Panasonic[®]

INSTRUCTION MANUAL

Digital Laser Sensor Amplifier LS-501

Thank you very much for purchasing Panasonic 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

- Never use this product as a sensing device for personnel protection
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

11 INTENDED PRODUCTS FOR CE MARKING

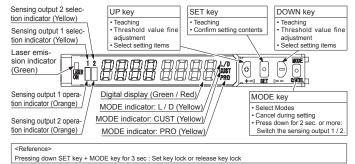
• This product complies with the following standards / regulations. <EU Directive>



Contact for CE

Panasonic Marketing Europe GmbH Panasonic Testing Center Winsbergring 15, 22525 Hamburg, Germany

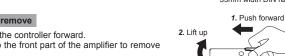
2 PART DESCRIPTION



3 MOUNTING

How to connect

- 1. Fit the rear part of the mounting section of the amplifier on a DIN rail. 2. Press down the rear part of the mounting sec-
- tion of the unit on the DIN rail and fit the front part of the mounting section to the DIN rail.



1. Push the controller forward

sor head **LS-H** series (optional).

- 2. Lift up the front part of the amplifier to remove



Connector

2. Press d

How to connect

- 1. Insert the connector of the sensor head LS-H series (optional) into the connector area for the sensor head of this product as shown in the right figure.
- 2. Fit the connector cover

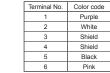
1. Pressing the release lever attached to the connector of the sensor head, pull



<Terminal arrangement>

Ramco National





5 INSTALL MORE AMPLIFIER OF SERIES CONNECTION TYPE

- Make sure that the power supply is OFF while adding or removing the series connection type.
- In case 2 or more the series connection types are connected in cascade, make sure to mount them on a DIN rail.
- In case installing additional amplifier of series connection type, the maximum 11 the series con nection types using sub cables can be added to an amplifier using a main connection cable.
- When connecting 2 or more the series connection types in cascade, use the sub cable (optional) for the second series connection type onwards.

For mounting and removing the amplifier, refer to " MOUNTING."

- 1. Mount the amplifiers, one by one, on the DIN rail.
- 2. Slide the amplifiers next to each other, and connect the quick-connection
- 3. Mount the end plates MS-DIN-E (optional) at both the ends to hold the amplifiers between their flat sides.
- 4. Tighten the screws to fix the end

- 1. Loosen the screws of the end plates. 2. Remove the end plates
- 3. Slide the amplifiers and remove them
- one by one.

Sub cable (Optional window End plate MS-DIN-E (Optional) Slide Main cable (Optional)

8 TEACHING MODE

in teaching if less margin is applied.

• Teaching can be set in RUN mode

to be made in PRO mode beforehand.

2-point teaching This is basic teaching method.

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마하라도ト위유교를 및 및 모델 Stable sensing is not possible

ground are existing

Be sure that detection may become unstable depending on the use environment

When teaching in Window comparator mode or Hysteresis mode, a setting has

In case 1-point teaching, make sure to set the shift amount. (initial value is 10%

For the setting, refer to <PRO6> in " PRO MODE OPERATION DESCRIPTION."

Useful when sensing object can be set

<Retroreflective type> <Diffuse reflective type>

대표 한 마리 1. Press the SET key in the sensing object present condition.

2. Press the SET key in the sensing object absent condition.

Useful when sensing object cannot be set

Limit-teaching This is teaching method in case small object or object in back

<Thru-beam type and retroreflective type, diffuse reflective type are common>

1. Press the SET key in the sensing object present

condition or non sensing object present condition

2. The threshold level is shifted to high value

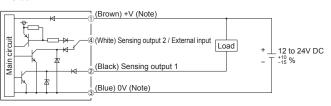
(low sensitivity) by pressing down UP key

The threshold level is shifted to low value

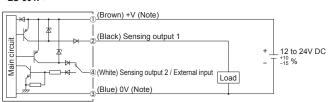
(high sensitivity) by pressing down UP key.

6 I/O CIRCUIT DIAGRAMS

<LS-501>



<LS-501P>



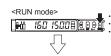
Note: The quick-connection sub cable does not incorporate +V (brown) and 0V (blue). The power is supplied from the

1	
2—	4
3	

+V
Sensing output 1
0V
Sensing output 2 / External input

7 OPERATION PROCEDURE

- The sensing output can be switched to sensing output 1 or sensing output 2 by holding down the mode key.
- The changed settings are not stored if turning the power OFF while setting Therefore, confirm the settings by pressing the SET key before turning the power
- When turning ON the power, RUN mode is displayed and the digital display shows the threshold value (green) and the incident light intensity (red)



<RUN mode:

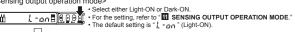
Displays threshold value (green) and incident light intensity (red).

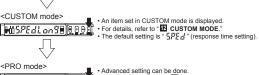
Teaching, threshold value fine adjustment and key lock function can be set.

For setting method of each function, refer to " 11 TEACHING MODE," " 11

THRESHOLD VALUE FINE ADJUSTMENT FUNCTION," or 11 11 KEY LOCK

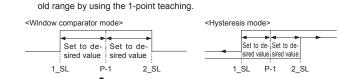
<Sensing output operation





Advanced setting can be done. For the setting, refer to "IP PRO MODE."

1-point teaching (Window comparator mode / Hysteresis mode) • This is method to set the shift amount to the desired value and to set the thresh-



1. Pressing SET key down

2. Press the SET key down in the sensing object present condition. 3. The threshold value (1_SL) that is 10% lower from the incident light

intensity and the threshold value (2 SL) that is 10% higher from the incident light intensity are set. (Note 1, 2)

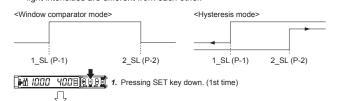
In the Boad ● ● ● ■ Stable sensing is possible #曲 lbch HRcd目 현교면의</mark> Stable sensing is not possible

Notes 1) The shift amount of 10% is an initial value. The shift amount can be set in PRO mode. Furtherm value can be set in incident light amount. For setting method, refer to <PRO6> in " PRO MODE OPERA-

2) If the value after setting exceeds the maximum (minimum), the maximum (minimum) sensitivity will be set.

2-point teaching (Window comparator mode / Hysteresis mode)

• This is method to set the threshold range by conducting the 2-point teaching (P-1, P-2). • When conducting teaching, use sensing objects (P-1 and P-2) whose incident light intensities are different from each other.

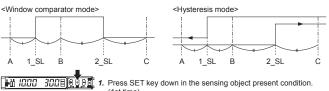


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Note: If the value after setting exceeds the maximum (minimum), the maximum (minimum) sensitivity will be se

3-point teaching (Window comparator mode / Hysteresis mode)

- This is the method to conduct the 3-point teaching (P-1, P-2, P-3) and to set the threshold range by setting the threshold value (1_SL) of the mid-point between "A" and "B" and the threshold value (2 SL) of the mid-point between "B" and "C"
- When conducting teaching, use sensing objects (A, B and C) whose incident light intensities are different
- After teaching, P-1, P-2 and P-3 will be automatically relocated in ascending order: i.e. the lowest value is placed in "A", the second lowest in "B" and the highest in "C"



2. Press SET key down in the sensing object present condition.

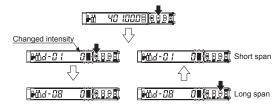
3. Press SET key down in the sensing object present condition.

Stable sensing is possible ■前当たこれおれては目 ● 回り面 Stable sensing is not possible

Note: If the value after setting exceeds the maximum (minimum), the maximum (minimum) sensitivity will be set

Span adjustment in rising differential mode or trailing differential mode

- Move to the rising differential mode, or the trailing differential mode in the PRO6 mode, and press the jog switch to confirm the setting.For the setting procedure, refer to <PRO6> in " I PRO MODE OPERATION DESCRIPTION."
- The threshold can be set by using the threshold value fine adjustment function. For the threshold value fine adjustment function, refer to " THRESHOLD VAL-UE FINE ADJUSTMENT FUNCTION."



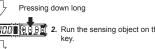
Useful when not want to stop production line and to keep the sensing object move Full-auto teaching This is method to conduct teaching doing sensing object is <Thru-beam type and retroreflective type, diffuse reflective type are common> 150 150 1000 1000 1. Pressing SET key down. Pressing down long

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Note: The shift value of approx. 15% is an initial value. Display of the shift value can be changed to percent-age [approx. 0 to 999% (unit 1 %)] or incident light intensity [0 to 9999 (unit 1)]. For setting the shift amount, refer to <PROX1 > in "BI PRO MODE OPERATION DESCRIPTION."



3. " Ruka" is displayed on the digital display (green) and when the sensing object secret "" Automatic key. ្រាប់ការរដ្ឋានិធិប្រាស្នា Stable sensing is possible

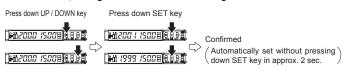
្រីម៉ាក់ដែលកកកជា 🧕 🗓 🗜 🗓 Stable sensing is not possible

email: nsales@ramcoi.com

9 THRESHOLD VALUE FINE ADJUSTMENT FUNCTION

- Set the fine adjustment of threshold value in RUN mode.
- · Also, the threshold value fine adjustment function can be used in forced ON output mode and forced OFF output mode.
- For setting of the sensing output, refer to <PRO6> in " PRO MODE OPERA-TION DESCRIPTION.

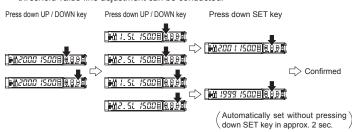
<Normal mode, Rising differential mode or Trailing differential mode>



<Window comparator mode or Hysteresis mode>

• When setting sensing output to the window comparator mode or hysteresis mode, 1. 51 " and " 2. 51 " can be changed to another by pressing down SET key for 2

In case conducting threshold value fine adjustment of " 1,51, " or " 2,51, ", press down UP key or Down key, and " 1.51." or " 2.51." are displayed. Then, the threshold value fine adjustment can be conducted

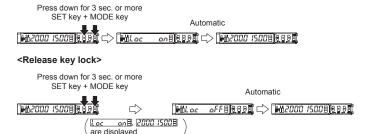


Note: It may not respond when values of " 1.51." and "2.51." are close because of relation of hysteresis. Be sure to confirm with this device

10 KEY LOCK FUNCTION

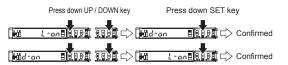
- The key lock function prevents key operations so that the conditions set in each setting mode are not inadvertently changed.
- If operating key switch after key lock is set, "Lac ລກ " is indicated on the digital display

<Set key lock>



11 SENSING OUTPUT OPERATION MODE

• When MODE indicator: L / D (yellow) lights up, sensing output operation can be



DOWN key

MODE indicato

CUST (Yellow)

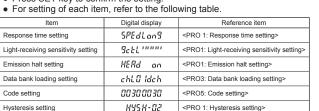
MODE key

SET key

UP key

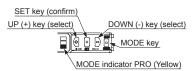
12 CUSTOM MODE

- When MODE indicator: CUST (yellow) lights up, Response time setting, Emission power setting or Hysteresis setting can be displayed. For the setting procedure, refer to <PRO5> in "ID PRO MODE OPERATION DESCRIPTION."
- · By pressing UP key or DOWN key, the setting in each item will be changed.
- · Press SET key to confirm the setting.

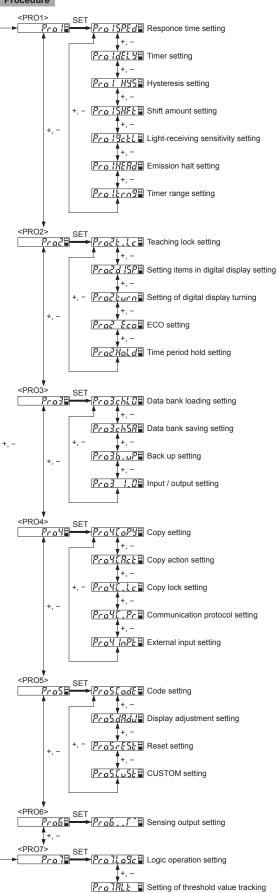


13 PRO MODE

- When MODE indicator: PRO (yellow) lights up, PRO mode can be set.
 For detail of PRO mode, refer to " PRO MODE OPERATION DESCRIPTION."



Procedure

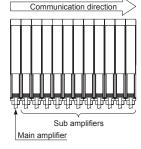


14 OPTICAL COMMUNICATION

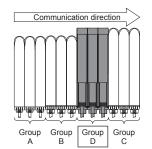
• When the setting of data bank loading / saving, copy setting, or copy action setting is conducted via optical communications, cascade the sub amplifiers right side to the main amplifier as follows.

However, in case using data bank loading / saving, use LS-501□ or LS-501□-C2 as main amplifier.

- If an amplifier is under any of the following conditions, the setting of data bank loading / saving, or copy setting cannot be carried out.
- Copy lock setting is set to copy lock ON " [] Le on .
- Digital display is blinking
- External input setting of main amplifier is set to " InFL SELF." (Only databank loading / saving)
- When communication protocol of a sub amplifier is set to communication emission halt "[Pr pF " the setting of data bank loading / saving, or copy setting cannot be carried out to sub amplifiers subsequent to the mentioned amplifier.
- · Make sure to mount closely like follows since interference prevention function is conducted by optical communication



• When this product and other products (e.g. fiber sensor amplifiers, pressure sensor controllers, etc.) are connected together in cascade, install those products so that they are in order of Group A, B, D and C as shown in the right figure. This product is included in Group D.



Group	Model No.
Α	FX-301 (Conventional version unit) FX-301B (G (H , LS-401
В	FX-301 (Modified version unit) FX-305 FX-301 -C1
С	LS-403□, DPS series
D	FX-500 series, LS-500 series

- · Within each group, identical models should be connected in a lump.
- In case conducting copy setting of this device and other LS-500 series together, functions which are incorporated in this device will be copied but functions which are not incorporated in this device will not be copied.

15 INTERFERENCE PREVENTION FUNCTION

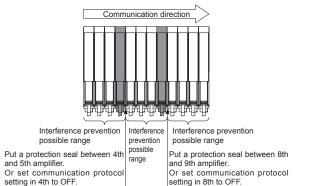
• Possible number of amplifiers for interference prevention function is different as

shown in table below.								
Response time	H-SP	FAST	STD	LONG	U-LG	HYPR		
Number of amplifiers	0	2	4	4	4	4		

• In case putting in more amplifiers than limit of interference prevention function, put the amplifier protection seal to amplifier which is adjacent of end of an amplifier that the interference function is valid or set OFF in communication protocol setting of the end of amplifier that the interference prevention function is valid.

Example: Putting in 12 of this device and set STD of response time setting. · Possible number of interference prevention is 4.

Put the amplifier protection seals 4th and 5th amplifiers and between 8th and 9th amplifiers or change the communication protocol setting of 4th and 8th to OFF since interference prevention works from 1st to 4th, from 5th to 8th and



- In case mounting more amplifiers whose response time setting are different, put protection seal between amplifiers that have different response time setting or set communication protocol setting of the upper amplifier to OFF.
- For communication protocol setting procedure, refer to <PRO4> in " PRO MODE OPERATION DESCRIPTION.

16 ERROR INDICATION

• In case of errors, attempt the following measures

Error indication	Description	Remedy				
ErO1	EEPROM is broken or reached the end of its working life.	Please contact our office.				
Er02	EEPROM writing error					
Er 11	Load of the sensing output 1 is short-circuited causing an over-current to flow.	Turn OFF the assume and shoot the load				
Er 12	Load of the sensing output 2 is short-circuited causing an over-current to flow.	Turn OFF the power and check the load.				
Er42	Fault error of sensor head.	Check the connection of sensor head. If the error persists despite checking the connection, please contact us.				
Er52	Communication error when the amplifiers are mounted in cascade.	Verify that there is no loose or clearance between amplifiers.				
Er53	Communication error between the upper communication unit and amplifiers.	Verify that there is no loose or clearance betwe the upper communication unit and amplifiers.				

17 SPECIFICATIONS

_	Series conr	nection type					
Туре	NPN output	PNP output					
Model No.	LS-501P						
Supply voltage	12 to 24V DC *10 % Ripple P-P10% or less						
Power consumption	Normal operation: 1,200mW or less (current co Eco mode: 980mW or less (current consumpt						
Sensing output (Sensing output 1 / 2)	NPN open-collector transistor Maximum sink current: 50mA (Note 1) Applied voltage: 30V DC or less (Between sensing output and 0V) Residual voltage: 2V or less (Note 2) [At 50mA (Note 1) sink current]	PNP open-collector transistor • Maximum source current: 50mA (Note 1) • Applied voltage: 30V DC or less (Between sensing output and +V • Residual voltage: 2V or less (Note 2) [At 50mA (Note 1) source current					
Output operation	Switchable either Light-ON or Dark-ON						
Short-circuit protection	tection Incorporated						
Response time	H-SP: 60µs or less, FAST: 150µs or less, STD: 250µs or less, LONG: 500µs or less U-LG: 5ms or less, HYPR: 24ms or less, Selectable						
External input	Signal condition High: +8V to +V DC or Open Low: 0 to +1.2V DC (at 0.5mA source current) Input impedance: Approx. 10kΩ	Signal condition High: +4V to +V DC (at 3mA sink current Low: 0 to +0.6V DC or Open Input impedance: Approx. 10kΩ					
Protection	IP40	(IEC)					
Ambient temperature	-10 to +55°C (If 4 to 7 units are mounted in cascade: -10 to +50°C or if 8 to 16 units are mounted in cascade: -10 to +45°C) (No dew condensation or icing allowed) Storage: -20 to +70°C						
Ambient humidity	35 to 85% RH, Stor	rage: 35 to 85% RH					
Material	Enclosure: Polycarbonate, Key: Polya	icetal, Protective cover: Polycarbonate					
Weight (Main body only)	Appro	x. 15g					
Accessory	FX-MB1 (Amplifier p	rotection seal): 1 set.					

Notes: 1) 25mA max. if 5 or more series connection types are connected together 2) In case of using the quick-connection cable (cable length 5m) (optional) 3) Cables are not accessories. Be sure to use cables in table below.

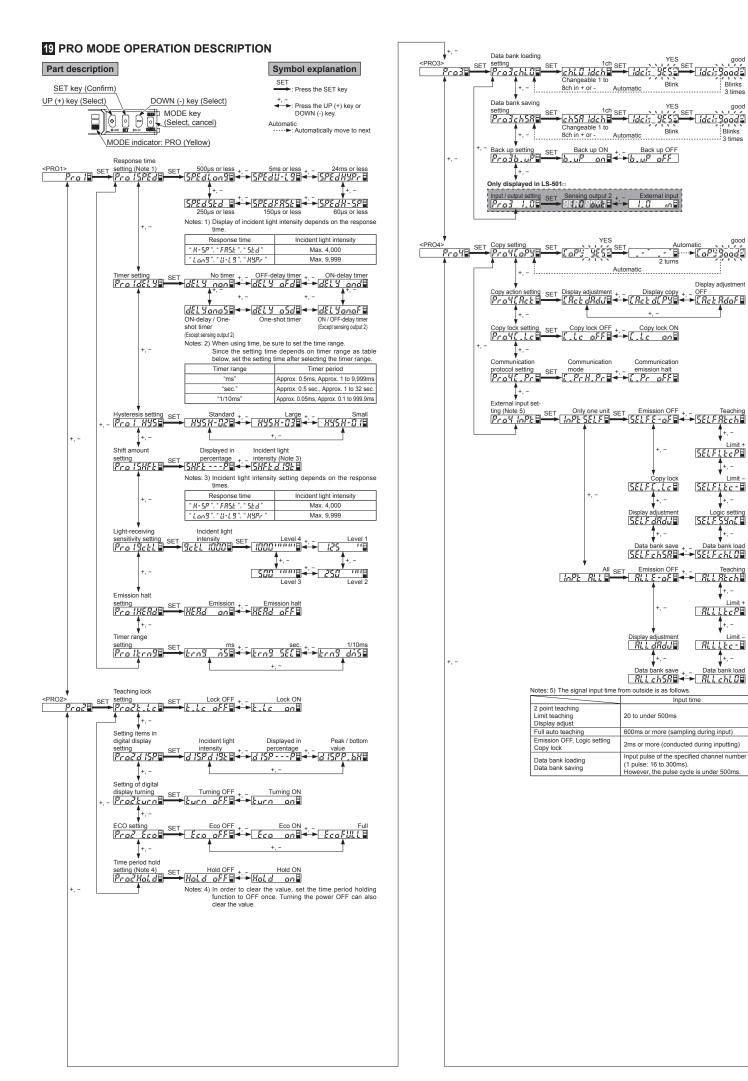
<Series connection type>

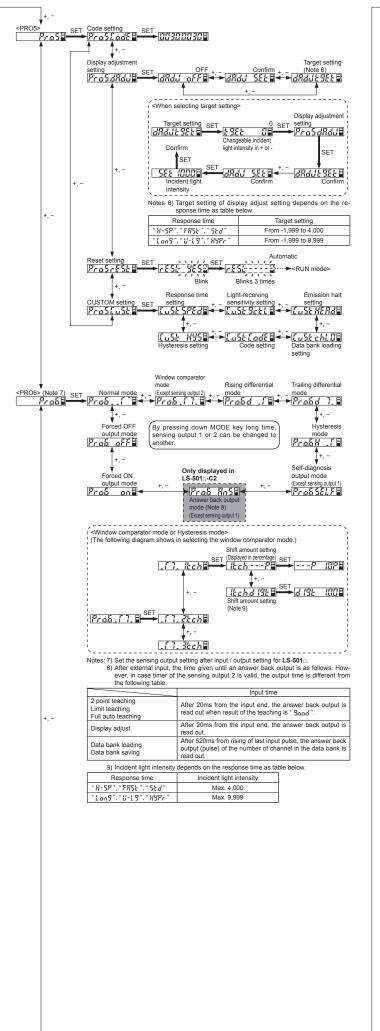
			Ca	ble		
	Cable le	ngth 1m	Cable le	ngth 2m	Cable le	ngth 5m
	Main cable	Sub cable	Main cable	Sub cable	Main cable	Sub cable
LS-501□	CN-74-C1	CN-72-C1	CN-74-C2	CN-72-C2	CN-74-C5	CN-72-C5

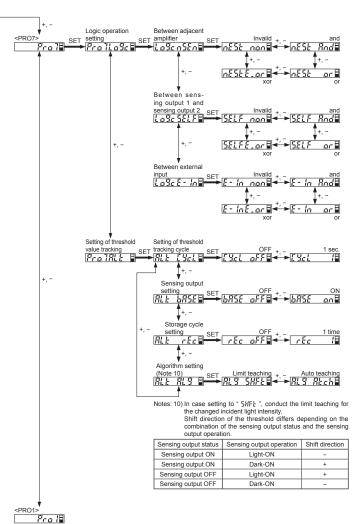
18 CAUTIONS

- This product has been developed / produced for industrial use only.
- Make sure that the power supply is OFF while adding or removing the amplifiers.
- Take care that if a voltage exceeding the rated range is applied, or if an AC power supply is directly connected, the product may get burnt or be damaged.
- Take care that short-circuit of the load or wrong wiring may burn or damage the product
- Do not run the wires together with high-voltage lines or power lines, or put them in the same raceway. This can cause malfunction due to induction.
- The specification may not be satisfied in a strong magnetic field.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- The ultra long distance (U-LG, HYPR) mode is more likely to be affected by extraneous noise since the sensitivity of that is higher than the other modes. Make sure to check the environment before use.
- Do not use during the initial transient time (H-SP, FAST, STD: 0.5 sec., LONG, U-LG, HYPR: 1 sec.) after the power supply is switched ON.
- Extension up to total 100m is possible. However, in order to reduce noise, make the wiring as short as possible. When you extend the cable, be sure to use cables which have 0.3mm² or more of conductor cross-section area. Set the power supply voltage while taking into account the voltage drop in the power cable due to its resistance
- Make sure that stress by forcible bend or pulling is not applied to the sensor cable
- This product is suitable for indoor use only.
- Avoid dust, dirt, and steam.
- · Take care that the product does not come in contact with oil, grease, organic solvents such as thinner, etc., strong acid or alkaline.

 This product cannot be used in an environment containing inflammable or explo-
- sive gasses.
- Never disassemble or modify the product.
- This product adopts EEPROM. Settings cannot be done 100 thousand times or more because of the EEPROM's lifetime







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\vdash	Item Response time set-	Default setting	Description
	ting	SPEdLan9	Set response time.
	Timer setting	dELY non	Set operation and period of the timer. Hysteresis can be set when the normal mode or the window com-
e e	Hysteresis setting	HY5H-02	parator mode is selected.
PRO1 mode	Shift amount setting	SHFEP	Set shift amount of threshold value in limit teaching. Selects light-receiving sensitivity from 4 levels.
PRO1	Light-receiving sensi- tivity setting	1000'''''	Selects ignit-receiving sensitivity from 4 levels. " !! Level 1 " !!! Level 2 " !!!!" Level 3
	Emission halt setting Timer range setting	HERd on Ern9 AS	Selects laser emission from the sensor head to execute or halt. Change unit time of timer.
	Teaching lock setting	t-Le off	Be able to prevent from wrong operation of teaching. " of f": Teaching mode is valid " on ": Teaching mode is invalid
	Digital display item	d 15Pd 19b	Incident light intensity can be displayed in percentage or the peak /
	setting Digital display turning	turn off	bottom value can be displayed on the digital display (red).
ode	on setting	curn arr	Sets the viewing orientation of the digital display. Power consumption can be lowered.
PRO2 mode	ECO setting	Eco off	* oFF*: ECO OFF on "! If any key operation is not carried out for 20 sec. in RUN mode, the digital display turns OFF. *FULL*: If key operation is not done in 20 sec. or setting the key lock function in Run mode, all indicators turns OFF.
	Period hold setting	Hald off	 αFF *. Peak / bottom value in the digital display refreshing condition can be displayed. αn *. Peak / bottom value in the hold condition can be displayed.
	Data bank loading setting	chL0 ldch	Load a setting from specified data bank. (1 to 8 channel)
PRO3 mode	Data bank saving set- ting	ch58 ldch	Save a setting to specified data bank. (1 to 8 channel)
PRO3	Back up setting	b.up on	Select to save or not to save the threshold value by teaching in EE- PROM.
	Input / output setting (LS-501□ only)	1.0 out	Select either sensing output 2 or external output.
	Copy setting	-	Using optical communications, be able to copy setting contents in main amplifier to all of the sub amplifiers connected from the main amplifier. LS-501□ cannot send or receive threshold value when conducting copy.
PRO4 mode	Copy action setting	ERct dRdJ	sity are conducted or canceled by using optical communication. In case incident light intensity does not have enough margin, automatically set optimum value. "dRad": Display adjustment of main amplifier and sub amplifiers can be conducted. Set to the target value of display adjustment in each amplifier. "dCPY": Incident light intensity of main amplifier can be copied to sub amplifier. However, when the difference between main amplifier and sub amplifier is big, it will not be copied. "RdoF": Display adjust of main and sub amplifier can be set to OFF. Do not press down the SET key many times when display is "RdoF". When "RdoF" is not displayed in confirmation, also do not press down set key many times.
	Copy lock setting	C.Lc off	When conducting the setting of copy setting or data bank loading / saving from the main amplifier via optical communications, it is possible that only the sub amplifier which is set to copy lock ON " f . Lc an " does not receive the set contents. However, even if copy lock ON " is set, the copy action setting is communicated.
	Communication protocol setting	E.PrH.Pr	When conducting the copy setting or setting of data bank loading I saving from the main amplifier via optical communications, the optical communications through a sub amplifier which is set to communication emission halt ${}^*\mathcal{L}$, \mathcal{P}_{Γ} ${}_{\alpha}\mathcal{F}_{\Gamma}$ and the following sub amplifiers can be halted.
L	External input setting	InPt SELF	Set external input. Consistent setting can be done by inputting 8-digit code instead of
	Code setting	00300030	independent setting. In addition, present setting can be confirmed.
PRO5 mode	Display adjustment setting	dRdJ oFF	Set incident light intensity to target value. If conducting display adjustment setting when incident light intensity does not have enough margin, "DIEr," is blinked. "aFF." Display adjustment OFF "SEŁ". Side to (smaller side) incident light intensity from the set of target setting. "ESEL" Set incident light intensity to value you want (negative side). In case setting to 0-adjustment, set to 0.
	Reset setting	-	If setting to " 4£5," returns to default settings (factory settings).
\vdash	CUSTOM setting	CuSt SPEd	Select an item in CUSTOM mode to display. Set sensing output 1 mode and sensing output 2 mode.
PRO6 mode	Sensing output mode	Pro5	

	Item	Default setting	Description						
	Logical operation setting	LogenSEn	Description Select for logical operation and set logical operation methods (and, or, xor). *n5En*: Logical operation is sensing output 1 of this device and conduct logical operation between the sensing output 1 and sensing output 1 of this device. The calculation result of upper amplifiers and this product is output from the sensing output 1 of this product. *5ELF*: Logical operation is outer input and conduct logical operation between the output and sensing output 1 of this device. *E*-In*: Logical operation is sensing output 1 of an upper adjacent amplifier and conduct logical operation between the sensing output 1 of this device.						
PRO7 mode			Logical	Sensing	Setting	of logical ope	rations		
			operation	output 1 of this device	and	or	xor		
2			ON	ON	ON	ON	OFF		
후			ON	OFF	OFF	ON	ON		
-			OFF	ON	OFF	ON	ON		
			OFF	OFF	OFF	OFF	OFF		
	Setting of threshold value tracking	[Yel off	This mode can change the threshold value depending on the cycle (1 to 9,999 sec.) that is set with the variations of the incident ligh intensity. The tracking shift amount is the one which is set at the shift setting.						
	Sensing output setting	b85E off	Selects whether tracking threshold when the output is OFF or when the output is ON.						
	Storage cycle set- ting	rEc off	Selects a thi	reshold storage	cycle in EEP	ROM from 1 to	250 times.		
	Algorithm setting	ALS SHEE	When setting to limit teaching, threshold value is followed up bases of shift amount. Furthermore, when setting to auto teathreshold value be followed up on the bases of each cycle						

LS-501□ / Code setting table

• Green digital display (right side is the first digit)

a)	Forth	digit	an an	Third	l digit	an a	Second digit		First digit
Code	Sensing output	operation mode	Şode	Timer operation Timer period	Code	CUSTOM setting			
	Sensing output 1	Sensing output 2		Sensing output 1	Sensing output 2		Timer period		
B	Light-ON	Light-ON	a	No timer	No timer	B	0.5ms	a	Response time setting
1	Light-ON	Dark-ON	1	OFD	No timer	1	1ms	1	Light-receiving sensitivity setting
2	Dark-ON	Light-ON	2	OND	No timer	2	3ms	2	Emission halt setting
3	Dark-ON	Dark-ON	3	ONOF	No timer	3	5ms	3	Data bank loading setting
ч	-	-	ч	OSD	No timer	ч	10ms	ч	Code setting
5	-	-	5	ONOS	No timer	5	30ms	5	Hysteresis setting
Б	-	-	Б	No timer	OFD	Б	50ms	Б	-
7	-	-	7	No timer	OND	7	100ms	7	-
8	-	-	8	No timer	OSD	8	300ms	8	-
3	-	-	9	-	-	3	500ms	9	-
Я	-	-	Я	-	-	В	1 sec.	Я	-
ь	-	-	ь	-	-	Ь	2 sec.	ь	-
с	-	-	с	-	-	c	3 sec.	с	-
d	-	-	d	-	-	d	4 sec.	d	_
Ε	-	-	Ε	-	-	Ε	5 sec.	Ε	-

(OFD: OFF-delay timer, OND: ON-delay timer, ONOF: ON / OFF-delay timer, OSD: One-shot timer ONOS: ON-delay / One-shot timer

• Red digital display (right side is the first digit)

	read digital dioplay (right oldo to the mot digit)										
Ф	Forth	digit	Ф	υ Third digit		е	Second digit	Code	First digit		
Code	Copy lock setting	Hysteresis setting	Code	Setting items in digi- tal display setting	Back up setting	Code	Response time setting		Sensing output setting (Note)		
B	Copy lock OFF	H-02	a	Incident light intensity	Back up ON	O	H-SP	a	Normal mode		
1	Copy lock ON	H-02	1	Incident light intensity	Back up OFF	1	FAST	1	WC mode		
2	Copy lock OFF	H-03	2	Displayed in percentage	Back up ON	2	STD	2	Rising differen- tial mode		
3	Copy lock ON	H-03	3	Displayed in percentage	Back up OFF	3	LONG	3	Trailing dif- ferential mode		
ч	Copy lock OFF	H-01	ч	Peak / bottom value	Back up ON	ч	U-LG	ч	HYS mode		
5	Copy lock ON	H-01	5	Peak / bottom value	Back up OFF	5	HYPR	5	-		

(WC mode: Window comparator mode, HYS mode: Hysteresis mode)

Note: It is a setting only for sensing output 1. Sensing output 2 cannot be set.

LS-501 -C2 / Code setting table

. Green digital display (right side is the first digit)

m	Forth digit		m	Thire	l digit	_m	Second digit	d)	First digit
Code	Sensing output	operation mode	Code	Timer operation		Code	Timer period	Code	CUSTOM setting
_	Sensing output 1	Sensing output 2		Sensing output 1	Sensing output 2	Ľ	Timer period	Ŭ	
O	Light-ON	Light-ON	O	No timer	No timer	Ø	0.5ms	a	Response time setting
1	Light-ON	Dark-ON	1	OFD	No timer	1	1ms	1	Light-receiving sensitivity setting
2	Dark-ON	Light-ON	2	OND	No timer	2	3ms	2	Emission halt setting
3	Dark-ON	Dark-ON	3	ONOF	No timer	3	5ms	3	Data bank loading setting
ч	-	-	ч	OSD	No timer	ч	10ms	ч	Code setting
5	-	-	5	ONOS	No timer	5	30ms	5	Hysteresis setting
5	-	-	Б	No timer	OFD	Б	50ms	Б	-
7	-	-	7	No timer	OND	7	100ms	7	-
8	-	-	8	No timer	OSD	8	300ms	8	-
9	-	-	9	-	-	9	500ms	9	-
R	-	-	R	-	-	R	1 sec.	Я	-
Ь	-	-	Ь	-	-	Ь	2 sec.	Ь	-
c	-	-	c	-	-	c	3 sec.	c	-
d	-	-	d	-	-	d	4 sec.	d	-
Ε	-	-	Ε	-	-	Ε	5 sec.	Ε	-

OFD: OFF-delay timer, OND: ON-delay timer, ONOF: ON / OFF-delay timer, OSD: One-shot timer ONOS: ON-delay / One-shot timer

Red digital display (right side is the first digit)

Code	Forth digit			Third digit		<i>a</i> n	Second digit	a)	First digit	
	Copy lock setting	Hysteresis setting	Code	Setting items in digital dis-	Back up setting	Code	Response time setting	Code	Sensing output setting	
	setting setting	setting		play setting			unie setung		Sensing output 1	Sensing output 2
a	Copy lock OFF	H-02	a	Incident light intensity	Back up ON	0	H-SP	8	Normal mode	Normal mode
1	Copy lock ON	H-02	1	Incident light intensity	Back up OFF	1	FAST	1	Normal mode	Rising differ- ential mode
2	Copy lock OFF	H-03	2	Displayed in percentage	Back up ON	2	STD	2	Normal mode	Trailing differ- ential mode
3	Copy lock ON	H-03	3	Displayed in percentage	Back up OFF	3	LONG	3	Normal mode	HYS mode
ч	Copy lock OFF	H-01	ч	Peak / bot- tom value	Back up ON	ч	U-LG	ч	Normal mode	Self-diagnosis output mode
5	Copy lock ON	H-01	5	Peak / bot- tom value	Back up OFF	5	HYPR	5	Normal mode	Answer back mode
5	ı	-	5	-	-	5	-	Б	WC mode	Normal mode
7	ı	-	7	-	-	7	-	7	WC mode	HYS mode
8	-	-	8	-	-	8	-	8	Rising differ- ential mode	Trailing differ- ential mode
9	_	_	9	_	-	9	-	9	HYS mode	Normal mode

(WC mode: Window comparator mode, HYS mode: Hysteresis mode)

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