

Instruction Manual

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Safety Precautions

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.

Meaning of Safety Symbols

WARNING Indicates a possible hazard that may result in death, serious injury, or serious property damage if the product is used without observing the stated instructions.

CAUTION Indicates a possible hazard that may result in personal injury or property damage if the product is used without observing the stated instructions.

Mandatory Requirements

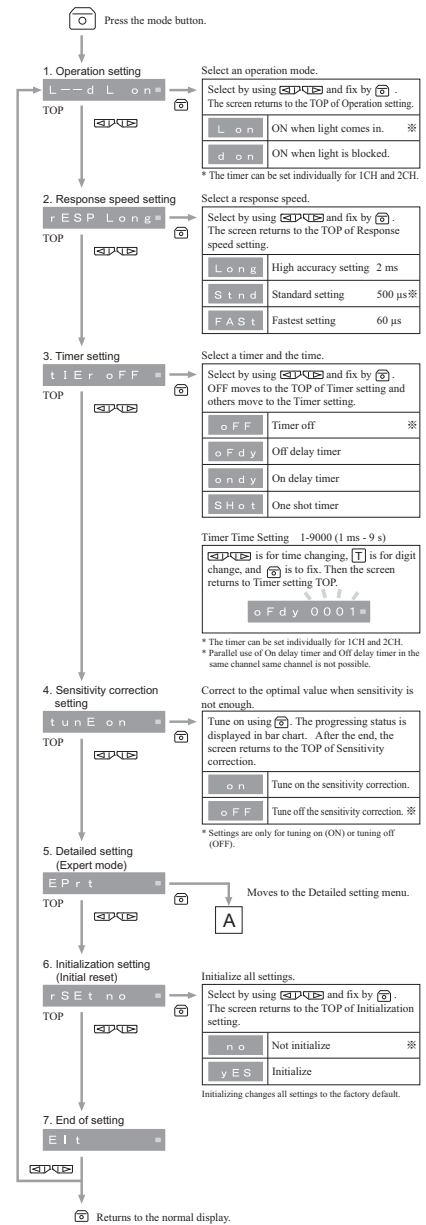
- This product is not an explosion-proof construction. Do not use the product under flammable, explosive gas or liquid environment.
- Do not use the product in water.
- Do not disassemble, repair, or convert the product. Failure to do this may cause failure, fire, or electric shock.
- Operate within the rated range.

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

Operational Precautions

- Use the specified sensor head to connect this product. Any use other than specified will cause accident or product damage.
- 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 scattering water or oil.
 4. A place suffered from heavy vibration or impact.
- 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.
- Don't bend the cable when the temperature of the cable atmosphere is below freezing.

Function Setting

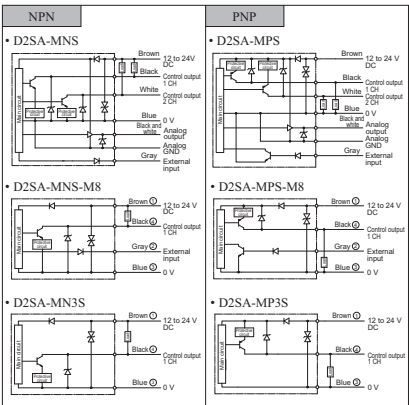


Precautions for Function Setting

- Some function settings automatically delete the invalid settings or settings, of which concomitant use is not allowed, from the displayed items. This does not indicate any failure.
- Some functions are not incorporated or not settable to D2SA-M□3S / D2SA-M□S-M8.
- Hold down the operation button for approx. 0.3 seconds if not especially specified.
- Analog output and Analog setting is available when response time setting is "Long" or "Standard".
- 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.
- For functions other than Operation setting and Timer setting, both settings of 1 CH and 2 CH are changed when the setting of each function is modified.
- * means factory default setting.

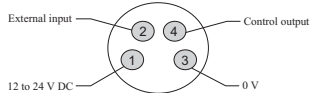
Model	Advanced Model (2CH)	Standard Model (1CH)
Cable type	D2SA-M(NP)S	D2SA-M(NP)3S
M8 connector type	-	D2SA-M(NP)S-M8
Adaptable sensor head	DS Series	
Power source, voltage	12 - 24 V DC \pm 10 % including a ripple	
Consumption current	45 mA or less / 24 V	
Response time	60 μ s / 500 μ s / 2ms (Fast/Standard/Long)	
Control output	NPN / PNP Open collector Load current: 100 mA or less Residual voltage: 1.8 V or less	
Indicator light	Laser emission indicator light: Green, Output Indicator light: Orange (1-2CH) Teaching indicator light: Red Channel indicator light: Green (1-2CH)	
Digital display	7 segment 8 digit display	
Timer function	OFF, On delay, Off delay, One-shot	
Timer time	1 ms - 9 s	
Output method	Light on / Dark on Switching type in the function	
Analog output	Current output: 4 - 20 mA	-
External input setting	External input setting (teaching, synchronizing input, floodlight off, counter reset)	External input setting (teaching, synchronizing input, floodlight off, counter reset)
Setting input/output	Output setting (2CH output + Alarm output) * Settable only with DSA-M□S-M8	-
Operating temperature/humidity	-25 to +55°C / 35 to 85 % RH (No freezing)	
Store temperature/humidity	-40 to +70°C / 35 to 85 % RH (No condensation)	
Shock resistance	10 to 55 Hz Double amplitude 1.5 mm 2 hours for each direction of X, Y, and Z	
Protective category	IP50	
Material	PC: Case and cover	
Weight (including the cables)	Cable type: 65 g M8 connector type: 30 g	-

Input/Output Schematic



Pin layout

- D2SA-M□S-M8



No.	Name	Function
①	Laser emission indicator light	Turns on while the amplifier is powered.
②	1 CH output indicator light	Turns on when the output of 1 CH is ON.
③	2 CH output indicator light	Turns on when the output of 2 CH is ON.
④	Main monitor (Red)	Displays light intensity, function, and the number of counts.
⑤	Sub monitor (Green)	Displays the threshold, function selection, and the number of counts.
⑥	Teaching mode indicator light	Turns on in the Teaching mode.
⑦	Valid channel indicator light (1 CH)	Keeps turning ON when the monitor display value, adjustment, and the function setting are valid to 1 CH.
⑧	Valid channel indicator light (2 CH)	Keeps turning ON when the monitor display value, adjustment, and the function setting are valid to 2 CH.
⑨	UP button	RUN mode: Displays or changes the threshold.
⑩	DOWN button	Function mode: Selects the function or changes the numerical values.
⑪	Mode button	RUN mode: Switches to the Function mode. (0.5 s \pm 0.1 s) Function mode: Fix the selection.
⑫	Teaching button	RUN mode: Switches the channel. Function mode: Returns to RUN mode or performs scaling. Set mode: Run the teaching.
⑬	SET/RUN selection switch	Switches between Teaching mode and RUN mode.

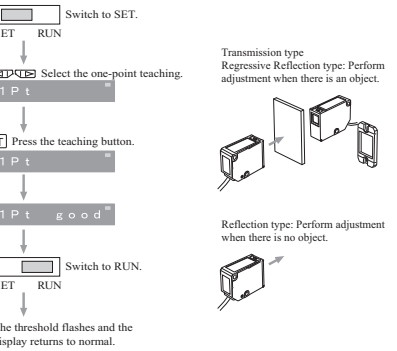
* The button function varies in each mode: RUN mode, Function mode, and SET mode.
* D2SA-M□3S/D2SA-M□S-M8 are 1 output (1 CH) type. ③ and ⑤ do not turn on. The channel switching of ⑩ also becomes invalid.

Adjustment

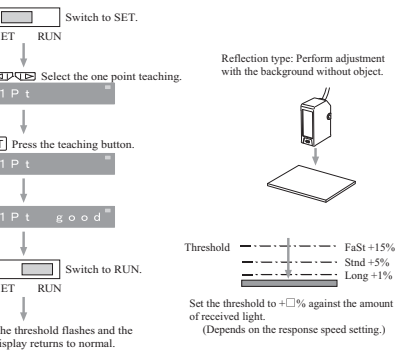
The available teaching depends on "5.3 Detection Mode setting." Refer to below:

St n (Standard detection)	All teachings are valid.
h d f / h d l (Edge detection)	No teaching is valid.
d i f f (Differential detection)	Only one point teaching is valid.

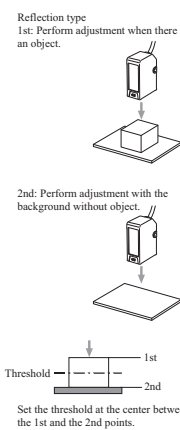
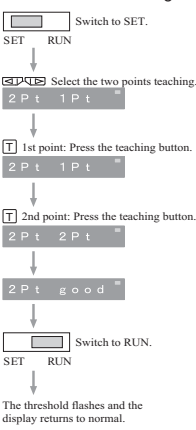
Setting Maximum Sensitivity



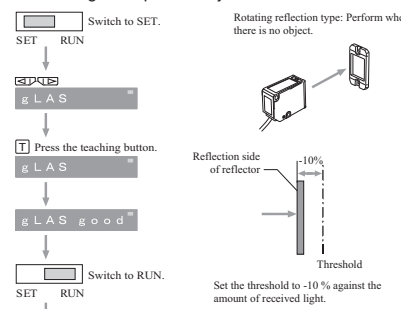
One Point Teaching



Two Points Teaching

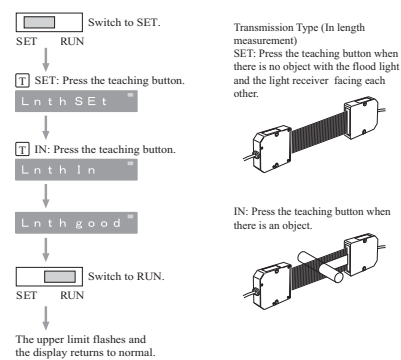


Teaching Transparent Object



Teaching Length Measurement

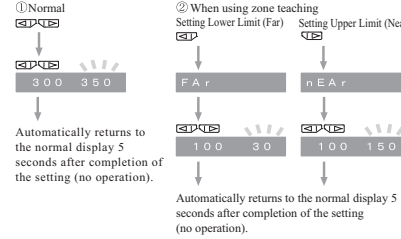
Valid only when the length measurement function is set. Allows to determine the size or the length of object.
* Not displayed on the teaching mode menu unless the application of length measurement is selected in the detection mode setting.
* Teaching length measurement or length measurement mode does not measure the actual length of object accurately.



Manual Adjustment

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

When using the zone teaching, the threshold of upper/lower limit can be set individually.



Error Display in Teaching

An error message is displayed in the event of error during adjustment. Refer to the table below for readjustment.

E r r 1	Indicates shortage of light intensity or no difference of light intensity.
E r r 2	Indicates a sampling error in teaching of a moving object.
E r r 3	Indicates a calculation error.
n o t o p l t	Indicates that the teaching is interrupted.

Switching Channel

Pressing the [T] button during the RUN mode allows switching. At the same time the channel indicator light switches.



Returning to Normal Display with One Button

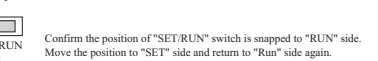
Pressing the [T] button for 2 seconds or more in setting each function enables to return to the normal display (RUN mode) without using Eit (Exit).
* Invalid while setting the timer time, number of count, or span slant.

Key Lock

Cancels all the operations. Useful to prevent accidental operation. Hold down the [SET/RUN] buttons for 2 seconds or more simultaneously in the RUN mode. Operate in the same way to cancel as well.

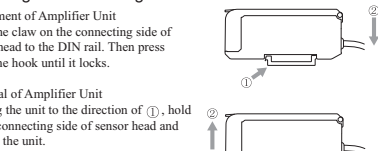
Reset "Peak/ Bottom hold"

Peak/Bottom hold can be reset by operating with amplifier itself at the time of analog output.



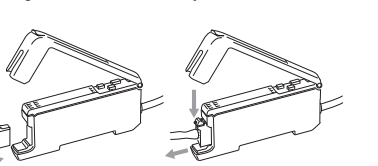
Setting Amplifier Unit

Attaching and Removing to/from DIN rail



Connecting Sensor Head

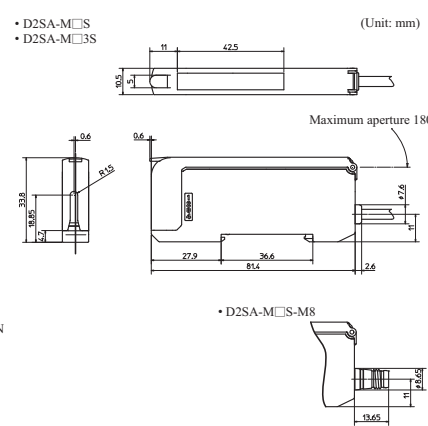
Open the protective cover and plug the connector into the amplifier unit with the lock lever facing up. Make sure that it clicks. When removing, hold down the lock lever and pull out the connector.



CAUTION

- Do not attach any sensor head other than the specified one (DS Series).
- When removing the connector, do not pull on the cable. Failure to do so will break the cable or damage the product.

Dimensional drawing



Options

