

Digital Amplifier Detachable Photoelectric Sensor
D2SA Series
 Laser Type Amplifier Unit D2SA-M□S
 D2SA-M□3S
 D2SA-M□S-M8

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.

Specification

Model	Advanced Model (2CH)	Standard Model (1CH)
Cable type	D2SA-M(N/P)S	D2SA-M(N/P)3S
M8 connector type	-	D2SA-M(N/P)S-M8
Adaptable sensor head	DS Series	
Power source, voltage	12-24 V DC ± 10% including a ripple	
Consumption current	45 mA or less / 24 V	
Response time	60µs/500µs/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	-
Setting input/output	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 codes)	Cable type: 65 g M8 connector type: 30 g	

Each Part

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. Function mode: Selects the function or changes the numerical values.
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 ≥) 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.

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

WARNING

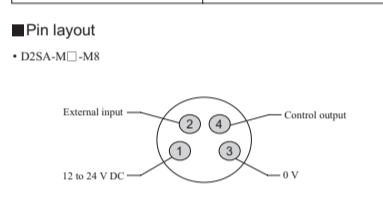
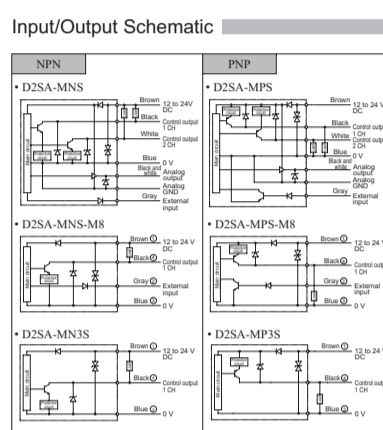
- This product is not an explosion-proof construction. Do not use the product under flammable, explosive gas or liquid environment.
- Do not use the product in water.
- Do not disassemble, repair, or convert the product. Failure to do this may cause failure, fire, or electric shock.
- Operate within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

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

Operational Precautions

CAUTION

- 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:
 - A dusty or steamy place
 - A place generating corrosive gas
 - A place directly receiving scattering water or oil.
 - 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.



Adjustment

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

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

Setting Maximum Sensitivity

Switch to SET. Select the one-point teaching. Press the teaching button. The threshold flashes and the display returns to normal.

Transmission type: Perform adjustment when there is an object. Reflection type: Perform adjustment when there is no object.

One Point Teaching

Switch to SET. Select the one point teaching. Press the teaching button. The threshold flashes and the display returns to normal.

Reflection type: Perform adjustment with the background without object.

Two Points Teaching

Switch to SET. Select the two points teaching. Press the teaching button. The threshold flashes and the display returns to normal.

Reflection type: Perform adjustment when there is an object.

Auto Teaching

Switch to SET. Select the auto teaching. Press the teaching button. The threshold flashes and the display returns to normal.

Reflection, Transmission, Regressive Reflection Type: Start and End: Perform adjustment while the object is passing.

Zone Teaching

Switch to SET. Select the zone teaching. Press the teaching button. The threshold flashes and the display returns to normal.

Reflection type: Perform adjustment with the background without object, and when there is an object.

Teaching Transparent Object

Switch to SET. Press the teaching button. The threshold flashes and the display returns to normal.

Rotating reflection type: Perform when there is no object.

Teaching Length Measurement

Valid only when the length measurement function is set. Allows to determine the size or the length of object.

Transmission Type (In length measurement): Press the teaching button when there is no object with the flood light and the light receiver facing each other.

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.

Err 1	Indicates shortage of light intensity or no difference of light intensity.
Err 2	Indicates a sampling error in teaching of a moving object.
Err 3	Indicates a calculation error.
no t o P L t	Indicates that the teaching is interrupted.

Function Setting

- Operation setting**: Select an operation mode (L o n, L o n, d o n).
- Response speed setting**: Select a response speed (L o n g, S t n d, F A S T).
- Timer setting**: Select a timer and the time (o f f, o n d e l a y, o n d e l a y, o n e s h o t).
- Sensitivity correction setting**: Correct to the optimal value when sensitivity is not enough.
- Detailed setting (Expert mode)**: Select a function to be detailed.
- Initialization setting (initial reset)**: Initialize all settings.
- End of setting**: Returns to the normal display.

Function Setting (Continued)

- 5.1 Zero-reset setting**: Select a displayed value on the main monitor to "0".
- 5.2 Display setting**: Select a display method of normal main monitor.
- 5.3 Detection mode setting**: Select a detection method from the list below.
- 5.4 Counter setting**: Select counter function ON/OFF and a increasing/decreasing direction of value.
- 5.5 Output setting**: Select an output method of 1CH and 2CH.
- 5.6 External input setting**: Select an assignment of external input.
- 5.7 Analog function setting**: Select an analog function setting detail menu.

Function Setting (Continued)

- 5.11 Length measurement standard value setting**: Select a width of flood line of sensor head.
- 5.12 End of Detail Setting (Expert mode)**: Returns to the TOP of Detail Setting.
- 5.7.1 Analog output setting**: Select either read out or turn off the analog output.
- 5.7.2 Span setting**: Set the slant of output.
- 5.7.3 Output clamp hold setting**: Select a measurement value state when measurement is impossible.
- 5.7.4 Average counter setting**: Select a number of times of sampling.
- 5.7.5 Hold setting**: Select a hold state.
- 5.7.6 End of Analog function setting**: Returns to the TOP of Analog function setting.

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 Exit (Exit).

Key Lock

Prevents all the operations. Useful to prevent accidental operation.

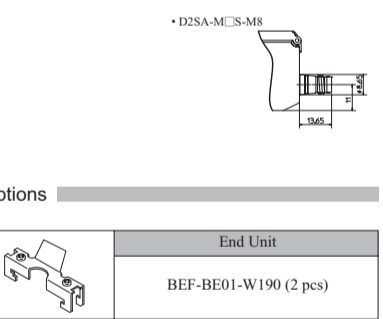
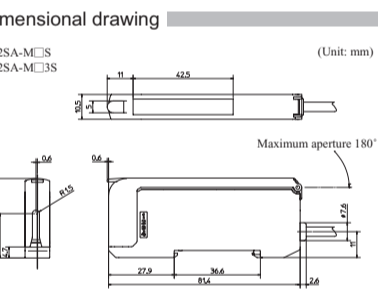
Reset "Peak/ Bottom hold"

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



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.

* D2SA-M□3S/D2SA-M□S-M8 do not allow these settings.
 * D2SA-M□3S 1 do not allow these settings.
 * External teaching can be available in several teachings which are chosen by appropriate adjusting methods.

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.

- The product specification may change without notice for improvement.
- For any inquiry, please contact the manufacturer/vendor below.

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