

Laser Line Sensor Controller
LD-C60

CMJE-LDC60(03)No.0032-84V

Thank you very much for using our products. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

WARNING This product is not a safety sensor. Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal object detection sensor.

1 OUTLINE

This product is a controller which controls the sensor head to detect the edge of an inserted object and outputs sensing data.

2 MAJOR SPECIFICATIONS

Type	Controller
Item Model No.	LD-C60
Applicable sensor head	LD-600, LD-601
Sensing object	Opaque object
Min. sensed object	φ0.5mm
Sensing method	Edge sensing, Width sensing (Dark, Light)
Measuring accuracy	±22 μm (Edge sensing) ±44 μm (Width sensing)
Supply voltage	24V DC±10% Ripple P-P±10% or less
Current consumption	250mA or less (Including supply current to sensor)
REQ/SHD input	Low: 1V or less High: 5V or more, or open
ACK output	NPN open collector transistor • Residual voltage: 1V or less (at 20mA sink current) • Maximum sink current: 20mA • Applied voltage: 30V or less
Output operation	ON when data is output
Short-circuit protection	
Data output (D0 to D10)	NPN open collector transistor • Residual voltage: 1V or less (at 20mA sink current) • Maximum sink current: 20mA • Applied voltage: 30V or less
Output operation	Binary output of pixel
Short-circuit protection	
Response time	1.2ms or less
Power indicator	Red LED (lights up while the power is supplied)
REQ indicator	Red LED (lights up when REQ output is in Low state)
ACK indicator	Red LED (lights up when ACK output is activated)
Data display	Four digit LED display (Display resolution 10 μm) (*2)
Ambient temperature	0 to +40°C (No dew condensation or icing allowed), Storage: -10 to +60°C
Ambient humidity	35 to 85% RH, Storage: 35 to 85% RH
Earthing method	Capacitor earth between live parts and frame ground
Connection	Terminal: 3P (for power source) Connector: 25P (for data output)
Accessory	Input/Output connector (1 No.)
Weight	230g approx.
Number of possible SHD times	400million times

(*1) Refer to INSTRUCTION MANUAL of LD-600 or LD-601 for more details.

(*2) Please note that the displayed value and the output value differs.

3 SELECTION OF MEASUREMENT/CALIBRATION

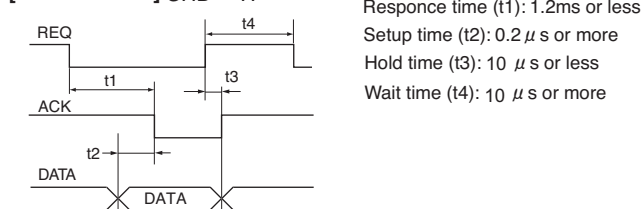
Measurement/Calibration is selected by SHD input.

SHD = 'H': Normal measurement

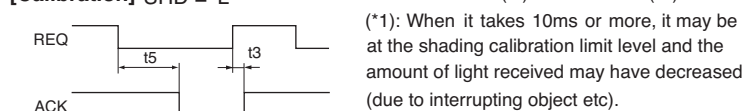
SHD = 'L': Calibration *Calibration: Shading calibration

Timing chart

[Measurement] SHD = 'H'



[Calibration] SHD = 'L'

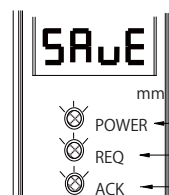


- Calibrated data will be automatically saved in the internal memory on completion of shading correction. Therefore, do not turn off the power for approximately 5 s after shading correction is completed. The data display will indicate "SA v E" while data is being saved.
- Data being saved midway will be discarded if the power is turned off. In that case, an SHD saving error will occur when the power is turned on next time. When the SHD saving error occurs, data output (D0 to D10) will be held in a 'L' (Low) level and the data display will indicate the occurrence of the error.

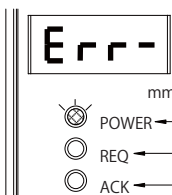
Note 1: Perform shading correction again if an SHD saving error has occurred. The operation of the sensor will return to normal when shading correction is successful.

Note 2: An SHD error state will be maintained even if measurement input (REQ set to 'L' level) is implemented unless the error state is restored.

<Displayed while SHD saving>



<Displayed in case of SHD error>



4 SETTING OF SENSING METHOD (MEASUREMENT MODE)

Four sensing methods (measurement modes) are set by mode switch 1 and 2.

Switch1	Switch2	Measurement mode
OFF	OFF	Edge · Dark measurement
OFF	ON	Edge · Light measurement
ON	OFF	Width · Dark measurement
ON	ON	Width · Light measurement

* Edge · Dark measurement mode is set on shipment.

5 CAUTIONS

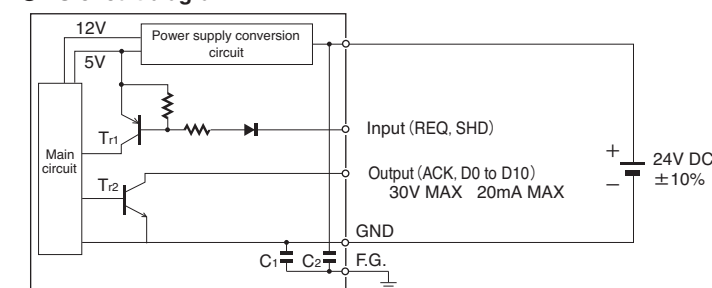
- This product has been designed to meet the specifications when it is used along with the optional sensor heads. If it is used along with a sensor head other than these optional sensor heads, not only the specifications may not be met, but this may also cause a malfunction or breakdown. Hence, please ensure to use this product along with the optional sensor heads.
- When the sensor is installed (or changed) please ensure to perform calibration. If calibration is not performed, correct measurement cannot be done.
- Avoid using this product for 1 sec. approx. of transient duration immediately after power supply is switched on.
- Always make power ON/OFF with input signal (REQ, SHD) in the open (or 'H' level) state.

- This product has been developed / produced for industrial use only.
- Always use an insulated transformer as DC power supply. If an auto-transformer is used, power supply or internal circuit may be damaged.
- If a surge arises out of the power supply, connect a surge absorber to the source.
- Verify that the supply voltage ripple is within the rating.
- Do not run the sensor cable a long any high-voltage or power cable or put then in the same raceway. It may cause malfunction due to induction.
- Do not supply power while wiring.
- Make the cable length as short as possible to lessen the trouble of picking up noise.
- In this product, capacitor earth is used between live parts and F.G. to enhance the noise characteristics.
- Where some device generating noise such as switching regulator or an inverter motor is placed near the sensor, ground the F.G. terminal.
- Do not turn off the power for approximately 5 sec. after shading correction is completed.
- The guaranteed number of shading correction saving times is 4 million. An SHD saving error may occur when the power is turned on after shading correction is performed 4 million times.
- Perform shading correction again if an SHD saving error has occurred when the power is turned on.

- Avoid places where the sensor will be directly exposed to fluorescent lights with rapid starters or high frequency starters.
- Avoid dust, dirt, and steam. Do not place it in an area where it may be directly exposed to water.
- Make sure that the sensor is not exposed to chemical agents such as thinner or organic solvent.
- This product is not a measuring instrument. Hence, the company does not offer any calibration services.
- In case of using this product as a CE marking conformity product, the power wire and I/O wire connected to this product must be within 30m.

6 CONNECTION

I/O circuit diagram



(*1) : Do not supply power while wiring.

Terminal pin position

Power source terminal (3P)

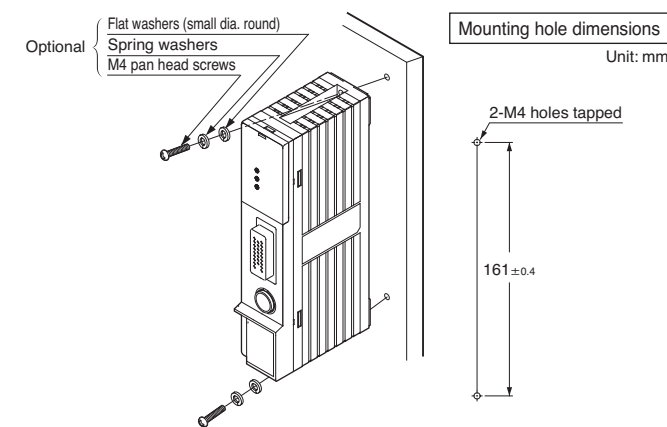
No.	Symbol	Description
①	+	+24V DC
②	-	0V DC
③	F.G.	Frame ground

I/O data terminals (25P)

No	Symbol	I/O	Description	No	Symbol	I/O	Description
1	REQ	Input	Data output request	14	D4	Output	Data (2 ⁴)
2	ACK	Output	Data output processing	15	D5	Output	Data (2 ⁵)
3	SHD	Input	Shading calibration	16	D6	Output	Data (2 ⁶)
4	—	—	Not connected	17	D7	Output	Data (2 ⁷)
5	—	—	Not connected	18	D8	Output	Data (2 ⁸)
6	—	—	Not connected	19	D9	Output	Data (2 ⁹)
7	—	—	Not connected	20	D10	Output	Data (2 ¹⁰)
8	G	Output	0V	21	—	—	Not connected
9	G	Output	0V	22	—	—	Not connected
10	D0	Output	Data (2 ⁰)	23	—	—	Not connected
11	D1	Output	Data (2 ¹)	24	G	—	0V
12	D2	Output	Data (2 ²)	25	G	—	0V
13	D3	Output	Data (2 ³)				

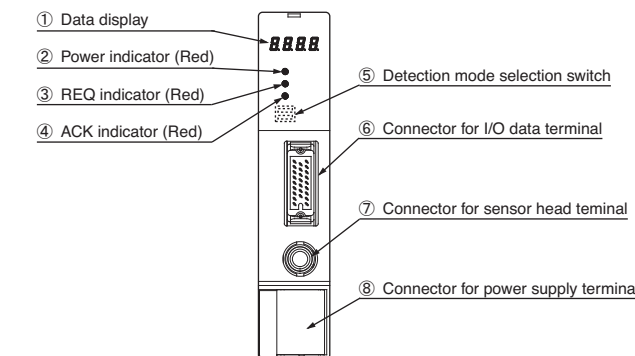
(*1) : 0V of the I/O data terminals and 0V DC of the power supply terminal are common internally.

7 MOUNTING



- The controller should be mounted with 2 Nos M4 pan head.

8 FUNCTIONAL DESCRIPTION



No.	Description	Function
①	Data display (4 digit LED display)	During measurement: Measured value is displayed in mm. (Display resolution: 10 μm) During calibration: If calibration is OK, some number is displayed. 8888 If calibration is NG, ' - - - - ' is displayed. (*1) - - - -
②	Power indicator (red)	Lights up when the power is supplied.
③	REQ indicator (red)	Lights up when REQ output is in Low state.
④	ACK indicator (red)	Lights up when ACK output is activated.
⑤	Mode switch	Sensing method (measurement mode) is selected by the mode switch 1,2. On shipment, the switch is set to OFF·OFF (Edge·Dark measurement).
⑥	I/O data terminals	REQ, ACK, SHD, DATA (D0 to D10) I/O signals are input or output.
⑦	Sensor head terminals	Sensor head LD-600 (LD-601) is connected by a connector.
⑧	Power supply terminals	+24V GND and F.G. are connected.

(*1) : If calibration is NG, it is possible that dust or dirt may be sticking to the glass portion of emitter / receiver of the sensor head. Hence, please clean the glass with a clean soft cloth or a lens paper.

9 INTENDED PRODUCTS FOR CE MARKING

The models listed under "2 SPECIFICATIONS" come with CE Marking. As for all other models, please contact our office.



Contact for CE

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