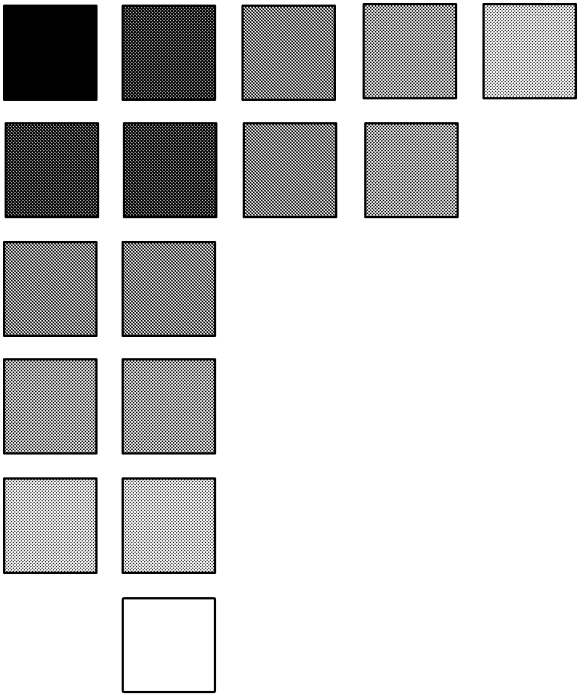
OMRON

形F39-MC21
Setting Console

取扱説明書
Instruction Manual



カタログ番号 SCHG-712D

Introduction

Thank you for your purchase of our setting console F39-MC21 (hereinafter F39-MC).
This document describes how to use F39-MC. You must follow instructions described below.

- F39-MC must be handled by a “responsible person” who deeply understands a machine for which F39-MC is used.
- In this document, a “responsible person” represents a person who is qualified, authorized, and responsible for safety in every step of the machine’s design, installation, operation, maintenance, and disposal.
- F39-MC must be used properly based on its installation environment and machine’s performance and functions. Installation must be done after risk assessment by parties concerned.
- Thoroughly read this manual and understand the contents to use properly.
- This document must be stored at hand for easy reference at any time.

For purchasers of Omron's product

Agreement on your order and application

Unless otherwise specified, following warranty, limit on responsibility, and conditions for application are applied to your order in estimation, contract, and specifications of our product.
You must carefully read and agree to the following details before ordering.

1. Warranty details

(1) Warranty Period
Warranty period of this product must be 1 year after the purchase or delivery to specified site.

(2) Scope of Warranty
If any failure occurs in this warranty period due to our responsibility, we shall provide replacement or repair at the purchase site for free.
If, however, cause of the failure is any of the followings, the failure shall be out of our scope of warranty.

a) Due to application under other condition, environment, or usage than those specified in our catalog and/or instruction manual

b) Due to other product than this one

c) Due to modification and/or repair made by other one than Omron

d) Due to other usage than proper one for this product

e) Due to anything that could not be predicted by level of science and/or technology at the time of our delivery

f) Due to any other cause such as natural or other disaster for which we are not responsible

Note that this warranty represents warranty for this product by itself. Any damage caused by the result of this product's failure shall be out of our warranty.

2. Limit on our responsibility

(1) Any damage caused by this product, regardless of whether it is special, indirect, or passive, Omron shall not be responsible.

(2) Omron shall not be responsible for any program that is made by other one than Omron for this programmable product, or shall not be responsible for a result caused by such a program.

3. Condition for Application

(1) To use this product in combination with other product, you must verify related standards, laws, and regulations to be applied. Compatibility of this product with a system, machine, or equipment used by you must be verified by yourself. If it is not performed by you, Omron shall not be responsible for the compatibility of this product.

(2) To use this product for applications described below, you must consult our sales person to verify the application with specifications, etc. In addition, you must take countermeasures such as sufficient margin for rating and performance for the application and safety circuit that should minimize hazard even when a failure occurs.

a) Outdoor application, application by which a potential chemical or electrical damage might be caused, or other application than those specified in our catalog and/or instruction manual

b) Application fro nuclear control equipment, incineration equipment, railway, aviation, or vehicle equipment, medical equipment, entertainment equipment, and equipment that should comply with governmental of industrial regulations

c) Application for a system, machine, or equipment that may jeopardize human life and/or property

d) Application to equipment that requires high responsibility such as gas, water, or electricity supply system or continuous operation system for 24 hours

e) Other application that requires safety as high as a) to d) described above

(3) If you want to use this product for an application that may jeopardize human life and/or property, you must beforehand verify that the system should be designed to notify hazard or secure the required safety by redundant design, and that this product should be properly wired and installed for its purpose in the whole system.

(4) Application examples on our catalog is only for reference. For actual application, you must verify functions and safety for devices and equipment before using the product.

(5) You must understand and comply with every inhibition and caution for application so that an accidental damage should no occur to you or others due to an improper application of this product.

4. **Change of Specification**
   Specifications and accessories of products described in our catalog and/or instruction manual are subject to change by improvement and/or other reasons. Please contact our sales person to check the actual specifications of this product.

5. **Scope of Service**
   Price of this product does not include service cost for dispatching our engineer, etc.
   If you have any request, please contact our sales person.

6. **Price**
   Standard prices on our catalog are only for reference. They should not represent fixed price for a user. Also, the prices do not include consumption tax.

7. **Scope of Application**
   Description above is based on transaction and application in Japan. For transaction and application in other region, please contact our sales person.

Notice on Safety

Indication and meaning for safe use

This instruction manual describes notification and/or waning with indication and symbols as shown below for safe use of F39-MC. Since this notification describes very important details for safety, you must follow the description. Shown below are indication and symbols.

⚠ Warning	If you fail to use a product properly, it may result in injuries, light or heavy, and may lead to death. Also, a serious damage on property may be caused.

⚠ Caution	If you fail to use a product properly, it may result in injuries or damage on property.

Definition of Symbols

	Caution for Fracture Indicates that fracture may occur under a certain condition.

Warning Labels

⚠ Warning
To execute setting change by F39-MC, you must understand specification of F3SJ.
F39-MC must be managed by a qualified person designated by the employer. Other person must not be allowed to use it.
After setting change of a sensor, inspection must be performed by a qualified person to confirm its safety before starting its operation.
Setting change must be performed under compliance with related laws and regulations.
Do not use it where it can come into contact with water.Doing so may result in electric shock or damage to the product.
Do not connect F3SJ to a DC power supply of 24V+20% or higher, or an AC power supply.Doing so may result in electric shock.

Do not use the product where too much noise can be applied to a communication unit or F3SJ.Otherwise data may not be properly transmitted, resulting in serious injury.
Do not try to disassemble, repair, or modify this product.Doing so may cause the safety functions to stop working properly.
Do not use the product in environments where flammable or explosive gases are present.Doing so may result in explosion.
Install protective structure for all zones of disabled zone so that a worker should not be able to approach hazardous zone of a machine without passing through zones disabled by the fixed blanking function. Failure to do so may result in serious injury.
If teaching beam is designated for fixed blanking, detection capability gets larger near an object that interrupts beams. Calculate a safety distance based on the setting.
You must ensure that a test rod should be detected in all zones where it should be detected after setting the fixed blanking function. Failure to do so may result in serious injury.
When floating blanking is used, detection capability gets larger. To calculate safety distance, you must use the detection capability under floating blanking. Otherwise a machine may not be stopped before a human body reaches to the hazardous zone, resulting in heavy injury.
You must ensure that the system works as you intended after configuring floating blanking. Failure to do so may result in serious injury.
Do not use the auxiliary output or external indicator output for safety applications. Failure of these outputs may result in serious injury.
The muting function disables safety functions of the device. You must ensure safety using other measures during this function is enabled.
Install muting sensors so that they can distinguish between a person and an object that is being allowed to pass through the detection zone.
All muting lamps (external indicators) that indicate state of muting function must be installed where workers can see them from all the operating positions.
Use independent 2 input devices for muting input.

Muting related time must be properly configured for its application by a sufficiently trained and qualified person, and the person must have responsibility for settings, especially when setting the muting time limit to infinite.
Warning Zone output is non-safety output. You must not include it to calculation of safety distance. Otherwise safety distance may be reduced, resulting in heavy injury.
A warning zone CANNOT be used for safety applications. Always install your system so that a detection zone should be passed before reaching a source of danger.
A sufficiently trained and qualified person must perform setting recovery. Incorrect setting may cause a person to go undetected, resulting in serious injury.

Caution Labels

⚠ Caution
Do not connect F39-MC's dedicated cable to other device. The device may be broken. 
When F39-MC is connected to F3SJ, its output is turned OFF and the product cannot execute normal operation.

Precautions for Safe Use

Make sure to observe the following precautions that are necessary for ensuring safe use of the product.

- Thoroughly read this manual and understand the installation procedures, operation check procedures, and maintenance procedures before using the product.
- Do not drop the product.
- Dispose the product complying with laws and regulations for waste disposal of a country where it is used.

Precautions for Correct Use

Observe the precautions described below to prevent operation failure, malfunctions, or undesirable effects on product performance and functions.

(1) Do not use under following installation environment:
- Areas with high humidity where condensation is likely to occur
- Areas with smoke or particle that may degrade quality
- Areas where corrosive gases are present
- Areas where water, oil, or chemicals may contact with the product

(2) Wiring and Installation
- Make sure to perform wiring while the power supply is turned OFF.
- If you do not set up or read data, detach F39-MC from the F3SJ.

(3) Cleaning
- Do not use thinner, benzene, or acetone for cleaning.

(4) This is a class A product. In residential areas it may cause radio interference. in which case the Responsible Person may be required to take adequate measures to reduce interference.

Checking the Contents

Before use, confirm that the items below were shipped with the product.
If you find that an item is missing, please contact your local branch office or distributor.

Product	Quantity
F39-MC21 Main Unit	1
Branch Connector	1
Dedicated Cable (2m)	1
Plugged Dedicated Cable	1
Connector Cap	1
Instruction Manual (This Document)	1

Content

1.Overview

F39-MC21 can configure functional settings of safety light curtain F3SJ-A series and can monitor the usage status. Available functions include:

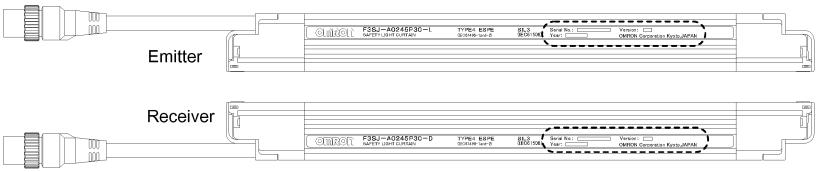
Menu	Setting	F3SJ-A series	Safty multi-beam F3SJ-AM series	F3SJ-A-TS series
SET	Fixed Blanking Function	✓	-	-
	Floating Blanking Function	✓	-	-
	Auxiliary Output	✓	✓	-
	External Indicator Output	✓	✓	-
	External Device Monitoring Function	✓	✓	-
	Interlock Function	✓	✓	-
	Muting Override Function	✓	✓	-
	Warning Zone Function	✓	-	-
	Setting Recovery Function	✓	✓	-
	Operating Range Setting Change Function	✓	✓	-
CHECK	Incident Light Level Display / Load Switching Frequency / Power-On Time / Error History / Disturbance Light Level Display / Rated Response Time Check	✓	✓	✓
COPY/ PROTECT	Upload / Download / Bank Lock / Password Change	✓	✓	✓

✓: Available

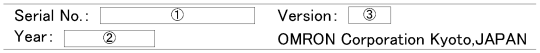
■F3SJ Version

The setting tool can be used for F3SJ of version 2 or later. It cannot be used for F3SJ of Version 1.Or, if any one of series connected F3SJs is version 1, the setting tool cannot be used as well.(Lockout can occur due to a communication error)
F3SJ cannot be upgraded for its versions.
FYou can check a label on your F3SJ for its version as shown below.

Location where version of F3SJ is indicated (framed by dashline)



Closeup of the part framed by dash line



① : Serial No.
② : Year of manufacture
③ : Version of F3SJ (ensure that the version is greater than 2)

1.1. List of Functions and Menus

*For details of “Fixed Blanking”, “Floating Blanking”, “Auxiliary Output”, “External Indicator Output”, “External Device Monitor”, “Interlock”, “Muting Override”, “Warning Zone”, “Setting Recovery”, “Operating Range Setting Change”, see User’s Manual of F3SJ.

■SET Menu

SET.1 Fixed Blanking Function

Configure for each CH in case of a series connection.

Function	Available Setup Item	Description
Fixed Blanking	Disabled/Enabled	Move to the item below if it is enabled.
Teaching Beam Designation	Teaching	Configure this item in a bulk while an interrupting object exists.
Manual Beam Designation	Beam number	Enable or disable the setting for each beam.

SET.2 Floating Blanking Function

Configure for each CH in case of a series connection.

Function	Available Setup Item	Description
Floating Blanking	Disabled/Enabled	Move to the item below if it is enabled.
Floating Blanking Mode	1~2	1: Beams-in-concatenation mode 2: Non-Concatenation mode
Number of floating blanking beams	1~4	Number of floating blanking beams must be specified.
Number of allowable beams	1~3	Number of allowable beams must be specified.
Outermost Beam Disabling Mode	Disabled/Enabled	Beams on both ends must be specified as normal beams.

SET.3 Auxiliary Output

Configure in a bulk in case of a series connection.

Function	Available Setup Item	Description
Output Selection	1/2	Auxiliary output (1 or 2) to be configured must be specified.
Output Operation Mode	Safety Output Information	Output must be provided when safety output is ON.
	Light Diagnosis Information	Output must be provided when F3SJ is ON state and light intensity is from 100 to 130% of ON-threshold for 10 seconds or longer.
	Error/Lockout Information	Output must be provided when under lockout.
	Muting/Override Information	Output must be provided while muting or override.
	Blanking/Warning Zone Information	Output must be provided when fixed or floating blanking or Warning Zone function is being enabled.
	Power-On Time Information	Output must be provided when power-on time exceeds power-on time threshold value.
	Warning Zone Information	Output must be provided when a warning zone is interrupted
	Test Input ON Information	Output must be provided when test input is ON
	Blanking Beam Light Receiving Information	Output must be provided when fixed or floating blanking beams are receiving light.
	Interlock Information	Provides output under interlock state
	Muting Error Information	Provides output under muting error state
	Excess Load Switching Frequency Information	Provides output when load switching frequency exceeds its threshold
Reverse Output Mode	Disabled/Enabled	Output must be reversed.

Function	Available Setup Item	Description
Lighting-Up Pattern (Auxiliary Output 1 Only)	On/Blink[0.5s]/ Blink[1.0s]/ Blink[2.0s]	Lighting-up pattern when external indicator is connected must be configured.
Auxiliary Output Diagnosis (Auxiliary Output 1 Only)	Disabled/Enabled	Breakage of auxiliary output 1 must be detected.

SET.4 External Indicator Output

Configure in a bulk in case of a series connection..

Function	Available Setup Item	Description
Output Selection	1 (Receiver)/2 (Emitter)	External indicator output (1 or 2) must be specified.
Output Operation Mode	Safety Output Information	Output must be provided when safety output is ON.
	Light Diagnosis Information	Output must be provided when F3SJ is ON state and light intensity is from 100 to 130% of ON-threshold for 10 seconds or longer.
	Error/Lockout Information	Output must be provided when under lockout.
	Muting/Override Information	Output must be provided while muting or overriding.
	Blanking/Warning Zone Information	Output must be provided when fixed or floating blanking or Warning Zone function is being enabled.
	Power-On Time Information	Output must be provided when power-on time exceeds power-on time threshold value.
	Warning Zone Information	Output must be provided when a warning zone is interrupted
	Test Input ON Information	Output must be provided when test input is ON.
	Blanking Beam Light Receiving Information	Output must be provided when fixed or floating blanking beams are receiving light.
	Interlock Information	Provides output under interlock state

Function	Available Setup Item	Description
	Muting Error Information	Provides output under muting state
	Excess Load Switching Frequency Information	Provides output when load switching frequency exceeds its threshold
Reverse Output Mode	Disabled/Enabled	Output must be reversed.
Lighting-Up Pattern	On/Blink[0.5s]/ Blink[1.0s]/ Blink[2.0s]	Lighting-up pattern when external indicator is connected must be configured.
External Indicator Diagnosis	Disabled/Enabled	Breakage of external indicator output must be detected.

SET.5 External Device Monitoring

Configure in a bulk in case of a series connection.

Function	Available Setup Item	Description
External Device Monitoring	Disabled/Enabled	Move to the item below if it is enabled.
Allowable Delay Time	0.1 to 2.5 s; by 0.1s	Maximum allowable value of external deviceÅfs operation time after safety output changes must be specified.

SET6. Interlock Function

Configure in a bulk in case of a series connection.

Function	Available Setup Item	Description
Start Interlock	Disabled/Enabled	Enabling or disabling must be selected for start interlock function.
Restart Interlock	Disabled/Enabled	Enabling or disabling must be selected for restart interlock function.

Set.7 Muting/Override Function

Muting Zone Selection: Configure for each CH in case of a series connection.
Muting Time Limit, Override Time Limit: Configure in a bulk in case of a series connection.

Function	Available Setup Item	Description
Muting Zone Selection	All beams	All beams must be specified for muting.
	Partial (Bottom Beam No./Top Beam No.)	Beams for muting must be specified.
Muting Time Limit	1 to 600 sec, or infinite	Time for which muting must be maintained must be specified.
Override Time Limit	1 to 600 sec.	Time for which override must be maintained must be specified.

SET.8 Warning Zone Function

Configure for each CH in case of a series connection.

Function	Available Setup Item	Description
Warning Zone Function	Disabled/Enabled	Enabling or disabling of Warning Zone function must be specified.
Warning Zone Selection	All beams	All beams must be specified for a warning zone.
	Partial (From bottom beam/From top beam)	Beams for warning zone must be specified

SET9. Setting Recovery Function

Configure in a bulk in case of a series connection.

Function	Available Setup Item	Description
Setting Recovery Function	Setting Recovery	Setting must be recovered to factory shipment setting.

SET.A Operating Range Change Function

Configure for each CH in case of a series connection.

Function	Available Setup Item	Description
Operating Range Change	0.5m/1m/2m/3m/5m/ MAX	Operating range must be switched.

■CHECK Menu

CHECK.1 Incident Light Level Display

Display for each CH in case of a series connection.

Monitor	Item to be Displayed	Description
Peak/Bottom Display	Peak and bottom light intensity level	Peak and bottom light intensity level must be displayed.
	Bottom Position	Bottom position must be roughly displayed.
Individual Light Intensity Level	Light Intensity Level	Receiving light intensity level of each beam must be displayed.
Individual Peak	Peak value of light intensity level	Peak value of the designated bema must be displayed.
Percentile Display	Light Intensity Level Percentile Value	Percentile value of receiving light intensity to the ON threshold must be displayed.

CHECK.2 Load Switching Frequency

Configure or display in a bulk in case of a series connection.

Monitor	Item to be Displayed	Description
Accumulated Load Switching Frequency	Sum of safety output OFF counts	Accumulated value of all F3SJs in a load switching frequency must be displayed.
Load Switching Frequency Reset	Reset	Load switching frequency must be reset to 0.

CHECK3. Power-On Time

Configure or display for each CH in case of a series connection.

Monitor	Item to be Displayed	Description
Power-On Time	Power-On Time	Power-on time must be displayed.
Power-On Time Threshold	Power-on time threshold value	Power-on time to be provided as power-on time information must be specified.
Power-On Time Reset	Reset	Power-on time must be reset to 0.
Total Power-On Time	Sum of power-on time values	Accumulated value of power-on time must be displayed.

CHECK.4 Error History

Display for each CH in case of a series connection.

Monitor	Item to be Displayed	Description
Error History	Error code	Past 10 records of error log must be displayed.

CHECK.5 Disturbance Light Level Display

Display for each CH in case of a series connection.

Monitor	Item to be Displayed	Description
Disturbance Light Level Display	Disturbance Light Intensity	Beam # and receiving light intensity of a beam affected by disturbance light must be displayed.

CHECK6. Rated Response Time Check

Display in a bulk in case of a series connection.

Monitor	Item to be Displayed	Description
Rated Response Time	OFF Response Time Calculation	Response time from ON to OFF must be displayed.
	ON Response Time Calculation	Response time from OFF to ON must be displayed.

■COPY/PROTECT Menu

COPY/PROTECT.1 Upload

Configure for each CH in case of a series connection.

Function	Available Setup Item	Description
Upload (F3SJ -> F39-MC)	Bank 1	Setting data of one F3SJ unit must be copied to F39-MCÅfs Bank (Internal Memory).

COPY/PROTECT.1 Download

Configure for each CH in case of a series connection.

Function	Available Setup Item	Description
Download (F39-MC -> F3SJ)	Bank 1	Setting data stored in F39-MCÅfs bank must be copied to one F3SJ unit.

COPY/PROTECT.3 Bank Lock

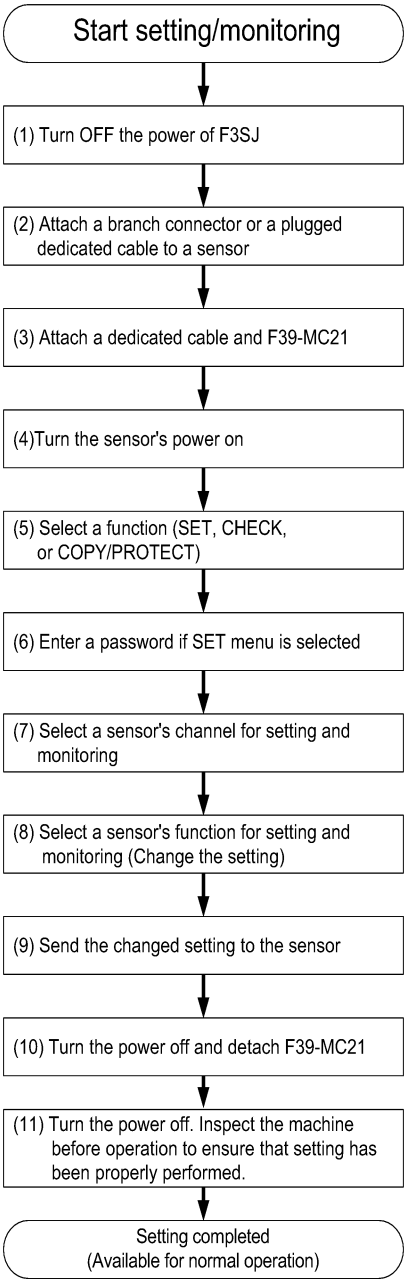
Function	Available Setup Item	Description
Bank Lock	LOCK	Writing to bank (internal memory) must be inhibited.
	FREE	Writing to bank (internal memory) must be permitted.

COPY/PROTECT.4 Password Change

Configure in a bulk in case of a series connection.

Function	Available Setup Item	Description
Password Change	4-digit alphanumeric	Password must be changed.
Password Initialization	4-digit alphanumeric	Password will be initialized by entering the master password. The value after initialization must be "0000".

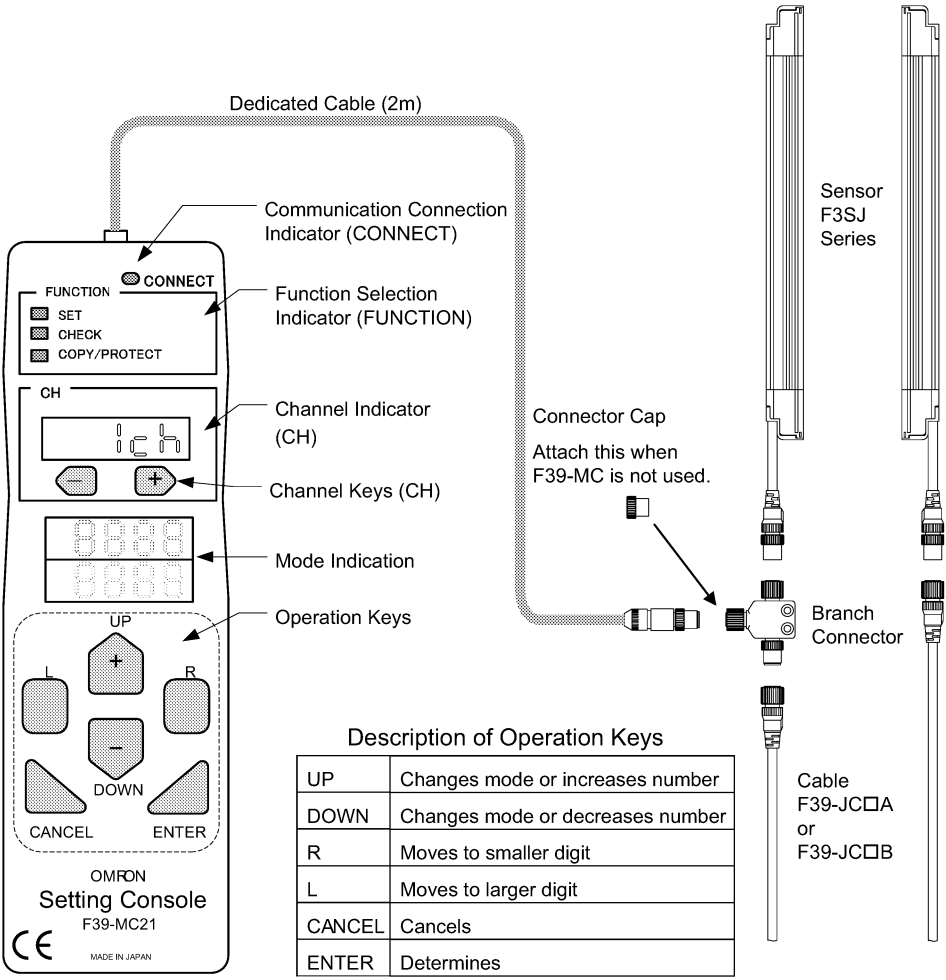
1.2. Operational Overview



2.Ratings

Item \ Model		F39-MC21
Available Sensor		F3SJ Series
Communication Method		Proprietary
Power Supply		DC24V+/-20% (Shared with F3SJ's power supply)
Consumption Current		55mA max.
Ambient Temperature for Use		-10 deg. C to 55 deg. C (without freezing)
Ambient Temperature for Storage		-25 deg. C to 65 deg. C
Ambient Humidity		25~85%RH (without condensation)
Insulation Resistance		20M ohm max. (by DC500V Megger)
Dielectric Strength Voltage		AC1,000V 50/60Hz 1min
Material	Case	ABS
	Window	Polycarbonate
Weight		87g (main unit only) Approx.700g (Packaged)
Accessories		Branch Connector, Dedicated Cable (2m), Plugged Dedicated Cable (0.3m), Connector Cap, Instruction Manual (This Document)

3.Name of Parts



Description of Operation Keys

UP	Changes mode or increases number
DOWN	Changes mode or decreases number
R	Moves to smaller digit
L	Moves to larger digit
CANCEL	Cancels
ENTER	Determines

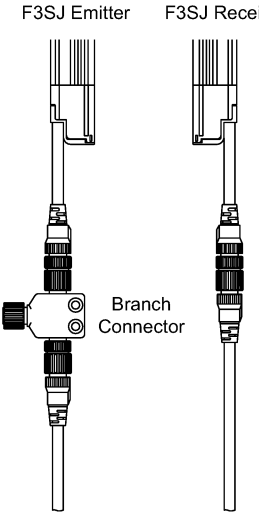
4.Wiring and Connection

⚠Caution
When F39-MC is connected to F3SJ, its output is turned OFF and the product cannot execute normal operation.
Before attaching or detaching F39-MC, you MUST turn OFF the power of F3SJ.

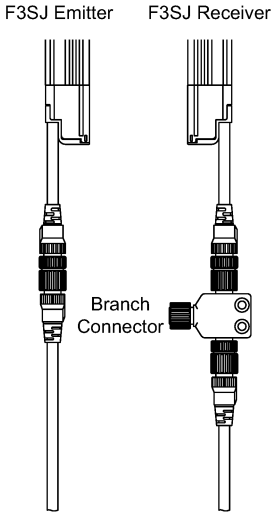
4.1. Attaching a Branch Connector

Attach an accessory branch connector to F3SJ. A branch connector can be attached to an emitter or a receiver. A position of a branch connector to be attached to F3SJ as in (i) or (ii), however, may be different from a figure shown below, due to distortion of a cable or other reasons.If the connector is attached to the F3SP-B1P end as in (iii) or (iv), its direction should be fixed as shown below.

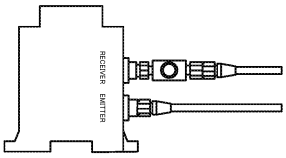
(i) Attaching to an emitter



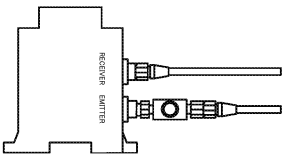
(ii) Attaching to a receiver



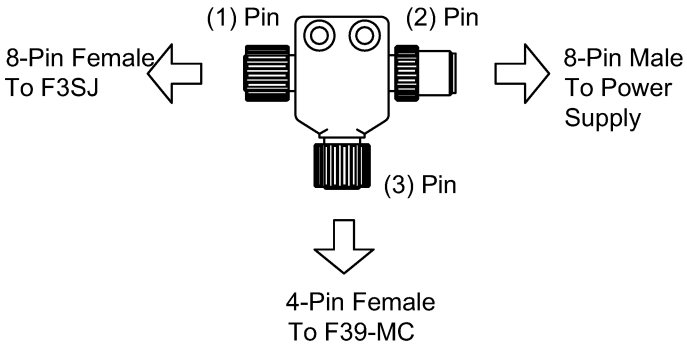
(iii) Attaching to a receiver of F3SP-B1P

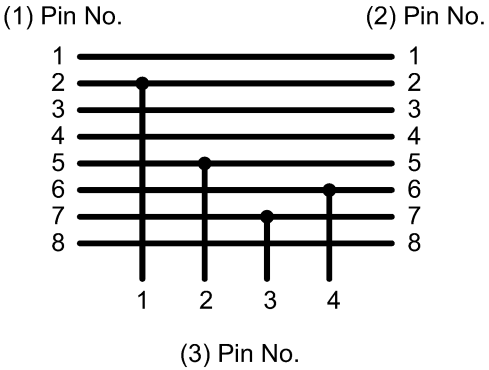


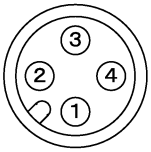
(iv) Attaching to an emitter of F3SP-B1P



4.2. Branch Connector Wiring Diagram





(3) Pin Layout	Pin No.	Signal Name
	1	+24 V (24VDC)
	2	Communication Line (+)
	3	0V
	4	Communication Line (-)

⚠Caution

Power supply of F39-MC is shared with that of F3SJ. Consumption current of F39-MC is 55mA max. Note that connection may not be available depending on your usage environment.

4.3. Attaching F39-MC

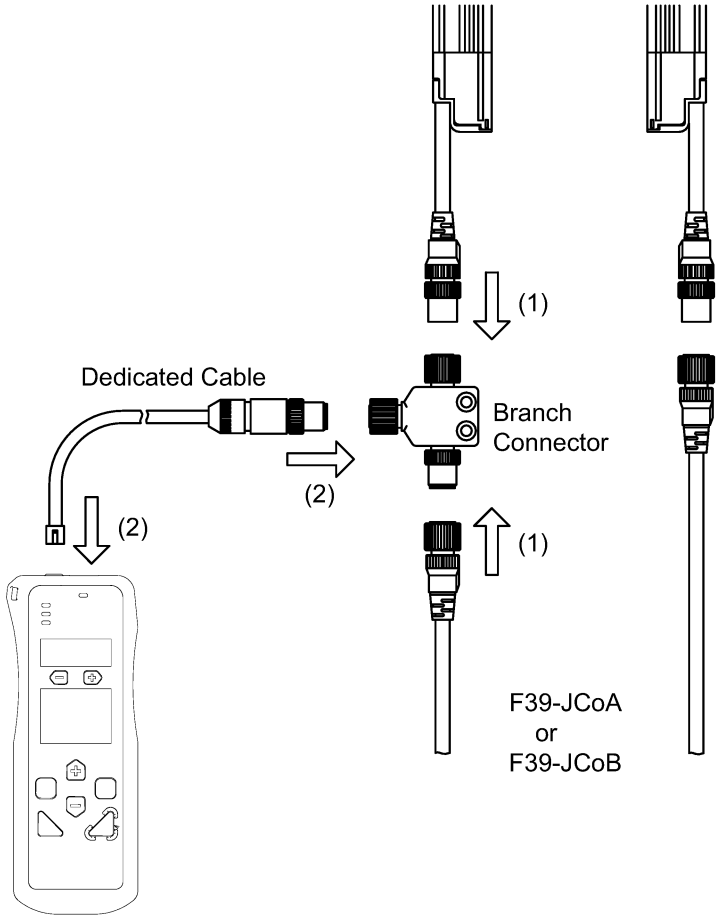
■In case of using a dedicated cable

Procedure

(1) Attach a branch connector between F3SJ and a double-end (single-end) connector cable F39-JC while the power of F3SJ is being turned OFF. (It can be connected to an emitter or a receiver.)

(2) Attach a dedicated cable to a branch connector and connect it to F39-MC.

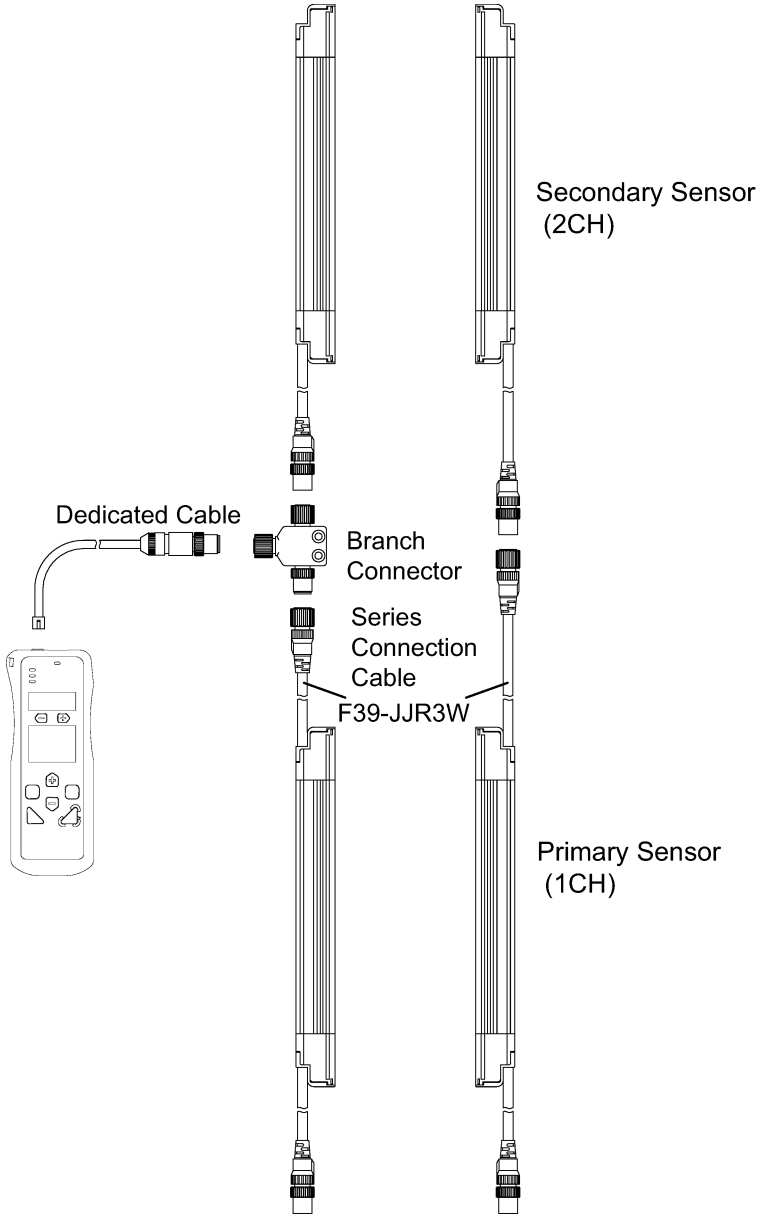
(3) Turn ON the power of F3SJ.



⚠Caution

F3SJ transitions to the lockout state if F39-MC is connected while F3SJ is operating.

If a series connection cable (F39-JJR3W) is used for series connection, a branch connector can be attached between a primary sensor (1CH) and a secondary sensor (2CH).



■In case of using a plugged dedicated cable

If a branch connector is difficult to attach due to F3SJ's installation environment, use an accessory plugged dedicated cable. Connect the plug to the cable or a terminal board to which a F3SJ's cable is wired.

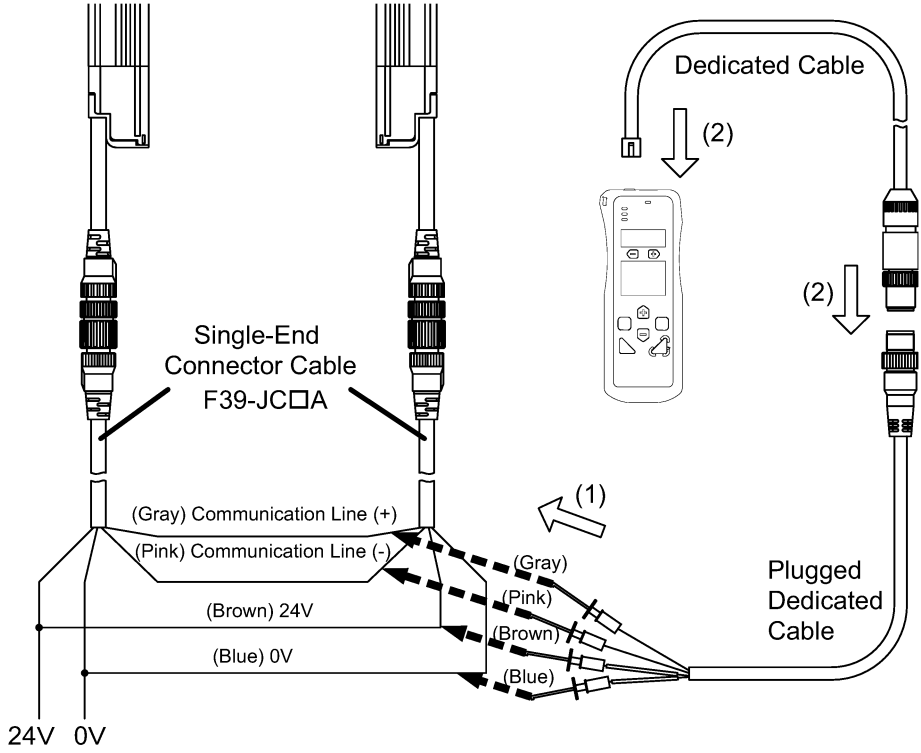
Procedure

(1) Attach a plugged dedicated cable to a single-end connector cable F39-JC☐A with the same color while the power of F3SJ is being turned OFF.

- (Gray) Communication Line (+) Gray Connector
- (Pink) Communication Line (-) Pink Connector
- (Brown) 24V Brown Connector
- (Blue) 0V Blue Connector

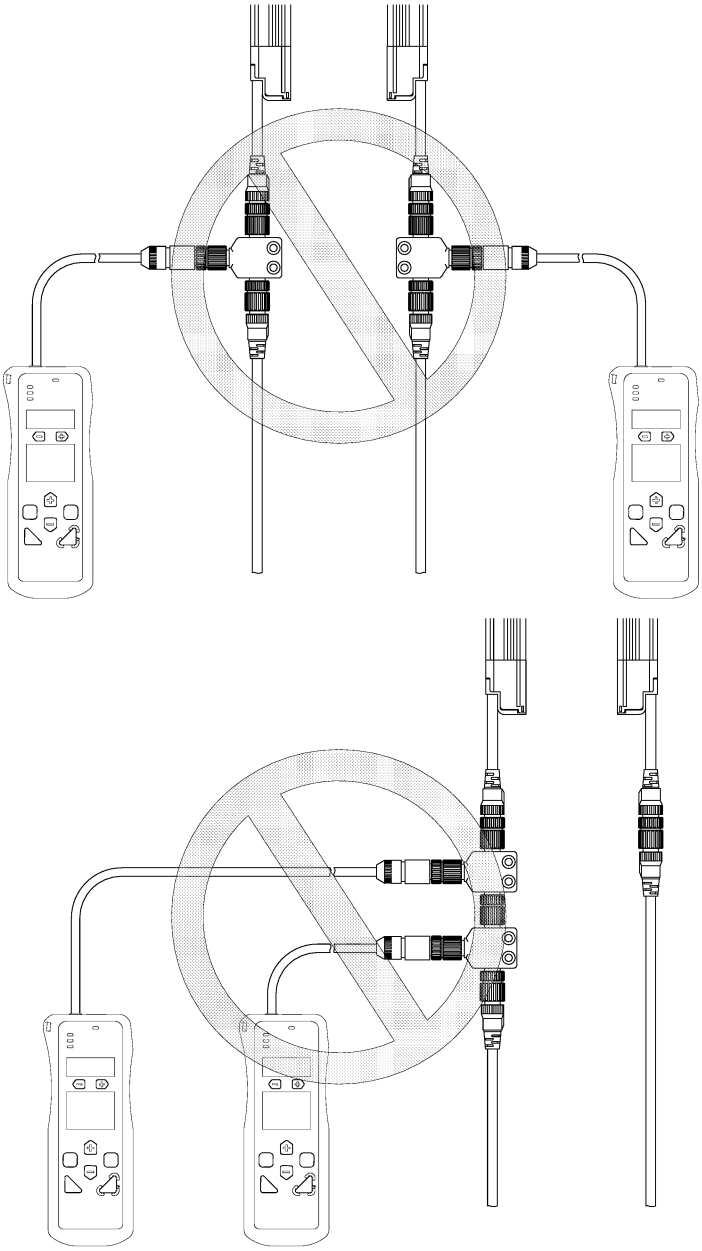
(2) Connect a plugged dedicated cable to a dedicated cable and connect it to F39-MC.

(3) Turn ON the power of F3SJ.



For F3SJ's wiring, see its wiring diagram in the F3SJ's User's Manual.

Do not connect two F39-MC21 units or PC Tool for F3SJ at the same time. F3SJ may cause an error.

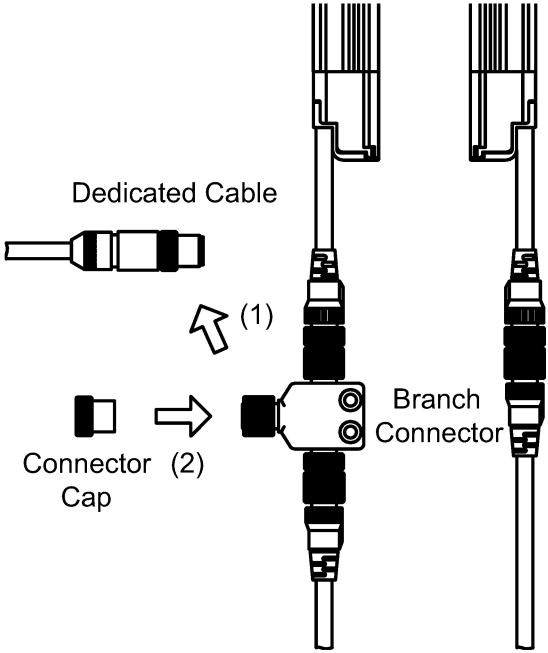


4.4. Detaching F39-MC

After the setting is completed, always detach F39-MC and a dedicated cable before turning F3SJ's power on again.

Procedure

(1) Detach F39-MC and a dedicated cable from a branch connector.
(2) Attach a connector cap to a branch connector.
(Water-resistance cannot be ensured without a connector cap)



⚠Caution

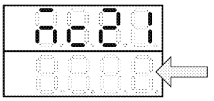
If F39-MC is not used, detach the dedicated cable and F39-MC and attach a connector cap (accessory) to the branching connector.
Water-resistance cannot be ensured without a connector cap.

5.Power-On

Power supply of F39-MC is shared with that of F3SJ. Power must be turned on through F3SJ's power supply.

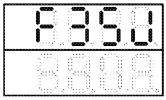
When F39-MC is turned on, connection check with F3SJ is performed. If connection is established, following indications are provided. If the connection is not properly made, "NOT CONN" is displayed. Make proper wiring again and turn its power ON again. See P.93 if an error code such as "ERR C002" is displayed.

(1) Mode indicator shows model code("MC21") and version("1.00" or other information will be displayed) of F39-MC for about 1 second.



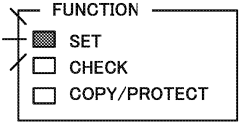
(2) Communication indicator (CONNECT) turns on

(3) Mode indicator shows model code of a sensor ("F3SJ") for about 1 second.



Connecting a safety multi-beam type F3SJ-AM□P□□□ displays "-MUL" in the bottom field.

(4) "Set" of a function selection indicator (FUNCTION) blinks (mode indicator itself turns off)



⚠Caution

When F3SJ's power is turned on while F39-MC is being connected, F3SJ's power indicator, ON indicator, or OFF indicator blinks. This state is called maintenance status. Under maintenance status, the ON indicator blinks if it should be ON under normal status, while the safety output is OFF.
Blanking/test indicators and receiver's power-connector indicator blink when setting is written to a F3SJ or during monitoring of incident light level display. For details, see F3SJ's User's Manual, "Chapter 3 F3SJ's Status when Setting Tool is Connected".

6.Function Selection

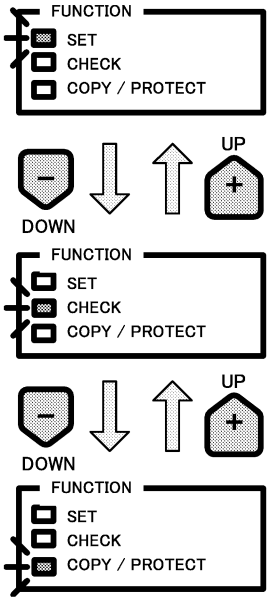
Provides selection of functions, “SET”, “CHECK”, and “COPY/PROTECT”.

SET Menu	:	Provides F3SJ’s setting change.
CHECK Menu	:	Provides F3SJ’s status check. This can be used for maintenance.
COPY/PROTECT Menu	:	Provides copy of F3SJ’s setting data and change of password.

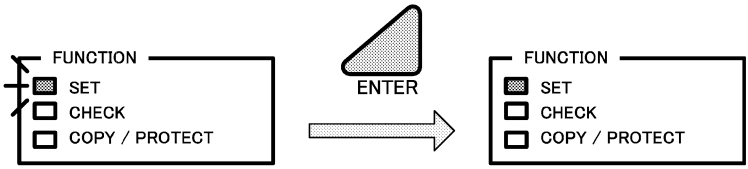
Function selection procedure is:

(1) Use [UP] or [DOWN] key to select a function. An indicator for a selected function blinks.

(2) See figures below for function selection procedure:



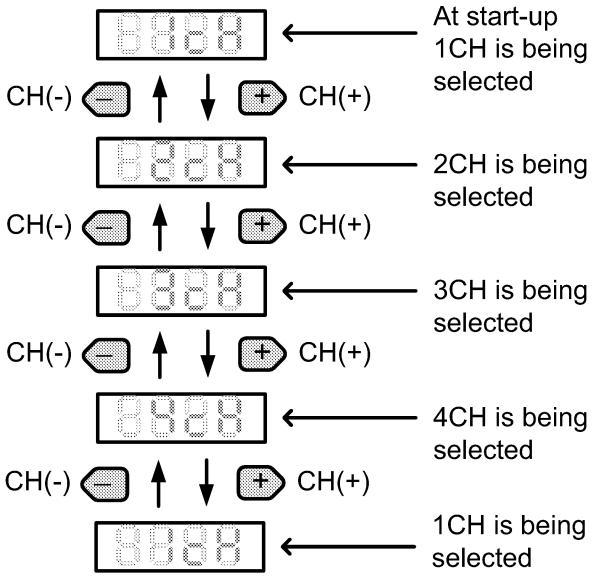
(3) When the [ENTER] key is pressed for the selected function, it is determined. The indicator turns on when the function is determined.



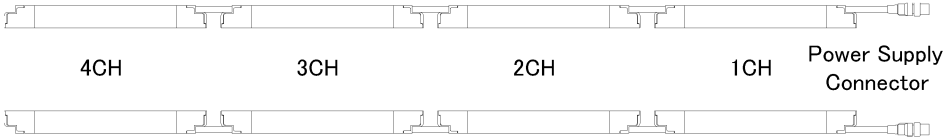
7.Channel selection

Select a channel (CH) to determine which F3SJ should be the target for setting change or monitoring from F39-MC. When F3SJ is used as a single sensor, indication is made for 1CH only. If used in a series connection, indication is made for as many as number of CHs of the connection.

(1) To select a CH, use [CH(-)] or [CH(+)] key to select an indicated item as follows. You do not have to press [ENTER] key.



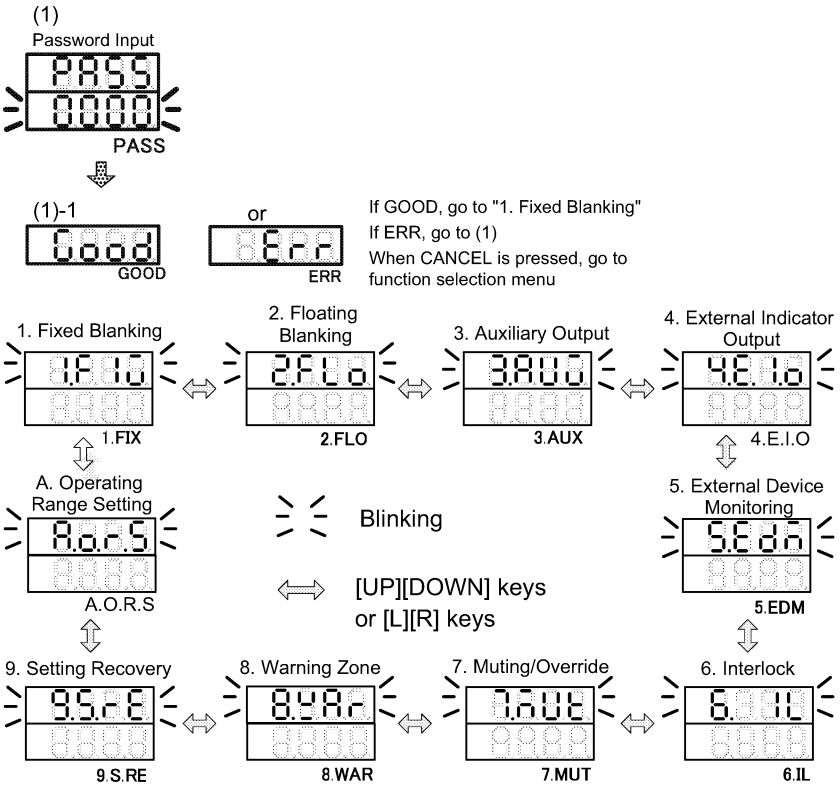
(2) Under a series connection, 1CH is F3SJ that is closest to the power supply, then 2CH, 3CH, and 4CH.



8.SET Menu

⚠Warning
After setting change of F3SJ, inspection must be performed by a qualified person to confirm its safety before starting its operation.
Setting change must be performed under compliance with related laws and regulations.

SET menu provides monitoring and change of functional details configured for F3SJ. (First indication for each item is the current value)
When SET is selected in “6. Function Selection” and [ENTER] key is pressed, a password input screen is displayed. Enter a password (initial valu is “0000”). After logging in with the password, pressing the [ENTER] key for a function to be changed enables setting change. Use [UP] or [DOWN] key to select alphanumeric characters (uppercase for alphabets), [L] or [R] key to select a column, then enter a password.
Always read <Precautions for setting change>, because combinations of functions are limited.



<Precautions for setting change>

1. Password must be changed immediately by an administrator. (See “10.4 Password Change Menu”, P.91)
2. In functional setting, display of "GOOD" after allowing the setting (pressing [ENTER] key while "E N T " is being displayed) indicates completion of the setting. If "GOOD" is not displayed or [ENTER] key is not pressed, the setting is not completed.
3. Do not turn off the power until “GOOD” is displayed after pressing the [ENTER] key. If the power is turned off, F3SJ may not work properly.
4. **If a parameter is configured that cannot be read from nor written to F39-MC by the PC tool for F3SJ, the set menu shows "9. Setting Recovery" only.** (Ex.: More than one fixed blanking zone is configured by the PC tool for F3SJ) To use F39-MC for setting under such a condition, recover the factory shipment setting by "9. Setting Recovery" before changing the setting. **"9. Setting Recovery" is displayed as well if F3SJ is under lockout.** Release the interlock state or execute the setting recovery before connecting again.
5. For combination of functions "Fixed Blanking (P.25)", "Floating Blanking (P.32)", "Muting (P.57)", and "Warning Zone (P.63)", see:

Combination of Functions

	Fixed Blanking	Floating Blanking	Muting Override	Warning Zone
Fixed Blanking		-	✓	-
Floating Blanking	-		-	-
Muting Override	✓	-		-
Warning Zone	-	-	-	

✓: Combination of functions is available (the functions can be enabled later)

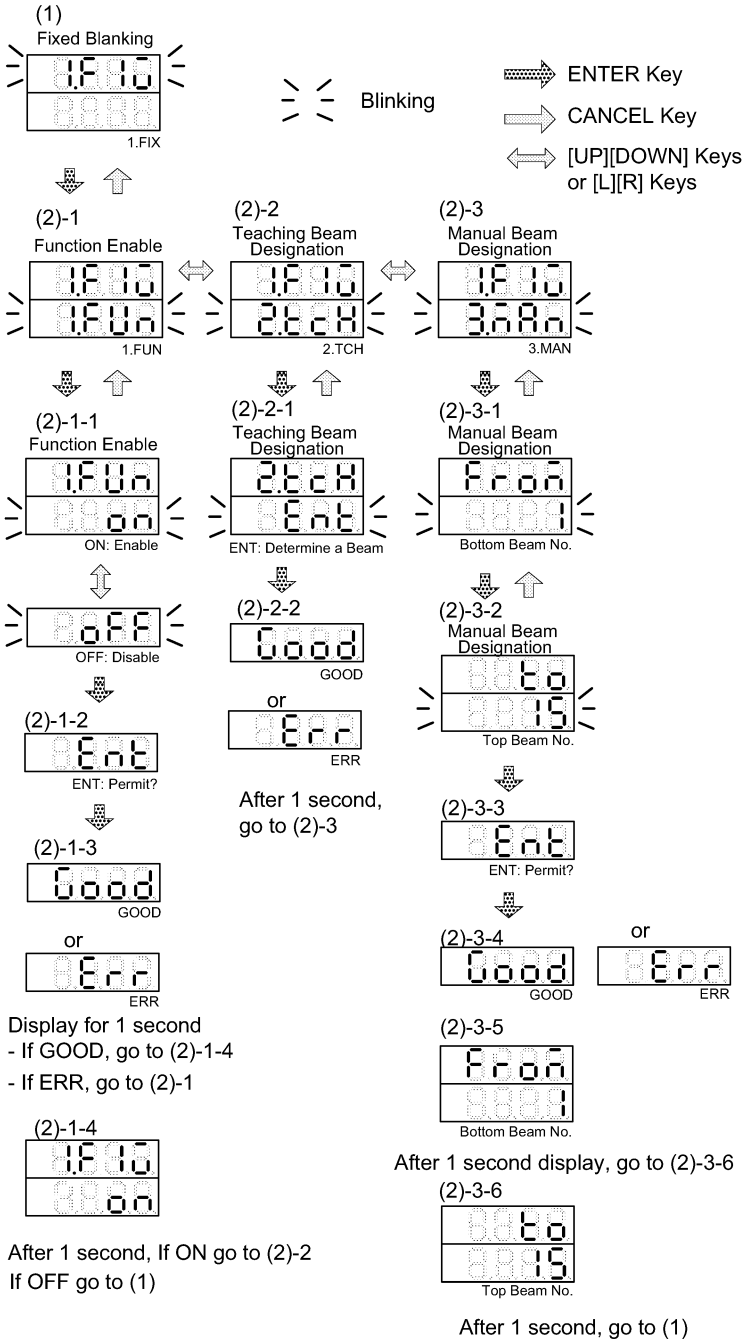
-: Combination of functions is not available (previously configured function is prioritized and the other functions cannot be enabled later)

8.1. Fixed Blanking Menu

⚠Warning
Install protective structure for all zones of disabled zone so that a worker should not be able to approach hazardous zone of a machine without passing through zones disabled by the fixed blanking function. Failure to do so may result in serious injury.
If teaching beam is designated for fixed blanking, detection capability gets larger near an object that interrupts beams. Calculate a safety distance based on the setting.
You must ensure that a test rod should be detected in all zones where it should be detected after setting the fixed blanking function. Failure to do so may result in serious injury.

For details of the function, see F3SJ's User's Manual.
Always read <Precautions>, because combinations of functions are limited. This menu is not displayed for safety multi-beam type F3SJ-AM□P□□□.

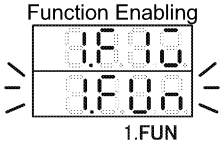
■Fixed Blanking Menu List



■Fixed Blanking Setup Procedure

1 Enabling Fixed Blanking Function

1-1.Press the [ENTER} key in “Function Enabling Menu”, use [UP] and [DOWN] keys to select “ON: Enable” and press the [ENTER] key.



1-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
1-3.Confirm that “GOOD” is displayed. If not, go back to step 1-1.
1-4.Use [UP] and [DOWN] keys to select “Teaching Beam Designation” or “Manual Beam Designation” and press the [ENTER] key.
For “Teaching Beam Designation” Go to Step 2-1.
For “Manual Beam Designation” Go to Step 3-1.

2 Teaching Beam Designation

2-1.Confirm that emitter/receiver is properly installed and that an interrupting object (for which fixed blanking should be configured) in the detection zone, and press the [ENTER] key.

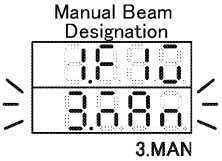
2-2.Confirm that “GOOD” is displayed. If not, go back to step 2-1.
2-3.Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

<How to check zones>

To check configured zone, perform operations from 3-1 to 3-3 in manual beam designation shown below. Beam numbers displayed in steps 3-2 and 3-3 indicate a zone currently configured.

3 Manual Beam Designation

3-1.Confirm relation between position of an interrupting object and F3SJ's beam number (see a figure in the right), and press [ENTER].



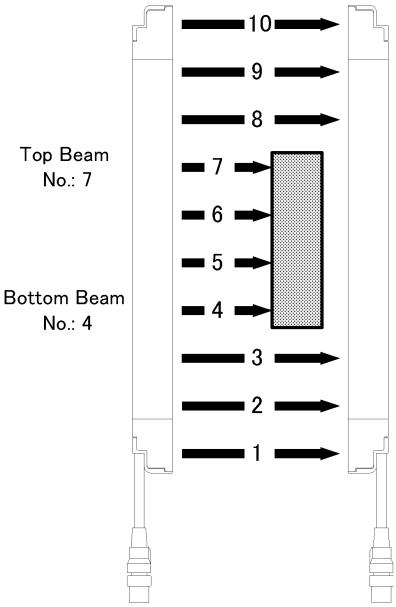
3-2.Use [UP] and [DOWN] keys to select the bottom beam number when "FROM" is displayed, and press the [ENTER] key.

3-3.Use [UP] and [DOWN] keys to select the top beam number when "TO" is displayed, and press the [ENTER] key.

3-4.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.

3-5.Confirm that "GOOD" is displayed. If not, go back to step 3-1.

3-6.Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.



<Precautions>

1. To prevent danger, F3SJ locks out when a beam configured for fixed blanking receives light. While F39-MC cannot disable the monitoring function, the PC tool for F3SJ can.
2. For “Teaching Beam Designation”, you cannot configure under all beams receiving light nor being interrupted. Check interrupting condition of the object or beam adjustment.("ERR" is displayed)
3. Whether allowable beams are configured for fixed blanking zone or not depends on a size of the blanking zone and interrupted/uninterrupted.
   When allowable beams are configured, detection capability gets larger. Calculate a safety distance based on the detection capability again.

   Teaching Setting
   - 3 or more beams are interrupted
     When receiving light intensity level of beams ((a) and (b) in Fig. 1) adjacent to interrupted zone are:
     (1) 100 to 200% then they are configured as allowable beams. ((a) in Fig. 1)
     (2) 200% or higher then the outermost beams of the interrupted zone are configured as allowable beams. ((b) in Fig. 1)
   - 2 or less beams are interrupted
     No allowable beam is configured.

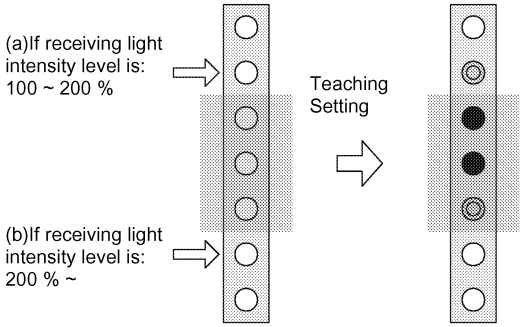


Fig. 1 3 or more beams are interrupted

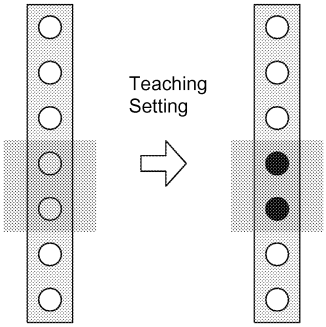


Fig. 2 2 or less beams are interrupted

Manual Setting

- 3 or more beams are interrupted
  Outermost beams of the configured zone are set as allowable beams.
- 2 or less beams are interrupted
  No allowable beam is configured.

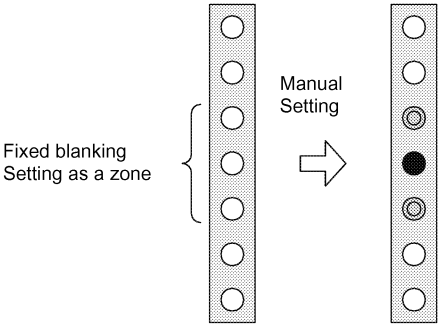


Fig. 3 3 or more beams are interrupted

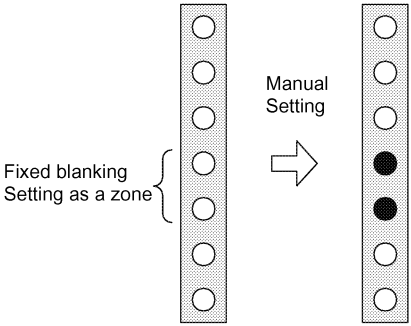


Fig. 4 2 or less beams are interrupted

○ Normal beam ● Fixed blanking beam ◎ Allowable beam

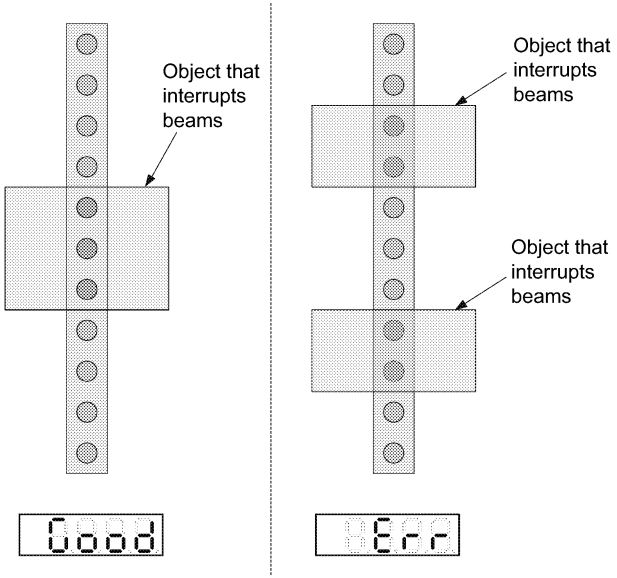
Detection capability for fixed blanking

Fixed Blanking Function	F3SJ-A□□□□ □14 series	F3SJ-A□□□□ □20 series	F3SJ-A□□□□ □30 series	F3SJ-A□□□□ □55 series
No allowable beams exist	14 mm	20 mm	30 mm	55 mm
Allowable beams exist	23 mm	35 mm	55 mm	105 mm

4. Do not select 0 for neither of bottom beam # nor top beam #. Also, FROM (bottom beam #) must be equal to or smaller than TO (top beam #).
5. You cannot enable “fixed blanking” if either of “floating blanking (P.32)” or “Warning Zone (P.63)” function is already enabled."OFF" Is Displayed In Menu List (2)-1. (Combination of these functions is available only when the zone is set by the PC tool for F3SJ (Model: F39-GWUM))
   For combination of functions, see:
   Available Model

Model	Setting Change
F3SJ-A series	Fixed blanking function can be configured.
F3SJ-AM series	Fixed blanking function cannot be configured.

6. Under “Teaching Beam Designation”, you can configure fixed blanking for only one zone to one F3SJ unit (see below). If more than one zone is specified, an error is returned.



7. Even if a muting zone and a fixed blanking zone are configured as overlapped, fixed blanking monitoring function is effective. Thus a fixed blanking beam receives light under muting, operation is based on setting of the monitoring function. Monitoring function cannot be changed by F39-MC. To change the monitoring function, use the PC tool for F3SJ.
8. If F3SJ, which was already configured by the PC tool for F3SJ with multiple zones, is reconfigured by F39-MC, Set menu shows the setting recovery menu only. To perform setting again, enable fixed blanking function must be enabled after the setting recovery. To configure multiple zones, use the PC tool for F3SJ.

8.2. Floating Blanking Menu

⚠Warning
When floating blanking is used, detection capability gets larger. To calculate safety distance, you must use the detection capability under floating blanking. Otherwise a machine may not be stopped before a human body reaches to the hazardous zone, resulting in heavy injury.
You must ensure that the system works as you intended after configuring floating blanking. Failure to do so may result in serious injury.

For details of the function, see F3SJ's User's Manual.
Always read <Precautions>, because combinations of functions are limited. This menu is not displayed for safety multi-beam type F3SJ-AM□P□□□.

■Type of Use Floating Blanking

Floating blanking has the following 2 modes available for setting

1. Beams-in-concatenation mode
   If a size of an interrupting object is specified size or smaller, safety output is turned OFF. But if interrupting object(s) enter more than one zone of detection zone, safety output is turned OFF. If the interrupting object is removed, F3SJ transitions to lockout for safety.
2. Non-concatenation mode
   When total number of interrupted beams in a zone reaches the designated number or more, it is evaluated as interruption. If number of interrupted beams is less than a specified value, safety output will not turn OFF even if more than one zone is interrupted.

For details of floating types, see F3SJ's User's Manual, "Chapter 3 Floating Blanking".

<Precautions>

Under the sequential beam mode, if the interrupting object is removed from the detection zone, F3SJ transitions to lockout for safety.
Using the PC tool for F3SJ can disable the monitoring function. (Lockout will not occur even if the interrupting object is removed)

■Configuration Condition for Beams-in-concatenation mode

To enable beams-in-concatenation mode, following 2 items must be set:

Number of floating blanking beams setting

Sets a maximum number of beams for floating blanking. Settings from 1 to 4 are available. Available number of beams for setting depends on F3SJ's model code. Setting must be performed based on the object's size. Detection capability gets larger as the number of floating beams does.

Number of allowable beams settings

Sets a lower limit for which F3SJ will not transition to lockout and keep operating. Lockout gets unlikely to occur as the number of allowable beams gets larger, but monitoring against failure of detection for an interrupting object gets loose. Allowable beam(s) may not be configured for some models and number of floating beams. For available combinations, see table below.

Available Setup Item List

Model	Number of floating blanking beams	Number of allowable beams
F3SJ-A□□□□□14 F3SJ-A□□□□□20	1 beam	not settable
	2 beams	not settable
	3 beams	2 beams
	4 beams	2 beams
		3 beams
F3SJ-A□□□□□30 F3SJ-A□□□□□55	1 beam	not settable
	2 beams	1 beam
	3 beams	1 beam
		2 beams
	4 beams	1 beam
		2 beams

If a setting is configured with other combination of number of floating beams and number of allowable beams than those in this table, "ERR" is displayed.

■Configuration Procedure for Beams-in-Concatenation Mode

1. Refer to F3SJ's chart of each model. (P.35)
2. Ensure that a size of an interrupting object is within a range of a chart.
3. Use F39-MC to configure number of floating beams and allowable beams from ranges.

If more than one setting is available

1. Maximum value on the chart is smaller . . . Detection capability gets smaller.
2. Available range for setting on a chart is smaller . . . Monitoring against failure of detection for an interrupting object gets more sensitive.

Safe setting can be performed by prioritizing Step 1 to 2.

If it won't work normally:

- If safety output turns OFF:

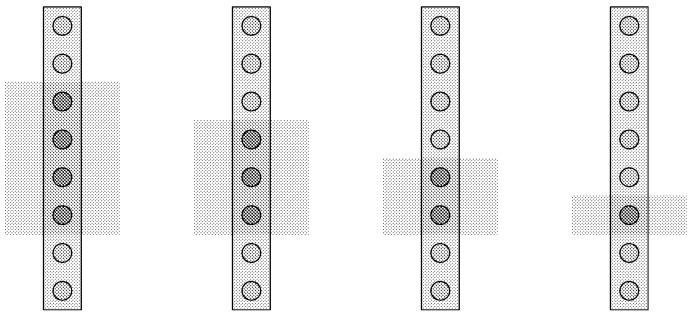
1. Use a setting with a larger maximum value on a chart.
2. Change to F3SJ with wider beam gap.

- If it locks out:

1. Use a setting with a smaller minimum value on a chart.
2. Change to floating mode 2 (Non-Concatenation Mode). Note that failure of detection for an interrupting object cannot be monitored.

Setting Example of Beams-in-Concatenation mode

- Number of floating beams: 3
  (F3SJ keeps the output ON up to 3 beams interruption. The output is OFF when 4 beams interruption.)
- Number of allowable beams: 1
  (F3SJ keeps the output ON up to 2 (=3-1) beams interruption. It transitions to rockout state when 1 beam interruption.)



4 Beams Interruption
Outputs: OFF

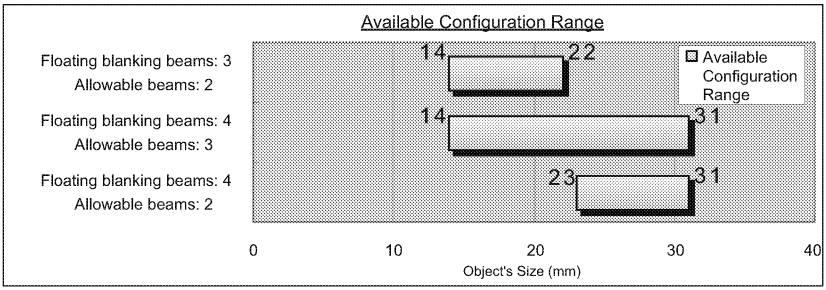
3 Beams Interruption
Outputs: ON

2 Beams Interruption
Outputs: ON

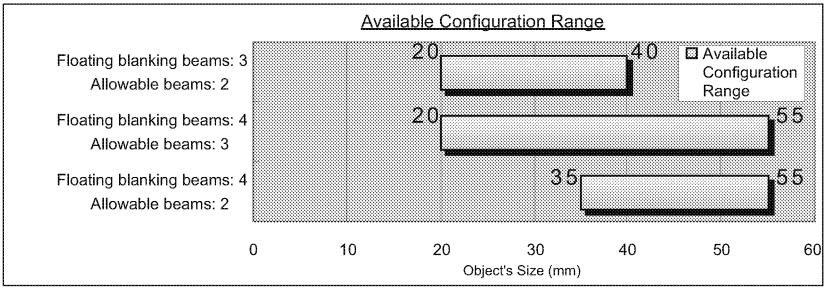
1 Beam Interruption
Rockout

Effective range of beams-in-concatenation mode

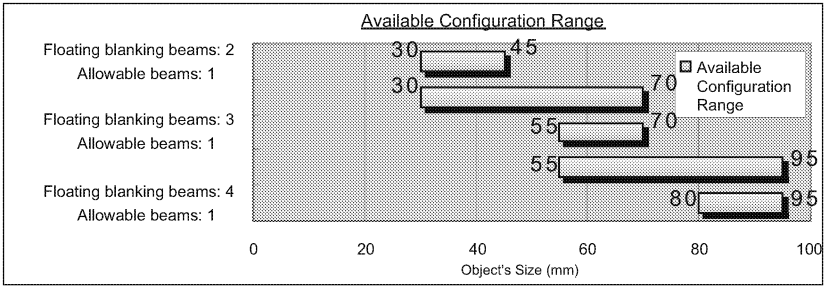
- For F3SJ-A□□□□P(N)14 series:



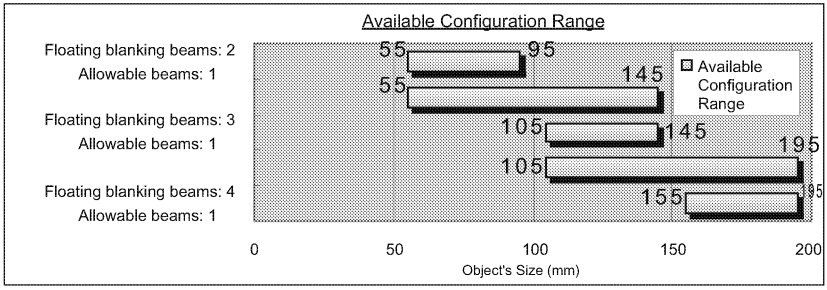
- F3SJ-A□□□□P(N)20 series:



- F3SJ-A□□□□P(N)30 series:



- F3SJ-A□□□□P55 series:



■Configuration Condition for Non-Concatenation Mode

To enable non-concatenation mode, following item must be set:

Number of floating blanking beams setting

Sets a maximum number of beams for floating blanking. From 1 beam to 4 beams are available. Available range depends on F3SJ's model code. Setting must be performed based on the object's size. Detection capability gets larger as the number of floating blanking beams does.

■Configuration Procedure for Non-Concatenation Mode

1. Refer to F3SJ's chart of each model. (P.37)
2. Ensure that each size of interrupting objects is within a range of a chart.
3. Configure smaller number of floating beams for each interrupting object within a given range. Use F39-MC to configure number of floating beams, which is a total number of floating beams configured as described above.

If it won't work normally:

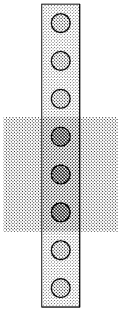
If safety output turns OFF:

1. Use a setting with a larger number of floating beams.
2. Change to F3SJ with wider beam gap.

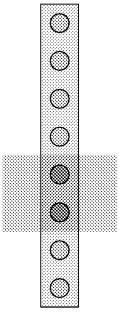
Setting Example of Non-Concatenation Mode

- Number of floating beams: 2
  (F3SJ keeps the output ON up to 2 beams interruption.)

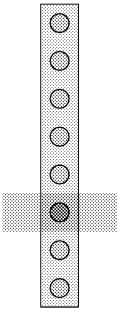
.



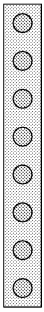
3 Beams Interruption
Outputs: OFF



2 Beams Interruption
Outputs: ON



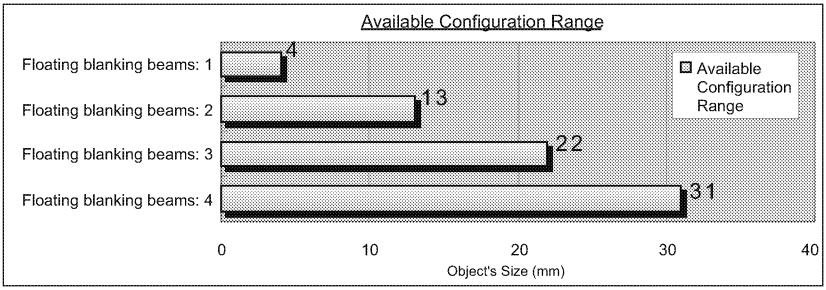
1 Beam Interruption
Outputs: ON



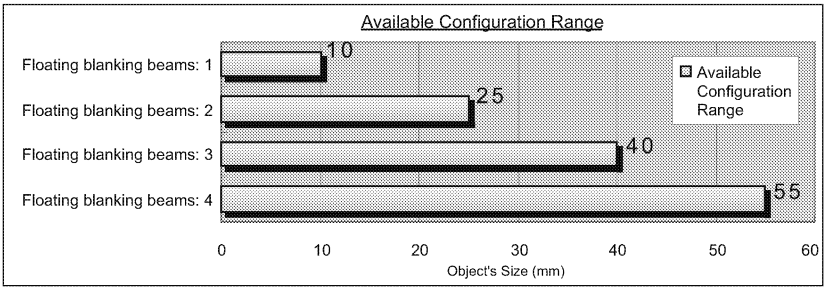
All Receiving Light
Output: ON

Effective range of non-concatenation mode

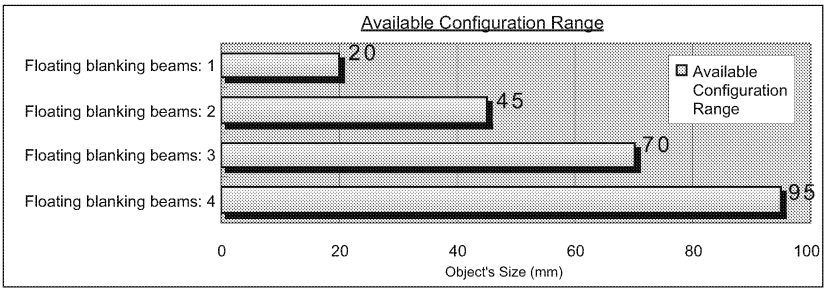
- For F3SJ-A□□□□P(N)14 series:



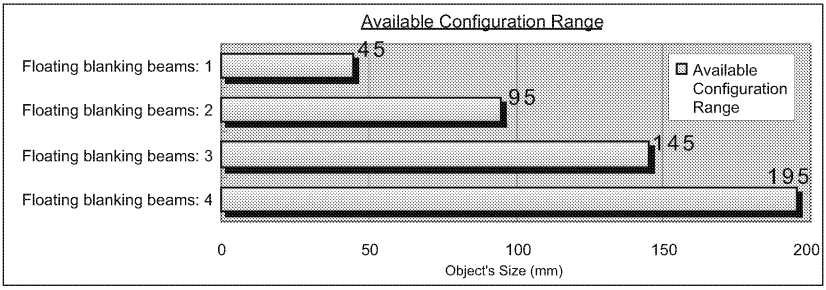
- For F3SJ-A□□□□P(N)20 series:



- For F3SJ-A□□□□P(N)30 series:

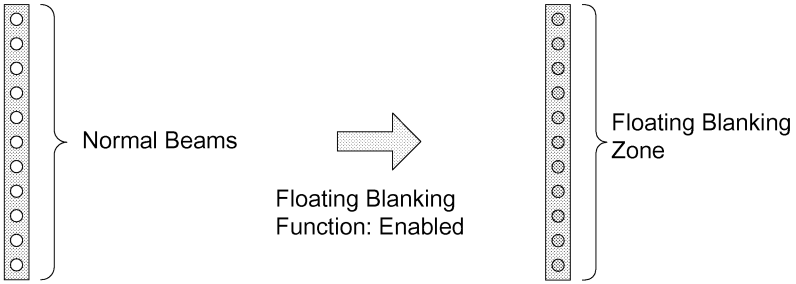


- For F3SJ-A□□□□P55 series:

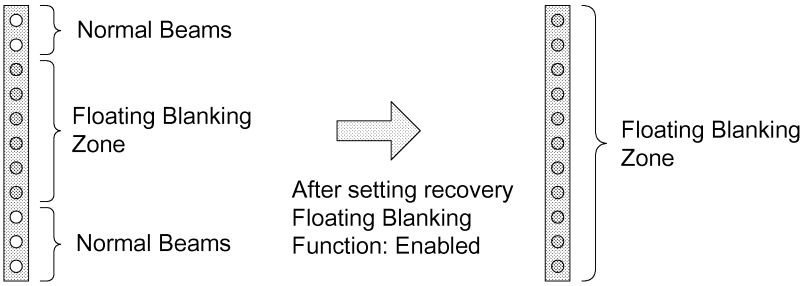


■Setting Example of Floating Blanking Function

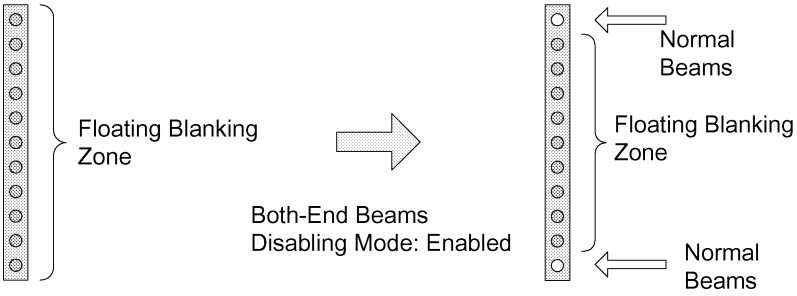
- Setting for Floating Blanking Zone
  If floating blanking function is enabled, all beams are configured as a floating blanking zone.For a muting system, however, floating blanking function cannot be enabled.



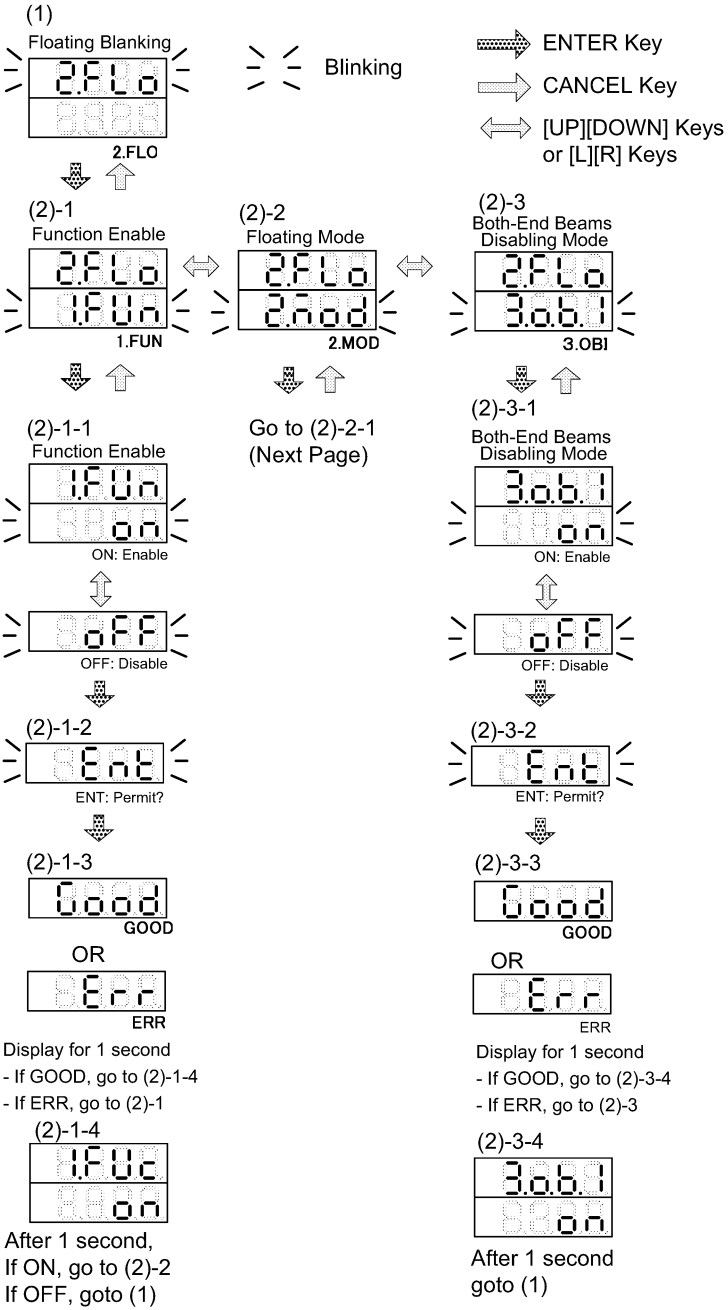
- Floating blanking zone setting configured by the PC tool for F3SJ
  If a floating blanking zone is configured partially by the PC tool for F3SJ, in case of F39-MC, set menu shows the setting recovery menu only. To perform setting again, enable floating blanking function must be enabled after the setting recovery. If all zones or outermost-beam invalid mode (zones other than outermost beams) is configured by the PC tool for F3SJ, the setting can be executed by F39-MC as it is.

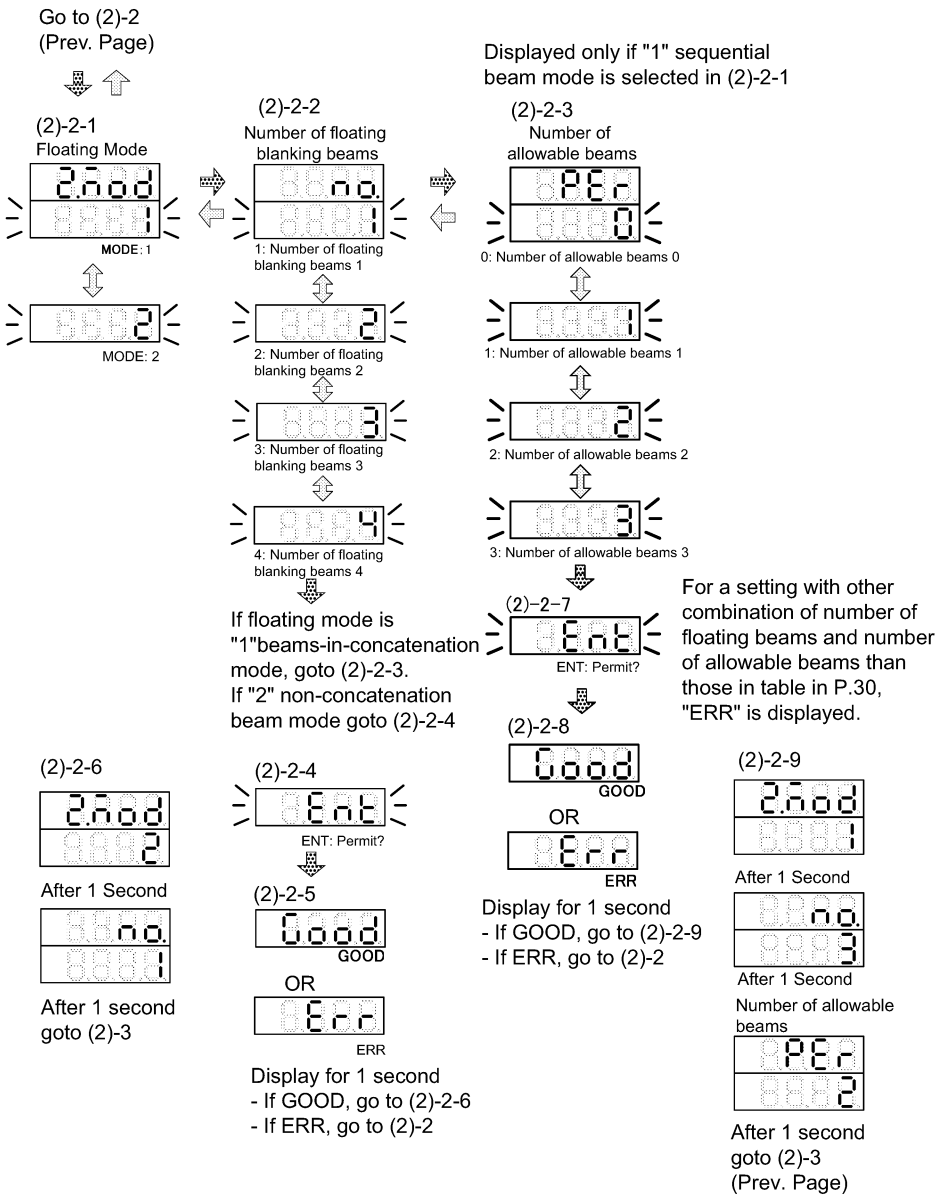


- Setting of outermost beam disabling mode
  If outermost beam disabling mode is enabled, beams on both ends of F3SJ are configured as normal beams.If this mode is enabled, and if either of beams on the end is interrupted, safety output is turned OFF regardless of number of floating beams.



■Floating Blanking Menu List

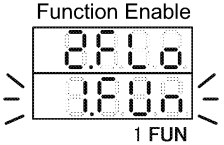



Go to (2)-2
(Prev. Page)
(2)-2-1
Floating Mode
2.nod
1
MODE: 1
2
MODE: 2
(2)-2-2
Number of floating blanking beams
no.
1
1: Number of floating blanking beams 1
2
2: Number of floating blanking beams 2
3
3: Number of floating blanking beams 3
4
4: Number of floating blanking beams 4
Displayed only if "1" sequential beam mode is selected in (2)-2-1
(2)-2-3
Number of allowable beams
PEr
0
0: Number of allowable beams 0
1
1: Number of allowable beams 1
2
2: Number of allowable beams 2
3
3: Number of allowable beams 3
If floating mode is "1"beams-in-concatenation mode, goto (2)-2-3.
If "2" non-concatenation beam mode goto (2)-2-4
(2)-2-7
EnE
ENT: Permit?
For a setting with other combination of number of floating beams and number of allowable beams than those in table in P.30, "ERR" is displayed.
(2)-2-8
Good
GOOD
OR
Err
ERR
Display for 1 second
- If GOOD, go to (2)-2-9
- If ERR, go to (2)-2
(2)-2-9
2.nod
1
After 1 Second
no.
3
After 1 Second
Number of allowable beams
PEr
2
After 1 second
goto (2)-3
(Prev. Page)
(2)-2-6
2.nod
2
After 1 Second
no.
1
After 1 second
goto (2)-3
(2)-2-4
EnE
ENT: Permit?
(2)-2-5
Good
GOOD
OR
Err
ERR
Display for 1 second
- If GOOD, go to (2)-2-6
- If ERR, go to (2)-2

■ Floating Blanking Setup Procedure

1 Enabling Floating Blanking Function

1-1.From “Function Enabling Menu”, press the [ENTER] key and then select “ON: Enable” using [UP] or [DOWN] key. And press the [ENTER] key.

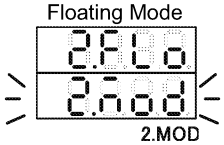


1-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
1-3.Confirm that “GOOD“ is displayed. If not, go back to step 1-1.

2 Floating Mode

2-1.Press the [ENTER] key and select a floating mode number from “Floating Mode“ menu using [UP] or [DOWN] key. After selecting a mode, press [ENTER] key. Mode numbers and operations are:

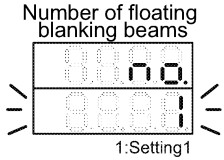
- Mode 1: Beams-in-Concatenation Mode
- Mode 2: Non-Concatenation Mode



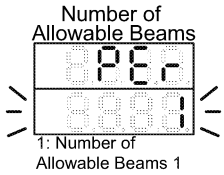
2-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.

3 Number of floating blanking beams setting

3-1.From “Number of Floating Blanking Beams” menu, select a number of floating blanking beams (number of beams for floating) and press the [ENTER] key.



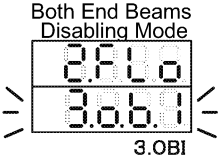
3-2. [ENT] is displayed if non-sequential beam mode is selected. If you want to allow setting change, press the [ENTER] key.
3-3.If sequential beam mode is selected, select setting number for allowable and press the [ENTER] key. For available number of allowable beams, see table in P.30.



3-4.Confirm that “GOOD” is displayed. If not, go back to step 2-1.

4 Both End Beams Disabling Mode

4-1.To configure a beam other than beams at the end as a floating blanking zone, press the [ENTER] key, select “ON: Enable“ using [UP] or [DOWN] key from “Both End Beams Disabling Mode“ menu, and press the [ENTER] key.



4-2.Confirm that “GOOD“ is displayed. If not, go back to step 4-1.

4-3.Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

<Precautions>

1. When floating blanking is used, detection capability gets larger. To calculate safety distance, you must use the detection capability under floating blanking.

   Detection capability for floating blanking

Model	Detection Capability by Floating Size Upper Limit Setting				
	Not specified	Setting 1	Setting 2	Setting 3	Setting 4
F3SJ-A□□□□□14 series	14 mm	23 mm	32 mm	41 mm	50 mm
F3SJ-A□□□□□20 series	20 mm	35 mm	50 mm	65 mm	80 mm
F3SJ-A□□□□□30 series	30 mm	55 mm	80 mm	105 mm	130 mm
F3SJ-A□□□□□55 series	55 mm	105 mm	155 mm	205 mm	255 mm
Number of interrupted beams to turn safety output OFF	1 beam	2 beams	3 beams	4 beams	5 beams

2. You cannot enable “floating blanking“ if either of “fixed blanking (P.25)“ or “Warning Zone (P.63)“ function is already enabled. “OFF“ is displayed in Menu List (2)-1 (Combination of these functions is available only when the zone is set by the PC tool for F3SJ (Model: F39-GWUM)). For combination of functions, see:

   Combination with Floating Blanking Function

	Fixed Blanking	Muting Override	Warning Zone
Floating Blanking	-	-	-

   -: Combination of functions is not available (previously configured function is prioritized and the other functions cannot be enabled later)

3. If connected F3SJ is a "muting system", floating blanking cannot be configured.

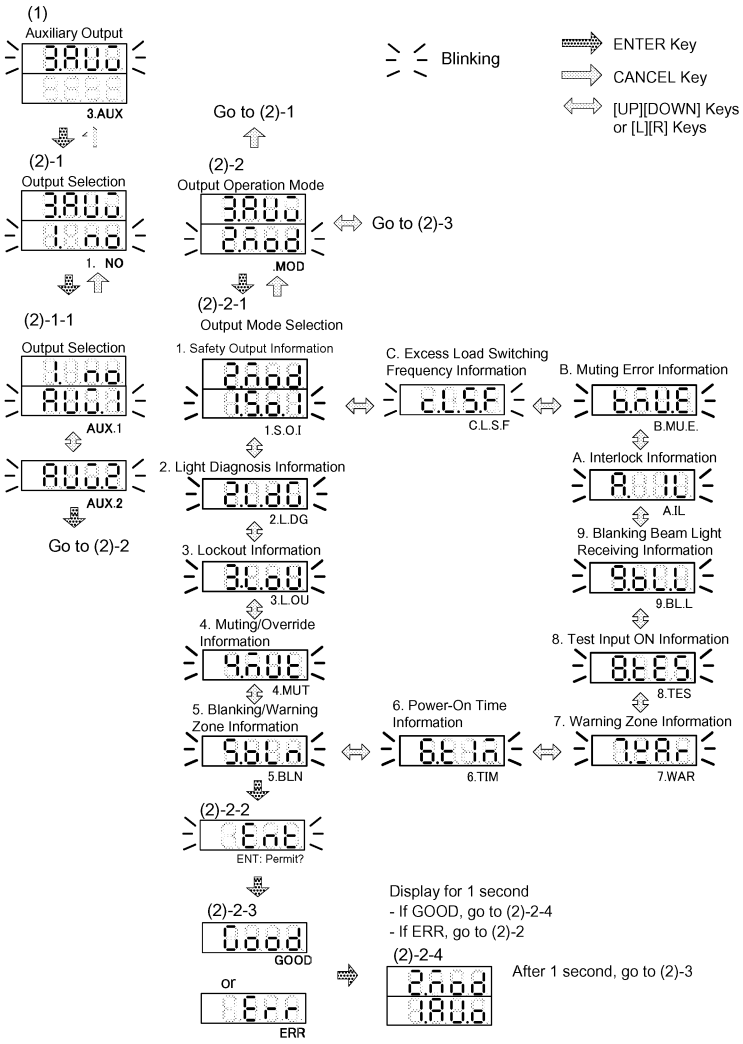
8.3. Auxiliary Output Menu

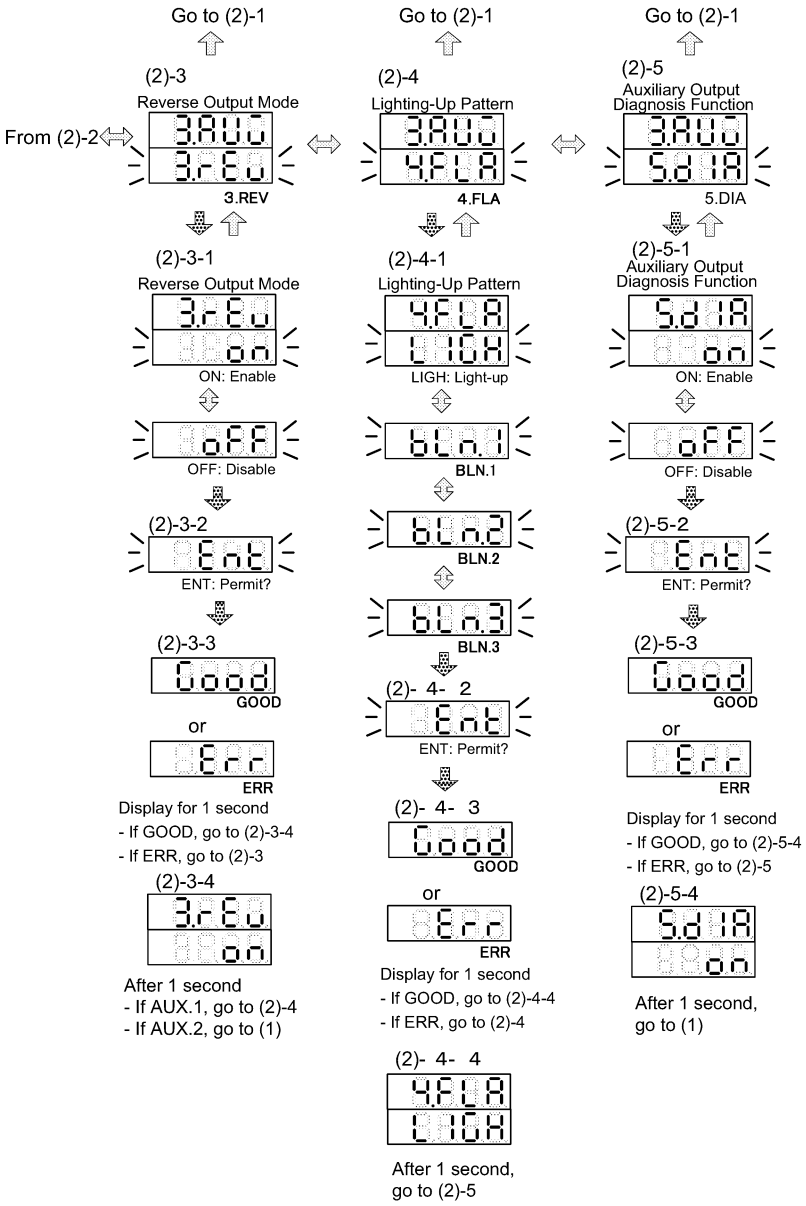
⚠Warning

Do not use the auxiliary output or external indicator output for safety applications. Failure of these outputs may result in serious injury.

For details of the function, see F3SJ's User's Manual.
Always read <Precautions>, because combinations of functions are limited.

■Auxiliary Output Menu List

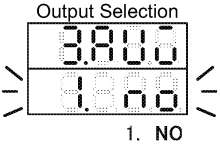



Go to (2)-1
Go to (2)-1
Go to (2)-1
(2)-3
Reverse Output Mode
3.AUU
3.rEU
3.REV
(2)-4
Lighting-Up Pattern
3.AUU
4.FLA
4.FLA
(2)-5
Auxiliary Output
Diagnosis Function
3.AUU
5.dIA
5.DIA
From (2)-2
(2)-3-1
Reverse Output Mode
3.rEU
on
ON: Enable
oFF
OFF: Disable
(2)-3-2
Ent
ENT: Permit?
(2)-3-3
Good
GOOD
or
Err
ERR
Display for 1 second
- If GOOD, go to (2)-3-4
- If ERR, go to (2)-3
(2)-3-4
3.rEU
on
After 1 second
- If AUX.1, go to (2)-4
- If AUX.2, go to (1)
(2)-4-1
Lighting-Up Pattern
4.FLA
LIGH
LIGH: Light-up
bLn.1
BLN.1
bLn.2
BLN.2
bLn.3
BLN.3
(2)- 4- 2
Ent
ENT: Permit?
(2)- 4- 3
Good
GOOD
or
Err
ERR
Display for 1 second
- If GOOD, go to (2)-4-4
- If ERR, go to (2)-4
(2)- 4- 4
4.FLA
LIGH
After 1 second,
go to (2)-5
(2)-5-1
Auxiliary Output
Diagnosis Function
5.dIA
on
ON: Enable
oFF
OFF: Disable
(2)-5-2
Ent
ENT: Permit?
(2)-5-3
Good
GOOD
or
Err
ERR
Display for 1 second
- If GOOD, go to (2)-5-4
- If ERR, go to (2)-5
(2)-5-4
5.dIA
on
After 1 second,
go to (1)

■ Auxiliary Output Setup Procedure

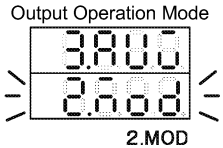
1 Output Selection for Auxiliary Output

1-1.From “Output Selection” menu, select “Auxiliary Output 1: AUX1” or “Auxiliary Output 2: AUX2”, and press the [ENTER] key.



2 Output Operation Mode Selection

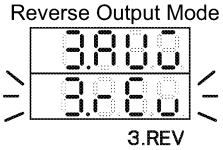
2-1.From “Output Operation Mode Selection” menu, press the [ENTER] key, select an output operation mode you want to set using [UP] or [DOWN] key, and press the [ENTER] key.



2-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
2-3.Confirm that “GOOD” is displayed. If not, go back to step 2-1.

3 Reversing Output Logic

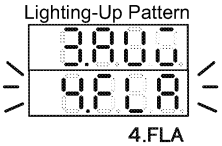
3-1.To reverse output logic, press the [ENTER] key, select “ON: Reverse Enable” from “Reverse Output Mode” menu using [UP] or [DOWN] key, and press the [ENTER] key.



3-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
3-3.Confirm that “GOOD” is displayed. If not, go back to step 3-1.

4 Lighting-Up Pattern

4-1.To connect an external indicator to the auxiliary output 1, press the [ENTER] key, select a lighting-up pattern to be configured from “Lighting-Up Pattern” menu using [UP] or [DOWN] key, and press the [ENTER] key.



4-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.

5 Diagnosis Function

5-1.To enable diagnosis function for auxiliary output 1, ress the [ENTER] key, select “ON: Diagnosis Enable” from “Auxiliary Output Diagnosis” menu using [UP] or [DOWN] key, and press the [ENTER] key.

5-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
5-3.Confirm that “GOOD” is displayed. If not, go back to step 5-1.
5-4.Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

<Precautions>

1. Unless either “AUX1” or "AUX2” is selected at menu (2)-1, Auxiliary Output menu after (2)-2 is not displayed.
2. For a muting system, “Auxiliary Output 2: AUX2” is not displayed.
3. Only auxiliary output 1 can use “Lighting-Up Pattern” and “Auxiliary Output Diagnosis ”.
4. For a muting system, F3SJ locks out if "muting/override information" is not configured for either of following items:
   - Auxiliary Output 1
   - External Indicator Output 1
   - External Indicator Output 2

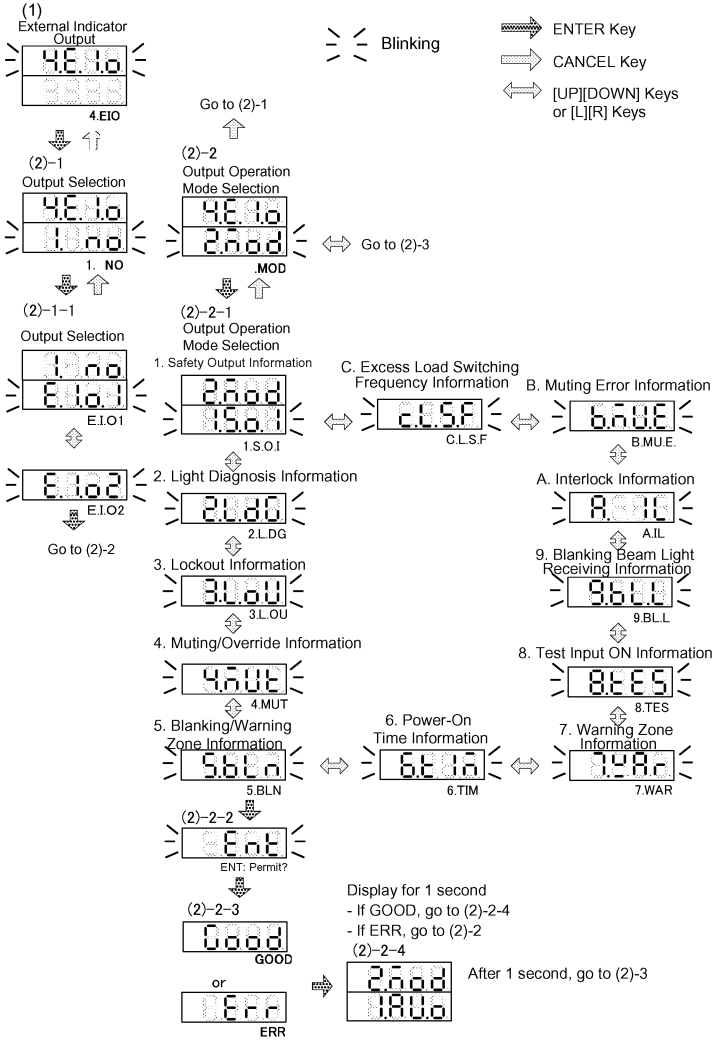
8.4. External Indicator Output Menu

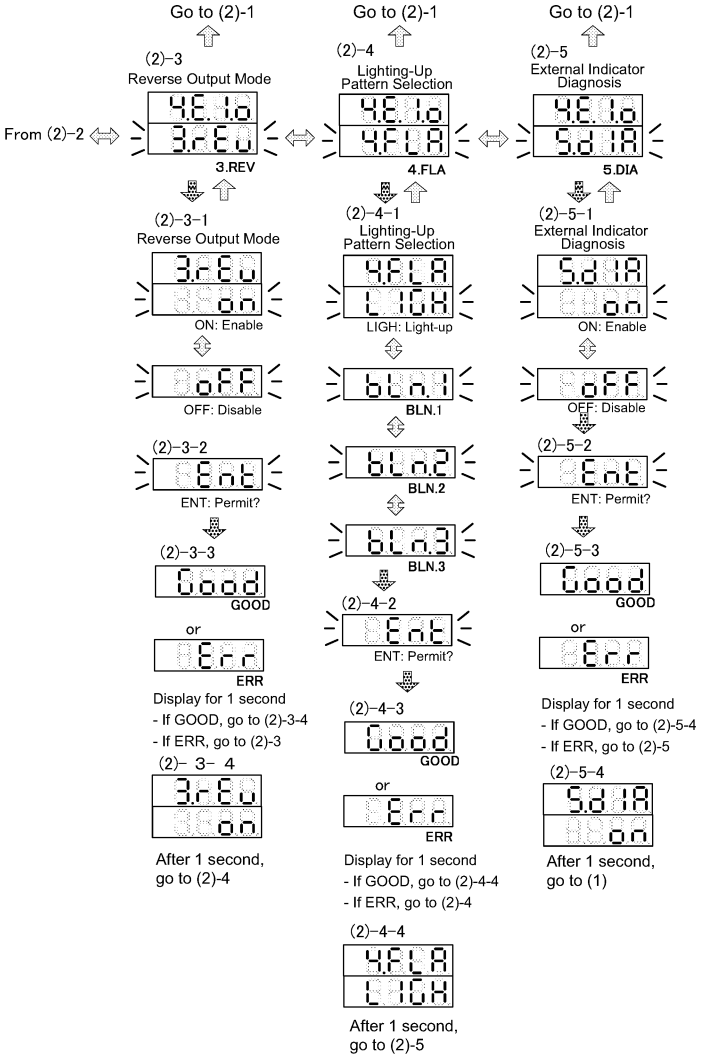
⚠Warning

Do not use the auxiliary output or external indicator output for safety applications. Failure of these outputs may result in serious injury.

For details of the function, see F3SJ's User's Manual.
Always read <Precautions>.

■External Indicator Output Menu List

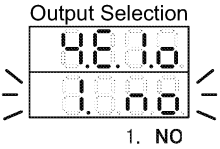



Go to (2)-1
Go to (2)-1
Go to (2)-1
(2)–3
Reverse Output Mode
(2)–4
Lighting-Up Pattern Selection
(2)–5
External Indicator Diagnosis
From (2)–2
3.REV
4.FLA
5.DIA
(2)–3–1
Reverse Output Mode
(2)–4–1
Lighting-Up Pattern Selection
(2)–5–1
External Indicator Diagnosis
ON: Enable
LIGH: Light-up
ON: Enable
OFF: Disable
BLN.1
OFF: Disable
(2)–3–2
BLN.2
(2)–5–2
ENT: Permit?
BLN.3
ENT: Permit?
(2)–3–3
(2)–5–3
GOOD
(2)–4–2
GOOD
or
or
ENT: Permit?
ERR
ERR
(2)–4–3
Display for 1 second
- If GOOD, go to (2)-3-4
- If ERR, go to (2)-3
GOOD
Display for 1 second
- If GOOD, go to (2)-5-4
- If ERR, go to (2)-5
or
(2)–5–4
(2)– 3– 4
ERR
Display for 1 second
- If GOOD, go to (2)-4-4
- If ERR, go to (2)-4
After 1 second, go to (2)-4
(2)–4–4
After 1 second, go to (1)
After 1 second, go to (2)-5

■External Indicator Output Setup Procedure

1 Output Selection for External Indicator Output

1-1.From “Output Selection” menu, press the [ENTER] key, select “External Indicator Output 1: EIO1” or “External Indicator Output 2: EIO2” using [UP] or [DOWN] key, and press the [ENTER] key.



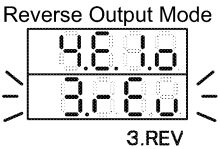
2 Output Operation Mode Selection

2-1.From “Output Operation Mode Selection” menu, press the [ENTER] key, select an output operation mode you want to set using [UP] or [DOWN] key, and press the [ENTER] key.

2-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
2-3.Confirm that “GOOD” is displayed. If not, go back to step 2-1.

3 Reversing Output Logic

3-1.To reverse output logic, press the [ENTER] key, select “ON: Reverse Enable” from “Reverse Output Mode” menu using [UP] or [DOWN] key, and press the [ENTER] key.



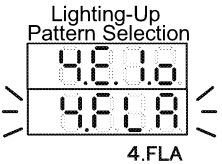
3-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
3-3.Confirm that “GOOD” is displayed. If not, go back to step 3-1.

4 Lighting -Up Pattern

4-1.To blink the indicator, press the [ENTER] key, select from BLN1 to 3 from “Lighting-Up Pattern” menu using [UP] or [DOWN] key, and press the [ENTER] key. Indication modes are:

LIGH: ON
BLN1: Blink (0.5s cycle)
BLN2: Blink (1.0s cycle)

BLN3: Blink (2.0s cycle)



4-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
4-3.Confirm that “GOOD” is displayed. If not, go back to step 4-1.

5 Diagnosis Function

5-1.To enable diagnosis function, press the [ENTER] key, select “ON: Diagnosis Enable” from “External Indicator Output Diagnosis” menu using [UP] or [DOWN] key, and press the [ENTER] key.

5-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
5-3.Confirm that “GOOD” is displayed. If not, go back to step 5-1.
5-4.Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

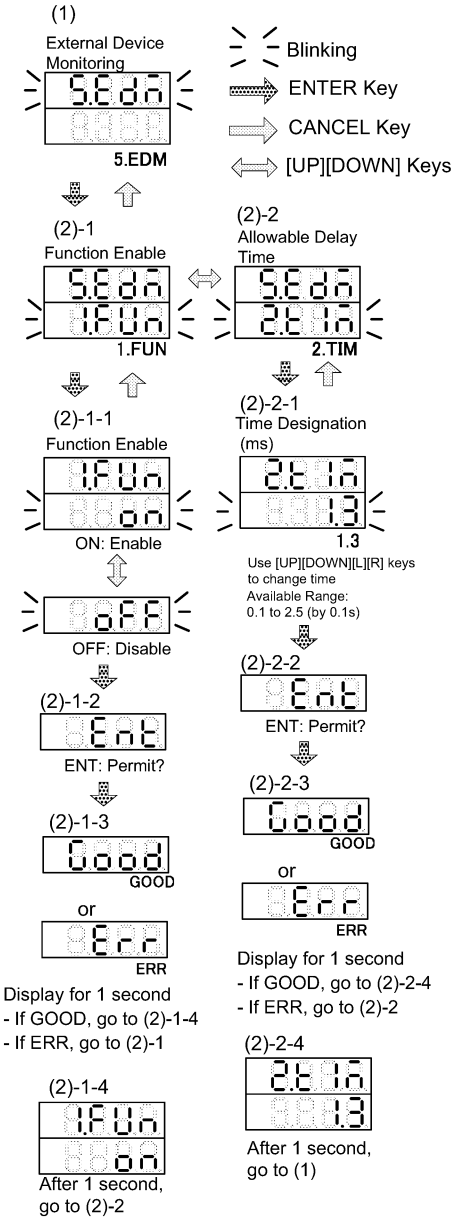
<Precautions>

1. Unless either “EIO1” or "EIO2” is selected at menu (2)-1, External Indicator Output menu after (2)-2 is not displayed.
2. For a muting system, F3SJ locks out if "muting/override information" is not configured for either of following items:
   - Auxiliary Output 1
   - External Indicator Output 1
   - External Indicator Output 2

8.5. External Device Monitoring Menu

For details of the function, see F3SJ's User's Manual.

■External Device Monitoring Menu List

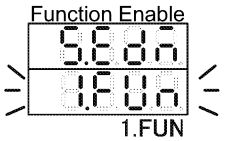


■External Device Monitoring Setup Procedure

* F3SJ's default setting for external device monitoring is "Enabled".

1 Enabling External Device Monitoring

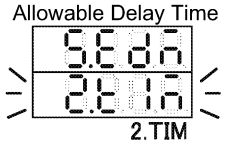
1-1.To enable or disable external device monitoring, press the [ENTER] key, select "ON: Enable" or "OFF: Disable" from "Function Enable Menu" using [UP] or [DOWN] key, and press the [ENTER] key.



1-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
1-3.Confirm that "GOOD" is displayed. If not, go back to step 1-1.

2 Allowable Delay Time

2-1.To change monitoring time of a feedback signal from an external device, set a value on the "Allowable Delay Time" menu considering delay time of the feedback signal, and press the [ENTER] key. To input "Allowable Delay Time", change a number using [UP] or [DOWN] key and move column number using [L] or [R] key. You can not set the first digit. Available time range is from 0.1 to 2.5s (by 0.1s step).



2-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
2-3.Confirm that "GOOD" is displayed. If not, go back to step 2-1.
2-4.Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

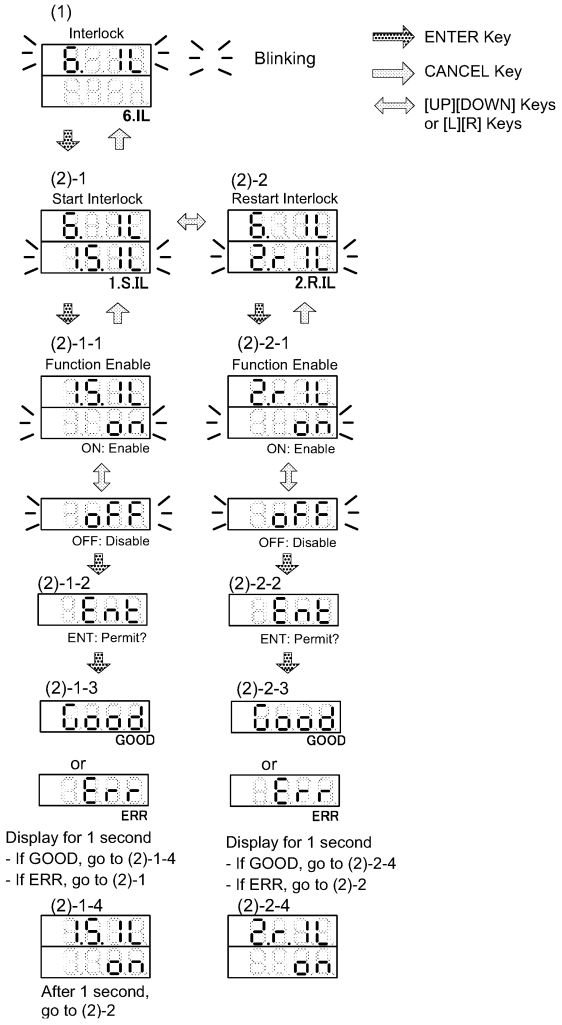
8.6. Interlock Menu

⚠Warning

Install the interlock reset switch in a location that provides a clear view of the entire hazardous zone and where it cannot be activated from within the hazardous zone.

For details of the function, see F3SJ's User's Manual.

■Interlock Menu List

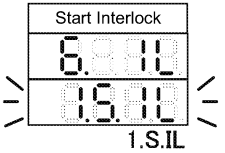


■Interlock Setup Procedure

- Basic System
  You can enable or disable “start interlock” and “restart interlock” under manual reset wiring.Both of them are enabled by default.For details of wiring, see F3SJ’s documentation.
- Muting System
  You can enable or disable “start interlock” and “restart interlock”. Both of them are disabled by default.

1 Start Interlock

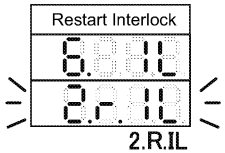
1-1.To disable start interlock function, press the [ENTER] key, select “OFF: Disable” from “Start Interlock - Function Enable Menu” using [UP] or [DOWN] key, and press the [ENTER] key.



1-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
1-3.Confirm that “GOOD” is displayed. If not, go back to step 1-1.

2 Restart Interlock

2-1.To disable restart interlock function, press the [ENTER] key, select “OFF: Disable” from “Restart Interlock - Function Enable Menu” using [UP] or [DOWN] key, and press the [ENTER] key.



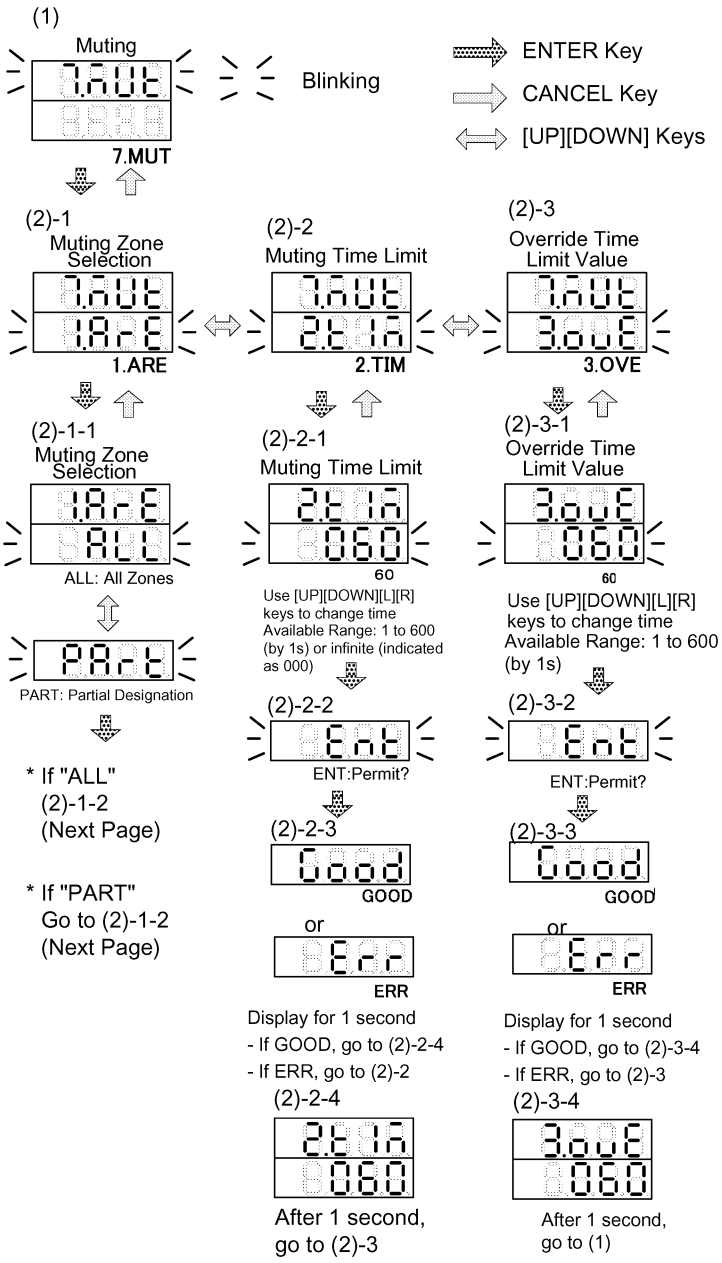
2-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
2-3.Confirm that “GOOD” is displayed. If not, go back to step 2-1.
2-4.Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

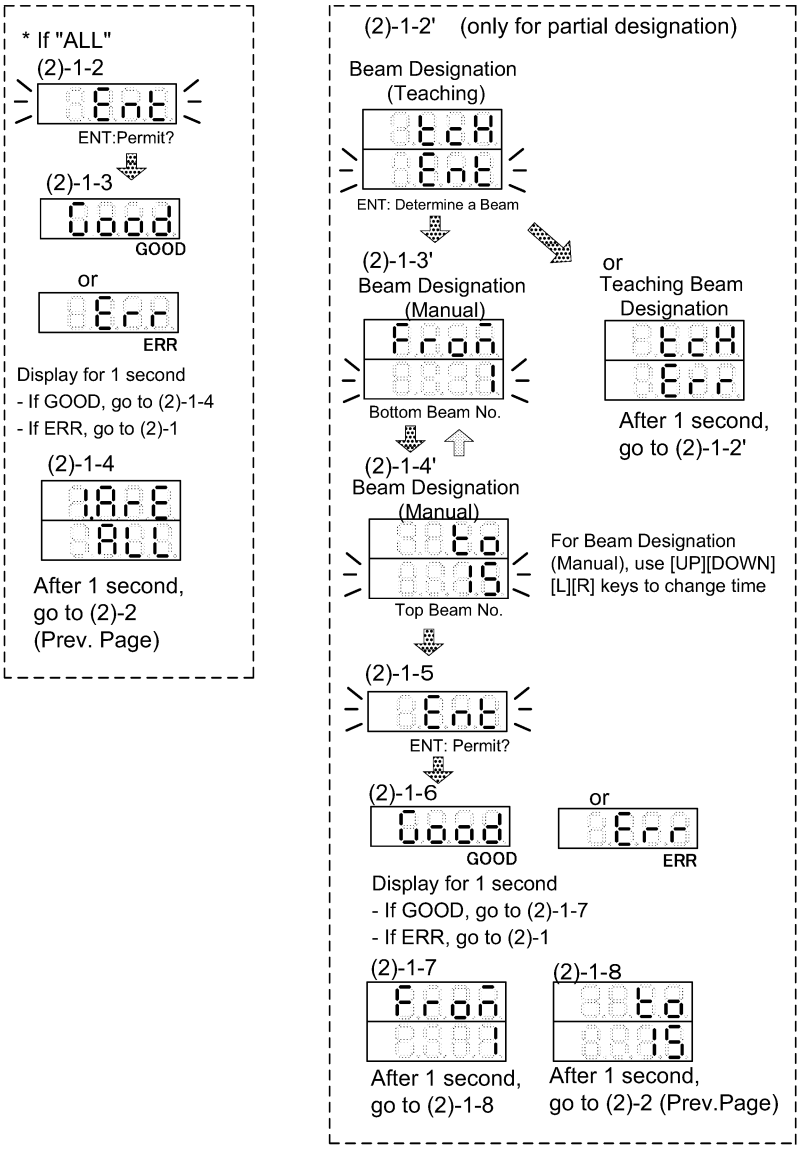
8.7. Muting/Override Menu

⚠Warning
The muting function disables safety functions of the device. You must ensure safety using other measures during this function is enabled.
Install muting sensors so that they can distinguish between a person and an object that is being allowed to pass through the detection zone.
All muting lamps (external indicators) that indicate state of muting function must be installed where workers can see them from all the operating positions.
Use independent 2 input devices for muting input.
Muting related time must be properly configured for its application by a sufficiently trained and qualified person, and the person must have responsibility for settings, especially when setting the muting time limit to infinite.

For details of the function, see F3SJ's User's Manual.
This menu is displayed only when F3SJ is a "muting system".
("Muting system" indicates a system attached with an optional muting keycap F39-CN6 to F3SJ's emitter or receiver)
Always read <Precautions>, because combinations of functions are limited.

■Muting/Override Menu List

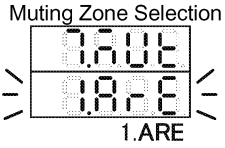



* If "ALL"
(2)-1-2
ENT
ENT:Permit?
(2)-1-3
Good
GOOD
or
Err
ERR
Display for 1 second
- If GOOD, go to (2)-1-4
- If ERR, go to (2)-1
(2)-1-4
ALL
After 1 second,
go to (2)-2
(Prev. Page)
(2)-1-2' (only for partial designation)
Beam Designation
(Teaching)
tcH
ENT
ENT: Determine a Beam
(2)-1-3'
Beam Designation
(Manual)
Fron
1
Bottom Beam No.
or
Teaching Beam
Designation
tcH
Err
After 1 second,
go to (2)-1-2'
(2)-1-4'
Beam Designation
(Manual)
to
15
Top Beam No.
For Beam Designation
(Manual), use [UP][DOWN]
[L][R] keys to change time
(2)-1-5
ENT
ENT: Permit?
(2)-1-6
Good
GOOD
or
Err
ERR
Display for 1 second
- If GOOD, go to (2)-1-7
- If ERR, go to (2)-1
(2)-1-7
Fron
1
After 1 second,
go to (2)-1-8
(2)-1-8
to
15
After 1 second,
go to (2)-2 (Prev.Page)

■Muting/Override Setup Procedure

1 Muting Zone Selection

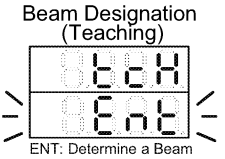
1-1.From “Muting Zone Selection”, specify a beam range for which muting function should be enabled. F3SJ’s default setting is “All Zones: ALL”. To partially enable muting function, press the [ENTER] key, select “Partial Designation: PART” using [UP] or [DOWN] key, and press the [ENTER] key.

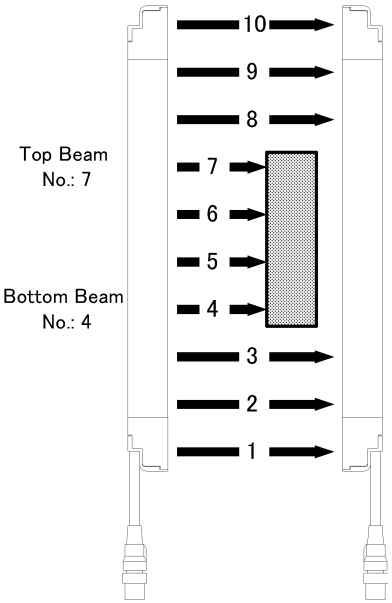


1-2.When “All Zones: ALL” is selected, [ENT] is displayed. If you want to allow setting change, press the [ENTER] key.

1-3.Confirm that “GOOD” is displayed. If not, go back to step 1-1.

1-4.If “Partial Designation: PART” is selected, “Beam Designation (Teaching)” menu is displayed. Here you must specify a beam range for which muting function should be enabled. Confirm that an interrupting object is placed in the detection zone of F3SJ, and press the [ENTER] key. A range where an interrupting object is placed goes into muting state.





1-5.After teaching, a beam range for which muting function should be enabled is displayed for confirmation. If you want to adjust the range, you can do it here, using [UP] or [DOWN] key. When “FROM” is displayed, select a bottom beam no. using [UP] or [DOWN] key. Then press the [ENTER] key again.

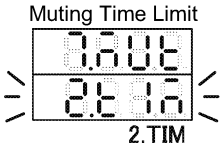
1-6.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.

1-7.Confirm that “GOOD” is displayed. If not, go back to step 1-1.

2 Muting Time Limit

2-1.To change an operation time for muting function, select a time limit from “Muting Time Limit” menu. F3SJ’s default setting is “60 sec”. Change can be made between 1s and 600s (by 1s) or no time limit (indicated as 000). To input

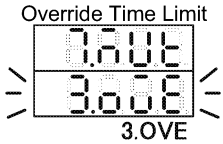
"Muting Time Limit", use [UP] or [DOWN] key to change numbers and [L] or [R] key to move column number, and press the [ENTER] key.



2-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
2-3.Confirm that "GOOD" is displayed. If not, go back to step 2-1.

3 Override Time Limit

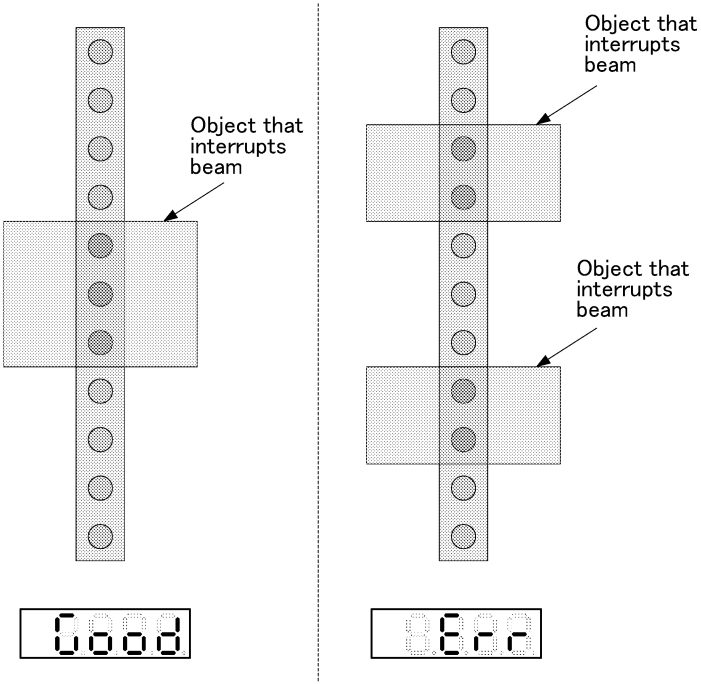
3-1.To change an operation time for override function, select a time limit from "Override Time Limit" menu. F3SJ's default setting is "60 sec". Change can be made between 1s to 600s (by 1s). No time limit cannot be configured. To input "Override Time Limit", use [UP] or [DOWN] key to change numbers and [L] or [R] key to move column number, and press the [ENTER] key.



3-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
3-3.Confirm that "GOOD" is displayed. If not, go back to step 3-1.
3-4.Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

<Precautions>

1. Under “Partial Designation”, muting function can be configured for only one zone (see below). If more than one zone is specified, an error is returned.

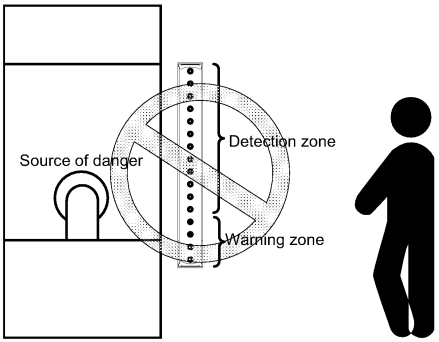
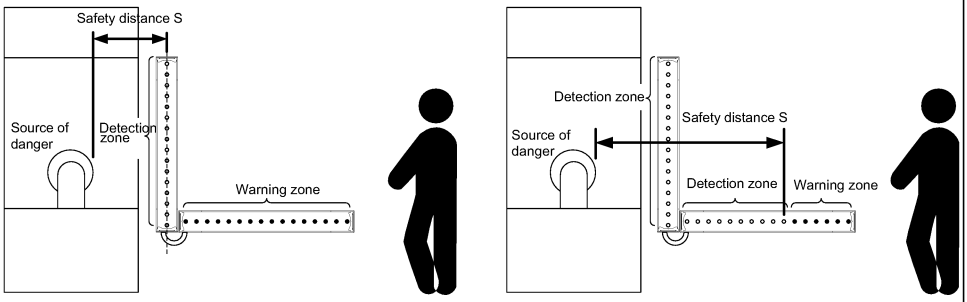


2. If either of “floating blanking (P.32)“ or “Warning Zone (P.63)“ is being enabled when a muting keycap is attached, F3SJ transitions to lockout. (Combination of these functions is available only when the zone is set by the PC tool for F3SJ (Model: F39-GWUM))
   For combination of functions, see:
   Combination with Muting Override Function

	Fixed Blanking	Floating Blanking	Warning Zone
Muting Override	O	X	X

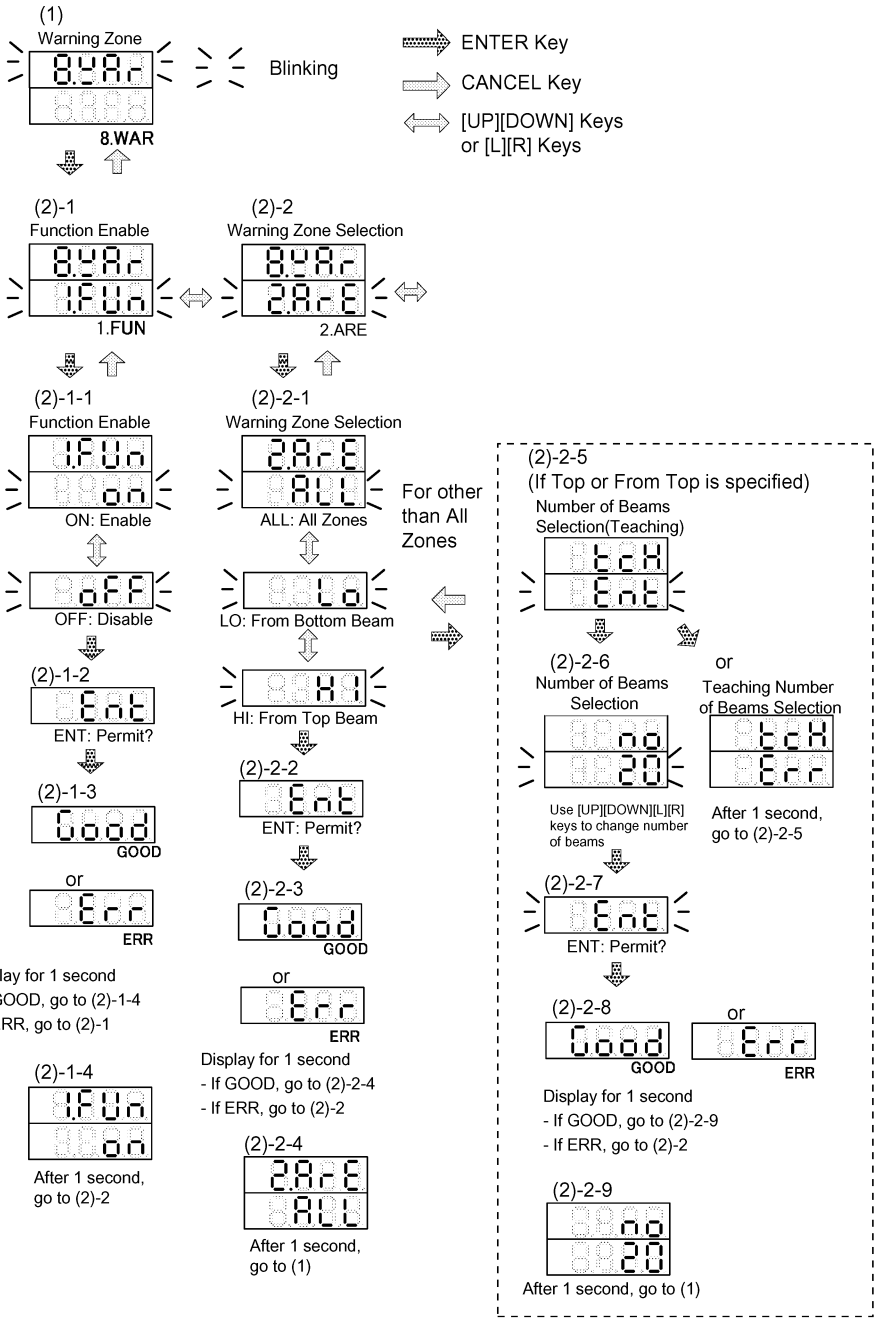
o: Combination of functions is available (the functions can be enabled later)
x: Combination of functions is not available (previously configured function is prioritized and the other functions cannot be enabled later)

8.8. Warning Zone Menu

⚠Warning
Warning Zone output is non-safety output. You must not include it to calculation of safety distance. Otherwise safety distance may be reduced, resulting in heavy injury.
A warning zone CANNOT be used for safety applications. Always install your system so that a detection zone should be passed before reaching a source of danger.
Warning Zone function can be used only when F3SJ is installed horizontally.It CANNOT be used when F3SJ is installed vertically. 
A warning zone must be configured based on a safety distance. 

For details of safety distance, see F3SJ's User's Manual.
Always read <Precautions>, because combinations of functions are limited. This menu is not displayed for safety multi-beam type F3SJ-AM□P□□□.

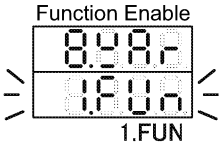
■Warning Zone Menu List



■ Warning Zone Setup Procedure

1 Enabling Warning Zone Function

1-1.To enable “Warning Zone” function, press the [ENTER] key and then select “ON: Enable” from “Function Enable Menu” using [UP] or [DOWN] key, and press the [ENTER] key.

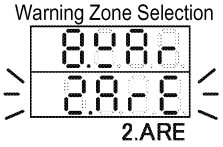


1-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
1-3.Confirm that “GOOD” is displayed. If not, go back to step 1-1.

2 Warning Zone Selection

2-1.Select a range for which “Warning Zone” function should be enabled. You can select a range through 3 ways. From “Zone Selection” menu, press the [ENTER] key and then select “All Zones: ALL”, “From Bottom Beam: LO”, or “From Top Beam: HI” using [UP] or [DOWN] key, and press the [ENTER] key.

(1) All Zones (only for series connection)
(2) From bottom to any beam (Bottom beam indicates one that is closest to the power supply. See figure 1 for a setting example)
(3) From top to any beam (Top beam indicates one that is closest to the series connection.)



If you select (1), go to 2-2.
If you select (2) or (3), go to 2-4.

2-2.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
2-3.For “All Zones: ALL”, confirm that “GOOD” is displayed. If not, go back to step 2-1.

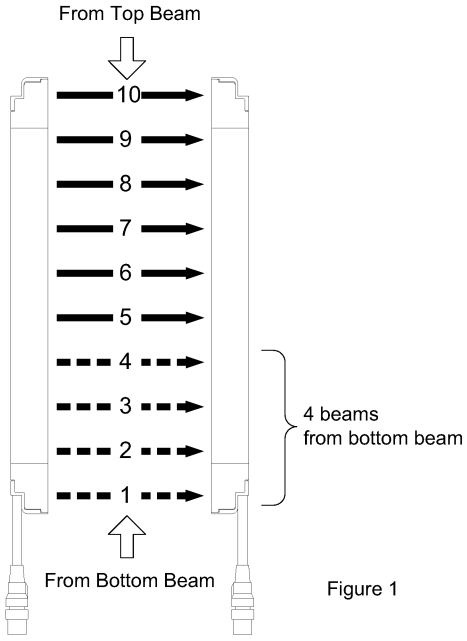
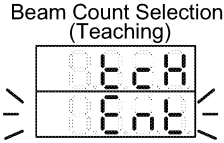


Figure 1

2-4.When the [ENTER] key is pressed for “From Bottom Beam: LO” or “From Top Beam: HI”, it transitions to teaching beam designation.

2-5.[ENT] is displayed. If you want to allow teaching beam designation, interrupt a range for which an warning zone should be configured and press the [ENTER] key. A consecutive zone including bottom or top beam must be interrupted if “From Bottom Beam: LO” or “From Top Beam: HI” is selected, respectively.
If teaching is performed if no beam is interrupted, or top or bottom beam is not interrupted, "ERR" is displayed.
If the interruption condition is not satisfied, or no beam is interrupted, "ERR" is displayed.



2-6.Select number of beams for which “Warning Zone” should be enabled from “Number of Beams Selection Menu”. If “ERR” is displayed, go back to step 2-4. To increase or decrease the configured zone size, adjust number of beams by [UP] or [down] key, and press the [ENTER] key. If you do not want to change the number, press the [ENTER] key as well.

2-7.[ENT] is displayed. If you want to allow setting change, press the [ENTER] key.

2-8.Confirm that “GOOD” is displayed. If not, go back to step 2-1.

2-9.Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

<Precautions>

1. You cannot enable "warning zone function" if either of "fixed blanking function (P.25)" or "floating blanking function (P.32)" is already being enabled, or the connected F3SJ is a "muting system" (Combination of these functions is available only when the zone is set by the PC tool for F3SJ (Model: F39-GWUM)). "OFF" Is Displayed In Menu List (2)-1. For combination of functions, see ("Muting system" indicates a system attached with an optional muting keycap F39-CN6 to F3SJ's emitter or receiver):
   Combination with Muting Override Function

	Fixed Blanking	Floating Blanking	Muting Override
Warning Zone	-	-	-

- : Combination of functions is not available (previously configured function is prioritized and the other functions cannot be enabled later)

2. All zones of 1 set can be configured as an warning zone only for series connection. (See figures 2 and 3)

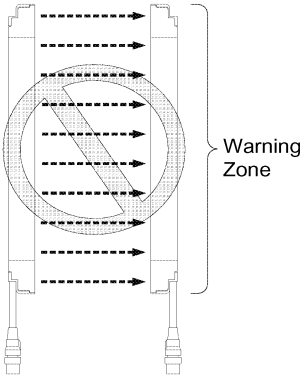


Figure 2

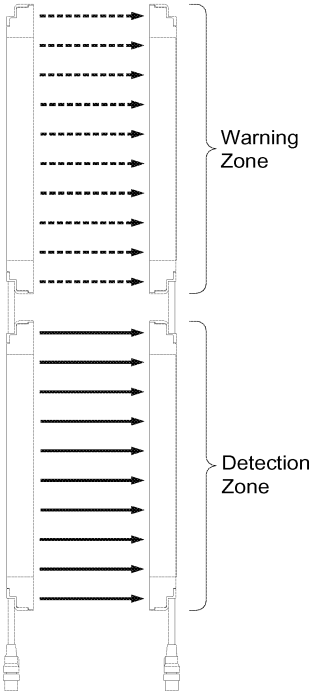


Figure 3

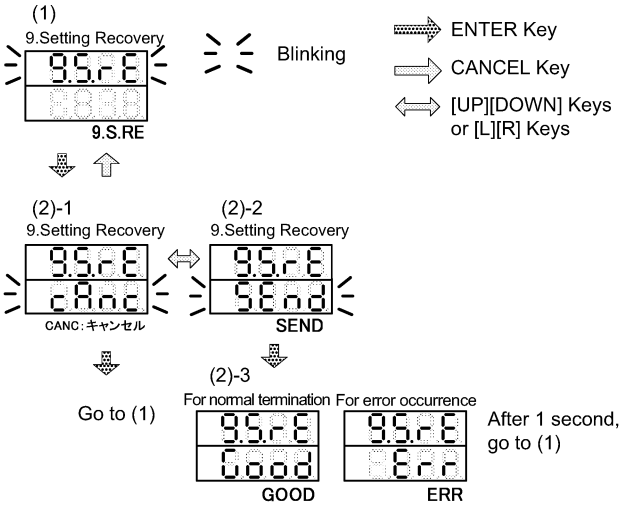
8.9. Setting Recovery Menu

⚠Warning

A sufficiently trained and qualified person must perform setting recovery. Incorrect setting may cause a person to go undetected, resulting in serious injury.

This function is used to reset F3SJ's configuration to factory shipment values. For details of the function, see F3SJ's User's Manual.

■Setting Recovery Menu List



■Setting Recovery Setup Procedure

1 Setting Recovery

1-1. From “Setting Recovery” menu, press the [ENTER] key and then select “SEND” using [UP] or [DOWN] key, and press the [ENTER] key.

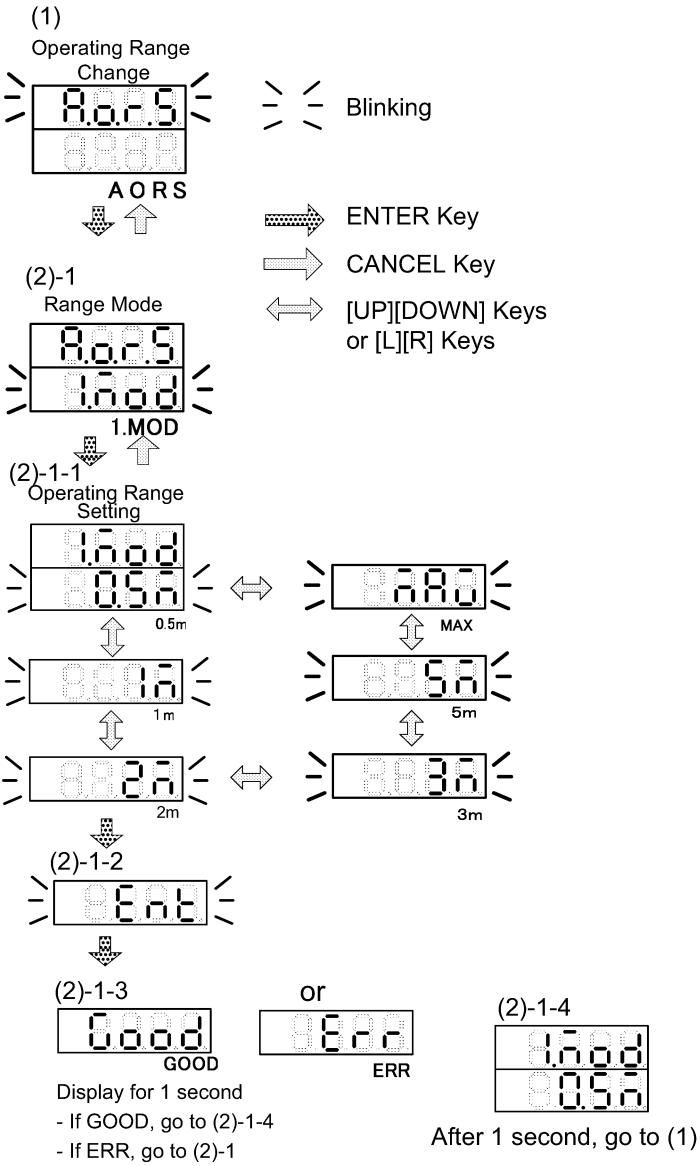
1-2. Confirm that “GOOD” is displayed. If not, go back to step 1-1.

1-3. Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

8.10.Operating Range Change Menu

F3SJ's operating range can be changed. For details of the function, see F3SJ's User's Manual.

■Operating Range Change Menu List



■ Operating Range Change Setup Procedure

1. Press the [ENTER] key and select an operating range from “Operating Range Setting” using [UP] or [DOWN] key. You can select it from 6 options. Then press the [ENTER] key again.
   0.5m, 1m, 2m, 3m, 5m, MAX (default is “MAX”)
2. [ENT] is displayed. If you want to allow setting change, press the [ENTER] key.
3. Confirm that “GOOD” is displayed. If not, go back to step 1.
4. Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

<Precautions>

1. “MAX” of “Operating Range Setting” indicates a rated operating range, which may differ depending on a protected height.

   Rated Operating Range
   F3SJ-A□□□□P(N)xx : If □□□□ ≤ 1649; 9m
   F3SJ-A□□□□P(N)xx : If □□□□ ≥ 1655; 7m
   Ex) For F3SJ-A2117P14, 2117 >= 1655, thus the maximum value (rated operating range) must be 7m.

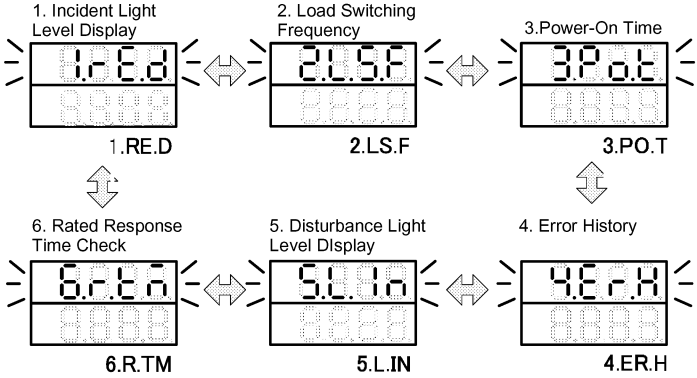
2. When the operating range is changed from its initial setting (MAX) and then an emitter or a receiver is replaced due to a failure of F3SJ or other reasons, set menu shows only the setting recovery menu for reconfiguration of operating range.

9.Check Menu (CHECK)

⚠Warning

After setting change of F3SJ, inspection must be performed by a qualified person to confirm its safety before starting its operation.

Check menu allows a user to monitor F3SJ's operating status. When CHECK is selected in "6. Function Selection" and [ENTER] key is pressed, "1. Incident Light Level Display" is displayed. To select a function: When the [ENTER] key is pressed for the selected function, a user can check the details.



A user can change setting for some functions.

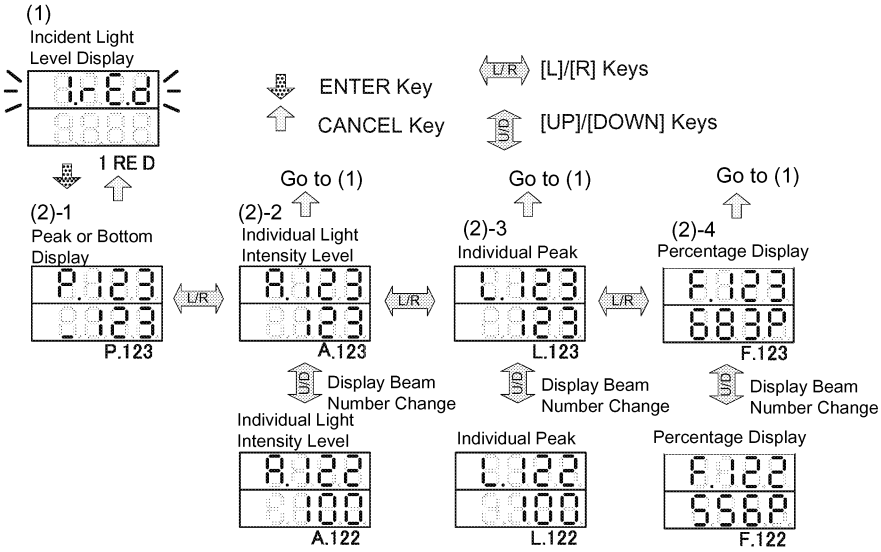
<Precautions for setting change and monitoring>

1. In functional setting, display of "GOOD" after allowing the setting (pressing [ENTER] key while "E N T " is being displayed) indicates completion of the setting. If "GOOD" is not displayed or [ENTER] key is not pressed, the setting is not completed.
2. Do not turn off the power until "GOOD" is displayed after pressing the [ENTER] key. If the power is turned off, F3SJ may not work properly.
3. If F3SJ is under lockout, the check menu shows "4. Error History" only.

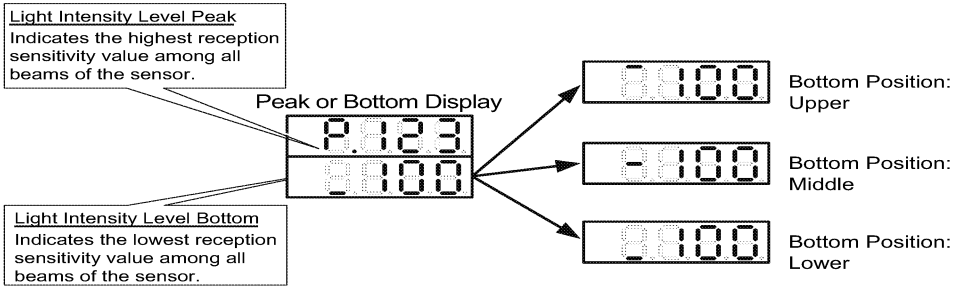
9.1. Incident Light Level Display Menu

Provides indication of F3SJ's receiving light intensity level. This function can be used to check receiving light intensity under current F3SJ installation environment and to adjust beams. For details of number of beams and functions, see F3SJ's User's Manual.

■Incident Light Level Display Menu List



■Peak/Bottom Display



For bottom position, F3SJ's detection zone is divided into 3: "Upper", "Middle", and "Lower".
In an example above, peak and bottom values are "123" and "100" respectively. Bottom position is "Lower", thus F3SJ with 60 beams should have a beam with bottom value from beams 1 to 20. (See figures 1)

(Important)
If there is a big difference between peak and bottom values, an emitter and a receiver may not be installed in parallel (i.e. some beams are unmatched). Adjust beams again.
If the result is not improved yet, there may be following reasons.

- Surfaces of emitter/receiver are partly dirty Clean up the surfaces.
- Emission power or reception sensitivity is partly degraded Replace F3SJ.

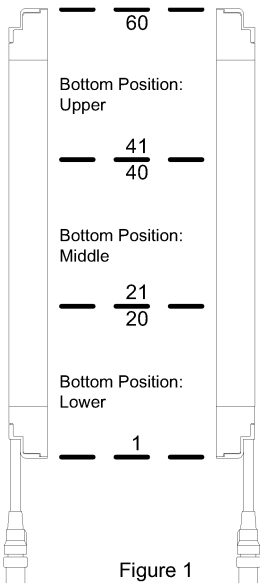
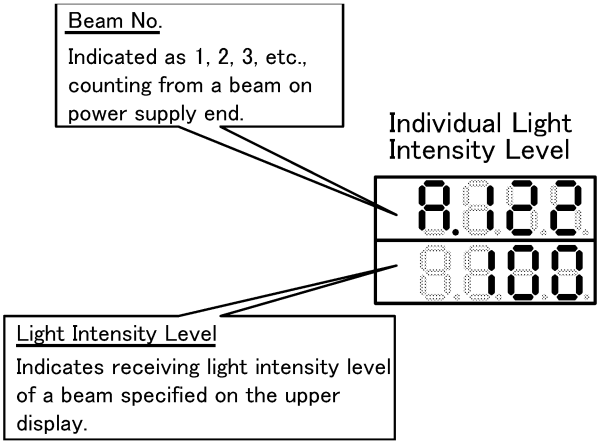


Figure 1

■Individual Light Intensity Level

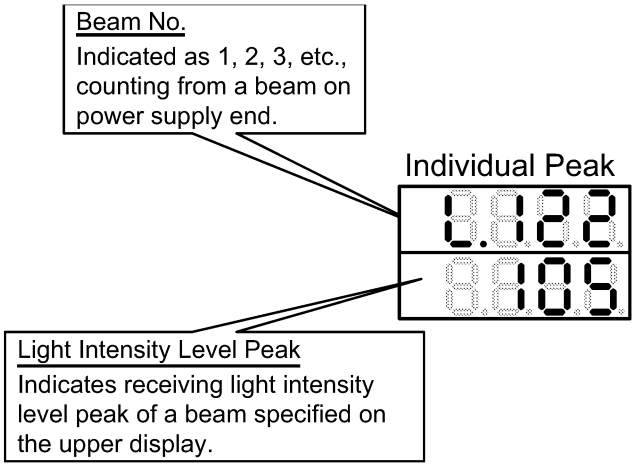
Receiving light intensity of each beam can be checked in realtime.



In an example above, current receiving light intensity level is “100”.

■Individual Peak

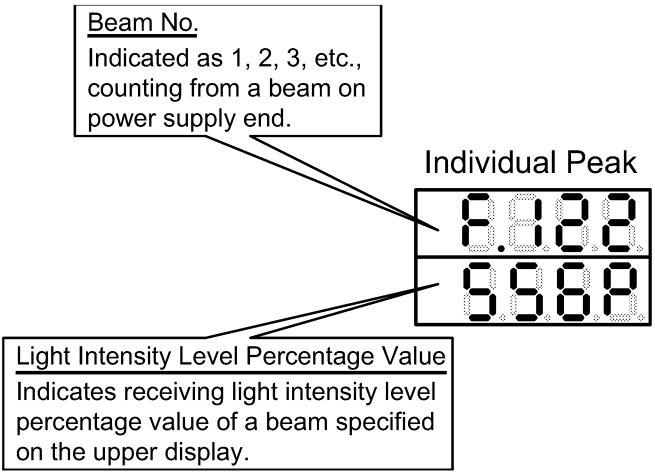
Highest reception sensitivity value among designated beams is held and displayed.



In an example above, receiving light intensity level of “122nd beam” is “105”. While adjusting beams, you can check light intensity from an emitter to receiver for each beam.

■Percentage Display

Percentile value of each beam's receiving light intensity is displayed.



In an example above, receiving light intensity level percentile value of "122nd beam" is "556 percent". It means the value has 5.56 times margin against ON threshold value.

* If the value is over 1000%, it is displayed as "999P"
* If the percentile value is less than 200%, adjust beams again. If the result is not improved yet, there may be following reasons.
  - Operating range is configured as too short Set a longer operating range.
  - Surfaces of emitter/receiver are dirty Clean up the surfaces.
  - Emission power or reception sensitivity is degraded Replace F3SJ.

(Important)

- This function allows a user to adjust beams to maximize receiving light intensity level, providing stable detection.
- Use receiving light intensity level check flow for maintenance in "12. Light Intensity Level - Installation Distance Chart" (P.109) and "Receiving light intensity level - installation distance chart" to check F3SJ's installation conditions.

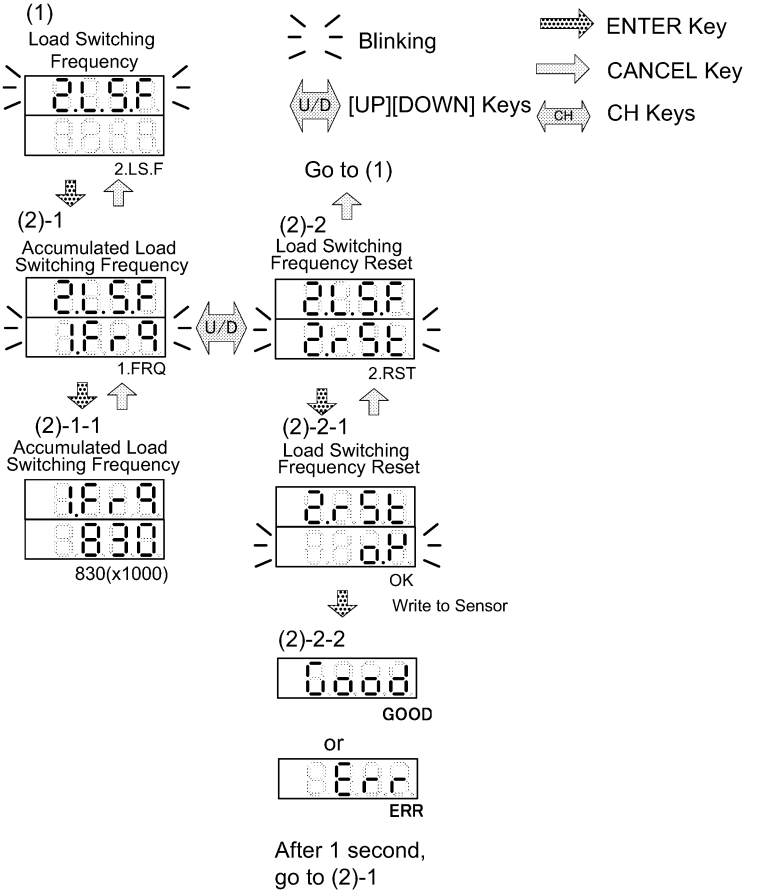
9.2. Load Switching Frequency Menu

Provides monitoring of “Load Switching Frequency” recorded in F3SJ. “Load Switching Frequency” is an accumulated value of safety output OFF count during F3SJ’s operation.

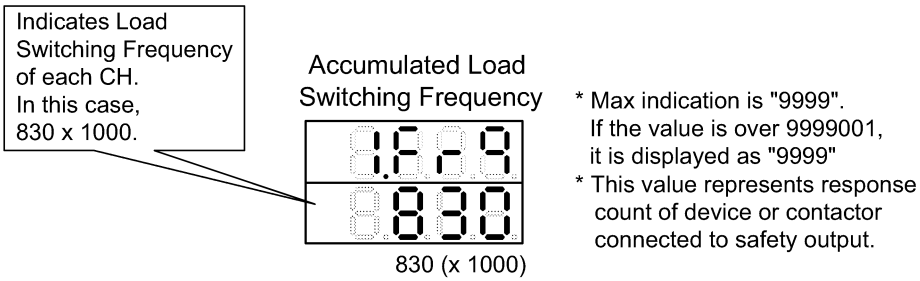
* Digits under hundreds are rounded up for display.
* If “400” is displayed, actual value must be from 399,001 to 400,000 count.

Monitoring “Load Switching Frequency” allows a user to check response count of an external device connected to F3SJ. It can be used for preventive maintenance of an external device. For details of the function, see F3SJ's User's Manual.

■Load Switching Frequency Menu List

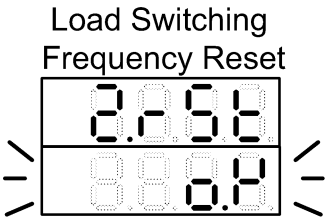


■Accumulated Load Switching Frequency



■Load Switching Frequency Reset

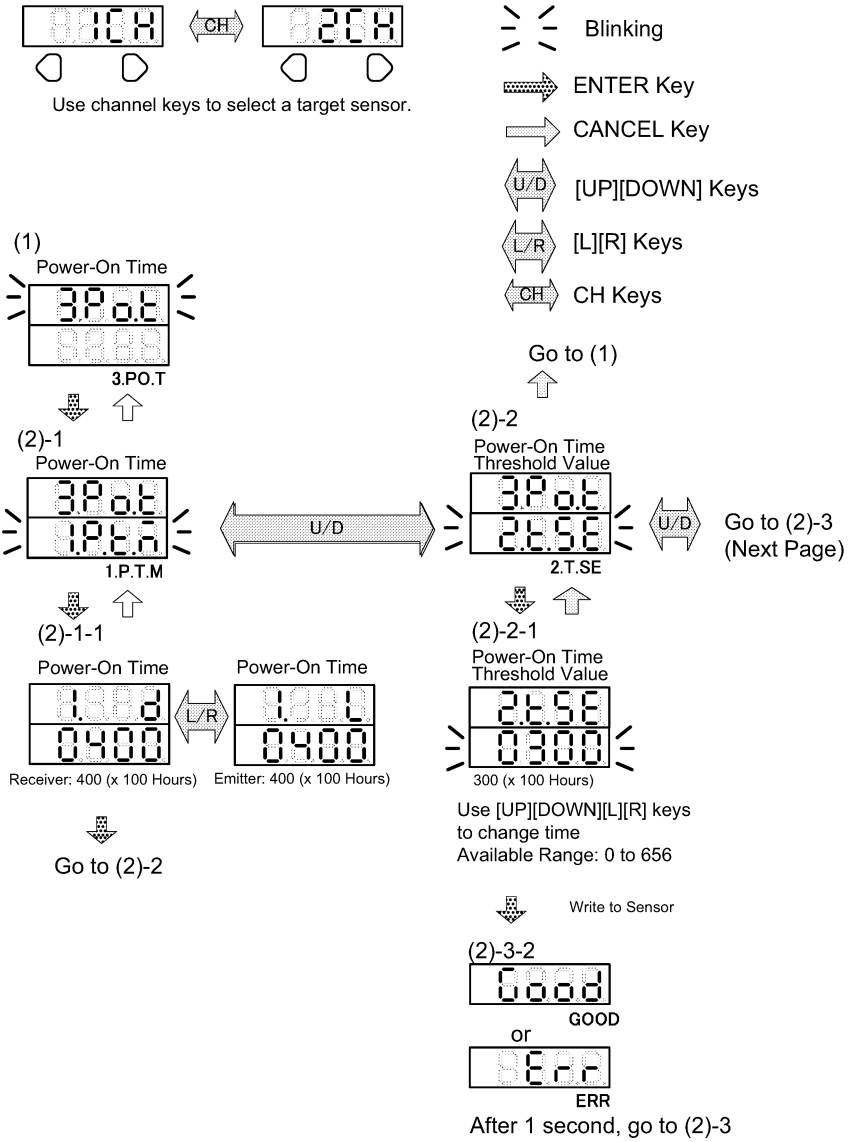
Provides resetting of “load switching frequency” recorded in F3SJ.
Resetting load switching frequency for a newly attached or replaced device or contactor connected to safety output provides recording of response count of these device or contactor.

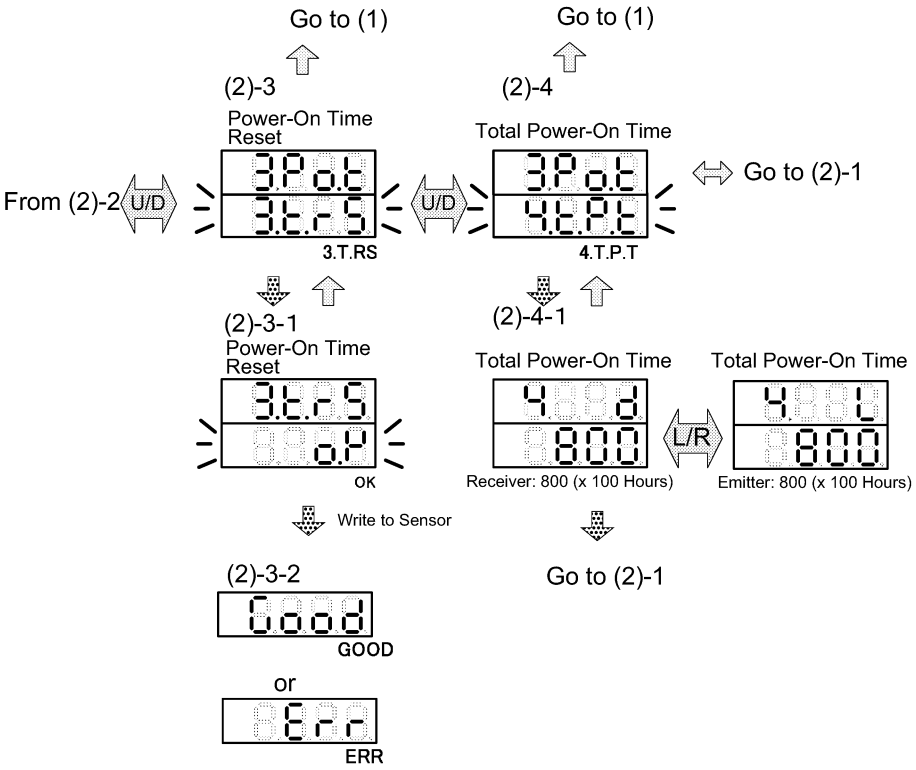


9.3. Power-On Time Menu

Provides F3SJ's power-on time monitor. For details of the function, see F3SJ's User's Manual.

■Power-On Time Menu List



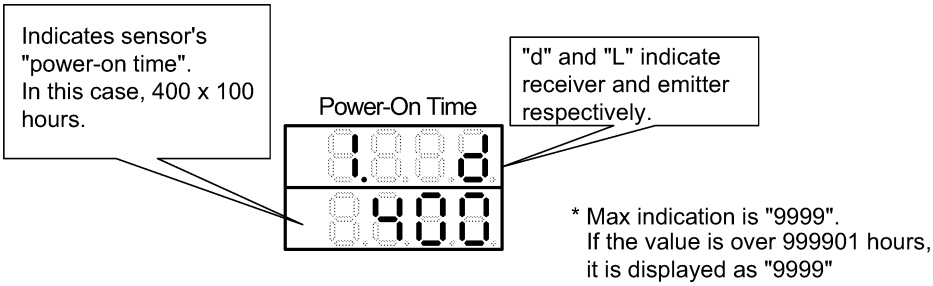


Checking the power-on time of F3SJ provides preventive maintenance for F3SJ and a system including F3SJ.

* Monitoring can be set only by each CH.
* F3SJ records power-on time at every hour.
* Digits under tens are rounded up for display.
* If “400” is displayed, actual value must be from 39,901 to 40,000 count.

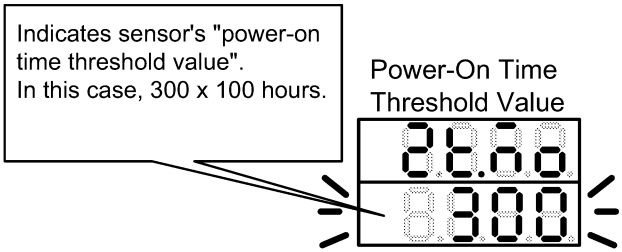
■Power-On Time

“Power-on time” indicates an accumulated power-on time from the first power-on of your purchase to current time of power-on (if “power-on time resetting” was performed, accumulated value since then).
Power-on time can be monitored for an emitter and a receiver independently.



■Power-On Time Threshold Value

F3SJ provides “power-on time notification”. If “power-on time information” is configured for “auxiliary output” or “external indicator output”, the function is enabled. When the power-on time exceeds the configured value(power-on threshold time), “auxiliary output” or “external indicator output” provides ON output.



“Power-On Time Threshold Value” can be configured from 100 to 999900 hours, by 100 hours.

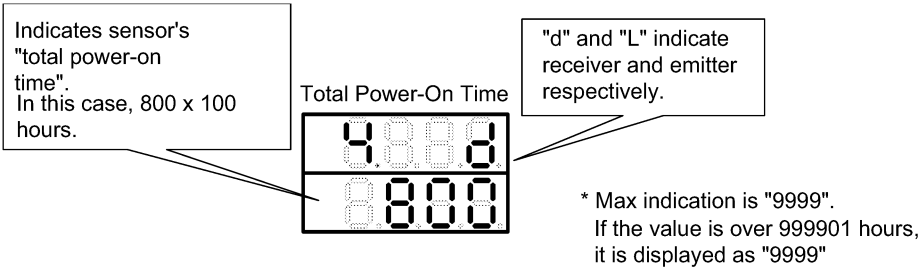
■Power-On Time Reset

Provides F3SJ's "power-on time" resetting. When F3SJ is restarted after resetting, power-on time is counted from 0 again.

* After the reset, power-on time indication of (1) becomes "0".

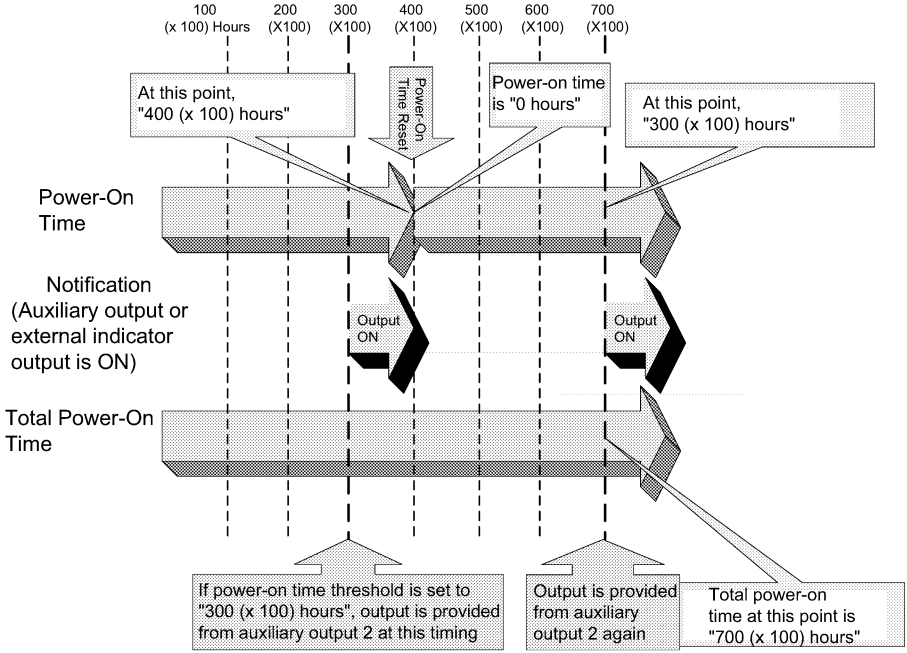
■Total Power-On Time

You can check how long F3SJ has been powered since your purchase.



* This value cannot be reset.

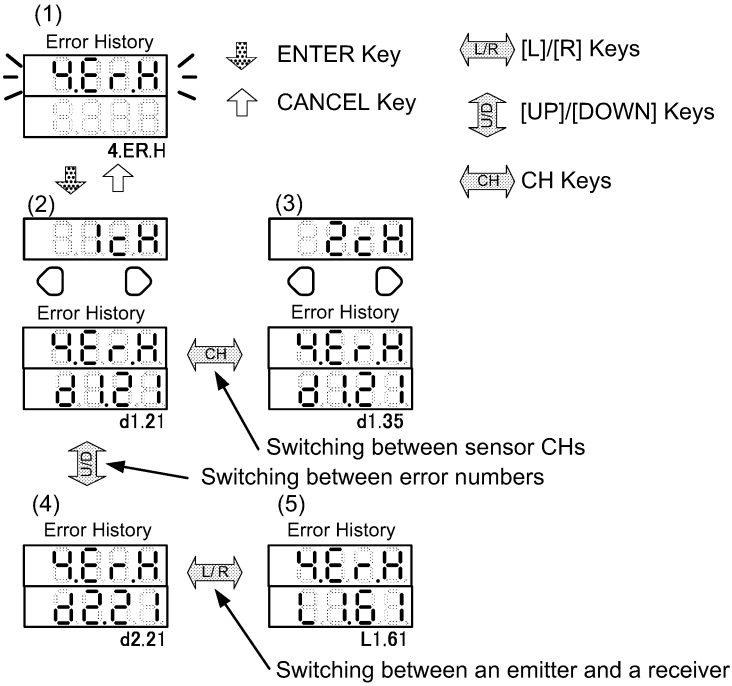
Example of Power-On Time Chart



9.4. Error History Menu

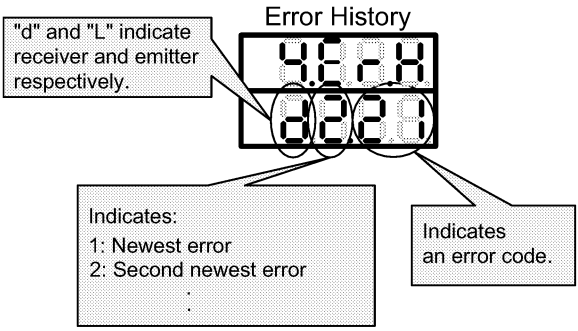
Provides display of error log recorded in F3SJ. For details of the function, see F3SJ's User's Manual.

■Error History Menu List



■ Error History Indication

Up to 10 error logs can be displayed. For detail of Error History, refer to "11.2. F3SJ Error Description Indicated in Error History" (P.96) in "11. Troubleshooting"



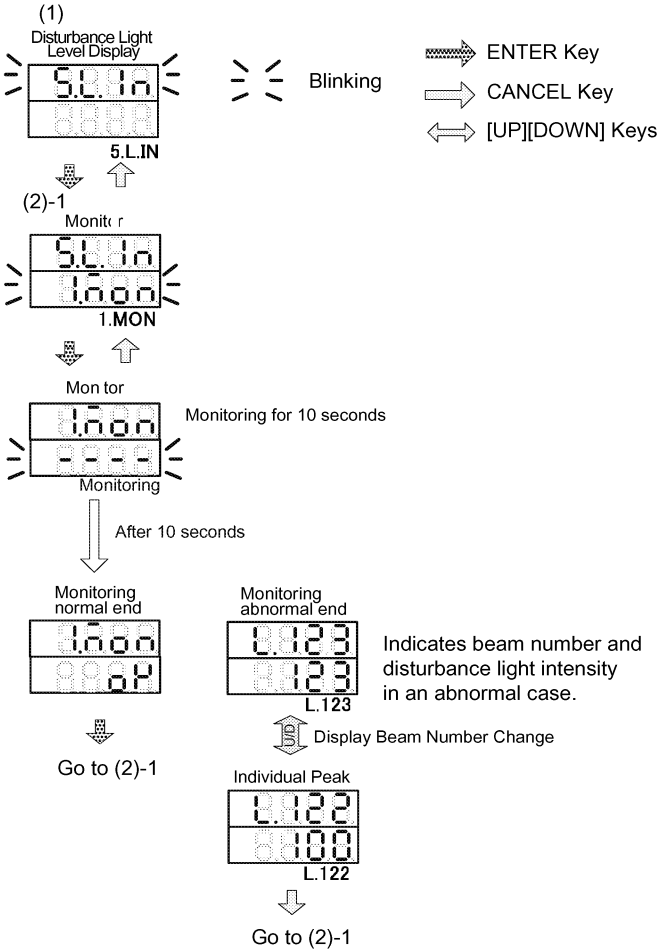
<Precautions>

1. F3SJ transitions to the lockout state due to communication error if F39-MC is connected while F3SJ is being turned on. To check error history when F39-MC is connected while F3SJ is being turned ON, skip the most recent error occurred and check the second error and later.
2. When an error occurred, a supply voltage error may be recorded in addition to the original error code if supply voltage is out of specification range.

9.5. Disturbance Light Level Display Menu

Provides checking of influence by disturbance light. For details of the function, see F3SJ's User's Manual.

■Disturbance Light Level Display Menu List

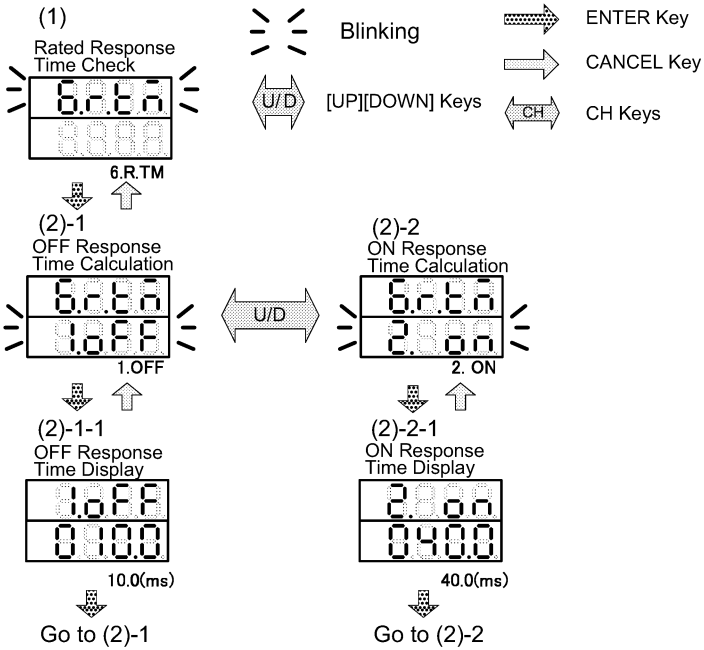


When disturbance light is detected, beam number and disturbance light intensity under its influence is displayed.
If no disturbance light is detected, “OK” is displayed.
If more than one beam detected disturbance light, up and down keys can be used to change beam number for display.
If disturbance light intensity could not be monitored due to communication error, "ERR" is displayed and indication becomes that of (2)-1 after 1 second.

9.6. Rated Response Time Check Menu

Provides readout of F3SJ's rated response time.For details of the function, see F3SJ's User's Manual.

■Rated Response Time Check Menu List

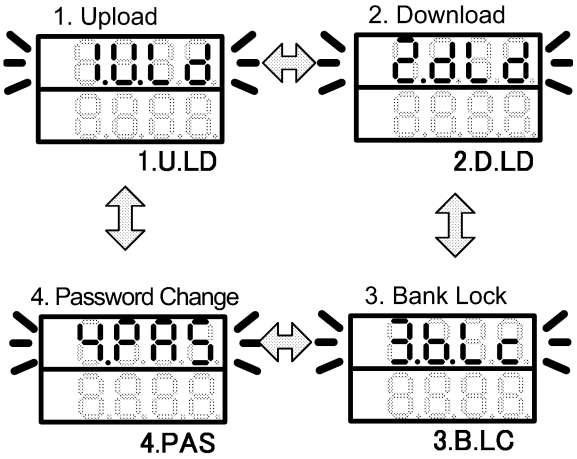


OFF response time (time from ON to OFF) and ON response time (OFF to ON) can be displayed. In case of series connection, rated response time (ms) of the whole F3SJs in the series connection.

10.COPY/PROTECT Menu (COPY/PROTECT)

⚠Warning
After setting change of F3SJ, inspection must be performed by a qualified person to confirm its safety before starting its operation.
Setting change must be performed under compliance with related laws and regulations.

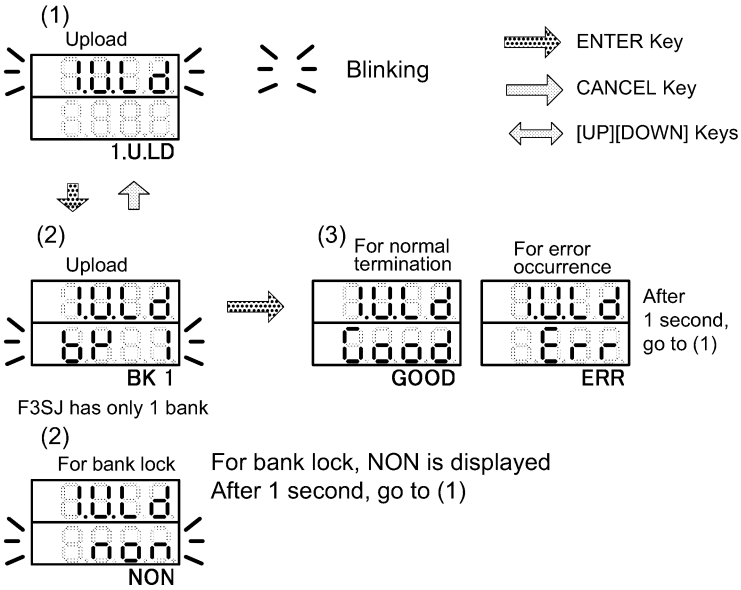
- When COPY/PROTECT is selected in "6. Function Selection" and [ENTER] key is pressed, “1. Upload” screen is displayed
- Copy function allows a user to copy F3SJ’s setting to another F3SJ.
- Setting to be copied includes all functions available for configuration by SET and CHECK menus.
- F39-MC has memory (bank) to store data of F3SJ. Data of the bank is stored in F39-MC’s EEPROM, thus will not be lost even if the power is turned off. Storage capacity is data of 1 F3SJ unit.
- To prevent important data to be erroneously erased, bank can be locked (bank lock).



10.1.Upload Menu

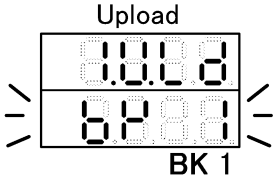
Setting data of one F3SJ unit is copied to F39-MC's bank (internal memory).

■Upload Menu List



■Upload Setup Procedure

1. Press the [ENTER] key on "Upload" menu, confirm that "BK 1" is displayed, and press the [ENTER] key. For bank lock, "NON" is displayed.

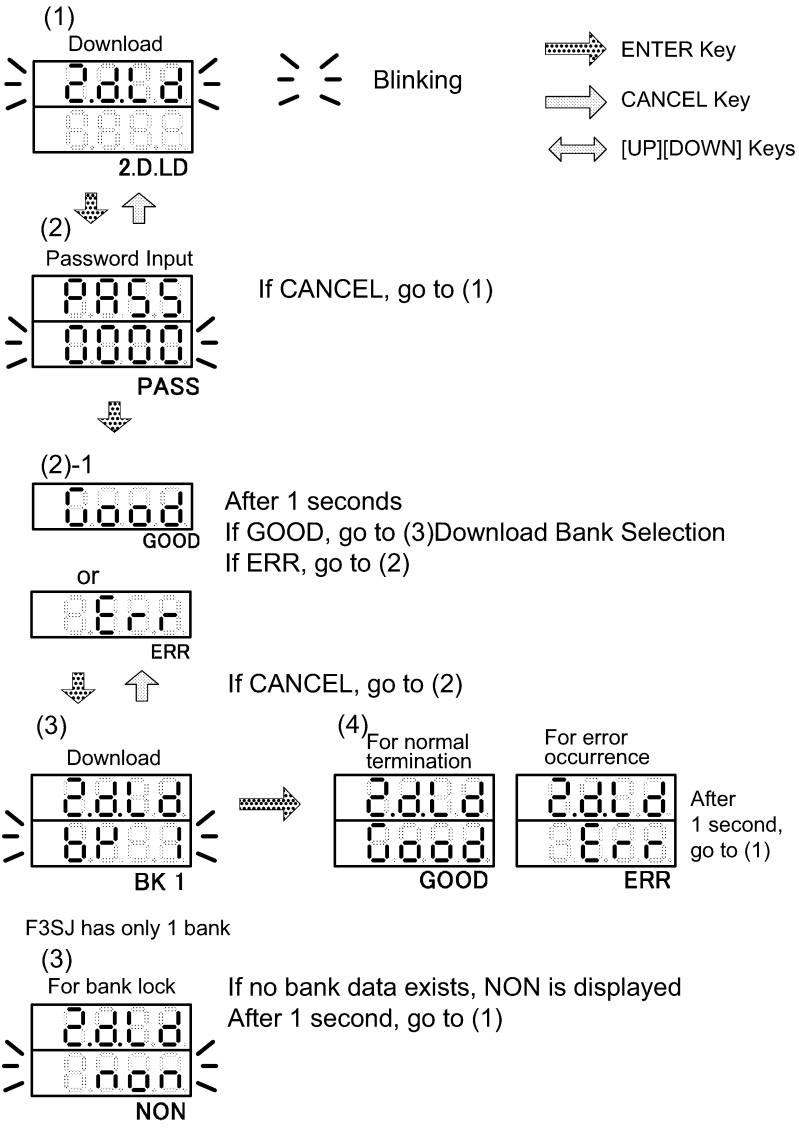


2. Confirm that "GOOD" is displayed. If not, go back to step 1.
3. Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

10.2.Download Menu

Setting data stored in F39-MC's bank is copied to one F3SJ unit.

■Download Menu List



■Download Setup Procedure

1. Press the [ENTER] key on “Download” menu. If “PASS” is displayed, enter the password and press the [ENTER] key. Use [UP] or [DOWN] key to select alphanumeric characters (uppercase for alphabets), [L] or [R] key to select a column, then enter a password.
2. Confirm that “GOOD” is displayed. If not, go back to step 1 and enter the password again.
3. Confirm that “BK 1” is displayed on “Download” menu, and press the [ENTER] key. Then select a CH to write setting data by channel keys, and press the [ENTER] key while a CH is being displayed. For no bank data, “NON“ is dis

4. Confirm that “GOOD” is displayed. If not, go back to step 1. If no bank data exists, “NON” is displayed.
5. Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

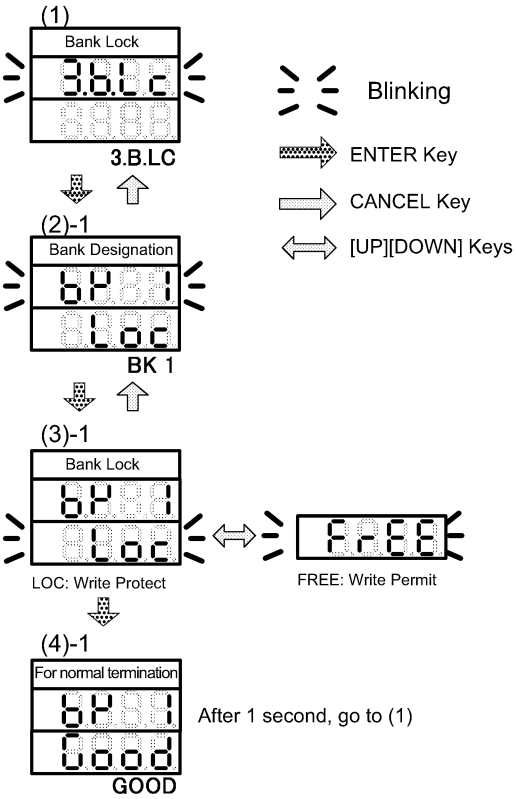
<Precautions>

Download is not available if a F3SJ model registered in the bank and downloading F3SJ model are unmatched.

10.3.Bank Lock Menu

To inhibit overwrite to a bank storing F3SJ's setting data, write protect can be set.

■Bank Lock Menu List



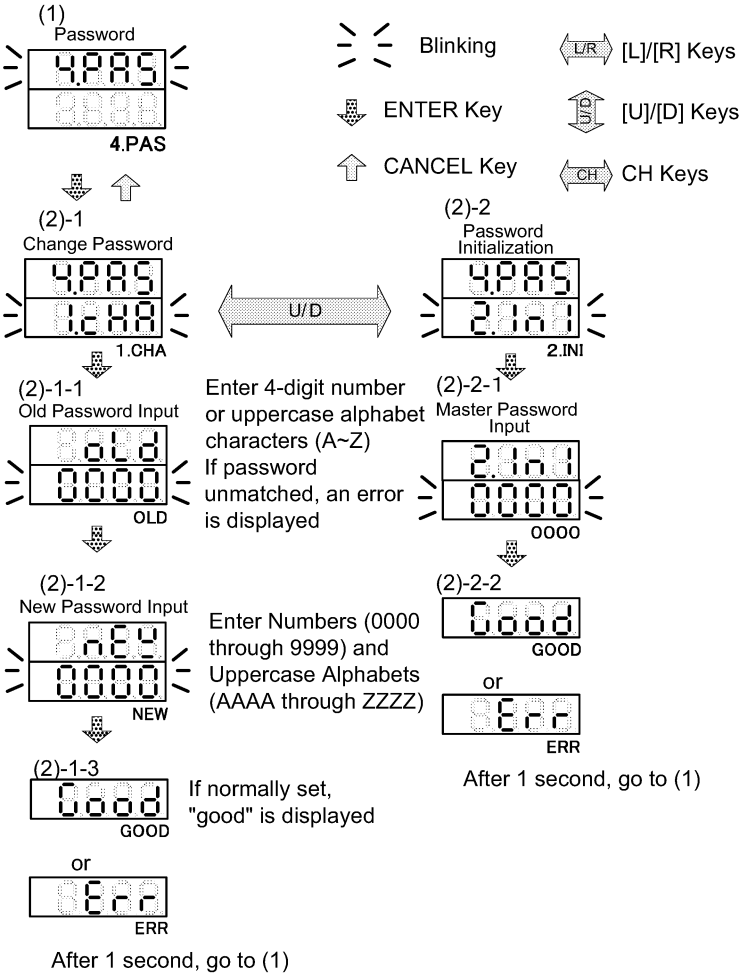
■Bank Lock Setup Procedure

1. Press the [ENTER] key on "Bank Lock" menu, then select "Write Protect: LOC" or "Write Permit: FREE" using [UP] or [DOWN] key, and press the [ENTER] key again.
2. Confirm that "GOOD" is displayed. If not, go back to step 1.

10.4.Password Change Menu

Entering password is required to change F3SJ's setting from setting menu. This password can be changed.
This function can be used to allow only a qualified person to perform F3SJ's setting change.

■Password Change Menu List

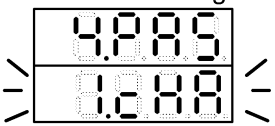


■Password Change Setup Procedure

1 Password Change

1-1.To change the password, press the [ENTER] key on “Password Change” menu.

Password Change



1.CHA

1-2.“OLD“ is dispalyed. Then enter the current password, and press the [ENTER] key. To enter a password, use [UP] or [DOWN] key to select alphanumeric characters (uppercase for alphabets), [L] or [R] key to select a column. Its default value is “0000”.

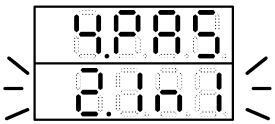
1-3.If it is incorrect, “ERR” is displayed. If the current password is correct, “NEW“ is displayed, then enter a new password. A password must consist of 4-digit alphanumeric characters (uppercase for alphabets). Then press the [ENTER] key again.

1-4.Confirm that “GOOD” is displayed. If not, go back to step 1-1.

2 Password Initialization

2-1.To initialize the password (to the default value “0000”), press the [ENTER] key on “Password Initialization” menu.

Password Initialization



2.INI

2-2.Enter the master password, and press the [ENTER] key. To enter a password, use [UP] or [DOWN] key to select alphanumeric characters (uppercase for alphabets), [L] or [R] key to select a column. If you forget the password changed, contact our customer service office with a serial number labeled on your F3SJ's receiver.

A master password will be issued to reset to the initial password "0000".

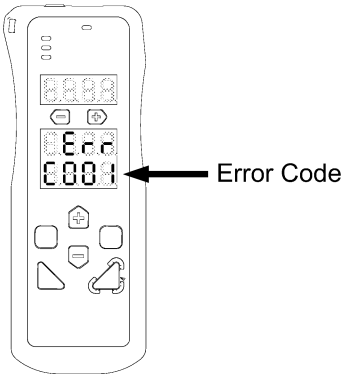
2-3.Confirm that “GOOD” is displayed. If not, go back to step 2-1.

2-4.Detach F39-MC from F3SJ and turn on F3SJ again. Confirm that F3SJ works properly.

11.Troubleshooting

11.1.Details of errors indicated when trouble occurs

An error may be displayed as shown in the left.



See below for error codes and details displayed on the lower zone of the mode indication.

Code	Error Description	Cause	Action
C001	Model error	An emitter and a receiver are different models.	Use those with the same model.
		Models of F3SJs under series connection are different.	Use the same model (protected height and detection capability can differ) of F3SJ for series connection.
		Versions of F3SJs under series connection are different.	Version of all F3SJs under series connection must be 2 or higher. For identification of F3SJ's version, see "1. Overview P1"

Code	Error Description	Cause	Action
C002	Communication error	F3SJ of version 1 is connected.	F3SJ of version 1 cannot be connected. For identification of F3SJ's version, see "1. Overview P1".
		Other sensor than F3SJ is connected.	Other sensor than F3SJ, such as F3SN series, cannot be connected.
		Communication error occurred while communication with F3SJ.	Turn its power on again. Check if the wiring is correct. Check loose connection between connector or terminal board, and that there should be too much noise.
C003	Connection error	Connection failure with operating F3SJ. (such as communication line breakage)	Check if the wiring is correct. Check loose connection between connector or terminal board, and that there should be too much noise.
C004	Failure of F39-MC	Failure of F39-MC's internal circuit.	Contact our sales representative.
C005	Failure of F39-MC	Failure of F39-MC's internal circuit.	Contact our sales representative.
C007	Exceeding maximum connection count error	Number of F3SJs under series connection exceeds 4 sets.	Number of F3SJs under series connection must be 4 sets or less.
C008	Exceeding maximum beam count error	Total number of beams of F3SJs under series connection exceeds 400.	Total number of beams of F3SJs under series connection must be 400 or less
C009	Receiver shortage error	Number of receivers under series connection is less than that of emitters.	Number of receivers under series connection must be the same as that of emitters.
C00A	Emitter shortage error	Number of emitters under series connection is less than that of receivers.	Number of receivers under series connection must be the same as that of emitters.

■Typical Problems

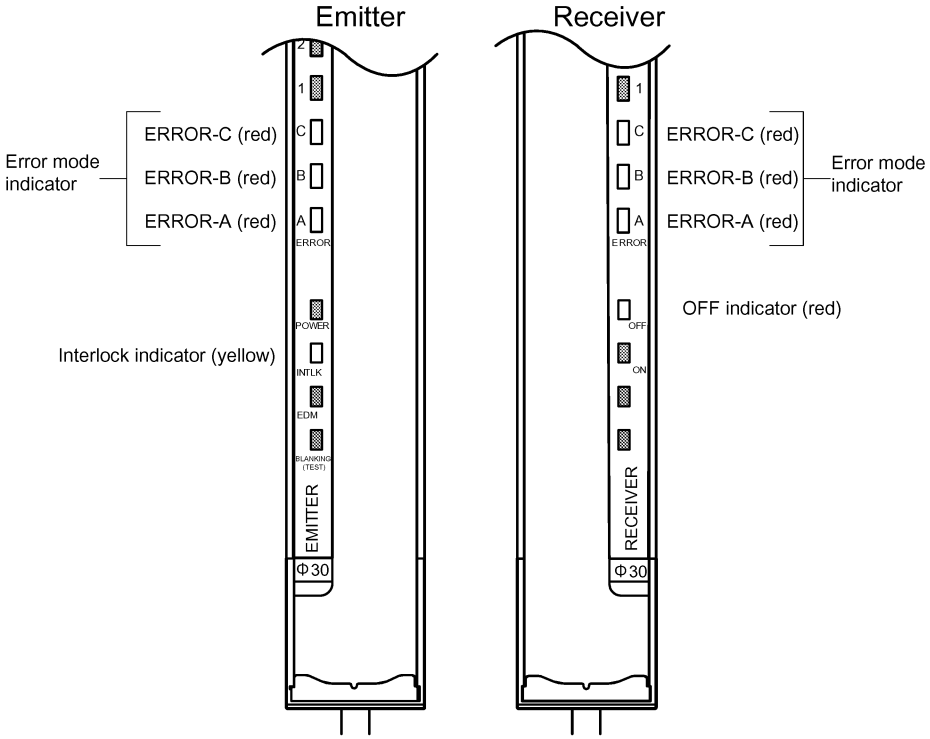
1. F39-MC cannot be turned on.
   Cause: (1) A dedicated cable or a branch connector is not properly attached.
   (2) Power supply capacity is too small.
   Action: (1) Perform the proper wiring.
   (2) Replace the power supply with one having larger capacity. Consumption current of F39-MC is 55mA max.
2. F39-MC's communication connection indication cannot be turned on, or "Not conn" is displayed.
   Cause: (1) F39-MC was connected after F3SJ's power on.
   (2)More than one F39-MC is connected.
   Action: (1) Turn ON the power of F3SJ and F39-MC at the same time.
   (2) Only one F39-MC unit must be connected.
3. "Err" is displayed when writing to F3SJ.
   Cause: (1) F3SJ's communication line is disconnected between an emitter and a receiver.
   (2) Communication line between a plugged dedicated cable and F3SJ.
   (3) Effect of noise is excessive.
   (4) Internal circuit of F3SJ or F39-MC is broken.
   Action: (1) Check the wiring condition.
   (2) Check the noise environment around F3SJ and F39-MC.
   (3) Replace F3SJ or F39-MC.
4. Set menu shows "setting recovery" menu only.
   Cause: (1) F3SJ transitioned to lockout.
   (2) A parameter is configured that cannot be read from nor written to F39-MC by the PC tool for F3SJ is configured for F3SJ.
   Action: (1) Solve the problem of F3SJ's lockout.
   (2) Execute setting recovery.
5. Set menu shows "error history" only.
   Cause: (1) F3SJ transitioned to lockout.
   Action: (1) Solve the problem of F3SJ's lockout.
   (2) Execute setting recovery.

11.2.F3SJ Error Description Indicated in Error History

■Lockout State

If F3SJ detects any failure, it keeps safety output OFF and transitions to lockout state. Under lockout state, an emitter and a receiver set interlock indicator and OFF indicator blinking respectively, and F3SJ that detected the failure sets an error mode indicator ON or blinking based on the failure. Solve the problems based on the table below. *1
Eliminate the cause of the problem. Turning the power on again or providing reset input resets the F3SJ.

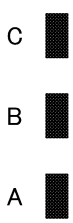
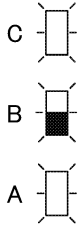
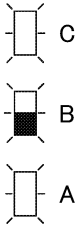
*1 If communication error is indicated on primary sensor's receiver, it may be caused by other F3SJ (emitter or secondary sensor)If a connector was disconnected before, especially in series connection, ensure that connection should not be loose and that internal connector pins should not be bent.

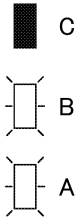
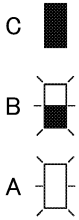
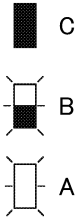



ON

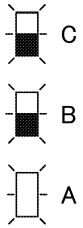

Blinking

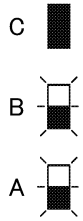
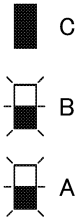
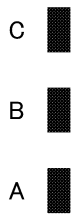
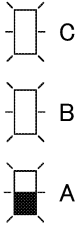

OFF

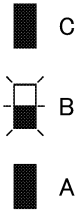
Emitter	Receiver	Error Code	Error Description	Cause	Solution
		10、11	Mutual interference error	Disturbance light is received.	Interrupt the disturbance light. [Refer to: F3SJ-A User's Manual Chapter 4 "Mutual Interference Prevention"]
				The receiver is receiving light emitted from another photoelectric switch or F3SJ.	See Chapter 4 "Mutual Interference Prevention". [Refer to: F3SJ-A User's Manual Chapter 4 "Mutual Interference Prevention"]
		19 *2	Power supply capacity error	Power supply voltage is outside the rated range.	Connect to a 24VDC± 20% power supply voltage.
				Voltage fluctuation due to insufficient power supply capacity.	Replace the power supply with one that has a larger capacity.
				Instantaneous break or instantaneous stop due to power sharing with other devices.	Do not share the power supply with other devices, and connect to a power supply that is dedicated to devices for electrical-detection protective functions, such as the F3SJ, safety controller, muting sensor, etc.

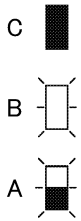
Emitter	Receiver	Error Code	Error Description	Cause	Solution
		20	Blanking monitoring error	A fixed blanking beam other than allowable beams received light.	Adjust a position of the device so that a fixed blanking beam other than allowable beam should not receiver light. Or, configure fixed blanking setting again. [Refer to: F3SJ-A User's Manual Chapter 3 "Floating Blanking Function"]
				Number of interrupted beams is less than (number of floating blanking beams - number of allowable beams).	Set number of floating blanking beams and number of allowable beams based on a size of interrupting object. [Refer to: F3SJ-A User's Manual Chapter 3 "Floating Blanking Function"]
		30、31、32、37、39	Communication error	The communication line or other wiring is broken or short-circuited.	Check the wiring and cables.
				Communication error due to noise.	Check the noise level in the environment around the communication line.
				A power cable or series connection cable connector is detached.	Check connectors of power cable and series-connection cables.
				Connection positions are reversed for emitter(s) and receiver(s) under series connection.	Correct connection positions of all F3SJ's emitters and receivers.
				Failure of F3SJ's internal circuit.	Replace the F3SJ.
				The setting tool is connected to series connection that includes F3SJ of version 1.	The setting tool cannot be used if the connection includes F3SJ of version 1. Do not connect F3SJ of version 1.

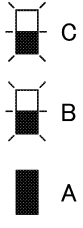
Emitter	Receiver	Error Code	Error Description	Cause	Solution
C B A	C B A	38	Lockout of other sensor than the primary receiver (error mode indicator will not turn on)	A sensor other than the primary receiver is in lockout when series-connected.	Solve the problem of an emitter or F3SJ in a series connection.

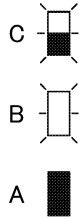
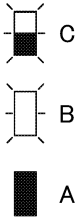
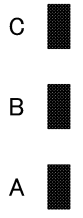
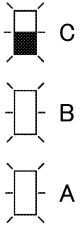
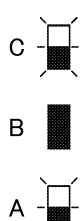
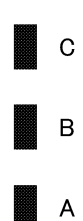
Emitter	Receiver	Error Code	Error Description	Cause	Solution
		3A	Excessive number of beams	Total number of beams of F3SJs under series connection exceeds 400.	Rearrange series connection so that total number of beams of series connection should not exceed 400.
		3B	Excessive number of connected sensors	Five or more sensors are connected.	Number of F3SJs under series connection must be 4 or less.
		3C	Model error (between series connection)	Models of the primary sensor and secondary sensor are unavailable for connection. (Primary: PNP Output, Secondary: NPN Output, etc.)	Connect them properly. [Refer to: F3SJ-A User's Manual Chapter 4 "Series Connection"]
		3D	Model error (between emitter/receiver)	Models are different between an emitter and a receiver (lengths, output types, or beam gaps are different)	
		3E	Sensor count error (no emitter)	Number of emitters under series connection is less than that of receivers (emitters: 3, receivers: 4, etc.)	
		3F	Sensor count error (no receiver)	Number of receivers under series connection is less than that of receivers (emitters: 4, receivers: 3, etc.)	

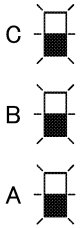
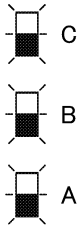
Emitter	Receiver	Error Code	Error Description	Cause	Solution
		40	Setting value error	Function setting value configured by the setting tool is out of valid range.	When recovery is not possible, perform setting recovery to restore factory settings. [Refer to: F3SJ-A User's Manual Chapter 3 "Setting Recovery"]
				Muting enabling keycap is attached but muting/override information is not assigned to either of auxiliary output 1, external indicator output 1 or 2.	To use muting function, muting/override information must be assigned to at least one of auxiliary output 1, external indicator output 1 or 2. [Refer to: F3SJ-A User's Manual Chapter 3 "Auxiliary Output" or "External Indicator Output"]
		4E	Cap position error	Failure of F3SJ's internal circuit.	Replace the F3SJ.
		4F	Cap error	Cap is not attached.	Attach the cap properly.

Emitter	Receiver	Error Code	Error Description	Cause	Solution
		50、51、52、53	External device monitoring error	Relay is welded.	Replace the relay.
				The relay and external device monitoring input line are not properly wired.	Check the wiring for the relay.
				The relay response time exceeds the allowable delay time.	Replace the relay with one that has an appropriate response time. Or, change the device monitoring time by the setting tool. [Refer to: F3SJ-A User's Manual Chapter 3 "External Device Monitoring Function"]
				If short-circuit is made to an auxiliary output instead of a relay, the auxiliary output line is broken or short-circuited.	Make sure there is no failure in the external device monitoring input and auxiliary output lines. Or, use the setting tool to set output mode of auxiliary output 1 to safety output information and enable reverse output mode (factory shipment setting). [Refer to: F3SJ-A User's Manual Chapter 3 "Auxiliary Output"]
				Emitter(s) and receiver(s) are reversely connected when connected to connector type controller. (Connectors of F3SP-B1P's emitter/receiver are reversely attached, etc.)	Check connectors' positions.

Emitter	Receiver	Error Code	Error Description	Cause	Solution
		5B	Failure of interlock selection input line	The interlock selection input line is broken or short-circuited.	Check wiring of interlock selection input line.
		5E	Interlock wiring error	The reset input line and interlock selection input line are not properly wired.	Check that wiring has been made for auto reset or manual reset. [Refer to: F3SJ-A User's Manual Chapter 2 "Wiring Diagrams" in ""Basic System"]
				Connection positions are reversed for emitter(s) and receiver(s).	Correct connection positions and directions of all F3SJs. [Refer to: F3SJ-A User's Manual Chapter 4 "Series Connection"]
				Connection direction is upside down for emitter(s).	
				Emitter(s) and receiver(s) are reversely connected when connected to connector type controller. (Connectors of F3SP-B1P's emitter/ receiver are reversely attached, etc.)	Check connectors' positions.
		5D	Muting wiring error	The reset input line is not properly wired when muting enabling keycap is attached.	Wire the reset input line properly. [Refer to: F3SJ-A User's Manual Chapter 2 "Wiring Diagrams" in ""Muting System"]

Emitter	Receiver	Error Code	Error Description	Cause	Solution
		60、61、62、63、64、65	Safety output error (1)	The safety output lines are short-circuited to each other.	Wire the output lines properly.
				Safety output line and 24V, 0V, or other input/output line are short-circuited at power on.	
				Failure of safety output circuit.	Replace the receiver.
				Connection positions are reversed for emitter(s) and receiver(s), or their directions are upside down.	Correct connection positions and directions of all F3SJs.[Refer to: F3SJ-A User's Manual Chapter 4 "Series Connection"]
			Series connection cable error (1)	Safety output error occurred due to short circuit, breakage, or disconnection of series connection cables.	Check if series connection cables are connected properly. Replace a series connection cable if it is broken.
		66、67、68、69	Safety output error (2)	Safety output lines are short-circuited to each other after power on.	Wire the output lines properly.
				Safety output line and 24V, 0V, or other input/output line are short-circuited after power on.	
			Series connection cable error (2)	Safety output error occurred due to short circuit, breakage, or disconnection of series connection cables.	Check if series connection cables are connected properly. Replace a series connection cable if it is broken.

Emitter	Receiver	Error Code	Error Description	Cause	Solution
		70	External indicator output error	The external indicator output and 24V, 0V, or other input/output line are short-circuited when diagnosis function of an external indicator output is being enabled. Or, an external indicator output line is broken.	Perform the proper wiring.
				Load (such as indicator or relay) connected to an external indicator output is broken.	Replace the load.
				Failure of external indicator circuit.	Replace the F3SJ.
		71	Auxiliary output 1 error	The auxiliary output line and 24V, 0V, or other input/output line than external device monitoring input line are short-circuited when diagnosis function of an auxiliary output 1 is being enabled. Or, an auxiliary output line is broken.	Perform the proper wiring for auxiliary output 1.
				Load (such as indicator or relay) connected to an auxiliary output 1 is broken.	Replace the load.
				Failure of auxiliary output 1 circuit.	Replace the F3SJ.
		80	Series connection cable error (3)	Series connection cable is broken. (Test input line of a series connection cable is broken)	Replace the series connection cable.

Emitter	Receiver	Error Code	Error Description	Cause	Solution
		Error code other than those above	Effect of noise.	Effect of noise is excessive.	Check the noise level in the surrounding environment.
			Lockout of other F3SJ in the series connection	Failure occurred in another F3SJ under series connection.	Solve the problem of F3SJ in a series connection.
			Failure of F3SJ's internal circuit.	F3SJ's internal circuit is damaged.	Replace the F3SJ.

*2 When an error occurred, a supply voltage error may be recorded in addition to the original error code if supply voltage is out of specification range.

■Problem under other state than lockout

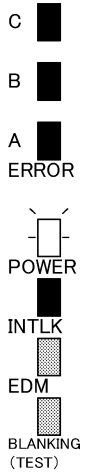
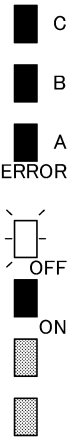
Shown below are actions to take when F3SJ does not work properly while no lockout occurred or no error code is displayed.

 ON

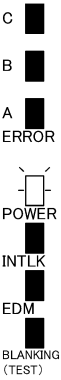
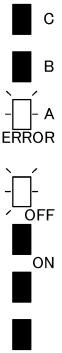
OFF

ON, OFF, or Blinking according to setting condition

- Light intensity level indicators do not turn ON even if a beam receives light, while only the power indicator and OFF output indicator are being turned ON

Emitter	Receiver	Cause	Action
		Beam is misaligned.	Adjust the beam so that it should receive light. A beam will not receive light if its installation surface is tilted or its height is misaligned. If the beam still does not receive light after adjustment, detach the F3SJ from installation surface, set an emitter and a receiver face to face, and check if the beam receives light. [Refer to : F3SJ-A User's Manual Chapter 4 "Adjuxtment Procedure" in "Mounting"]
		Operating range is too short.	Use the setting tool to configure longer operating range. [Refer to : F3SJ-A User's Manual Chapter 3 "Operating Range Change Function"]
		Test input is being applied.	Check if the test indicator is blinking. If it is blinking, set the test input OFF or open.
		Detection surface of an emitter or a receiver is dirty.	Clean the surface.
		A blanked beam received light that is not configured as an allowable beam while fixed blanking function is being enabled and monitoring function is configured as release at uninterrupted.	(1) A fixed blanking zone is configured wider. Configure the zone again, or execute teaching. (2) If (1) did not solve the problem, configure allowable beams. If one allowable beam has been already configured, set 2 beams as allowable beams.

- Light intensity level indicators do not turn ON even if a beam receives light, while only the power indicator, OFF output indicator, and receiver's error code A are being turned ON

Emitter	Receiver	Cause	Action
		Communication line is broken between an emitter and a receiver, or effect of noise on the communication line is too much.	Perform the proper wiring. Or, check the noise level in the environment around the communication line.
		Power connector is detached.	Plug the power connector tightly to ensure connection.

- Safety output may be turned OFF even if a beam is not uninterrupted.

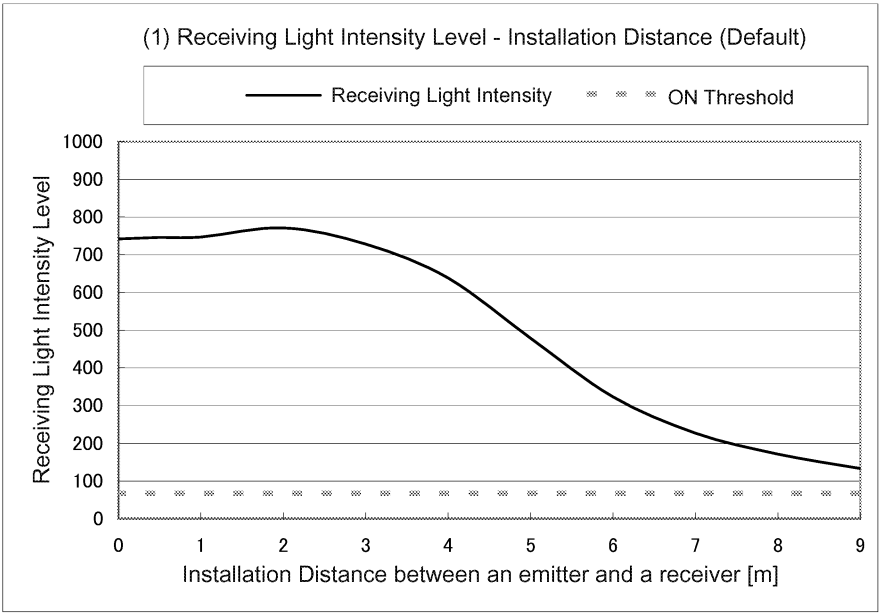
Cause	Action
Beam may be misaligned due to oscillation.	Install F3SJ sop that it should not be affected by oscillation. Also, adjust F3SJ beams based on F3SJ-A User's Manual Chapter 4 "Adjustment Procedeure".
Light emitted from another F3SJ or photoelectric sensor is being received.	Solve the problems based on F3SJ-A User's Manual Chapter 4 "Mutual Interference Prevention".
A blanked beam received light that is not configured as an allowable beam while fixed blanking function is being enabled and monitoring function is configured as release at uninterrupted.	Configure an allowable beam. If one allowable beam has been already configured, set 2 beams as allowable beams.

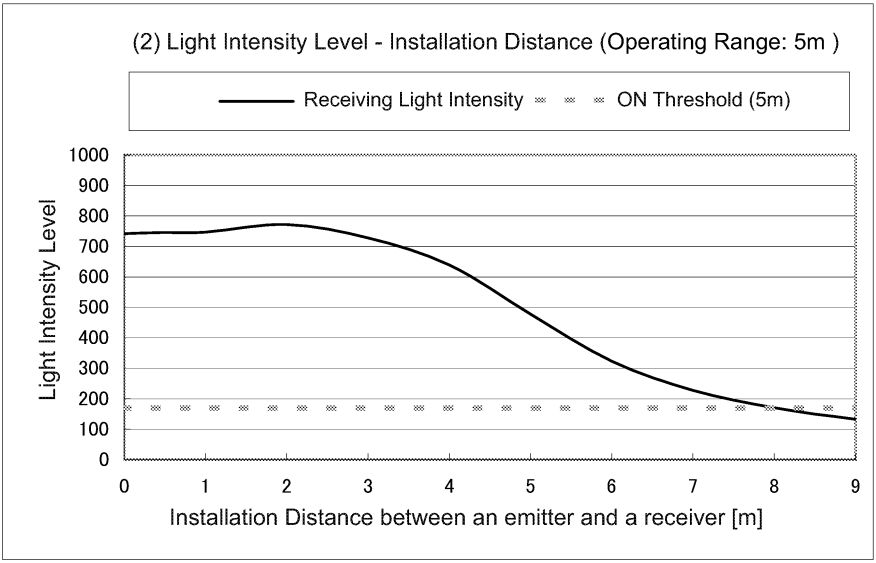
12.Light Intensity Level - Installation Distance Chart

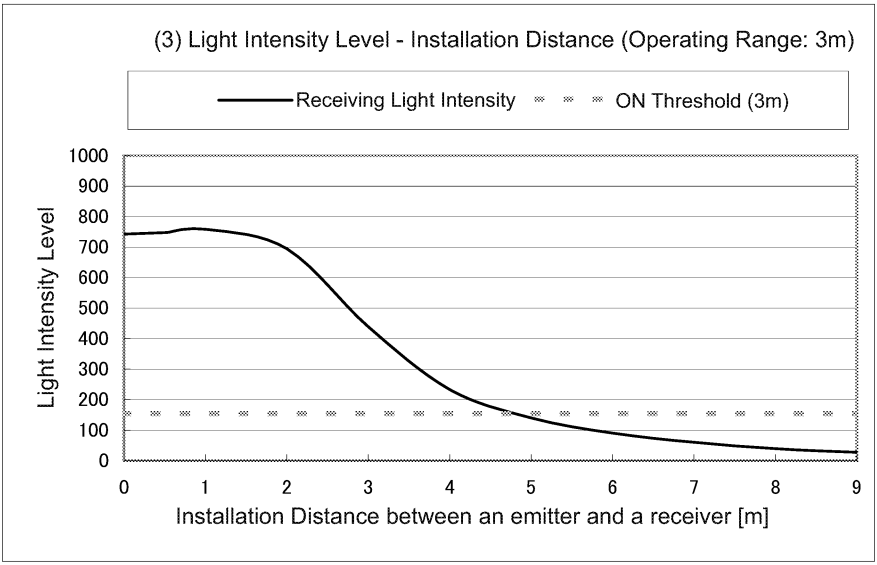
Provides receiving light intensity level when beams are properly adjusted under each installation distance (representative value). Use the data for installation and maintenance.

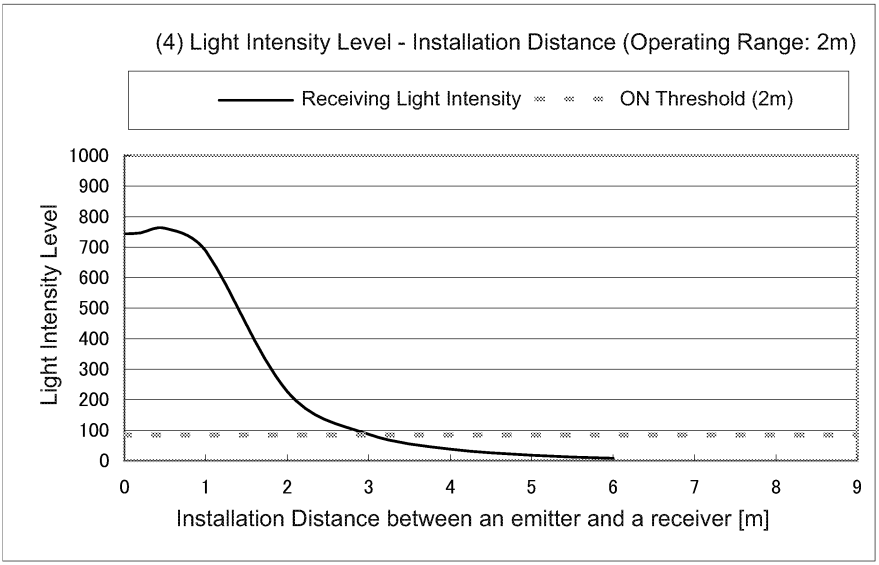
■Using Chart Display

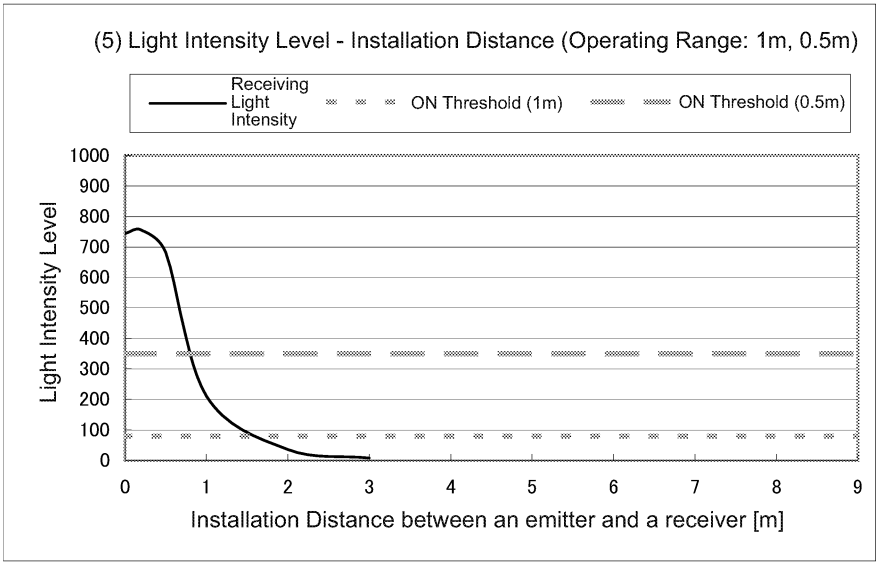
- Compare bottom light intensity value in the peak/bottom indication and receiving light intensity level charts from (1) to (5) in "Chapter 9.1. Incident Light Level Display." If the receiving light intensity level is far less than the chart levels, check if beams are misaligned or emission/reception surface is dirty.
- Chart (1) indicates initial status without a change of the operating range.
- Charts from (2) to (5) indicate those with a change of the operating range in "Chapter 8.10 Changing Operating Range."
- As a guideline, install the sensor so that the receiving light intensity level should be twice or higher than the ON threshold value.




(2) Light Intensity Level - Installation Distance (Operating Range: 5m)
Receiving Light Intensity
ON Threshold (5m)
Light Intensity Level
1000
900
800
700
600
500
400
300
200
100
0
0
1
2
3
4
5
6
7
8
9
Installation Distance between an emitter and a receiver [m]

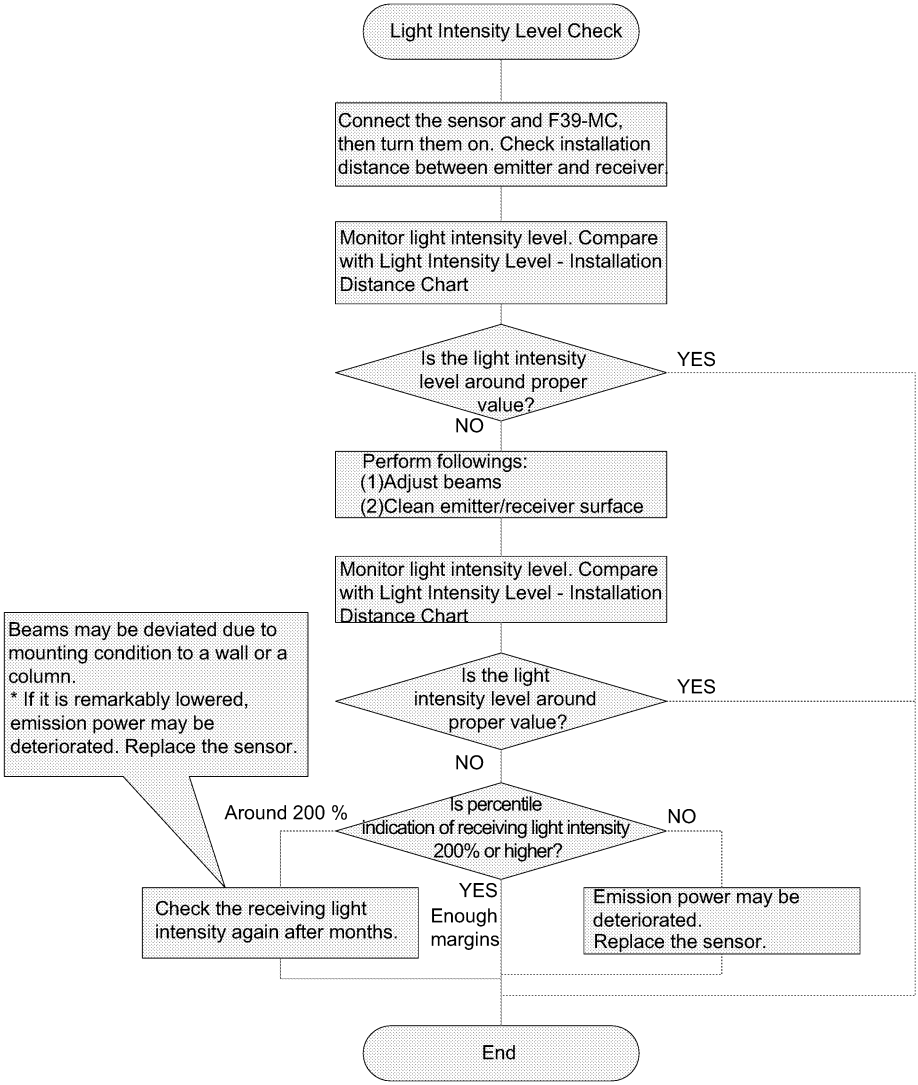

(3) Light Intensity Level - Installation Distance (Operating Range: 3m)
Receiving Light Intensity
ON Threshold (3m)
Light Intensity Level
1000
900
800
700
600
500
400
300
200
100
0
0
1
2
3
4
5
6
7
8
9
Installation Distance between an emitter and a receiver [m]


(4) Light Intensity Level - Installation Distance (Operating Range: 2m)
Receiving Light Intensity
ON Threshold (2m)
Light Intensity Level
1000
900
800
700
600
500
400
300
200
100
0
0
1
2
3
4
5
6
7
8
9
Installation Distance between an emitter and a receiver [m]


(5) Light Intensity Level - Installation Distance (Operating Range: 1m, 0.5m)
Receiving Light Intensity
ON Threshold (1m)
ON Threshold (0.5m)
Light Intensity Level
1000
900
800
700
600
500
400
300
200
100
0
0
1
2
3
4
5
6
7
8
9
Installation Distance between an emitter and a receiver [m]

12. Light Intensity Level - Installation Distance Chart

Check flow of receiving light intensity level for maintenance



13.Glossary

Term		Description
A	Accumulated Load Switching Frequency	Provides indication of F3SJ's accumulated count of load switching frequency operations since its power-on.
	Allowable delay time	Indicates maximum value of external device's operation time after safety output changes. F3SJ transitions to the lockout state if the external relay monitor input does not change when the time exceeds this maximum value.
	Auxiliary output	Unsafe output that can change output signal. This CANNOT be used for safety applications.
	Auxiliary output diagnosis function	Locks out F3SJ when an auxiliary output 1 is broken or short circuited.
B	Bank lock	Inhibits overwrite to a bank storing F3SJ's setting data.
	Basic System	Indicates F3SJ as it is purchased.The basic system provides basic safety light curtain functions. Most functions can be used without performing additional configuration.
	Beams-in-concatenation mode (Floating blanking)	Keeps output ON even when beams are interrupted if a size of interrupted beams is within a range configured from a contiguous zone.
	Blanking Beam Light Receiving Information (Auxiliary/External)	Provides ON output when an interrupting object is removed from a fixed or floating blanking zone.
	Blanking/Warning zone information (Auxiliary/External)	If fixed blanking, floating blanking, or Warning zone function is enabled, output turns ON when an enabled zone receives light.
	Both end beams disabling mode (Floating blanking)	Mode under which beams of both ends are excluded from floating blanking. If this mode is enabled, and if either of beams on the end is interrupted, output is turned OFF regardless of number of floating beams.
D	Disturbance Light Level Display	Indicates disturbance light intensity from other photoelectric sensor into F3SJ.

Term		Description
	Download	Setting data stored in F39-MC's bank is copied to one F3SJ unit.
E	Error/Lockout Information (Auxiliary/ External)	Provides output when F3SJ is under lockout state.
	External indicator output	Used to turn on muting lamps, etc. This CANNOT be used for safety applications.
	External indicator diagnosis	Locks out F3SJ when an external indicator line connected to an external indicator output is broken or short circuited.
	External device monitoring function	This function detects malfunctions, such as welding, in external devices (or contactors) that control the hazardous zone of a machine. It can detect malfunction such as contact welding. Evaluation time for this function can be changed for a device to be used. Available range for allowable delay time is from 0.1 to 2.5s, by 0.1s step.
F	Fixed Blanking Zone	Indicates a zone for which fixed blanking function is configured.The setting console can configure 1 zone while PC tool for F3SJ can 5 zones.
	Fixed blanking function	Disables part of F3SJ's detection zone. Output will not be changed even if an object goes into the disabled zone. If the interrupting object is removed and the disabled zone receives light, the sensor locks out and safety output immediately turns OFF. Power cycle or reset input resets this.
	Floating Beams (Floating Blanking)	Indicates a number of interrupted beams that does not cause lockout of F3SJ nor turn safety output OFF if floating blanking function is enabled.
	Floating Blanking Zone	Indicates a zone for which floating blanking function is configured.The setting console can configure 1 zone while PC tool for F3SJ can 5 zones.
	Floating blanking function	Function by which output is turned OFF when more than one beam of F3SJ is interrupted. Number of floating beams can be set from 1 to 4.

Term		Description
I	Incident Light Level Display	Provides readout of F3SJ's receiving light intensity.
	Interlock	Keeps the safety output OFF until the reset input is applied after the safety is ensured.
	Interlock Information (Auxiliary/External)	Provides output through auxiliary output or external indicator if the sensor is under interlock state.
L	Light diagnosis information (Auxiliary/External)	Outputs ON when unstable status stays for 3 seconds or longer. Degradation of optical capability caused by dirty optical surface, deviated beam, or LED deterioration. Unstable status represents status when receiving light intensity is within a range of threshold value+/-30%.
	Lighting-up pattern	Setup that provides pulse output of external indicator. Its default value is ON. If a cycle is set, an external indicator can blink. Blink cycle can be set as 0.5s/1s/2s.
	Load Switching Frequency	Count of F3SJ's safety output from ON to OFF is recorded to F3SJ main unit every 15 minutes, and the value is displayed.
	Lockout	Keeps safety output OFF when an error is detected by F3SJ.
	Lower beams	Indicate beams on F3SJ's power supply end.
M	Maintenance Status	Status when the setting tool is connected. This status has the following difference comparing with the normal operation status. - Safety outputs stay OFF. - The OFF-state indicator blinks when one or more beams are blocked. - The ON-state indicator blinks when no beams are interrupted. - The power indicator blinks. - Lockout state does not occur except by model error, communication error, setting value error and internal circuit failure.

Term		Description
	Manual reset mode	Mode under which interlock function is valid. This mode can be selected for interlock selection input line or reset input line.
	Muting function	Temporarily disables safety function of F3SJ, keeping control output ON even if beams are interrupted.
	Muting/Override information	An external indicator turns ON while muting or overriding.
	Muting time limit	Time to be continued for muting function. If muting state exceeds this time, the function is canceled.
N	Non-concatenation mode (Floating blanking)	When total number of interrupted beams in a floating blanking zone reaches the designated number or more, it is evaluated as interruption.
	Number of Allowable Beams	Allowable fixed blanking beams. It represents a beam out of the target of fixed blanking monitoring although it is a fixed blanking zone.
		Allowable floating blanking beams. F3SJ enters lockout if a size gets under setting value for contiguous floating mode with monitoring function enabled.
	Number of floating beams	Indicates number of beams for floating blanking. A size of an object for which safety output does not turn ON depends on this value and the model.
O	Operating Range Change Function	Changes operating range based on F3SJ's installation distance.
	Output Operation Mode	Output provided by auxiliary output or external indicator output.
	Override function	Function that forcibly turns the safety output ON when the muting start condition is not satisfied.
	Override time limit value	Time to be continued for override function. If override state exceeds this time, the function is canceled.

Term		Description
P	PC Tool for F3SJ	A set of configuration tool that connects to a PC to execute setup using the setting software (SD Manager).It can configure and monitor all the functional settings.
	Power-On Time Information (Auxiliary/ External)	Provides output when power-on time exceeds the power-on time threshold value.
	Power-on time threshold value	When power-on time exceeds this value, it can be output to auxiliary output and external indicator output.
	Power-on time	Power-on time from when the power-on time is reset to now.
	Power-on time reset	Resets F3SJ's power-on time to 0.
	Primary Sensor	Name of the F3SJ placed nearest the power supply in a series-connection.
R	Rated response time	Provides readout of F3SJ's rated response time.
	Restart interlock function	Function that holds the safety output to OFF (interlock state) when F3SJ is interrupted. When a reset operation is performed while no interrupting object exists in a detection zone, the interlock state can be canceled. This function is enabled only under manual reset mode.
	Reverse output mode	Enabling this function allows output to be reversed.
S	Safety Output	Provides output when receiving light.This can be used for safety applications.
	Safety Output Information (Auxiliary/External)	Provides output when safety output is ON.
	Secondary Sensor	Name used for other F3SJ than the primary sensor in a series-connection.
	Setup Tool	Indicates the setting console F39-MC21 and PC tool for F3SJ F39-GWUM.
	Setting recovery function	Resets F3SJ's settings to the factory shipment values.

Term		Description
	Setting Console	Handy tool that changes and monitors settings.It can be carried with a user on site.
	Short Detection	When short-circuit is detected between output terminals for external indicator, F3SJ is transitioned to lockout.
	Start interlock function	Function that holds the safety output to OFF (interlock state) even when the power is turned on. When a reset operation is performed while no interrupting object exists in a detection zone, the interlock state can be canceled. This function is enabled only under manual reset mode.
T	Teaching	Function that configures a zone by setting beams under interruption while setting a zone for muting, fixed blanking, or warning zone function.
	Test input ON information (External)	An external indicator turns ON when test input is ON. When a test input turns ON, F3SJ activates external diagnosis function.
U	Upload	Setting data of one F3SJ unit is copied to F39-MC's bank.
	Upper beams	Indicate beams on F3SJ's terminal end.
W	Warning Zone Information (Auxiliary/External)	Provides output when an warning zone is interrupted
	Warning Zone Function (Auxiliary/External)	A state of uninterrupted/interrupted of a warning zone doesn't affect safety output operation. When an output operation mode of auxiliary output or external indicator output is configured as a warning zone, its uninterrupted/interrupted state can be output.
	Wire Breakage Detection	When breakage is detected between output terminals for external indicator, F3SJ is transitioned to lockout.

14.Configuration Recording Card

When setting is changed, record the details in a table below.

Function	Setting	
Fixed Blanking Function	Function	Disabled/Enabled
	Beam Designation	_____ (Record the specified beam)
Floating Blanking Function	Function	Disabled/Enabled
	Floating Blanking Mode	1/2
	Number of floating beams	1/2/3/4
	Number of allowable beams	1/2/3
	Both End Beam Disabling	Disabled/Enabled
Auxiliary Output	Output Selection	1/2
	Output Operation Mode	Safety Output Information Light Diagnosis Information Error/Lockout Information Muting/Override Information Blanking/Warning Zone Information Power-On Time Information Warning Zone Information Test Input ON Information Blanking Beam Light Receiving Information Interlock Information Muting Error Information Excess Load Switching Frequency Information
	Reverse Output Mode	Disabled/Enabled
	Lighting-Up Pattern (Auxiliary Output 1 Only)	On/Off[0.5s]/Blink[1.0s]/ Blink[2.0s]
	Auxiliary Output Diagnosis Function (Auxiliary Output 1 Only)	Disabled/Enabled

Function	Setting	
External Indicator Output	Output Selection	1/2
	Output Operation Mode	Auxiliary Output Information Light Diagnosis Information Error/Lockout Information Muting/Override Information Blanking/Warning Zone Information Power-On Time Information Warning Zone Information Test Input ON Information Blanking Beam Light Receiving Information Interlock Information Muting Error Information Excess Load Switching Frequency Information
	Reverse Output Mode	Disabled/Enabled
	Lighting-Up Pattern	On/Off[0.5s]/Blink[1.0s]/ Blink[2.0s]
	External Indicator Diagnosis	Disabled/Enabled
External Device Monitoring Function	Function	Disabled/Enabled
	Allowable Delay Time	____s (0.1 to 2.5)
Interlock Function	Start Interlock	Disabled/Enabled
	Restart Interlock	Disabled/Enabled
Muting/Override Function	Muting Zone Selection	All Beams/Partial (Bottom Beam No./Top Beam No.)
	Muting Time Limit	_____s (1 to 600), Infinite
	Override Time Limit	_____s (1 to 600)

Function	Setting	
Warning Zone Function	Warning Zone Function	Disabled/Enabled from upper/Enabled from lower
	Warning Zone Selection	All Beams Partial (From bottom/From top, # of beams)
Operating Range Change	Operating Range	0.5m/1m/2m/3m/5m/MAX
Password Setting	Password	___4-digit Alphanumeric

15.Indication Character List

0	1	2	3	4	5	6	7	8	9
									
A	B	C	D	E	F	G	H	I	J
									
K	L	M	N	O	P	Q	R	S	T
									
U	V	W	X	Y	Z	-	-	-	-
						-	-	-	-

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