **SF-C14EX**.

Besides, this device performs the checking and copying the setting contents of the function, and protection of writing.

### <Functions>

- Fixed blanking function
- Floating blanking function
- Auxiliary output switching function
- Emission intensity control function
- Copy function
- Muting setting changing function
- Interlock setting changing function
- External device monitor setting changing function
- Protective function
- Initialization function
- Setting contents monitoring function
- Override setting changing function

## 2-2 Part Descriptions



### 2-3 Connecting / Setting Procedures

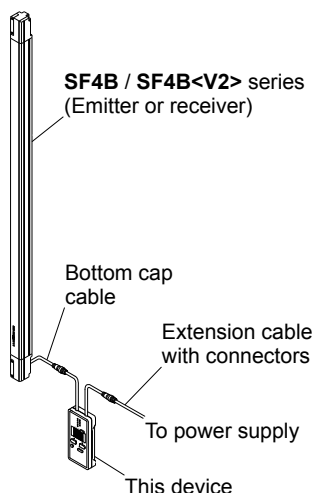
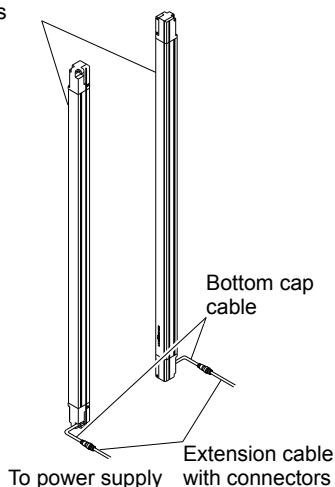
This section describes the connecting / setting procedures for both this device and **SF4B / SF4B<V2>** series or **SF-C14EX**.

#### 2-3-1 When Using with Light Curtain SF4B / SF4B<V2> Series Only

<When using the 8-core cable>

1. Set the **SF4B / SF4B<V2>** series, and check that the **SF4B / SF4B<V2>** series works properly. For mounting method of **SF4B / SF4B<V2>** series, refer to the respective Instruction Manuals.
2. Turn OFF the power, and disconnect the extension cable with connectors connected to **SF4B / SF4B<V2>** series, and then connect this device between **SF4B / SF4B<V2>** series (emitter or receiver) and the extension cable with connectors.

**SF4B / SF4B<V2>**  
series



3. Turn ON the power, and set the function with this device.  
After the power of this device is ON, approx. 30 sec. will be taken for data transmission with **SF4B / SF4B<V2>** series. While data transmission, “**7**” lights up in revolving.  
[The control output (OSSD 1 / 2) of **SF4B / SF4B<V2>** series is set to “OFF” while this device has been connected.]

REFERENCE ➤➤ Refer to “**3-1 Functional Descriptions <When Using with Light Curtain SF4B / SF4B<V2> Series Only>**” for the details of the functions, and refer to “**3-3 Function Setting (Operation Procedure)**” for the setting procedures of the functions respectively.

4. Turn OFF the power, then remove this device.
5. Connect both **SF4B / SF4B<V2>** series and the extension cable with connectors and return the device to the state described in procedure 1.
6. Check that the **SF4B / SF4B<V2>** series works as set at the procedure 3.  
Then, inspect the **SF4B / SF4B<V2>** series.

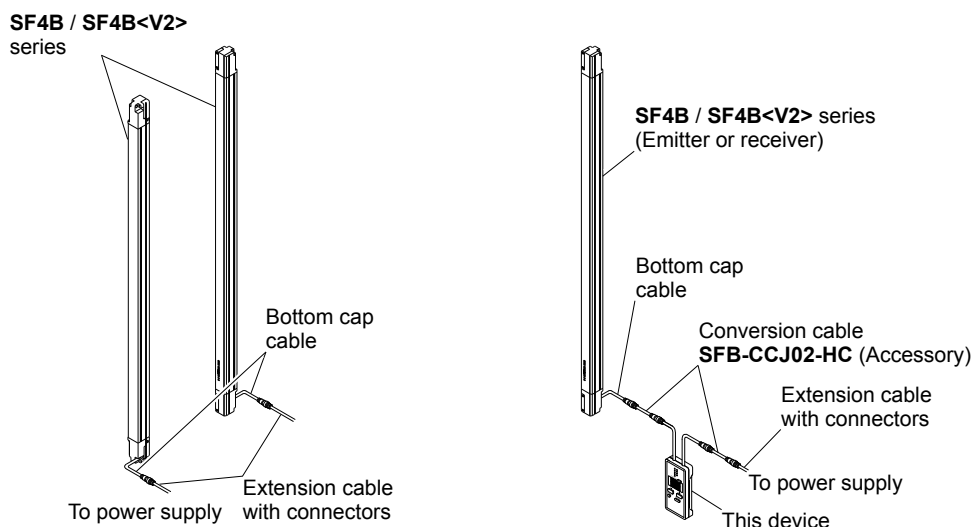
REFERENCE ➤➤ Refer to “**Chapter 4 Maintenance**” of the **SF4B / SF4B<V2>** series instruction manual for the details of the inspection of the **SF4B / SF4B<V2>** series.



### <When using the 12-core cable>

When the connection cable for the muting function, the conversion cable **SFB-CCJ02-HC** (accessory) is used.

1. Set the **SF4B / SF4B<V2>** series, and check that the **SF4B / SF4B<V2>** series works properly. For mounting method of **SF4B / SF4B<V2>** series, refer to the respective Instruction Manuals.
2. Turn OFF the power, and disconnect the extension cable with connectors connected to **SF4B / SF4B<V2>** series, and then connect this device and **SFB-CCJ02-HC** between the **SF4B / SF4B<V2>** series (emitter or receiver) and the extension cable with connectors.



3. Turn ON the power, and set the function with this device.  
After the power of this device is ON, approx. 30 sec. will be taken for data transmission with **SF4B / SF4B<V2>** series. While data transmission, “**J**” lights up in revolving.  
[The control output (OSSD 1 / 2) of **SF4B / SF4B<V2>** series is set to “OFF” while this device has been connected.]

REFERENCE ➤➤ Refer to “3-1 Functional Descriptions <When Using with Light Curtain SF4B / SF4B<V2> Series Only>” for the details of the functions, and refer to “3-3 Function Setting (Operation Procedure)” for the setting procedures of the functions respectively.

4. Turn OFF the power, then remove this device and **SFB-CCJ02-HC**.
5. Connect both **SF4B / SF4B<V2>** series and the extension cable with connectors and return the device to the state described in procedure 1.
6. Check that the **SF4B / SF4B<V2>** series works as set at the procedure 3.  
Then, inspect the **SF4B / SF4B<V2>** series.

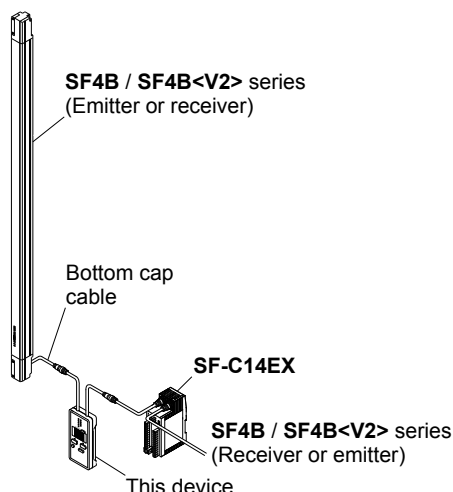
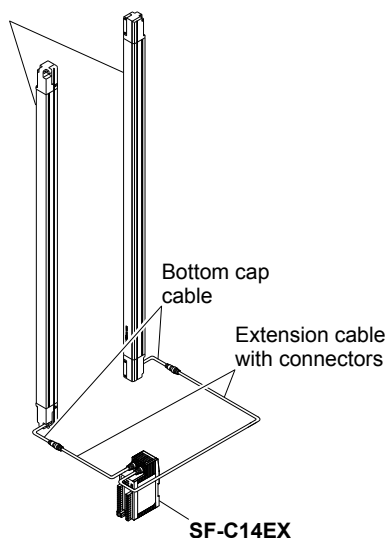
REFERENCE ➤➤ Refer to “Chapter 4 Maintenance” of the **SF4B / SF4B<V2>** series instruction manual for the details of the inspection of the **SF4B / SF4B<V2>** series.

### 2-3-2 When Using in Combination with Application Expansion Unit SF-C14EX

<The 8-core cable is used>

1. Set the **SF4B / SF4B<V2>** series and **SF-C14EX**, and check that the **SF4B / SF4B<V2>** series works properly. For mounting method of **SF4B / SF4B<V2>** series or **SF-C14EX**, refer to the respective Instruction Manuals.
2. Turn OFF the power, and disconnect the extension cable with connectors connected to the emitter side (or receiver side) of **SF4B / SF4B<V2>** series from **SF-C14EX**, and then connect the emitter side (or receiver side) of this device to the receiver side (or emitter side) connector of **SF-C14EX**.

**SF4B / SF4B<V2>**  
series



3. Turn ON the power, and set the function with this device.  
After the power of this device is ON, a total approx. 30 sec. will be taken for data transmission with **SF4B / SF4B<V2>** series and **SF-C14EX**. While data transmission, “**⌂**” lights up in revolving.  
[The safety output 1 / 2 of **SF-C14EX** series are set to “OFF” while this device has been connected.]

REFERENCE ➤➤ Refer to “**3-2 Functional Descriptions <When Using in Combination with Application Expansion Unit SF-C14EX>**” for the details of the functions, and refer to “**3-3 Function Setting (Operation Procedure)**” for the setting procedures of the functions respectively.

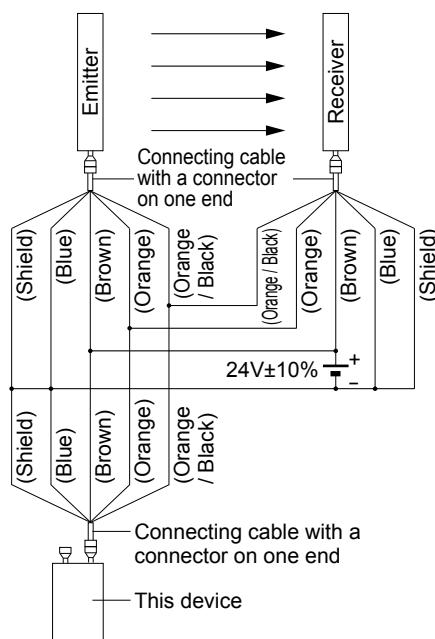
4. Turn OFF the power, and remove this device.
5. Connect the **SF4B / SF4B<V2>** series and **SF-C14EX**, and return the device to the state described in procedure 1.
6. Check that the **SF4B / SF4B<V2>** series works as set at the procedure 3.  
Then, inspect the **SF4B / SF4B<V2>** series.

REFERENCE ➤➤ Refer to “**Chapter 4 Maintenance**” of the **SF4B / SF4B<V2>** series instruction manual for the details of the inspection of the **SF4B / SF4B<V2>** series.

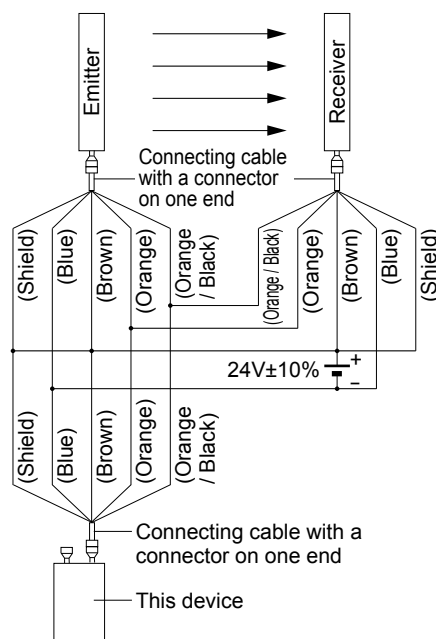
<In case this device cannot be connected between SF4B / SF4B<V2> series and the connecting cable>

- This device can be connected to SF4B / SF4B<V2> series by using the connection cable with a connector on one end (optional).

<For PNP output>



<For NPN output>



- Connection cable with a connector on one end: 2 pcs./set

Model No.	Cable length	Description
SFB-CC3	3m	For 8-core cable
SFB-CC10	10m	
SFB-CC3-MU	3m	For 12-core cable
SFB-CC10-MU	10m	

- The setting procedure remains the same.
- The control output (OSSD 1 / 2) of SF4B / SF4B<V2> series is set to "OFF" while this device has been connected. (The safety output 1 / 2 of SF-C14EX is also set to "OFF" while SF-C14EX has been used.) Once the setting is completed, turn OFF the power, remove this device and then turn ON the power again.

# CHAPTER 3 FUNCTIONS

## 3-1 Functional Descriptions <When Using with Light Curtain SF4B / SF4B<V2> Series Only>

This section describes each function when using with **SF4B / SF4B<V2>** series only.

[When using with **SF-C14EX**, refer to “3-2 Functional Descriptions <When Using in Combination with Application Expansion Unit SF-C14EX>.”]

### CAUTION

If configuration of the system is changed (change of the **SF-C14EX** to be used / not to be used, replace the **SF4B / SF4B<V2>** series etc.), set the function again.

### 3-1-1 Fixed Blanking Function

This is a function that the control output (OSSD 1 / 2) of **SF4B / SF4B<V2>** series is not turned OFF, even if the specified beam channel(s) is blocked OFF.

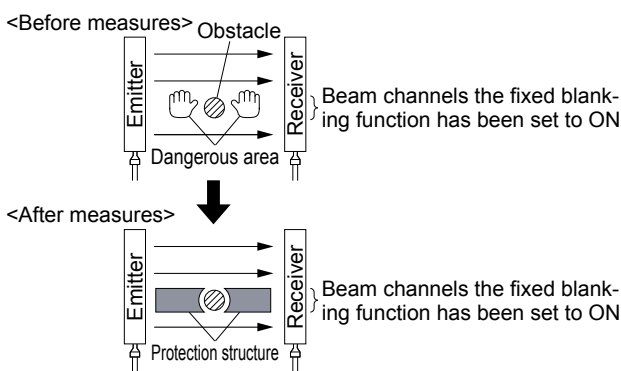
This is useful when an obstacle always blocks OFF the specific beam channel(s).

There are “Clear,” “Auto” and “Manual” for the setting method.

- Clear setting : The fixed blanking function is to be invalid (factory setting).
- Auto setting : The currently blocked OFF beam channels are set as “effective beam channels” in the fixed blanking function. Be sure to set this function in the state where the emitter emits light. Furthermore, this function cannot be set in the state where all beam channels receive lights / are blocked.
- Manual setting: Each beam channel can be set to “effective / ineffective” in the fixed blanking function respectively.

### WARNING

When the fixed blanking function is used, the control output (OSSD 1 / 2) of **SF4B / SF4B<V2>** series is not turned OFF even if the particular beam channels are blocked. By using a protection structure etc., make the dangerous parts of the machine inaccessible to personnel through the sensing area of the particular beam channels.



### CAUTION

When the effective beam channel(s) in the fixed blanking function receive(s) the beam(s) from the emitter, the control output (OSSD 1 / 2) of the **SF4B / SF4B<V2>** series is fixed to “OFF.” In this case, check the mounting condition and turn the power ON again. (Even if the power is turned ON again, the fixed blanking function still stays effective.) When the fixed blanking function is used, the received light intensity indicator of **SF4B / SF4B<V2>** series is turned OFF regardless of the received light intensity.

## 3-1-2 Floating Blanking Function

This function is set in each **SF4B / SF4B<V2>** series.

If the number of the blocked beam channels is less than the set number of the beam channels, the control output (OSSD 1 / 2) of **SF4B / SF4B<V2>** series is not turned "OFF."

This function is useful when an obstacle moves within the sensing area.

The factory setting of this function is "ineffective."

The following items can be set.

### Set number of beam channels

- Selectable among 0 (the floating blanking function is ineffective), 1, 2 or 3.

### Ineffective setting of both end beam channel

- "Effective / ineffective" of the floating blanking function for the both end beam channels can be selected.
  - SET (Effective) : The floating blanking function becomes ineffective for the both end beam channels. In case either end of the beam channel is blocked, the control output (OSSD 1 / 2) of **SF4B / SF4B<V2>** series is turned "OFF" regardless of the set number of the beam channels.
  - CLR (Ineffective) : The floating blanking function becomes effective for all beam channels including both end beam channels.

### Non-serial beam channel setting

- SET (Effective) : Even if the beam channels are blocked discontinuously in the set beam channels, the control output (OSSD 1 / 2) of **SF4B / SF4B<V2>** series is turned "ON." (Discontinuous mode)
- CLR (Ineffective) : When the beam channels are blocked discontinuously even in the set beam channels, the control output (OSSD 1 / 2) of **SF4B / SF4B<V2>** series is turned "OFF." (Continuous mode)



- When using the floating blanking function, the size of the minimum sensing object becomes larger, and the safety distance is longer as well. For the calculation of the safety distance, refer to the instruction manual enclosed with **SF4B / SF4B<V2>** series.
- Before designing the system, refer to the relevant laws and standards of the region where **SF4B / SF4B<V2>** series is to be used and then install **SF4B / SF4B<V2>** series.
- The minimum sensing object differs depending on the set number of the beam channels.

**[For use in Europe (EU) (as EN 999)] (Also applicable to ISO 13855)**

**(For intrusion direction perpendicular to the sensing area)**

**<In case that the minimum sensing object is ø40mm or less>**

- Equation  $S = K \times T + C$ 
  - S : Safety distance (mm)  
Minimum required distance between the sensing area surface and the dangerous parts of the machine.
  - K : Intrusion velocity of operator's body or object (mm/sec.)  
Taken as 2,000 (mm/sec.) for calculation
  - T : Response time of total equipment (sec.)  
 $T = T_m + T_{SF4B}$   
 $T_m$ : Maximum halting time of machine (sec.)  
 $T_{SF4B}$ : Response time of **SF4B / SF4B<V2>** series (sec.)
  - C : Additional distance calculated from the size of the minimum sensing object of the **SF4B / SF4B<V2>** series (mm)  
However, the value of C cannot be under 0.  
 $C = 8 \times (d - 14)$   
 $d$ : Diameter of the minimum sensing object (mm)

## Functional Descriptions

### <Minimum sensing object>

	Floating blanking function			
	Ineffective	Effective		
		1 beam channel	2 beam channels	3 beam channels
SF4B-F□, SF4B-F□<V2>	ø14mm	ø24mm	ø34mm	ø44mm
SF4B-H□, SF4B-H□<V2>	ø25mm	ø45mm	ø65mm	ø85mm
SF4B-A□, SF4B-A□<V2>	ø45mm	ø85mm	ø125mm	ø165mm

### CAUTION

If the floating blanking function is used, the incident light intensity indicator is turned OFF when an obstacle exists in the sensing range regardless of the incident light intensity.

### 3-1-3 Auxiliary Output Switching Function

This function changes the operation state of the auxiliary output. It is useful when desired to make an indicator to operate or inform the operation state of the **SF4B / SF4B<V2>** series to PLC.

### WARNING

Do not use the auxiliary output for the purpose of stopping the machine in which the **SF4B / SF4B<V2>** series is installed. Failure to do so could result in death or serious injury.

The following settings are selectable.

Setting mode	Auxiliary output setting	Operation of the auxiliary output corresponding to SF4B / SF4B<V2> series state				
		Emission halt	State of sensing area when emitting		Shielded	Lockout
			Unshielded			
			Unstable light-receiving condition	Others		
0	Negative logic of the control output (OSSD 1 / 2) (factory setting)	ON	OFF when OSSD is ON ON when OSSD is OFF			ON
1	Positive logic of the control output (OSSD 1 / 2)	OFF	ON when OSSD is ON OFF when OSSD is OFF			OFF
2	ON when emitting	OFF	ON			OFF
3	OFF when emitting	ON	OFF			ON
4	OFF under unstable light receiving condition (Note 1)	(Note 3)	OFF	ON	(Note 3)	(Note 3)
5	ON under unstable light receiving condition (Note 1)	(Note 3)	ON	OFF	(Note 3)	(Note 3)
6	ON during muting	OFF	ON during muting Others: OFF			OFF
7	OFF during muting	ON	OFF during muting Others: ON			ON
8	ON in light receiving condition (Note 2)	OFF	ON		OFF	OFF
9	OFF in light receiving condition (Note 2)	ON	OFF		ON	ON

Notes: 1) When the fixed blanking function, the floating blanking function or the muting function is used, the setting of ON / OFF under unstable light-receiving condition does not work.

2) By the setting of ON / OFF in light receiving condition, light-receiving / light interrupted condition is output regardless of the fixed blanking function, the floating blanking function or the muting function.  
<e.g.>

When the fixed blanking function is used, if an obstacle exists in the set area and other area is in light receiving condition, the control output (OSSD 1 / 2) is in ON state, however, the auxiliary output becomes OFF since the **SF4B / SF4B<V2>** series has been detecting the obstacle.

3) The state of the auxiliary output remains the same even if the **SF4B / SF4B<V2>** series state changes.

## 3-1-4 Emission Intensity Control Function

This function reduces the emitting intensity.

It is useful for preventing interference from the emitter to the other devices.

### Emission intensity control

- CLR (Ineffective) : Operating range is 0.3 to 9m for **SF4B-H□ / SF4B-H□<V2>** (12 to 64 beam channels) and **SF4B-A□ / SF4B-A□<V2>** (6 to 32 beam channels), 0.3 to 7m for **SF4B-F□ / SF4B-F□<V2>** and **SF4B-H□ / SF4B-H□<V2>** (72 to 96 beam channels) and **SF4B-A□ / SF4B-A□<V2>** (36 to 48 beam channels) (factory setting).
- SET (Effective) : The operating range is reduced by approx. 50%.

## 3-1-5 Copy Function

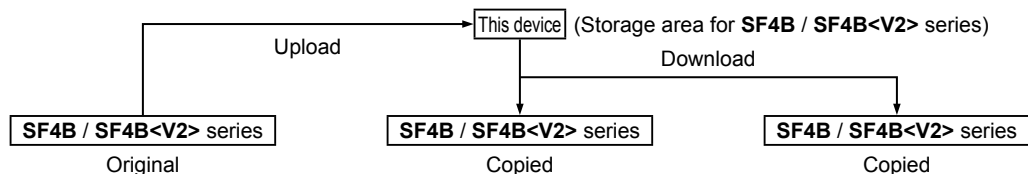
This is a function to copy the setting of a **SF4B / SF4B<V2>** series to other **SF4B / SF4B<V2>** series. This function is available only under the same system configuration (the number of sensors, the number of beam channels, same model No.).

All functions that are settable with this device can be copied.

Note that the password is also copied with this function.

The following operations are available with this function.

- Upload : Upload the functional setting data of **SF4B / SF4B<V2>** series to this device.
- Download : Download the functional setting data of this device to **SF4B / SF4B<V2>** series.
- Monitoring: Check the functional setting data saved in this device.



## 3-1-6 Muting Setting Changing Function

The setting of the muting function can be changed.

### Setting of the muting function on each beam channel

- Each beam channel can be set to “effective / ineffective” in the muting function respectively. (Note)
- The factory setting of this function is effective for all beam channels.

Note: If the beam channel set to ineffective in the muting function is blocked, the control output (OSSD 1 / 2) becomes “OFF” and the muting function is canceled.

- There are two setting methods, “Auto” and “Manual” to set muting beam channel.
  - Auto setting : The beam channel which is currently blocked is set as the “effective” beam channel. When all beam channels are in light receiving condition, the setting is not accepted. Furthermore, in the state where emission is halted or all beam channels are blocked, the all beam channels become “effective” in the muting function.
  - Manual setting: Each beam channel can be set to “effective / ineffective” in the muting function.  
ON: The muting function is effective  
OFF: The muting function is ineffective

## Functional Descriptions

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### Muting input conditions

- The order for inputting the muting input A and B, which the muting function activates, can be set.  
A = b: Effective even either comes first  
A b: Effective only when the input A comes first  
b A: Effective only when the input B comes first

Note: The setting is possible for each channel.

### Setting of the muting lamp diagnosis function (Ver. 2 or later)

- The muting lamp diagnosis function can be set to “effective / ineffective.” (Note)  
The factory setting of this function is effective.  
ON : The muting lamp diagnosis function is effective.  
OFF: The muting lamp diagnosis function is ineffective.

Note: If the muting lamp diagnosis function is set to ineffective, the muting function is maintained even if the lamp blew.

### Muting sensor output operation setting (Ver. 2.1 only)

- Output operation of the muting sensor can be selected.  
The factory setting is NONO (Normally Open, Normally Open).
  - **NONO (Normally Open, Normally Open)**  
A muting sensor which is to be connected to the muting input A (ON with light non-received status, ON with object approaching status and ON with object contacted status)  
A muting sensor which is to be connected to the muting input B (ON with light non-received status, ON with object approaching status and ON with object contacted status)
  - **NONC (Normally Open, Normally Closed)**  
A muting sensor which is to be connected to the muting input A (ON with light non-received status, ON with object approaching status and ON with object contacted status)  
A muting sensor which is to be connected to the muting input B (ON with light received status, ON with object non-approaching status and ON with object non-contacted status)

## 3-1-7 Interlock Setting Changing Function

One condition can be selected from the following three interlock conditions. It can be set to invalid, too. (Mode 3)

- **Start / Restart interlock (Mode 0)**  
The **SF4B / SF4B<V2>** series goes into interlock condition after the power is ON and when it is in the light receiving condition.

The factory setting is Start / Restart interlock.

- **Start interlock (Mode 1)**  
The **SF4B / SF4B<V2>** series goes into interlock condition only when the power is ON. Once the **SF4B / SF4B<V2>** series is reset, it does not go into interlock condition again.
- **Restart interlock (Mode 2)**  
The **SF4B / SF4B<V2>** series does not go into the interlock condition when the power is ON. The **SF4B / SF4B<V2>** series goes into interlock condition only when the **SF4B / SF4B<V2>** series receives the light, after the power is ON, the control output (OSSD 1 / 2) is turned into ON once and then the **SF4B / SF4B<V2>** series is blocked.

## 3-1-8 External Device Monitor Setting Changing Function

The setting of the external device monitor can be changed.

1. Allowable period of the response time: 100 to 600ms (unit of 10ms)  
The factory setting is 300ms.
2. “Effective / ineffective” of the external device monitor function can be selected.  
The factory setting is “effective.”



## 3-1-9 Protective Function

The functional settings are not allowed to change without the input of a password.

When the protective function is set to "effective," the setting can be changed by inputting the password.

The setting contents monitor function can be used regardless of the protective function "effective / ineffective."

The password should be a 4-digit number from 0 to 9. (The password of the factory setting is "0000.")

The protective function is set on the receiver side.



- When the protecting function is set to "ineffective," the third person may change the setting. It is recommended that the protecting function should be set to "effective" so as not to change the setting by the third person.
- Take sufficient care not to forget the set password. In case you forget the password, please contact us.

## 3-1-10 Initialization Function

The settings can be initialized. (factory setting) (Note)

The factory setting of each function is as follows.

Function		Setting
Fixed blanking function		Ineffective
Floating blanking function		Ineffective
Auxiliary output switching function		Mode 0
Emission intensity control function		Normal mode
Muting setting changing function	Setting of the muting function on each beam channel	Effective for all beam channels
	Muting input conditions	A = B
	Setting of the muting lamp diagnosis function (Ver. 2 or later)	Effective
	Muting sensor output operation setting (Ver. 2.1 only)	NONO
Interlock setting changing function		Start / Restart
External device monitor setting changing function		Effective / 300ms
Override setting changing function (Ver. 2.1 only)		60 sec.

Note: The setting of the protective function and the setting data of the copy function are not initialized.

## 3-1-11 Setting Contents Monitoring Function

Each setting of the **SF4B / SF4B<V2>** series can be monitored. The following can be monitored.

- Model No. / the number of beam channels
- Setting of the fixed blanking function (Reading out the record of the latest 5 times is possible)
- Setting of the floating blanking function (Reading out the record of the latest 5 times is possible)
- Setting of the auxiliary output switching function
- Setting of the emission intensity control function
- Setting of the muting setting changing function  
(Reading out the record of the latest 5 times is possible, however, only for setting beam channel.)
- Setting of the interlock setting changing function
- Setting of the external device monitor setting changing function
- Override setting changing function

## 3-1-12 Override Setting Changing Function (Ver. 2.1 only)

Maximum continuous effective time set at the override function can be changed.

The maximum continuous effective time can be set in the range of 60 to 600 sec. (in units of 10 sec.).

The factory setting is 60 sec.

## Functional Descriptions

### 3-2 Functional Descriptions <When Using in Combination with Application Expansion Unit SF-C14EX>

This section describes each function.

#### ⚠ CAUTION

If configuration of the system is changed (replacement of the **SF-C14EX**, series connection, change the number of the beam channels etc.), set the function setting again. When using in combination with the **SF-C14EX**, a part of the **SF4B / SF4B<V2>** series functions is changed as well.

#### 3-2-1 Fixed Blanking Function

This is a function that the safety output 1 / 2 of **SF-C14EX** are not turned OFF, even if the specified beam channel(s) is blocked OFF.

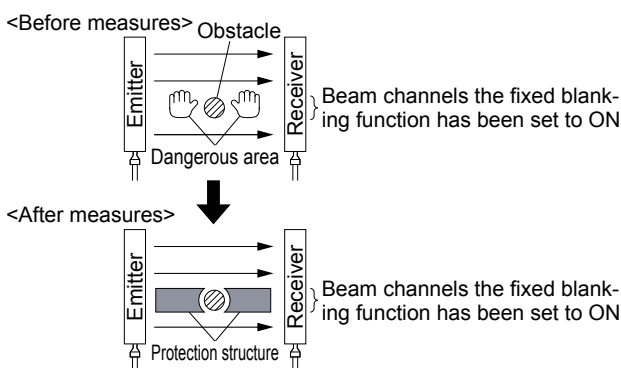
This is useful when an obstacle always blocks OFF the specific beam channel(s).

There are “Clear,” “Auto” and “Manual” for the setting method.

- Clear setting : The fixed blanking function is to be invalid (factory setting).
- Auto setting : The currently blocked OFF beam channels are set as “effective beam channels” in the fixed blanking function. Be sure to set this function in the state where the emitter emits light. Furthermore, this function cannot be set in the state where all beam channels receive lights / are blocked.
- Manual setting: Each beam channel can be set to “effective / ineffective” in the fixed blanking function respectively.

#### ⚠ WARNING

When the fixed blanking function is used, the safety output 1 / 2 of **SF-C14EX** are not turned OFF even if the particular beam channels of **SF4B / SF4B<V2>** series are blocked. By using a protection structure etc., make the dangerous parts of the machine inaccessible to personnel through the sensing area of the particular beam channels of **SF4B / SF4B<V2>** series.



#### ⚠ CAUTION

When the effective beam channel(s) in the fixed blanking function receive(s) the beam(s) from the emitter, the safety output 1 / 2 of the **SF-C14EX** are fixed to “OFF.” In this case, check the mounting condition and turn the power ON again. (Even if the power is turned ON again, the fixed blanking function still stays effective.) When the fixed blanking function is used, the received light intensity indicator of **SF4B / SF4B<V2>** series is turned OFF regardless of the received light intensity.

## 3-2-2 Floating Blanking Function

This function is set in each **SF4B / SF4B<V2>** series.

If the number of the blocked beam channels is less than the set number of the beam channels, the safety output 1 / 2 of **SF-C14EX** are not turned "OFF."

This function is useful when an obstacle moves within the sensing area of **SF4B / SF4B<V2>** series. The factory setting of this function is "ineffective."

The following items can be set.

### Set number of beam channels

- Selectable among 0 (the floating blanking function is ineffective), 1, 2 or 3.

### Ineffective setting of both end beam channel

- "Effective / ineffective" of the floating blanking function for the both ends the beam channels can be selected.
  - SET (Effective) : The floating blanking function becomes ineffective for the both end beam channels. If either end of the beam channel is blocked, the safety output 1 / 2 of **SF-C14EX** are turned "OFF" regardless of the set number of the beam channels.
  - CLR (Ineffective) : The floating blanking function becomes effective for all beam channels including both ends beam channels.

### Non-serial beam channel setting

- SET (Effective) : Even if the beam channels are blocked discontinuously in the set beam channels, the safety output 1 / 2 of **SF-C14EX** are turned "ON."  
(Discontinuous mode)
- CLR (Ineffective) : When the beam channels are blocked discontinuously even in the set beam channels, the safety output 1 / 2 of **SF-C14EX** are turned "OFF."  
(Continuous mode)



- When using the floating blanking function, the size of the minimum sensing object becomes larger, and the safety distance is longer as well. For the calculation of the safety distance, refer to the instruction manual enclosed with **SF4B / SF4B<V2>** series.
- Before designing the system, refer to the relevant laws and standards of the region where **SF4B / SF4B<V2>** series and **SF-C14EX** are to be used and then install **SF4B / SF4B<V2>** series and **SF-C14EX**.
- The minimum sensing object differs depending on the set number of the beam channels.

**[For use in Europe (EU) (as EN 999)] (Also applicable to ISO 13855)**

**(For intrusion direction perpendicular to the sensing area)**

**<In case that the minimum sensing object is ø40mm or less>**

- Equation  $S = K \times T + C$ 
  - S : Safety distance (mm)  
Minimum required distance between the sensing area surface and the dangerous parts of the machine.
  - K : Intrusion velocity of operator's body or object (mm/sec.)  
Taken as 2,000 (mm/sec.) for calculation
  - T : Response time of total equipment (sec.)  
 $T = T_m + T_{SF-C14EX}$   
 $T_m$ : Maximum halting time of machine (sec.)  
 $T_{SF-C14EX}$ : Response time of **SF-C14EX** (sec.)
  - C : Additional distance calculated from the size of the minimum sensing object of the **SF4B / SF4B<V2>** series (mm)  
However, the value of C cannot be under 0.  
 $C = 8 \times (d - 14)$   
 d: Diameter of the minimum sensing object (mm)

## Functional Descriptions

### <Minimum sensing object>

	Floating blanking function			
	Ineffective	Effective		
		1 beam channel	2 beam channels	3 beam channels
SF4B-F□, SF4B-F□<V2>	ø14mm	ø24mm	ø34mm	ø44mm
SF4B-H□, SF4B-H□<V2>	ø25mm	ø45mm	ø65mm	ø85mm
SF4B-A□, SF4B-A□<V2>	ø45mm	ø85mm	ø125mm	ø165mm

### CAUTION

If the floating blanking function is used, the incident light intensity indicator is turned OFF when an obstacle exists in the sensing range regardless of the incident light intensity.

### 3-2-3 Auxiliary Output Switching Function

This function changes the operation state of the auxiliary output (AUX4) of **SF-C14EX**. It is useful when desired to make an indicator to operate or inform the operation state of the **SF4B / SF4B<V2>** series to PLC.

### WARNING

Do not use the auxiliary output for the purpose of stopping the machine in which the **SF4B / SF4B<V2>** series is installed. Failure to do so could result in death or serious injury.

The following settings are selectable.

This function enables to set auxiliary output of the **SF4B / SF4B<V2>** series.

Setting mode	Auxiliary output setting of the <b>SF4B / SF4B&lt;V2&gt;</b> series	Operation of the auxiliary output corresponding to <b>SF4B / SF4B&lt;V2&gt;</b> series state				
		Emission halt	State of sensing area when emitting			Lockout
			Unshielded		Shielded	
			Unstable light-receiving condition	Others		
0	Negative logic of the control output (OSSD 1 / 2) (factory setting)	ON	OFF when OSSD is ON ON when OSSD is OFF			ON
1	Positive logic of the control output (OSSD 1 / 2)	OFF	ON when OSSD is ON OFF when OSSD is OFF			OFF
2	ON when emitting	OFF	ON			OFF
3	OFF when emitting	ON	OFF			ON
4	OFF under unstable light receiving condition (Note 1)	(Note 3)	OFF	ON	(Note 3)	(Note 3)
5	ON under unstable light receiving condition (Note 1)	(Note 3)	ON	OFF	(Note 3)	(Note 3)
6	ON during muting	OFF (Note 4)				
7	OFF during muting	ON (Note 4)				
8	ON in light receiving condition (Note 2)	OFF	ON		OFF	OFF
9	OFF in light receiving condition (Note 2)	ON	OFF		ON	ON

Notes: 1) When the fixed blanking function, the floating blanking function or the muting function is used, the setting of ON / OFF under unstable light-receiving condition does not work.

2) By the setting of ON / OFF in light receiving condition, light-receiving / light interrupted condition is output regardless of the fixed blanking function, the floating blanking function or the muting function.  
<e.g.>

When the fixed blanking function is used, if an obstacle exists in the set area and other area is in light receiving condition, the safety output 1 / 2 are in ON state, however, the auxiliary output becomes OFF since the **SF4B / SF4B<V2>** series has been detecting the obstacle.

3) The state of the auxiliary output remains the same even if the **SF4B / SF4B<V2>** series state changes.

4) When using in combination with **SF-C14EX**, the muting function cannot be set on **SF4B / SF4B<V2>** series side.  
Thus, the state of the auxiliary output remains the same regardless of the **SF4B / SF4B<V2>** series state.

## 3-2-4 Emission Intensity Control Function

This function reduces the emitting intensity.

It is useful for preventing interference from the emitter to the other devices.

### Emission intensity control

- CLR (Ineffective) : Operating range is 0.3 to 9m for **SF4B-H□ / SF4B-H□<V2>** (12 to 64 beam channels) and **SF4B-A□ / SF4B-A□<V2>** (6 to 32 beam channels), 0.3 to 7m for **SF4B-F□ / SF4B-F□<V2>** and **SF4B-H□ / SF4B-H□<V2>** (72 to 96 beam channels) and **SF4B-A□ / SF4B-A□<V2>** (36 to 48 beam channels) (factory setting).
- SET (Effective) : The operating range is reduced by approx. 50%.

## 3-2-5 Copy Function

This is a function to copy the setting of a **SF4B / SF4B<V2>** series to other **SF4B / SF4B<V2>** series and **SF-C14EX**.

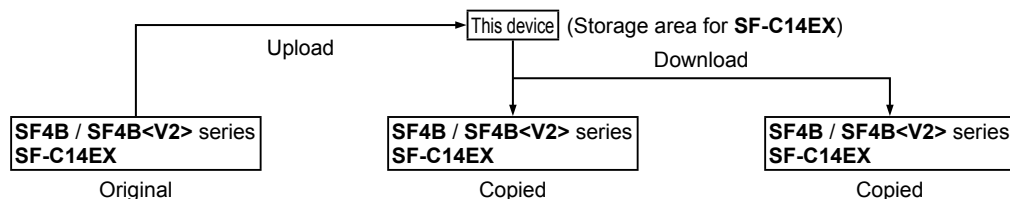
This function is available only under the same system configuration (the number of sensors, the number of beam channels, same model No.).

All functions that are settable with this device can be copied.

Note that the password is also copied with this function.

The following operations are available with this function.

- Upload : Upload the functional setting data of **SF4B / SF4B<V2>** series or **SF-C14EX** to this device.
- Download : Download the functional setting data of this device to **SF4B / SF4B<V2>** series or **SF-C14EX**.
- Monitoring: Check the functional setting data saved in this device.



## 3-2-6 Muting Setting Changing Function

The setting of the muting function can be changed.

### Setting of the muting function on each beam channel

- Each beam channel can be set to “effective / ineffective” in the muting function respectively. (Note)
- The factory setting of this function is effective for all beam channels.

Note: If the beam channel set to ineffective in the muting function is blocked, the safety output 1 / 2 of **SF-C14EX** becomes “OFF” and the muting function is canceled.

- There are two setting methods, “Auto” and “Manual” to set muting beam channel.
  - Auto setting : The beam channel which is currently blocked is set as the “effective” beam channel. When all beam channels are in light receiving condition, the setting is not accepted. Furthermore, in the state where emission is halted or all beam channels are blocked, the all beam channels become “effective” in the muting function.
  - Manual setting: Each beam channel can be set to “effective / ineffective” in the muting function.  
ON: The muting function is effective  
OFF: The muting function is ineffective

## Functional Descriptions

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### Muting input conditions

- The order for inputting the muting input A and B, which the muting function activates, can be set.  
A = b: Effective even either comes first  
A b: Effective only when the input A comes first  
b A: Effective only when the input B comes first

Note: The setting is possible for each channel.

### Setting of the muting lamp diagnosis function (Ver. 2 or later)

- The muting lamp diagnosis function can be set to “effective / ineffective.” (Note)  
The factory setting of this function is effective.  
ON : The muting lamp diagnosis function is effective.  
OFF: The muting lamp diagnosis function is ineffective.

Note: If the muting lamp diagnosis function is set to ineffective, the muting function is maintained even if the lamp blew.

### Muting sensor output operation setting (Ver. 2.1 only)

- This function cannot be set when **SF-C14EX** is used.

## 3-2-7 Interlock Setting Changing Function

This function cannot be set when **SF-C14EX** is used.

## 3-2-8 External Device Monitor Setting Changing Function

This function cannot be set when **SF-C14EX** is used.

## 3-2-9 Protective Function

The functional settings are not allowed to change without the input of a password.

When the protective function is set to “effective,” the setting can be changed by inputting the password.

The setting contents monitor function can be used regardless of the protective function “effective / ineffective.”

The password should be a 4-digit number from 0 to 9. (The password of the factory setting is “0000.”)

The protective function is set on the **SF-C14EX**.



- When the protecting function is set to “ineffective,” the third person may change the setting. It is recommended that the protecting function should be set to “effective” so as not to change the setting by the third person.
- Take sufficient care not to forget the set password. In case you forget the password, please contact us.

## 3-2-10 Initialization Function

The settings can be initialized. (factory setting) (Note 1)

The factory setting of each function is as follows.

Function		Setting
Fixed blanking function		Ineffective
Floating blanking function		Ineffective
Auxiliary output switching function		Mode 0
Emission intensity control function		Normal mode
Muting setting changing function	Setting of the muting function on each beam channel	Effective for all beam channels
	Muting input conditions	A = B
	Setting of the muting lamp diagnosis function (Ver. 2 or later)	Effective
	Muting sensor output operation setting (Ver. 2.1 only) (Note 2)	—
Interlock setting changing function (Note 2)		—
External device monitor setting changing function (Note 2)		—
Override setting changing function (Ver. 2.1 only) (Note 2)		—

Notes: 1) The setting of the protective function and the setting data of the copy function are not initialized.

2) This function cannot be set when **SF-C14EX** is used.

## 3-2-11 Setting Contents Monitoring Function

Each setting of the **SF-C14EX** series can be monitored. The following can be monitored.

- Model No. / the number of beam channels
- Setting of the fixed blanking function (Reading out the record of the latest 5 times is possible)
- Setting of the floating blanking function (Reading out the record of the latest 5 times is possible)
- Setting of the auxiliary output switching function
- Setting of the emission intensity control function
- Setting of the muting setting changing function  
(Reading out the record of the latest 5 times is possible, however, only for setting beam channel.)

## 3-2-12 Override Setting Changing Function (Ver. 2.1 only)

This function cannot be set when **SF-C14EX** is used.

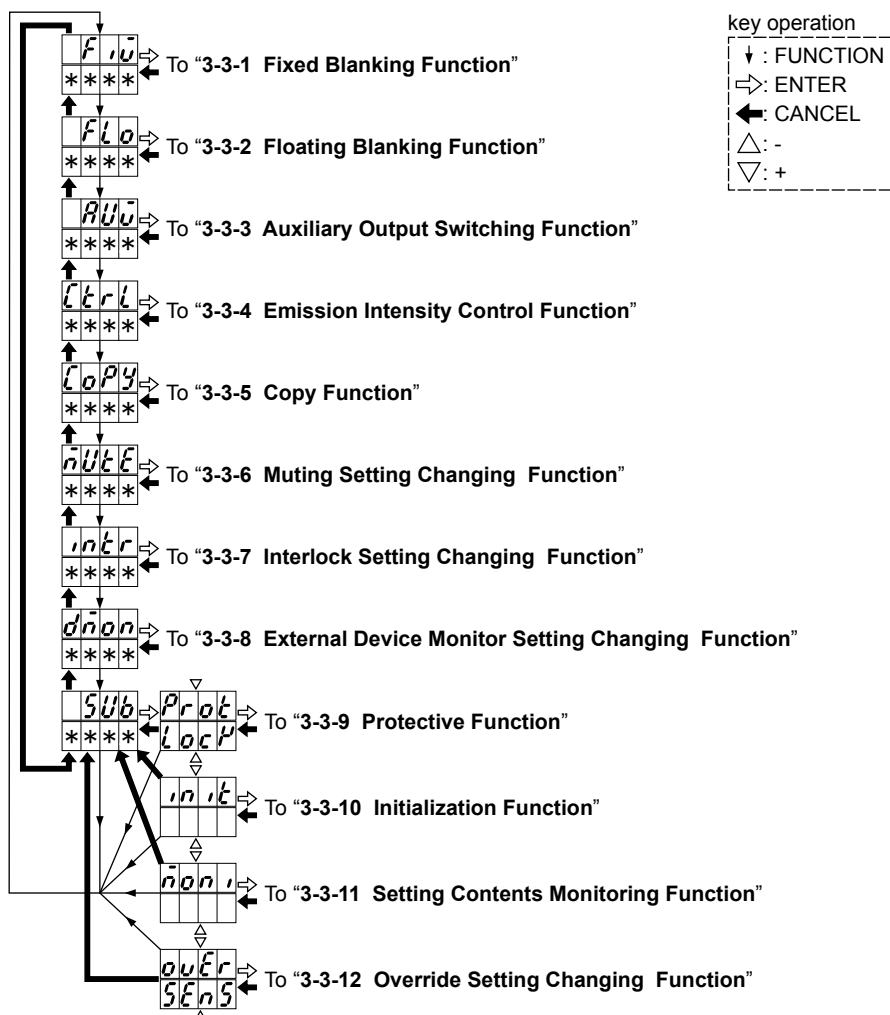
## Function Setting

### 3-3 Function Setting (Operation Procedure)

This section describes the setting of each function (operation procedure).

#### <Selecting the setting item>

Select a setting item with FUNCTION or CANCEL switch, and confirm it with ENTER.



“\*\*\*\*” indicates the connection state of the system.

- “S<sub>E</sub>n<sub>S</sub>”: SF4B / SF4B<V2> series is used only.
- “i<sub>Y</sub>E<sub>U</sub>”: SF-C14EX is used in combination.



## <Inputting a password>

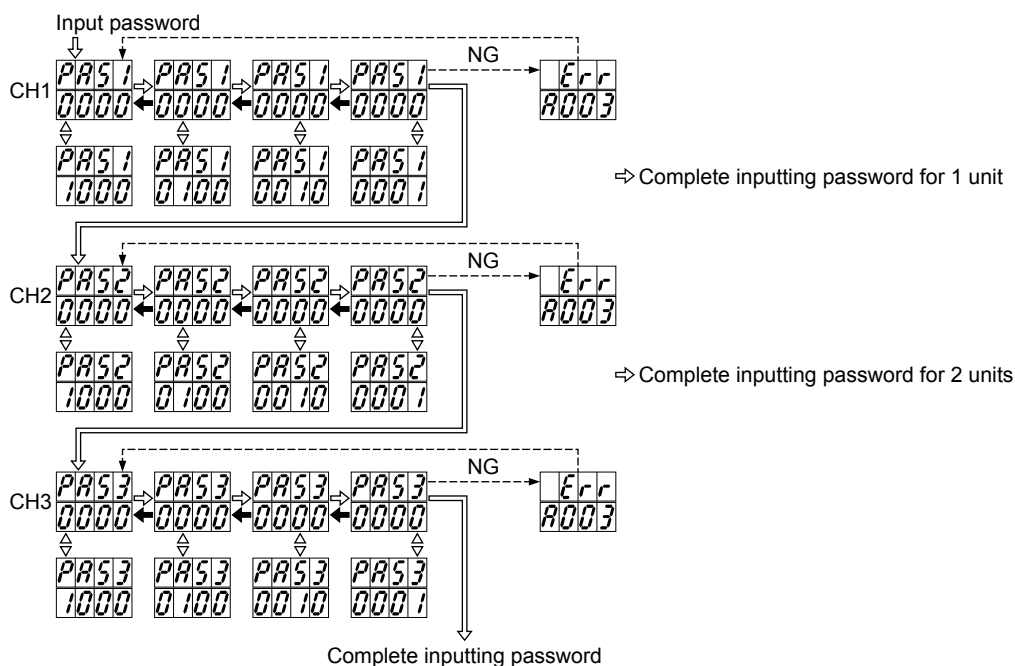
When the protective function is effective, "Lock" is shown on the lower section of the digital display. The functional settings of the **SF4B / SF4B<V2>** series cannot be changed unless the password is input. Note that "**3-3-9 Protective Function**" is "locked" even when the protective function is ineffective.

Remarks

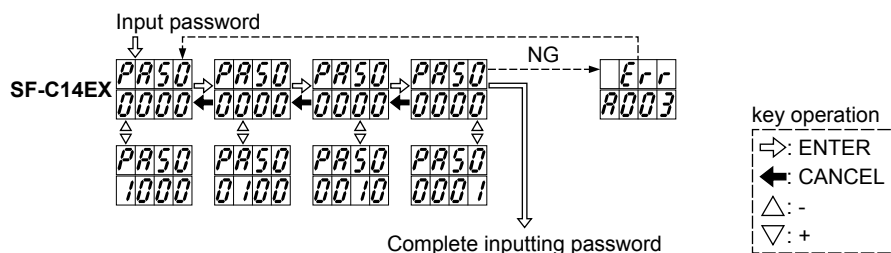
- 1) "**3-3-11 Setting Contents Monitoring Function**" is not "locked."
- 2) Once the password is input, you do not need to input the password again till the power is turned OFF. (Except "**3-3-9 Protective Function**") However, if the power is turned ON again without changing the protective function to ineffective, the password have to be input again since the protective function is still effective.

The procedure for inputting a password is as follows.

### • When using with SF4B / SF4B<V2> series only



### • When using in combination with SF-C14EX



## Function Setting

### <Selecting sensor>

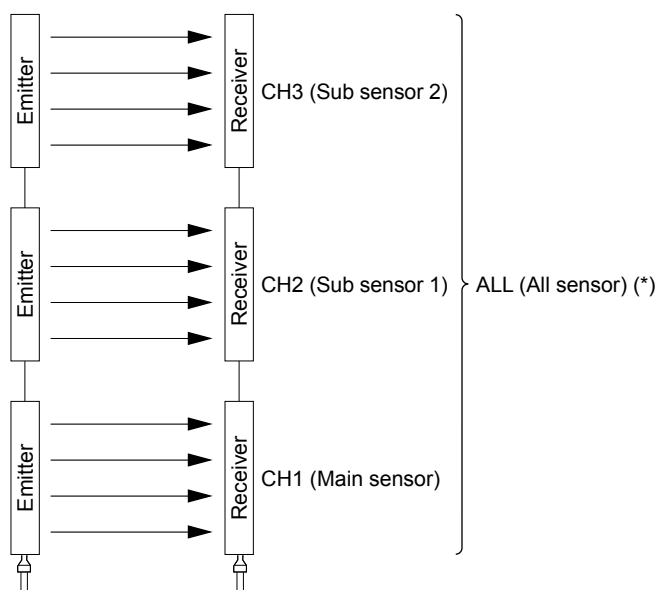
Each function can be set on each **SF4B / SF4B<V2>** series connected in series as well. Select a **SF4B / SF4B<V2>** series to set each function.

Remarks

Since “**3-3-5 Copy Function**” and “**3-3-9 Protective Function**” are set collectively, it is not necessary to select a sensor. Furthermore, when a **SF4B / SF4B<V2>** series unit is used, CH2 / CH3 cannot be selected. When two **SF4B / SF4B<V2>** series in series connection are used, CH3 cannot be selected.

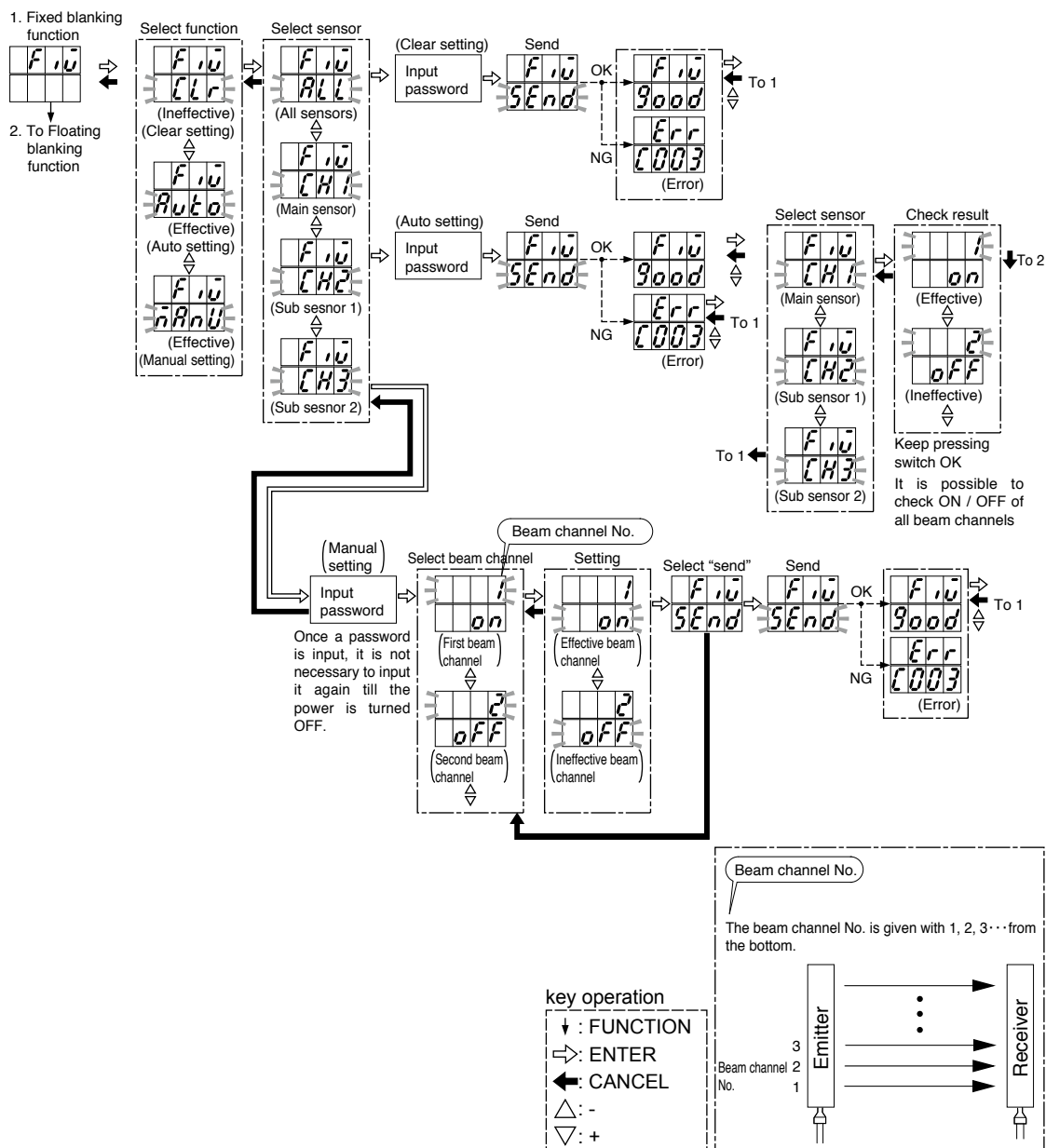
“**3-3-3 Auxiliary Output Switching Function**,” “**3-3-7 Interlock Setting Changing Function**” or “**3-3-8 External Device Monitor Setting Changing Function**” is set with CH1 only. CH2 and CH3 are not indicated.

When using in combination with **SF-C14EX**, the setting of “Muting sensor output operating setting” of “**3-3-5 Copy Function**,” “Muting sensor output operating setting” of “**3-3-6 Muting Setting Changing Function**,” “**3-3-7 Interlock Setting Changing Function**,” “**3-3-8 External Device Monitor Setting Changing Function**” and “**3-3-12 Override Setting Changing Function (Ver. 2.1 only)**” cannot be changed.



\*: When the units are not in series connection, it is not indicated.

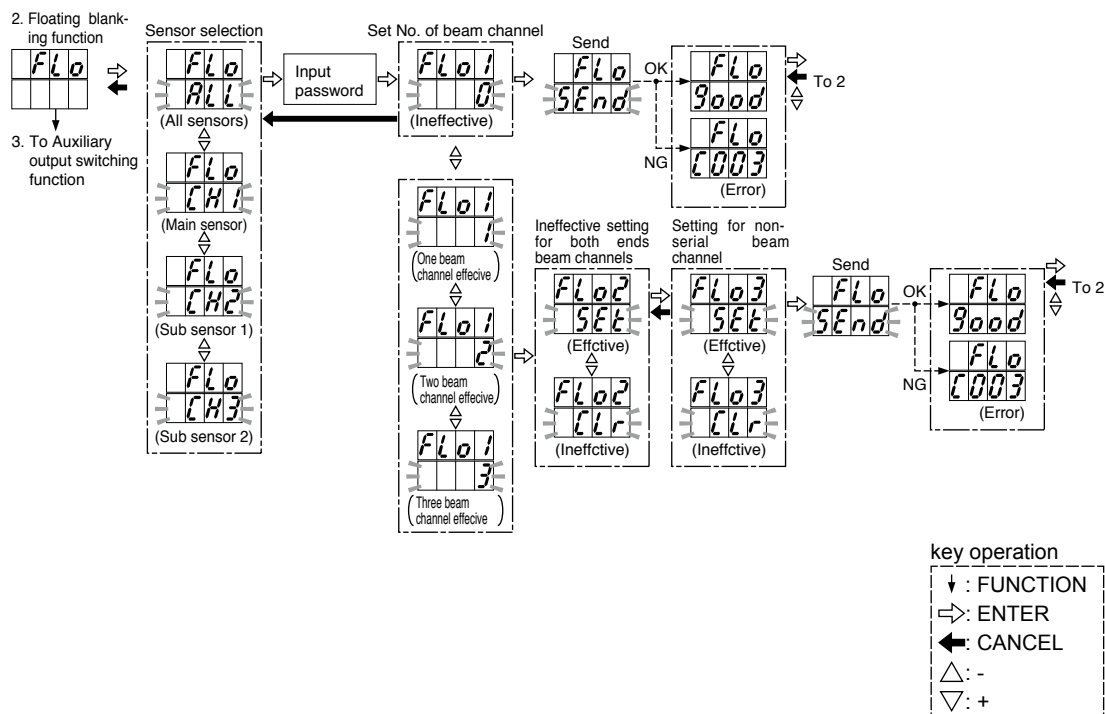
## 3-3-1 Fixed Blanking Function



\*: The functional setting for each beam channel is as follows.  
 on : The fixed blanking function is effective.  
 off : The fixed blanking function is ineffective.

## Function Setting

### 3-3-2 Floating Blanking Function



#### FLO1 <Effective setting of beam channel>

- 0: Ineffective
- 1: 1 beam channel setting
- 2: 2 beam channels setting
- 3: 3 beam channels setting

#### FLO2 <Ineffective setting of both end beam channel>

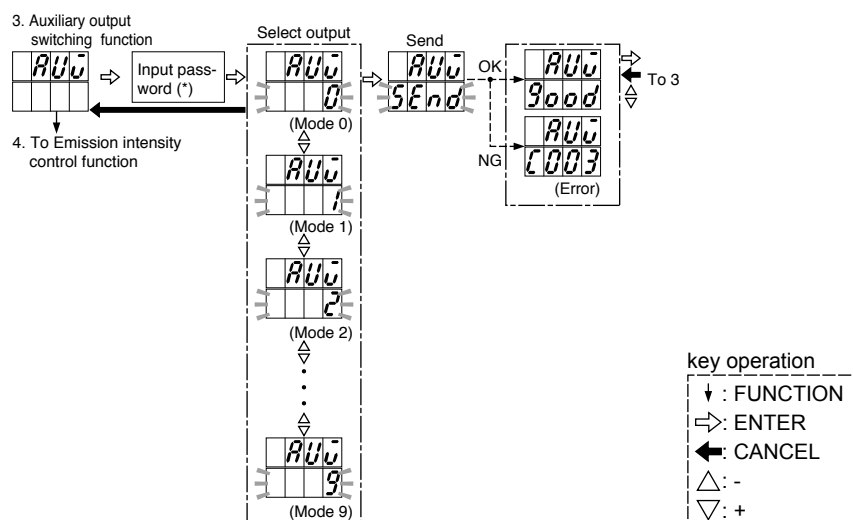
SET (Effective) : Both ends of the beam channels are not subject to the float blanking function  
 CLR (Ineffective) : All beam channels are subject to the floating blanking function

#### FLO3 <Non serial beam channel setting>

SET (Effective) : Non-serial beam channel mode  
 CLR (Ineffective) : Serial beam channel mode

Note: When "all sensors" is selected in the sensor selection, the setting of the floating blanking function on each **SF4B** / **SF4B<V2>** series should be identical.

## 3-3-3 Auxiliary Output Switching Function



\*: When two or more **SF4B** / **SF4B<V2>** series are connected, cancel the protective function of all **SF4B** / **SF4B<V2>** series.

### <Setting of the auxiliary output>

Mode 0: Negative logic of the control output (OSSD 1 / 2) (factory setting)

Mode 1: Positive logic of the control output (OSSD 1 / 2)

Mode 2: ON during emission, OFF when emission is not done.

Mode 3: OFF during emission, ON when emission is not done.

Mode 4: OFF when the received light level is unstable (Note 1)

Mode 5: ON when the received light level is unstable (Note 1)

Mode 6: ON during muting

Mode 7: OFF during muting

Mode 8: ON in the light receiving condition

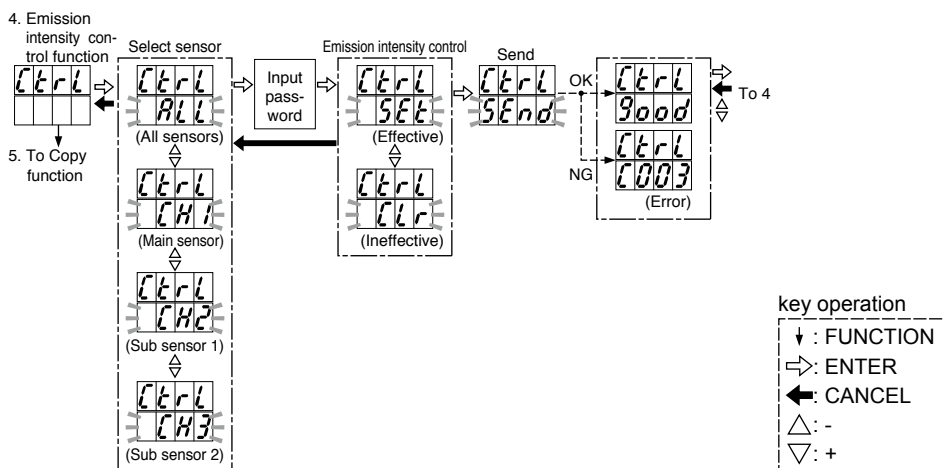
Mode 9: OFF in the light receiving condition

Notes: 1) This cannot be used when the fixed blanking function, the floating blanking function or the muting setting changing function is used.

2) When using with **SF4B** / **SF4B<V2>** series only, if the external device monitor function is not used, set the monitor setting to ineffective in "3-3-8 External Device Monitor Setting Changing Function."

## Function Setting

### 3-3-4 Emission Intensity Control Function

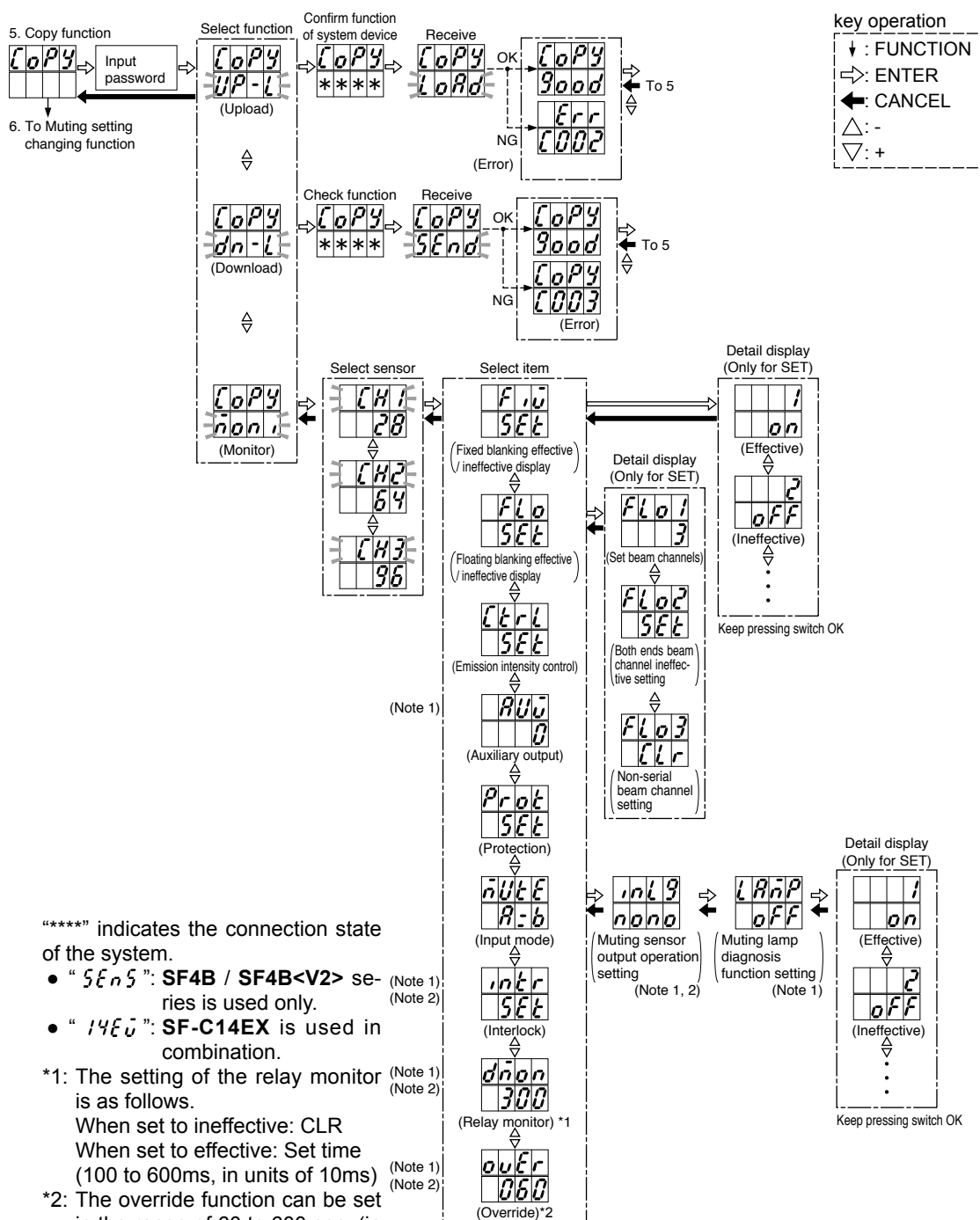


#### <Emission intensity control>

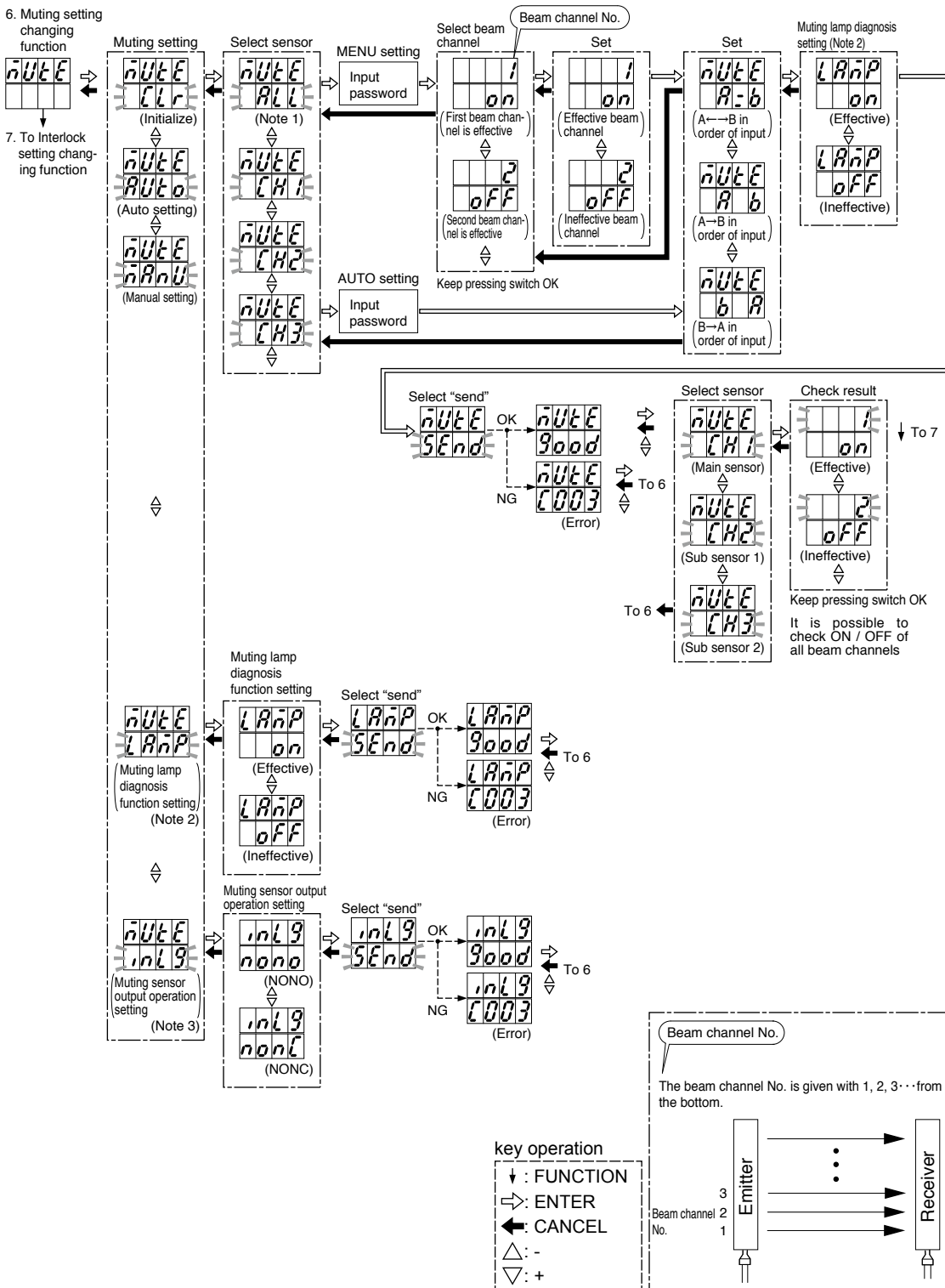
CLR (Ineffective) : Operating range is 0.3 to 9m for **SF4B-H□ / SF4B-H□<V2>** (12 to 64 beam channels) and **SF4B-A□ / SF4B-A□<V2>** (6 to 32 beam channels), 0.3 to 7m for **SF4B-F□ / SF4B-F□<V2>** and **SF4B-H□ / SF4B-H□<V2>** (72 to 96 beam channels) and **SF4B-A□ / SF4B-A□<V2>** (36 to 48 beam channels) (factory setting).

SET (Effective) : The operating range is reduced by approx. 50%.

## 3-3-5 Copy Function



### 3-3-6 Muting Setting Changing Function





\*: The functional setting of each beam channel is as follows.

on : The muting function is effective.

oFF : The muting function is ineffective.

- CLR initializes the all settings. (factory setting)
  - All beam channels: Effective
  - Input condition: A = b
  - Muting lamp diagnosis function setting: Effective
- When changing only the setting of the muting input condition, set it by manual setting.  
The input condition can be set at **SF4B** / **SF4B<V2>** series respectively.
- When initializing only the beam channel that the muting is effective, set to the auto setting in the emission halt condition.

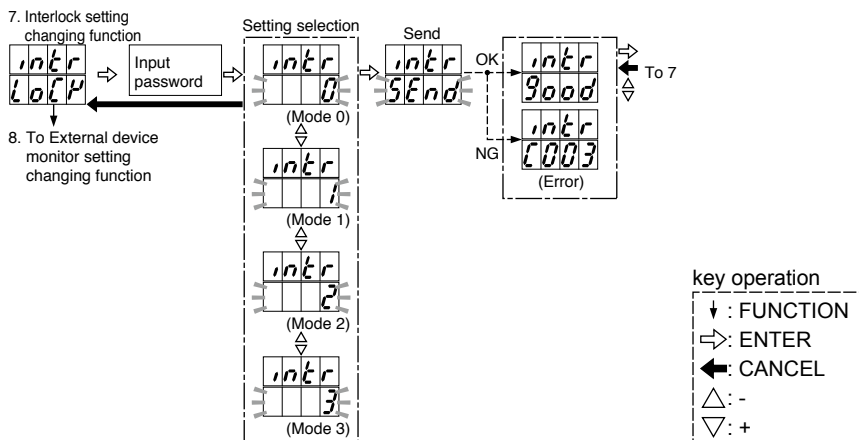
Notes: 1) "ALL" is displayed only when set by "Auto."

2) When only using the **SF4B** / **SF4B<V2>** series, set the muting lamp diagnosis function on all **SF4B** / **SF4B<V2>** series. However, if the function has been set through CLr / Auto / ManU on each **SF4B** / **SF4B<V2>** series, set the function on the **SF4B** / **SF4B<V2>** series. When using **SF-C14EX**, this function is set on the **SF-C14EX**. In this case, set the function in the same way when "ALL" is selected.

3) It is not indicated when using with **SF4B** series. In addition, it is not indicated when using with **SF-C14EX**, either.

## Function Setting

### 3-3-7 Interlock Setting Changing Function



\*: When two or more **SF4B** / **SF4B<V2>** series are connected, cancel the protective function of all **SF4B** / **SF4B<V2>** series.

#### <Setting of the interlock>

Mode 0: Start / restart interlock function (factory setting)

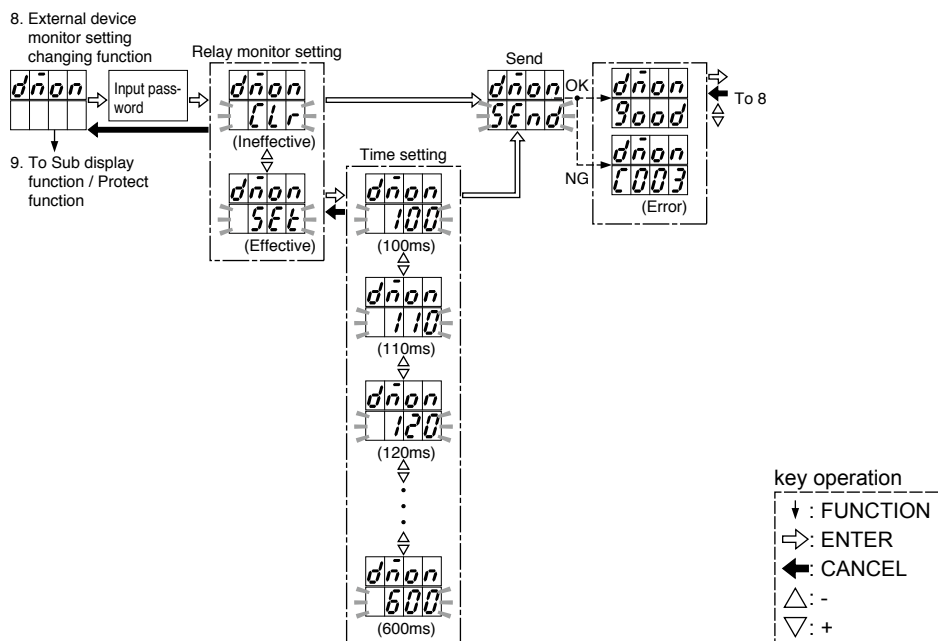
Mode 1: Start interlock function

Mode 2: Restart interlock function

Mode 3: Ineffective

Note: When using **SF-C14EX**, the display does not change even if ENTER key is pressed.  
(Mode 0, Start / Restart interlock function)

### 3-3-8 External Device Monitor Setting Changing Function



\*: When two or more **SF4B** / **SF4B<V2>** series are connected, cancel the protective function of all **SF4B** / **SF4B<V2>** series.

**<External device monitor>**

CLR (Ineffective): The external device monitor function is ineffective.

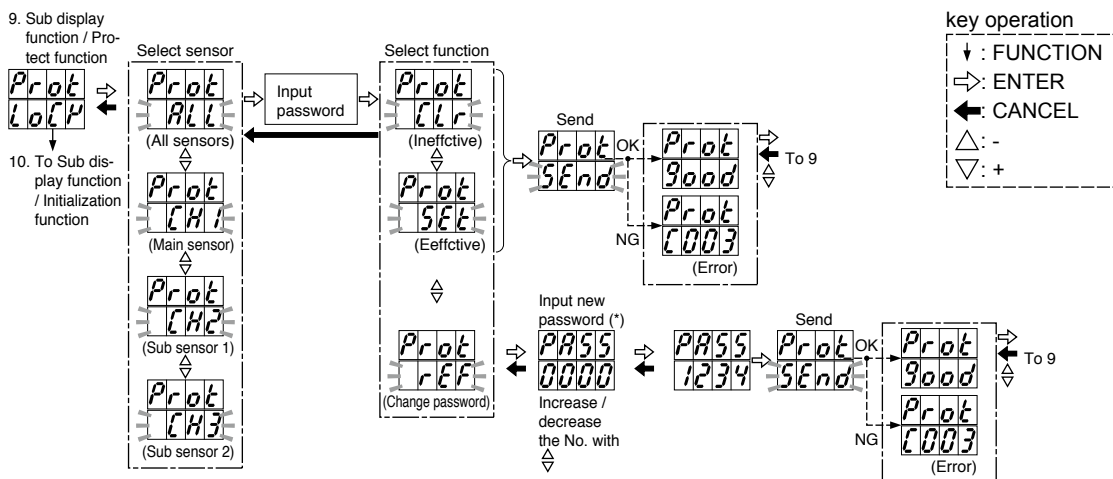
SET (Effective) : The external device monitor function is effective. (The factory setting is 300ms.)

Note: When using **SF-C14EX**, the display does not change even if ENTER key is pressed. (The external device monitor: Effective)

## Function Setting

### 3-3-9 Protective Function

#### • When using with SF4B / SF4B<V2> series only



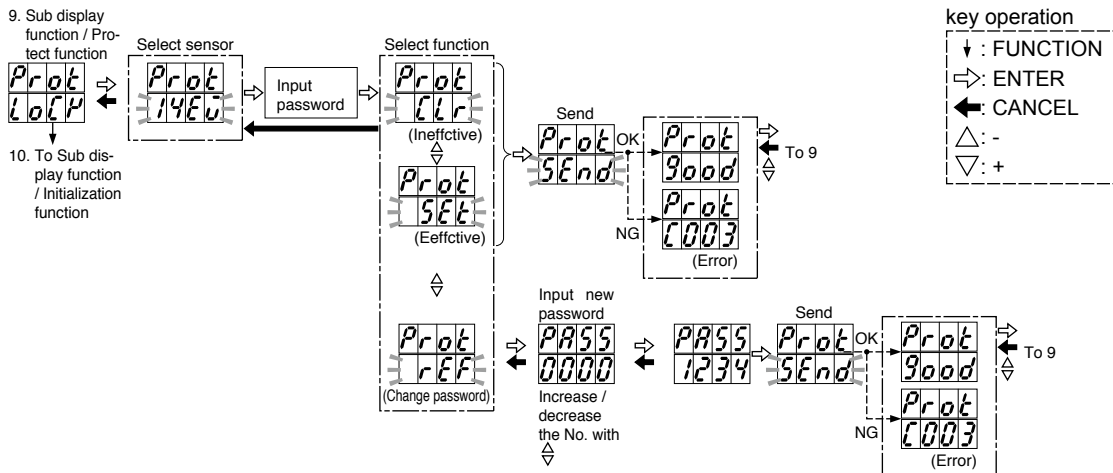
\*: When the units are connected in series, the indication is as follows.

CH1: "PASS 1"

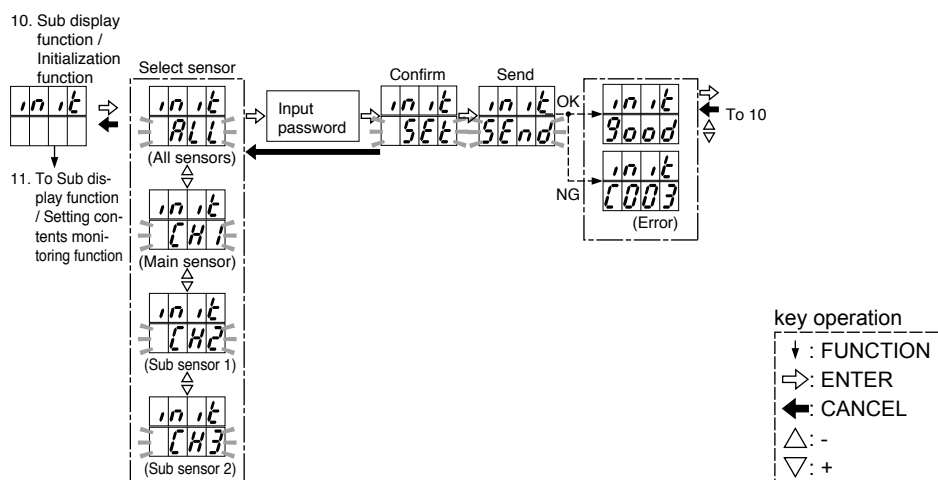
CH2: "PASS 2"

CH3: "PASS 3"

#### • When using in combination with SF-C14EX

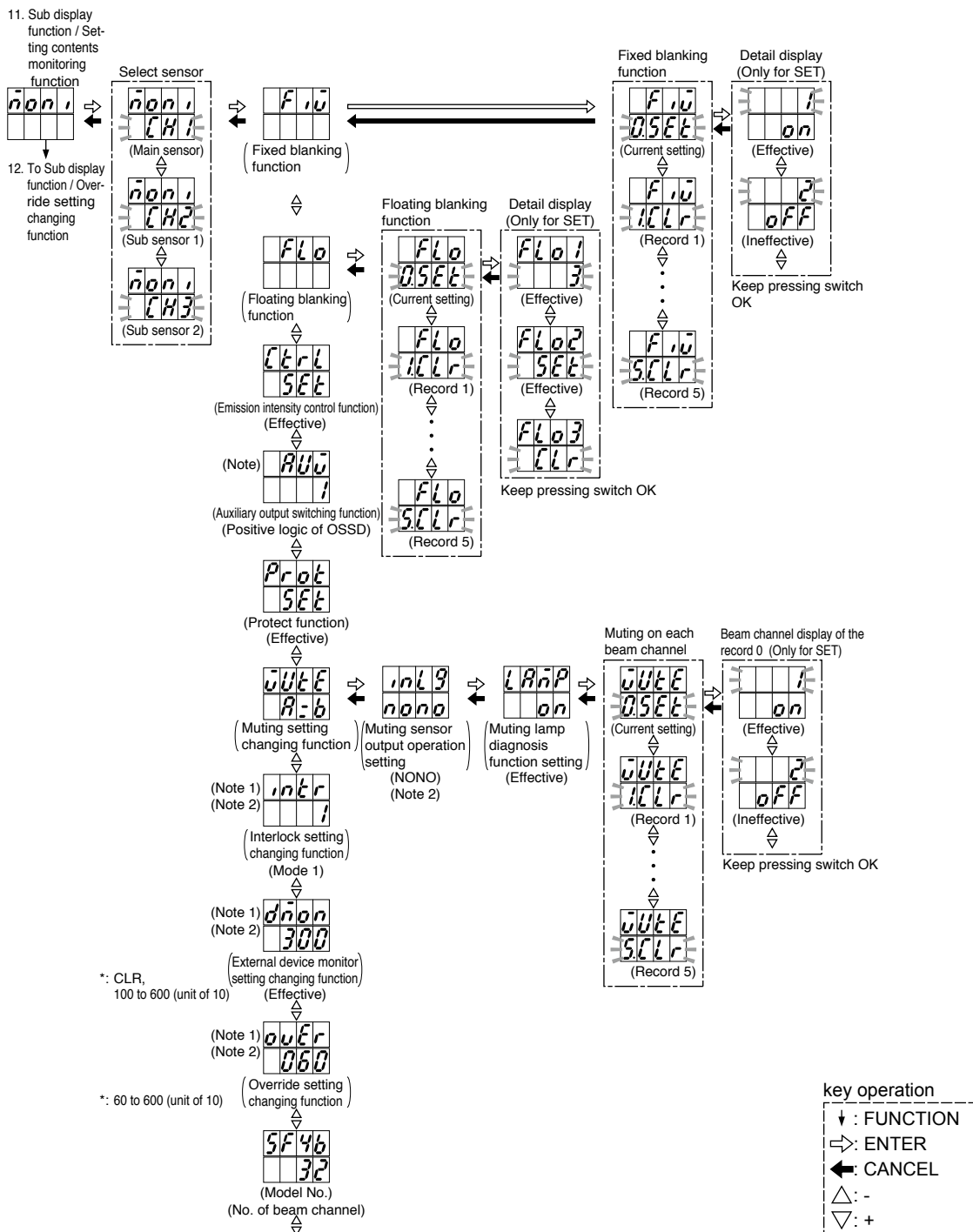


## 3-3-10 Initialization Function



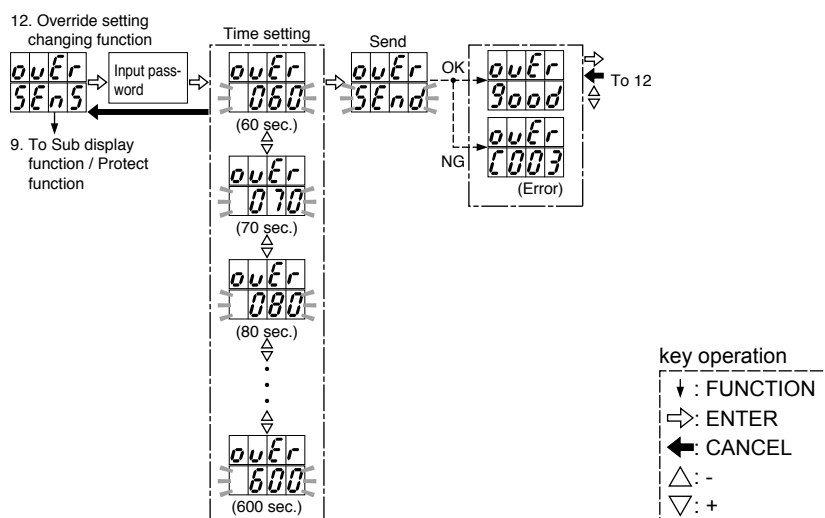
# Function Setting

## 3-3-11 Setting Contents Monitoring Function



Notes: 1) The indication is on the main sensor (CH1) only.  
2) When using **SF-C14EX**, this is not indicated.

## 3-3-12 Override Setting Changing Function (Ver. 2.1 only)



\*: When two or more **SF4B** / **SF4B<V2>** series are connected, cancel the protective function of all **SF4B** / **SF4B<V2>** series.









Notes: 1) The factory setting is 60 sec.

2) It is not indicated when using with **SF4B** series. In addition, it is not indicated when using with **SF-C14EX**, either.

# CHAPTER 4 TROUBLESHOOTING

Symptoms	Cause	Remedy
Control output (OSSD 1 / 2) is not turned ON.	This device is connected to the <b>SF4B</b> / <b>SF4B&lt;V2&gt;</b> series.	Disconnect this device.

Symptoms	Cause	Remedy
Safety output 1 / 2 is not turned ON.	This device is connected to the <b>SF-C14EX</b> .	Disconnect this device.

Error indication	Cause	Remedy
	The fixed blanking function is set in all lights received / all lights blocked condition, or the muting function is set in all lights received condition.	Do not set the fixed blanking function in all lights received / all lights blocked condition, or the muting function in all lights received condition.
	The copy function is used for the units having different system configuration from each other (the number of sensors / the number of beam channels / model No. is not same).	Use the copy function for the units having identical system configuration.
	In the copy function, download the data without uploading.	Upload the data before downloading.
	The password does not match.	Input the correct password. In case you forget the password, contact us. (Note)
	Sensor communication error 1 (Model No. is wrong)	Connect this device to <b>SF4B</b> / <b>SF4B&lt;V2&gt;</b> series.
	Sensor communication error 2 (Wrong wiring between the emitter and receiver.)	Connect the emitter and receiver correctly.
	Sensor communication error 3 (Effect from noise or failure of internal circuit)	Check the noise state around the <b>SF4B</b> / <b>SF4B&lt;V2&gt;</b> series.
	Failure of EEPROM in this device. (Failure on device)	Contact us.
	Failure of EEPROM in this device. (Failure on EEPROM data)	Contact us.

Note: The factory setting of the **SF4B** / **SF4B<V2>** series password is "0000."

If this device does not work, press ENTER key or CANCEL key one minute after pressing ENTER key.

If the device does not work correctly after checking the items above, please consult us.



# CHAPTER 5 SPECIFICATIONS / DIMENSIONS

## 5-1 Specifications

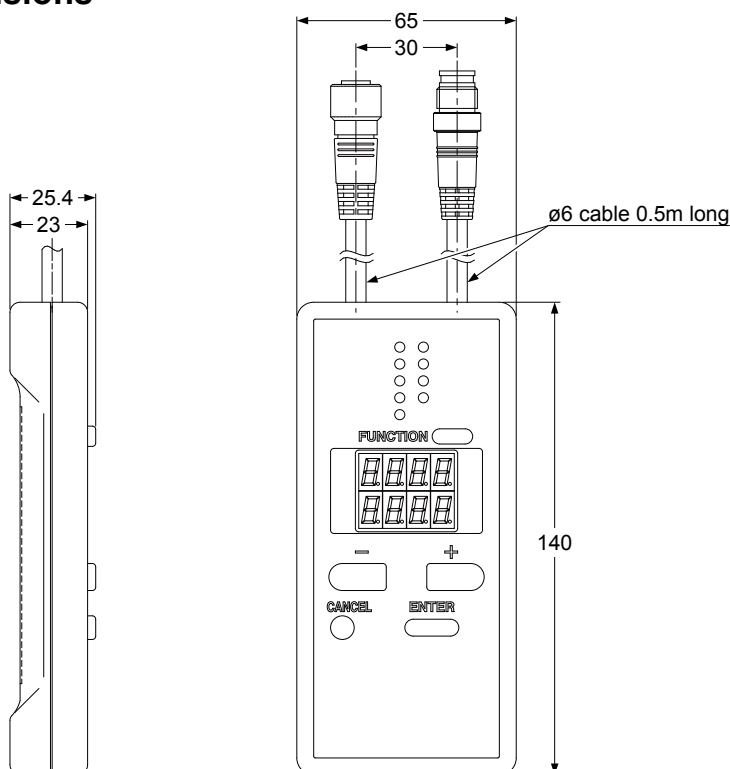
Model No.	SFB-HC (Ver.2.1)
Item	
Applicable model	Light curtain <b>SF4B/SF4B&lt;V2&gt;</b> series, Application expansion unit <b>SF-C14EX</b>
Supply voltage	24V DC±10% Ripple P-P 10% or less (common to sensor power supply)
Current consumption	65mA or less
Communication method	RS-485 two-way communications (specific procedure)
Digital display	4-digit red LED display × 2 (selected beam channels, setting contents etc. are displayed. )
FUNCTION indicator	Green LED × 9 (lights up when each functional setting is ON)
Functions	Fixed blanking function, Floating blanking function, Auxiliary output switching function Emission intensity control function, Copy function (Note 1), Muting setting changing function Interlock setting changing function (Note 2), External device monitor setting changing function (Note 2) Protective function, Initialization function, Setting contents monitoring function and Override setting changing function (Note 2, 3)
Ambient temperature	-10 to +55°C (No dew condensation or icing allowed), Storage: -25 to +70°C
Ambient humidity	30 to 85% RH, Storage: 30 to 85% RH
Voltage withstandability	1,000V AC for one minute between all supply terminals connected together and enclosure
Insulation resistance	20MΩ or more, with 500V DC megger between all supply terminals connected together and enclosure
Cable	8-core shielded cable with a connector on one end 0.5m long (2 pcs.)
Weight	Approx. 200g
Accessory	<b>SFB-CCJ02-HC</b> (Conversion cable): 2 pcs.

Notes: 1) There may be a case that the copied data through the copy function is deleted due to external causes. After the copy function was used, check the copied data.

2) When using in combination with **SF-C14EX**, the setting cannot be changed.

3) When using with **SF4B** series, the setting cannot be changed.

## 5-2 Dimensions



(Unit: mm)

#### Revision history

First edition	May 13, 2005
Second edition	July 14, 2005
Third edition	October 11, 2005
Fourth edition	April 28, 2006
Fifth edition	November 17, 2008
Sixth edition	July 1, 2011
Seventh edition	March 1, 2013

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- (1) Subject to the exclusions stated in 2 (EXCLUSIONS) herein below, Panasonic Industrial Devices SUNX warrants the Products to be free of defects in material and workmanship for a period of one (1) year from the date of shipment under normal usage in environments commonly found in manufacturing industry.
- (2) Any Products found to be defective must be shipped to Panasonic Industrial Devices SUNX with all shipping costs paid by Purchaser or offered to Panasonic Industrial Devices SUNX for inspection and examination. Upon examination by Panasonic Industrial Devices SUNX, Panasonic Industrial Devices SUNX will, at its sole discretion, repair or replace at no charge, or refund the purchase price of, any Products found to be defective.

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  - (ii) which was due to unauthorized modification by Purchaser, in part or in whole, whether in structure, performance or specification;
  - (iii) which was not discoverable by a person with the state-of-the-art scientific and technical knowledge at the time of manufacture;
  - (iv) which was due to an operation or use by Purchaser outside of the limits of operation or environment specified by Panasonic Industrial Devices SUNX;
  - (v) which was due to normal wear and tear;
  - (vi) which was due to Force Majeure; and
  - (vii) which was due to any use or application expressly discouraged by Panasonic Industrial Devices SUNX in 4 (CAUTIONS FOR SAFE USE) hereunder.
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  - (b) which are used outdoors or in environments subject to any likelihood of chemical contamination or electromagnetic influence;
  - (c) which are likely to be used beyond the limits of operations or environments specified by Panasonic Industrial Devices SUNX in the catalogue or otherwise;
  - (d) which may cause risk to life or property, such as nuclear energy control equipment, transportation equipment (whether on rail or land, or in air or at sea), and medical equipment;
  - (e) which are operated continuously each day for 24 hours; and
  - (f) which otherwise require a high level of safety performance similar to that required in those equipment, facilities or systems as listed in (a) through (e) above.

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