Digital Fiber Amplifier

D2RF/D2GF Series

D2RF-T□ D2GF-T□

D2RF-TC□ D2GF-TC□

Instruction Manual

- Thank you for purchasing DSA Series. We hope you are fully satisfied with this product and enjoy its performance.
- Carefully read this instruction manual and keep it for future reference.

Carefully read and understand the safety precautions before operation.
The important information is provided to protect your health and property.
Do not apply any other installing or operating procedure other than that described in this manual.

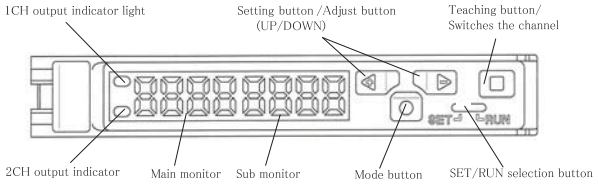
Safety Precautions

⚠ CAUTION

- It is dangerous to wire or attach/remove the connector with the power on. Make sure to turn off the power before operation.
- Make sure to use the product with the protective cover attached and closed.
- Installing in the following places may result in malfunction:
  1. A dusty or steamy place
  2. A place generating corrosive gas
  3. A place directly receiving water or oil mist.
  4. A place that is subjected to heavy vibration or impacts.
- The product is not designed for outdoor use.
- Do not use the sensor in transient state after power on (approx. 100 ms).
- Do not wire with the high voltage cable or the power line.
- Failure to do this will cause malfunction by induction or damage.
- The sensor performance or digital display values may depend on the individual units or the condition of detected product.
- This product is not an explosion-proof construction. Do not use the product in a flammable, explosive gas or liquid environment.
- Do not use the product in water.
- Do not disassemble, repair, or convert the product.
- Failure to do this may cause failure, fire, or electric shock.
- Operate within the rated range.

This product cannot be used as a safety device to protect human body.

Part Description

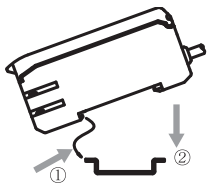


Model		Standard type	Color mark type
	Cable type	D2RF-T (N/P)	D2GF-T (N/P)
	M8 connector type	D2RF-TC (N/P)	D2GF-TC (N/P)
Power source, voltage		12-24V DC ±10% including ripple	
Consumption current		45mA or less / 24V	
Response time		60 μs / 250 μs / 2 ms (Fast/Standard/Long)	
Control output		NPN / PNP Open collector 100mA / 30V or less (output 1/output 2) Load current 100mA or less Residual voltage 1.8V or less	
Output method		Selectable Light on / Dark on	
Short-circuit protection		Incorporated	
Light source		Red LED	Green LED
Indicator light / Display		Output Indicator: Orange(output 1/output 2) / 7 segment / 8 digit display	
Sensitivity setting		Teaching / Manual adjustment	
Timer function		OFF, On delay timer, Off delay timer, One-shot timer	
Timer time		1ms - 9 sec.	
Setting input/output		External input setting Teaching / counter reset	
		Output setting Output 2 or Alarm output	
Operating temperature/humidity		-25 ~ +55°C / 35 ~ 85% RH No freezing and No condensation	
Store temperature/ humidity		-40 ~ +70°C / 35 ~ 85% RH No freezing and No condensation	
Shock resistance		10 ~ 55Hz Amplitude 1.5mm 2 hours for each direction of X,Y and Z	
Protective category		IP50	
Material		Case: PPE, Cover: PC	
Weight		Cable type: 65g (Including cable) M8 Connector type: 18g	

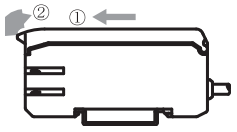
Mounting Amplifier

Attaching to and Removing from DIN rail

Attaching the amplifier.
Attach the front of the amplifer onto the DIN rail or mounting bracket. Press the back of the amplifier down until it snaps into place.



Amplifier removal.
Push the amplifier in the direction of ①, lift the front of the sensor and remove.

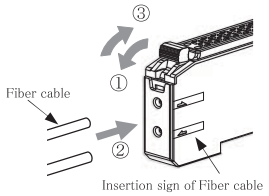


How to connect the fiber cables

Open fiber lock lever.
Insert fiber into holes to stop.

Approximately 15mm guided by fiber sign

Return fiber lock lever until it stops.

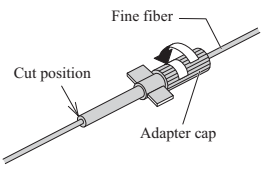


CAUTION

When using diffuse reflection co-axial fiber cables the cable with the single core or white line is the emitter, the multi-core fiber is the receiver.

How to use Fiber Adapter

Turn adapter cap completely counter-clockwise, then insert the fiber.
Lock the cable by turning adapter cap clockwise.
Cut the excess fiber with fiber cutter.



Adjustment

■Setting Maximum Sensitivity

SET RUN Switch to SET.

Select Single-point teaching.

1 P t

T Press the teaching button.

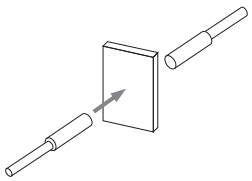
1 P t

1 P t good

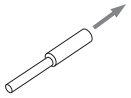
SET RUN Switch to RUN.

The threshold value flashes and the display returns to normal.

Thru-beam type: Perform the adjustment with an object present.



Reflective type: Perform the adjustment without an object present.



■Single Point Teaching

SET RUN Switch to SET.

Select Single-point teaching.

1 P t

T Press the teaching button.

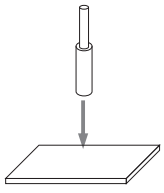
1 P t

1 P t good

SET RUN Switch to RUN.

The threshold value flashes and the display returns to normal.

Reflective type: Perform the adjustment on the background without an object present.



The threshold is set to 5% more than the received light intensity value.

■Two Point Teaching

SET RUN Switch to SET.

Select Two point teaching.

2 P t 1 P t

T 1st point: Press the teaching button.

2 P t 1 P t

T 2nd point: Press the teaching button.

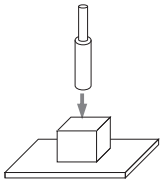
2 P t 2 P t

2 P t good

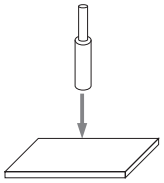
SET RUN Switch to RUN.

The threshold value flashes and the display returns to normal.

Reflective type:
1st: Perform the adjustment with the object present.



2nd: Perform the adjustment on the background without the object present.



The threshold is set to the center between the 1st and 2nd points.

■Auto Teaching

SET RUN Switch to SET.

Select Auto teaching.

A u t o S t r t

T Start: Press the teaching button.

A u t o S t r t

T End: Press the teaching button.

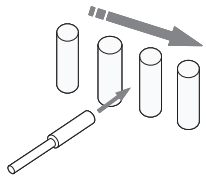
A u t o S t o P

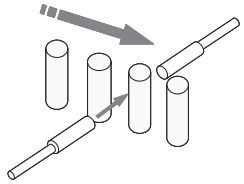
A u t o good

SET RUN Switch to RUN.

The threshold flashes and the display returns to normal.

Thru-beam / Reflective type:
Start and end: Perform the adjustment with objects passing by the sensor.





■ Zone Teaching

SET RUN Switch to SET.

Select Zone teaching.

Z o n E

T Press the teaching button.

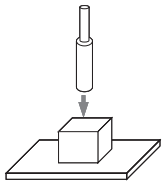
Z o n E

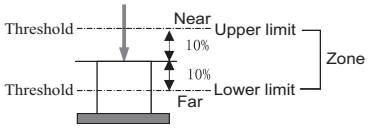
Z o n E good

SET RUN Switch to RUN.

The threshold value flashes and the display returns to normal.

Reflective type: Perform the adjustment with the object present.





The zone (detection area) is set to +/- 10% of the received light intensity value.

* If the target is not present perform the teach function on the background.

■ Transparent Object Teaching

SET RUN Switch to SET.

Select Transparent teaching

g L A S

T Press the teaching button.

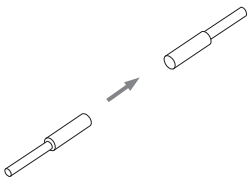
g L A S

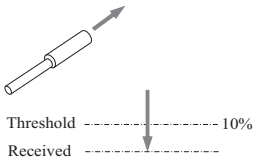
g L A S good

SET RUN Switch to RUN.

The threshold value flashes and the display returns to normal.

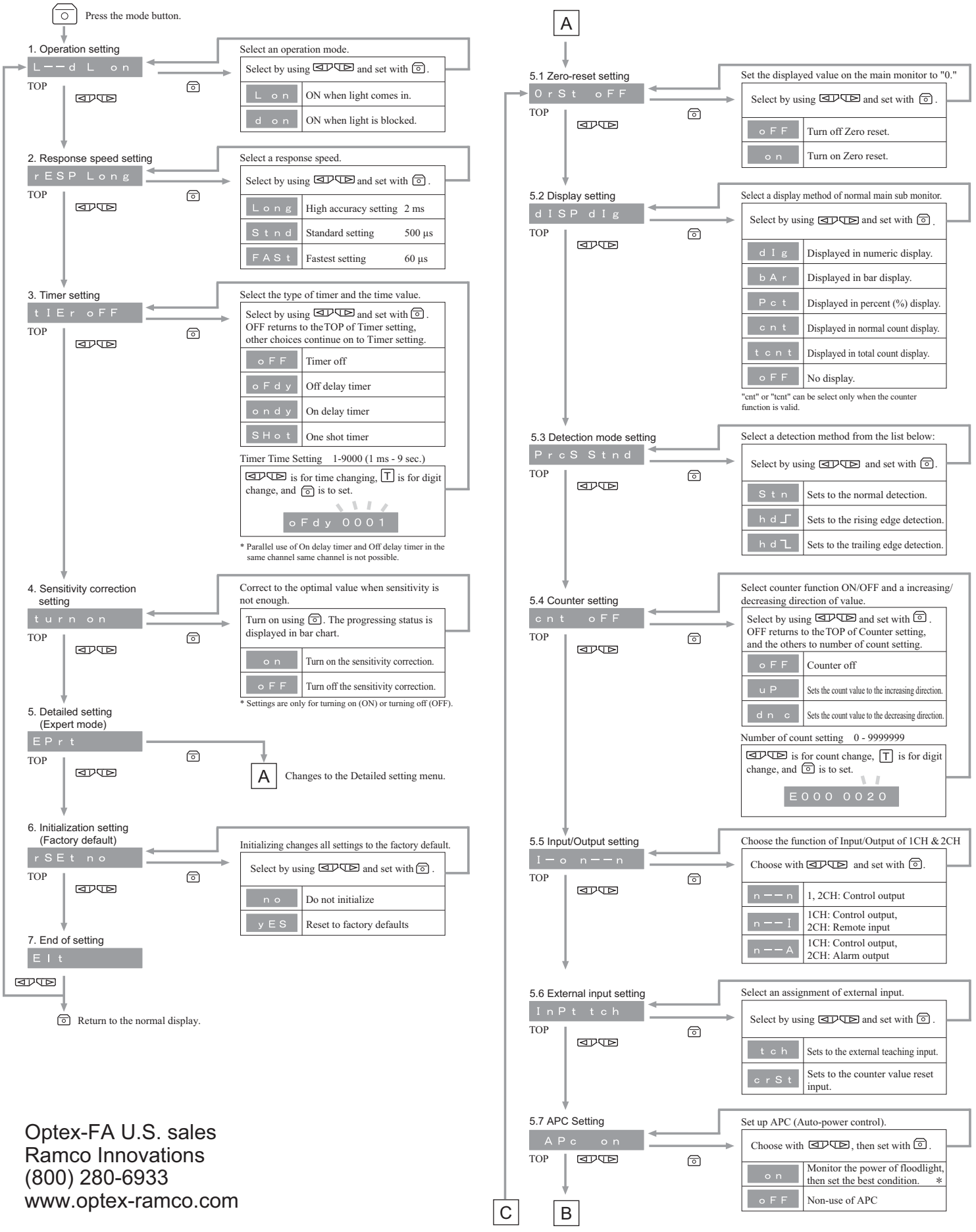
Thru-beam and Retro-reflective type:
Perform the adjustment with an object present.





The threshold value is set to 10% less than the received light level.

Function Setting



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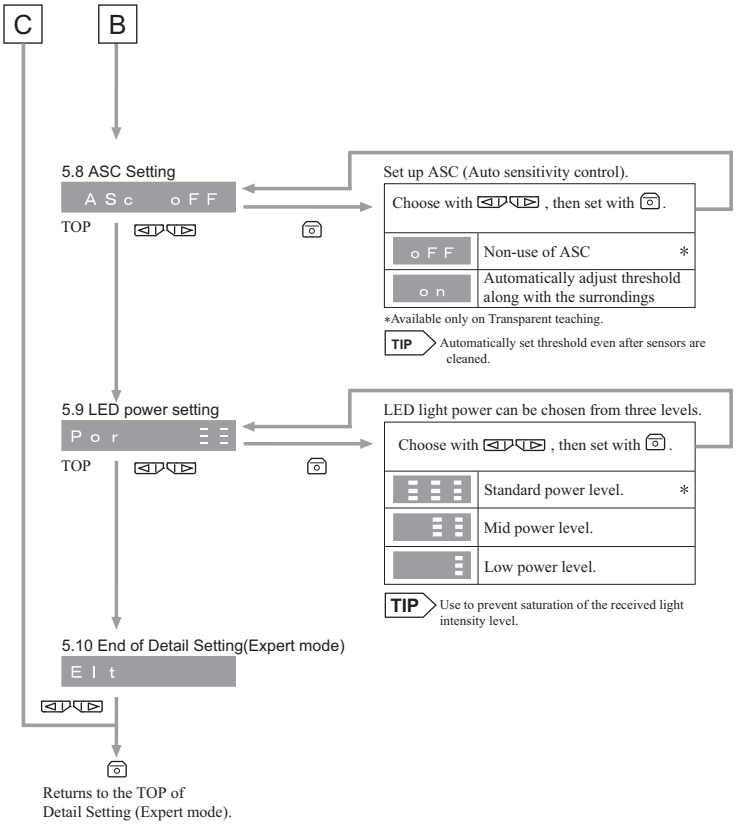
Function Setting (Continued)



■ Precautions for Function Settings

* indicates factory default setting
* Settings that are not available will not be indicated automatically
  This does not indicate a problem or failure.

* Hold down the operation button for approx. 0.3 seconds if not specified differently.
* The sub monitor starts flashing when each setting selection becomes available.
* The monitor in use of the counter function displays "U" when the up-counter is selected, and displays "d" when the down-counter is selected.

Three categories can be set separately between 1CH. and 2CH.
Other categories are not available for individual setting.

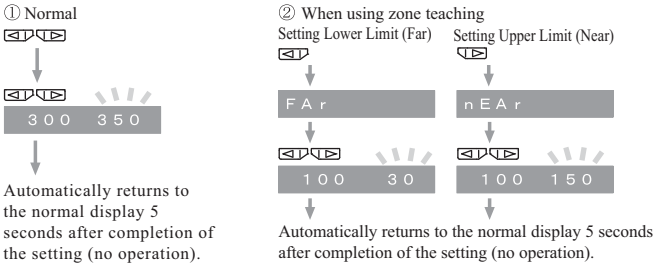
1 -Threshold 2 - Operation setting 3 - Timer selection and Timer value

Manual Setting

■Manual Adjustment

Pressing the UP/DOWN button in the RUN mode flashes the threshold value. This indicates that adjustment is possible. Adjust to any value using the UP/DOWN button.

When using the zone teaching, the threshold values of both the upper and lower limit can be set individually② .



* No operation state for 5 seconds during setting automatically returns the display to normal as well.

Error Display

■Error Display in Teaching

An error message is displayed in the event of error during adjustment.

Refer to the table below for readjustment.

Err1	Indicates shortage of light intensity or no difference of light intensity.
Err2	Indicates a sampling error in teaching of a moving object.
Err3	Indicates a calculation error.
not cPLt	Indicates that the teaching process was interrupted.

■Switching Channel

Press ▢ in the Run mode, the other channel number flashes and the sensor changes to it.

■Returning to Normal Display from Function Settings

Pressing and holding the ▢ button for more than 2 seconds while in the function settings will return the sensor to the normal display (RUN mode) without using Eit (Exit).

∗ Invalid while setting the timer time, number of count, or span value.

■Key Lock

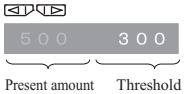
Cancels all the operations. Useful to prevent accidental operation.

Hold down both of the ◁▷ buttons for more than 2 seconds in the RUN mode to activate the Key Lock function. Repeat this procedure to cancel the Key Lock.

■Change threshold of Alarm output

With Alarm setting (Alarm output needs to be selected in section 5.5 Input/Output setting), threshold (Output timing) can be changed.
∗Changes are available on Transparent teaching, ASC setting On

On RUN mode, change to CH2 by pressing and holding ▢.
After CH 2 blinks, screen will be changed.
Setting changes are available with ◁▷



Output when the amount of light received of standard background which set by ASC setting is below threshold.

*when 5.2 indication setting is fixed with %, the amount of light received and threshold will be shown in %.

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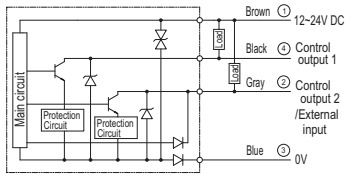
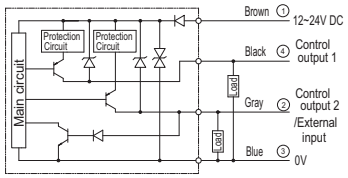
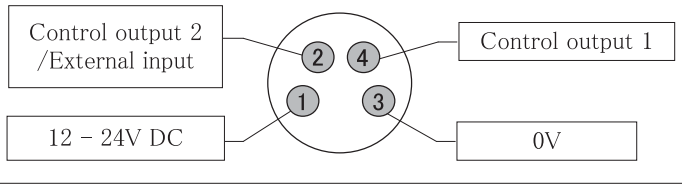
Input / Output Connection

NPN	PNP
	

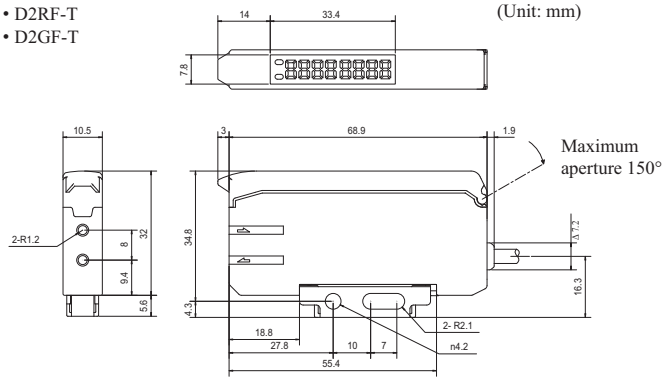
Pin layout

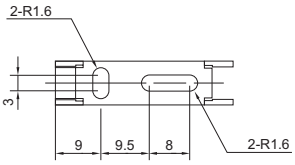


Dimensional drawing

• D2RF-T
• D2GF-T

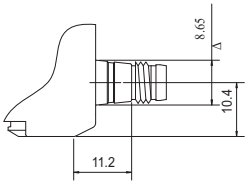
(Unit: mm)



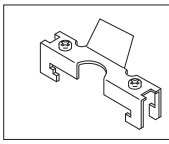


Backside of bracket

• D2RF-TC
• D2GF-TC



Options



End Unit
BEF-BE01-W190 (2 pcs)

- Specifications and equipment are subject to change without any obligations on the part of manufacturer.
- For more information, questions and comments regarding products, please contact us below.

Manufactured and sold by :

Head office: Mitsui Seimei Kyoto Yamashina BLDG 6F, 46-1
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607-8085 Japan
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FAX: +81-(0)75-594-8124

Website http://www.optex-fa.com

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Digital Fiber Amplifier

D2RF/D2GF Series

Interconnect Master / Slave Instructions

D2RF-T□□ D2GF-T□□

D2RF-T□C□4 D2GF-T□C□4

Instruction Manual

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Carefully read and understand the safety precautions before operation.
The important information is provided to protect your health and property.
Do not apply any other installing or operating procedure other than that described in this manual.

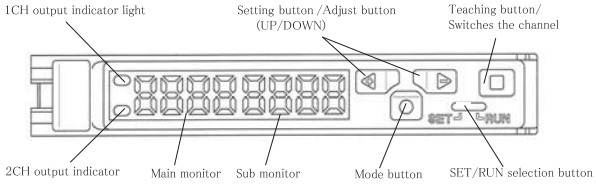
Safety Precautions

CAUTION

- It is dangerous to wire or attach/remove the connector with the power on. Make sure to turn off the power before operation.
- Make sure to use the product with the protective cover attached and closed.
- Installing in the following places may result in malfunction:
  1. A dusty or steamy place
  2. A place generating corrosive gas
  3. A place directly receiving water or oil mist.
  4. A place that is subjected to heavy vibration or impacts.
- The product is not designed for outdoor use.
- Do not use the sensor in transient state after power on (approx. 100 ms).
- Do not wire with the high voltage cable or the power line. Failure to do this will cause malfunction by induction or damage.
- The sensor performance or digital display values may depend on the individual units or the condition of detected product.
- This product is not an explosion-proof construction. Do not use the product in a flammable, explosive gas or liquid environment.
- Do not use the product in water.
- Do not disassemble, repair, or convert the product. Failure to do this may cause failure, fire, or electric shock.
- Operate within the rated range.

This product cannot be used as a safety device to protect human body.

Part Description

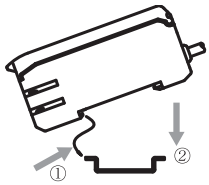


Model			Standard type	Color mark type
	Cable type	Master	D2RF-TM (N/P)	D2GF-TM (N/P)
		Slave	D2RF-TS (N/P)	D2GF-TS (N/P)
	M8 connector type	Master	D2RF-TMC (N/P) 4	D2GF-TMC (N/P) 4
		Slave	D2RF-TSC (N/P) 4	D2GF-TSC (N/P) 4
Supply voltage			12-24V DC ±10% including ripple	
Current consumption			45mA or less @ 24V	
Response time			60 μs / 250 μs / 2 ms (Fast/Standard/Long)	
Control output			NPN / PNP Open collector 100mA / 30V or less (output 1/output 2) Load current 100mA or less Residual voltage 1.8V or less	
Output operation			Selectable Light on / Dark on	
Short-circuit protection			Incorporated	
Light source			Red LED	Green LED
Indicator light / Display			Master unit: Output Indicator: Orange (output 1 and 2), 7 segment / 8 digit display Slave unit: Output: orange (1) - 7 segment / 8 digit display	
Sensitivity setting			Teaching / Manual adjustment	
Timer function			OFF, On delay timer, Off delay timer, One-shot timer	
Timer time			1ms - 9.999 sec.	
Setting input/output			External input: Remote Teach / Counter Reset	
			Output: Control output 2 / Alarm output	
Operating temperature/humidity			-25 ~ +55°C / 35 ~ 85% RH No freezing and No condensation	
Store temperature/ humidity			-40 ~ +70°C / 35 ~ 85% RH No freezing and No condensation	
Shock resistance			10 ~ 55Hz Amplitude 1.5mm 2 hours for each direction of X,Y and Z	
Protective category			IP50	
Material			Case: PPE, Cover: PC	
Weight			Cable type: 65g (Including cable) M8 Connector type: 18g	

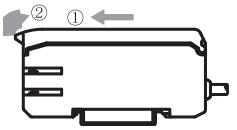
Mounting Amplifier

Attaching to and Removing from DIN rail

Attaching the amplifier.
Attach the front of the amplifier onto the DIN rail or mounting bracket. Press the back of the amplifier down until it snaps into place.



Amplifier removal.
Push the amplifier in the direction of ①, lift the front of the sensor and remove.

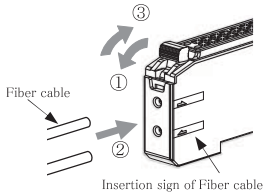


How to connect the fiber cables

Open fiber lock lever.
Insert fiber into holes to stop.

Approximately 15mm guided by fiber sign

Return fiber lock lever until it stops.

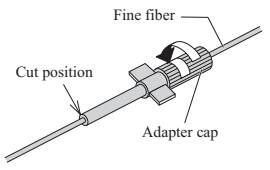


CAUTION

When using diffuse reflection co-axial fiber cables the cable with the single core or white line is the emitter, the multi-core fiber is the receiver.

How to use Fiber Adapter

Turn adapter cap completely counter-clockwise, then insert the fiber.
Lock the cable by turning adapter cap clockwise.
Cut the excess Þber with fiber cutter.



Adjustment

■Setting Maximum Sensitivity

Switch to SET.
SET RUN

Select Single-point teaching.

1 P t

T Press the teaching button.

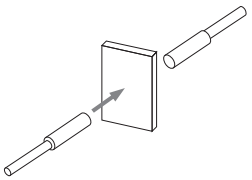
1 P t

1 P t good

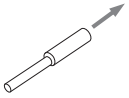
Switch to RUN.
SET RUN

The threshold value flashes and the display returns to normal.

Thru-beam type: Perform the adjustment with an object present.



Reflective type: Perform the adjustment without an object present.



■Single Point Teach

Switch to SET.
SET RUN

Select Single-point teaching.

1 P t

T Press the teaching button.

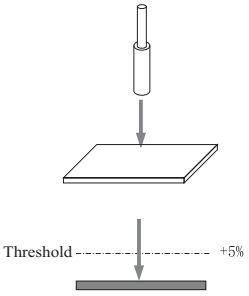
1 P t

1 P t good

Switch to RUN.
SET RUN

The threshold value flashes and the display returns to normal.

Reflective type: Perform the adjustment on the background without an object present.



The threshold is set to 5% more than the received light intensity value.

■Two Point Teach

Switch to SET.
SET RUN

Select Two point teaching.

2 P t 1 P t

T 1st point: Press the teaching button.

2 P t 1 P t

T 2nd point: Press the teaching button.

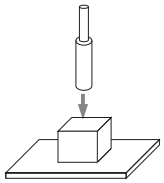
2 P t 2 P t

2 P t good

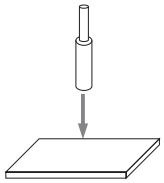
Switch to RUN.
SET RUN

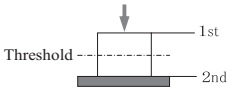
The threshold value flashes and the display returns to normal.

Reflective type:
1st: Perform the adjustment with the object present.



2nd: Perform the adjustment on the background without the object present.





The threshold is set to the center between the 1st and 2nd points.

■ Auto Teach

Switch to SET.
SET RUN

Select Auto teaching.

A u t o S t r t

T Start: Press the teaching button.

A u t o S t r t

T End: Press the teaching button.

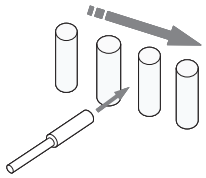
A u t o S t o P

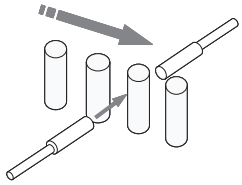
A u t o good

Switch to RUN.
SET RUN

The threshold flashes and the display returns to normal.

Thru-beam / Reflective type:
Start and end: Perform the adjustment with objects passing by the sensor.





■ Zone Teach

Switch to SET.
SET RUN

Select Zone teaching.

Z o n E

T Press the teaching button.

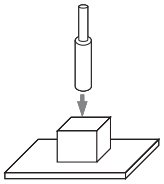
Z o n E

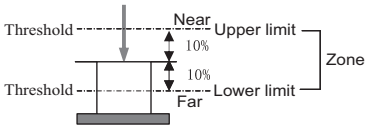
Z o n E good

Switch to RUN.
SET RUN

The threshold value flashes and the display returns to normal.

Reflective type: Perform the adjustment with the object present.





The zone (detection area) is set to +/- 10% of the received light intensity value.

* If the target is not present perform the teach function on the background.

■ Transparent Object Teach

Switch to SET.
SET RUN

Select Transparent teaching

g L A S

T Press the teaching button.

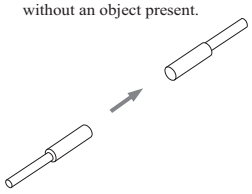
g L A S

g L A S good

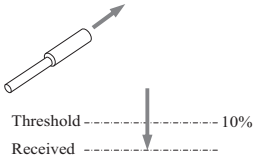
Switch to RUN.
SET RUN

The threshold value flashes and the display returns to normal.

Thru-beam type: Perform the adjustment without an object present.

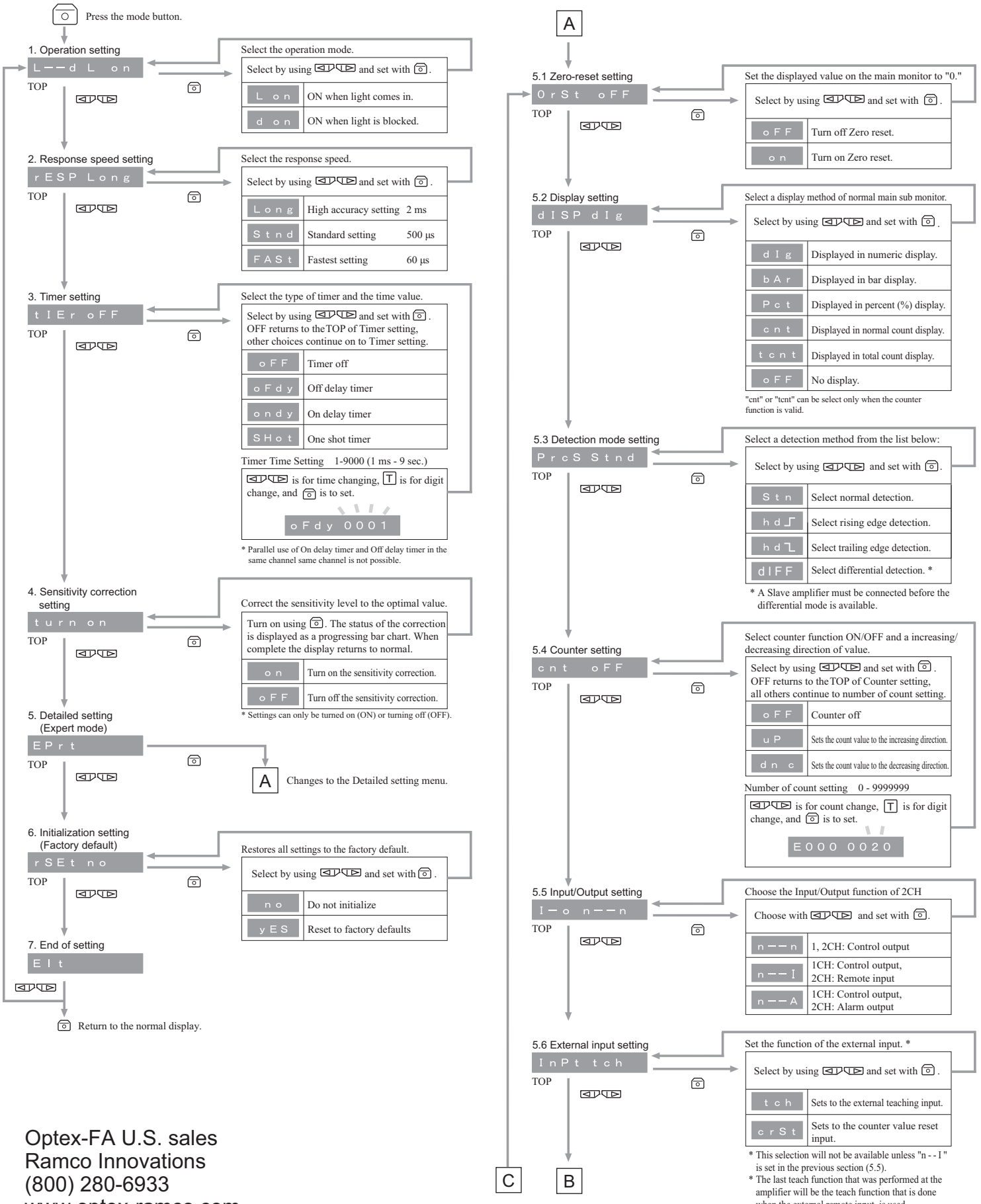


Reflective type: Perform the adjustment without an object present.



The threshold value is set to 10% less than the received light level.

Function Setting



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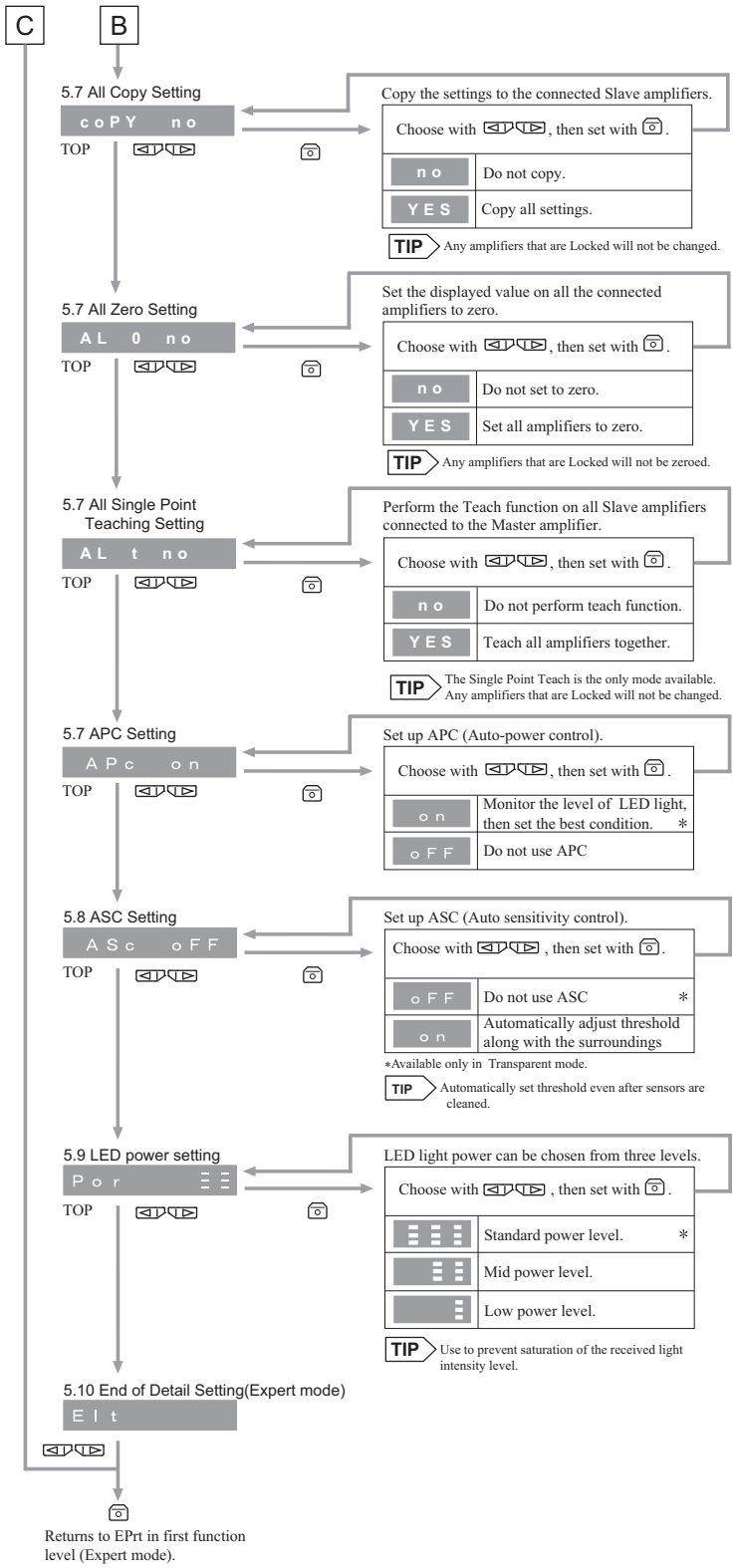
Function Setting (Continued)



■ Precautions for Function Settings

* indicates factory default setting
* Settings that are not available will not be indicated automatically
  This does not indicate a problem or failure.

* Hold down the operation button for approx. 0.3 seconds if not specified differently.
* The sub monitor starts flashing when each setting selection becomes available.
* The monitor in use of the counter function displays "U" when the up-counter is selected, and displays "d" when the down-counter is selected.
* The "All setting" functions described in sections 5.7 to 5.9 are applicable only to the Slave amplifiers that are connected to the right side of the amplifier that is sending the information.

Three categories can be set separately between 1CH. and 2CH.
Other categories are not available for individual setting.

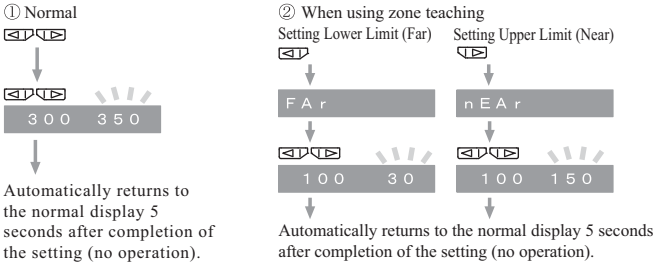
1 -Threshold 2 - Operation setting 3 - Timer selection and Timer value

Manual Setting

■Manual Adjustment

Pressing the UP/DOWN button in the RUN mode flashes the threshold value. This indicates that adjustment is possible. Adjust to any value using the UP/DOWN button.

When using the zone teaching, the threshold values of both the upper and lower limit can be set individually② .



* No operation state for 5 seconds during setting automatically returns the display to normal as well.

Error Display

■Error Display in Teaching

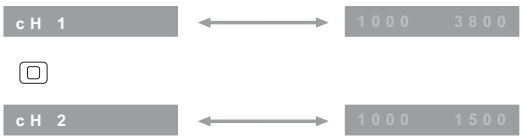
An error message is displayed in the event of error during adjustment.

Refer to the table below for readjustment.

Err1	Indicates shortage of light intensity or no difference of light intensity.
Err2	Indicates a sampling error in teaching of a moving object.
Err3	Indicates a calculation error.
not cPLt	Indicates that the teaching process was interrupted.

■Switching Channels

Press ▢ in the Run mode, the other channel number flashes and the information for it is displayed.



■Returning to Normal Display from Function Settings

Pressing and holding the ▢ button for more than 2 seconds while in the function settings will return the sensor to the normal display (RUN mode) without using Eit (Exit).

* Invalid while setting the timer time, number of count, or span value.

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■Key Lock

Cancels all the operations. Useful to prevent accidental operation.

Hold down both of the ◁▽△▷ buttons for more than 2 seconds in the RUN mode to activate the Key Lock function. Repeat this procedure to cancel the Key Lock.

Locked: Loc 300 ⇔ Unlocked: uLoc 300

■Changing threshold level of Alarm output

With Alarm setting (Alarm output needs to be selected in section 5.5 Input/Output setting), threshold (Output timing) can be changed.
*Changes are available on Transparent teaching, ASC setting On

On RUN mode, change to CH2 by pressing and holding ▢.
After CH 2 blinks, screen will be changed.
Setting changes are available with ◁▽△▷

◁▽△▷

500 300 ← Output when the amount of light received of standard background which set by ASC setting is below threshold.

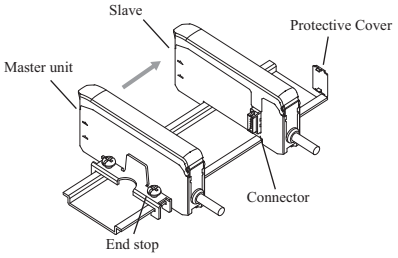
Present amount of light received | Threshold

*when 5.2 indication setting is fixed with %, the amount of light received and threshold will be shown in %.

■ Connecting Amplifier Units

First attach each amplifier unit onto the DIN rail. Slide the Slave and Master units together. Use an End stop on both sides.

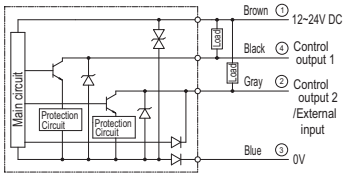
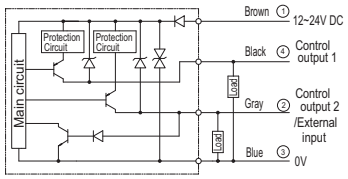
A maximum of 8 Slave units can be connected to the Master unit.



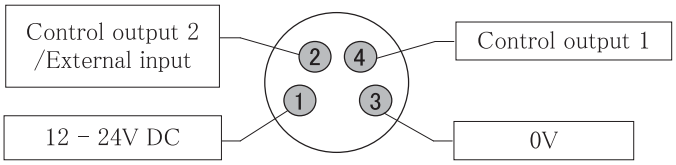
⚠ CAUTION

* Make sure to turn off the power before connecting or disconnecting amplifiers.
* Make sure to use DIN rail to mount the amplifiers and the end stop unit (BEF-BE01-W190) to hold in place.
* When using multiple amplifiers together, make sure to check the operating temperature (see Specifications).
* To avoid shorting the connecting terminals, the protection cover should be attached to amplifiers which have the connector open.
* Do not try to remove the combined units all together from the DIN rail. Separate them first.

Input / Output Connection

NPN	PNP
	

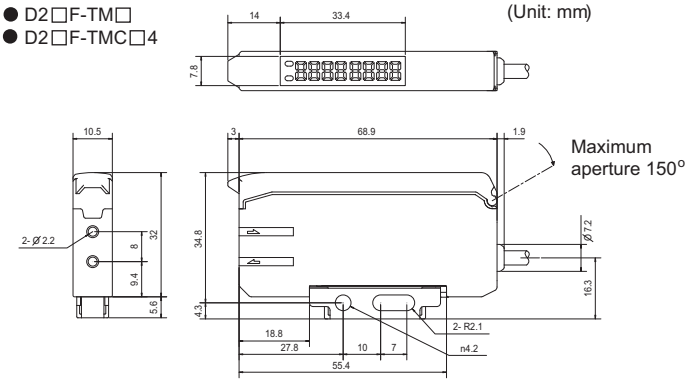
Pin layout



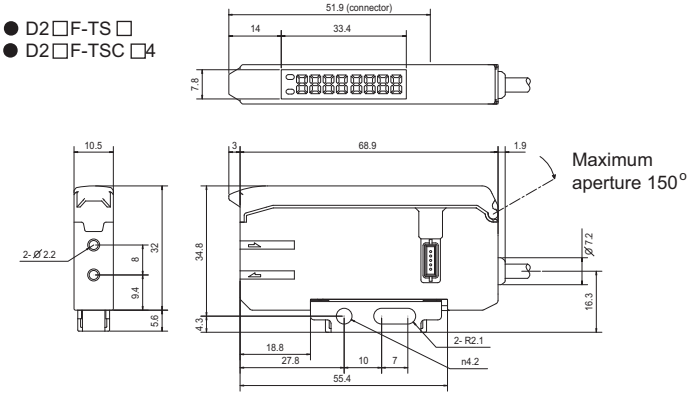
Dimensional drawing

(Unit: mm)

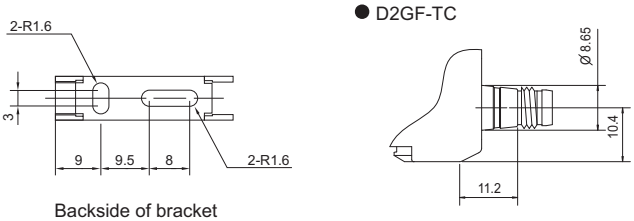
● D2□F-TM□
● D2□F-TMC□4



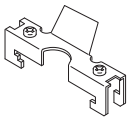
● D2□F-TS □
● D2□F-TSC □4



● D2RF-TC
● D2GF-TC



Options



End Unit
BEF-BE01-W190 (2 pcs)

● Specifications and equipment are subject to change without any obligations on the part of manufacture
● For more information, questions and comments regarding products, please contact us below

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