



THE BEST
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Setting manual Rev 2.4

Linear Sensor Camera

PR-LSC-21





Linear Sensor Camera PR-LSC-21

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Features of the product and Precautions

(Carefully read the following before using the unit)

The **linear scan camera sensor** is a color CCD image sensor which can precisely measure positions, widths and lengths etc.

The product is easy to mount anywhere due to its small size and light weight, and can detect precisely. Its light emitting unit does not use the existing fluorescent lamp but special high-flux LEDs to be proud of a long service life.

Features of the Product

1) Simple to operate

- It is operated only by a power source (DC +24 V).
- It outputs electric currents (4 ~ 20mA) proportional to the number of measurement (the number of incident light's pixels) only by connecting a power source.
- It shows an object's sensed condition on the LCD.

2) Perfect for the following applications

- If you want to control one edge of a material, you can use it as EPC, and if both edges, it is best to work as CPC.

3) Materials applicable for the controller

- Printing, screen printing
- Packaging, filling, pasting, painting
- Cleaning, drying, fabric, sewing, coloring

Precautions for Installation

- Maintain the right vertical and horizontal angles of the product for installation.
- Install the product in a place devoid of vibration, shock, high temperature or humidity, direct sunlight, much dust, or air containing much salt or ions.
- Do not install the product within the vicinity of inflammable gases or steam or dust.
- Wire the product as provided in the following drawings and check if all cables are properly connected.
- Ensure the earthing terminal is correctly grounded.
- Ensure the product is detached from the power supply cables or the cables with much electrical noise.



Warning

For the installation and wiring of the controller, completely isolate it from the external power supply. Failure to do so may result in an electrical shock or damage to the controller.



Warning

Use anti-explosive products where there are high risks of inflammation or explosion. Failure to do so may result in a fire or explosion. Use the anti-explosive products suitable to the given conditions.



Precaution

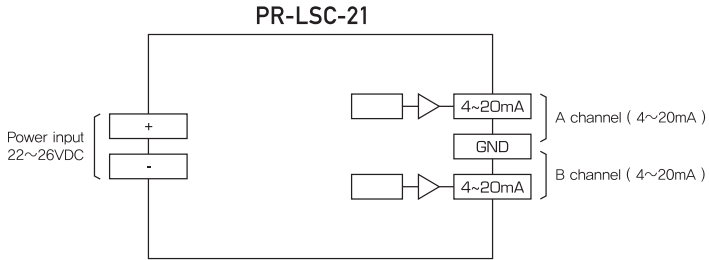
Check the surrounding environment. Do not install the controller where it can be exposed to excessive dust, conductive dust, corrosive gases, high temperature or rainy wind. It also should not be installed in the places susceptible to vibrations or shocks. Failure to do so may result in damages to, or malfunctioning or lowered performance of the controller.

Precautions for Use

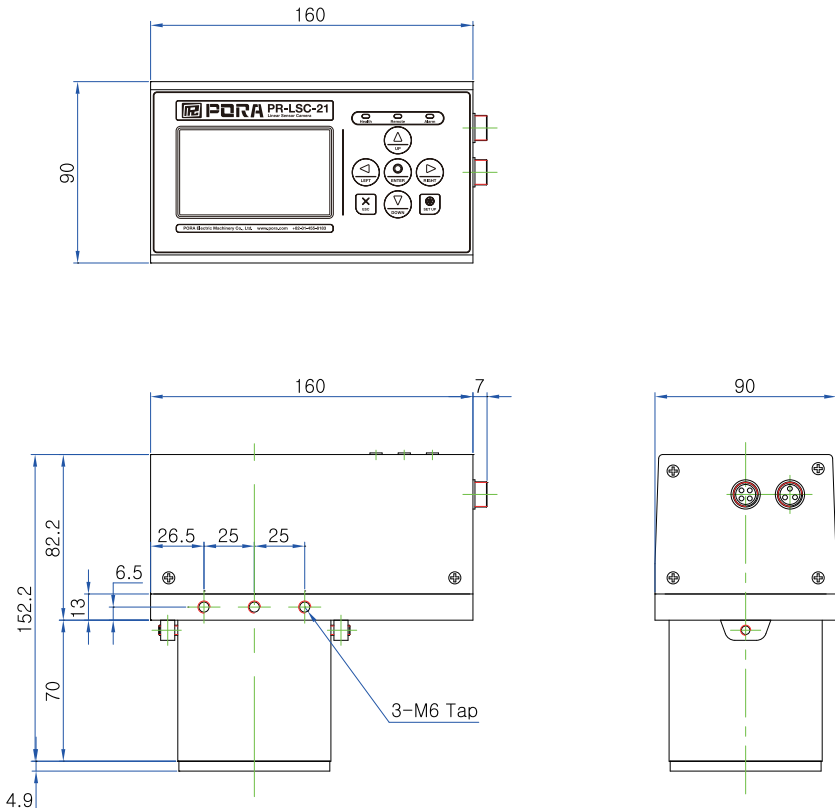
- Unwarranted operation of the controller may cause the defects of the object materials.
- Pora shall NOT be responsible for any damages to the controller caused by such operations.

Before Use

1. External Connection Diagram

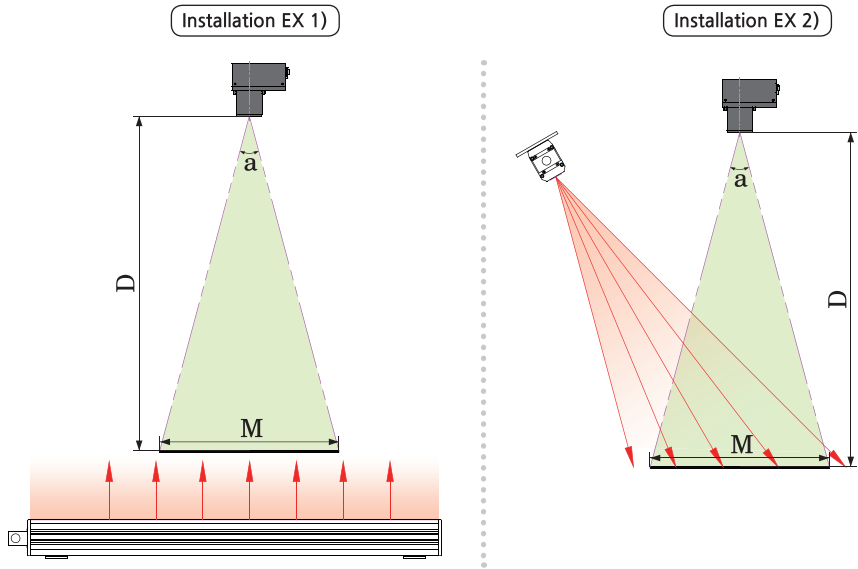


2. Exterior Dimension



3. Product Installation and Fine Control

1) Product Installation Methods

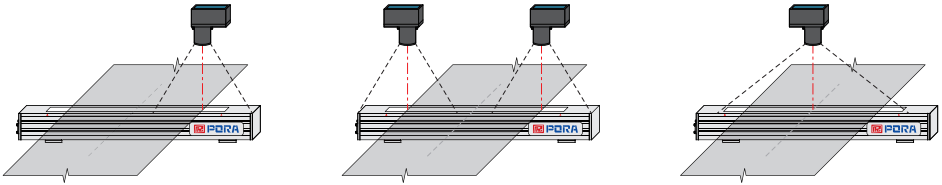


2) Length test for each lens

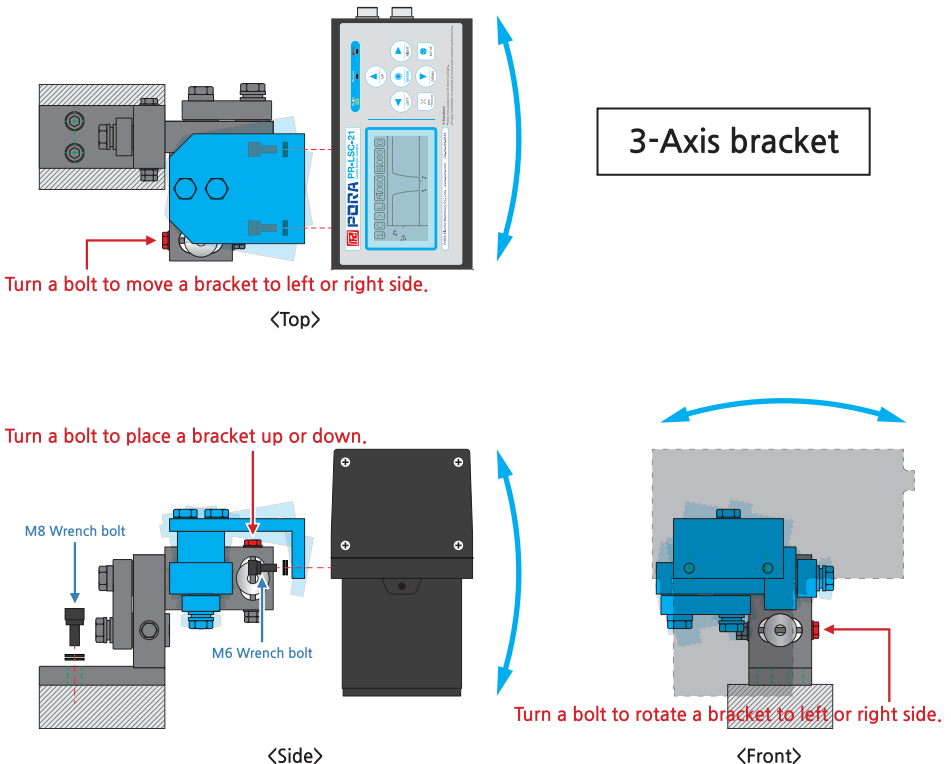
50mm			35mm		
D (mm)	M (mm)	a (°)	D (mm)	M (mm)	a (°)
500	330	33.42	500	400	38.65
750	490	33.15	750	600	38.65
1000	620	31.79	1000	800	38.65
1500	810	28.36	1500	1170	37.95
3000	1650	28.81	3000	2480	39.57

3) How to install a camera sensor

- 1) Place the camera sensor in a position where is perpendicular to the material and properly senses the light emitting unit's light.



- 2) Determine a position to install the camera sensor, and fix it tightly to the bracket.

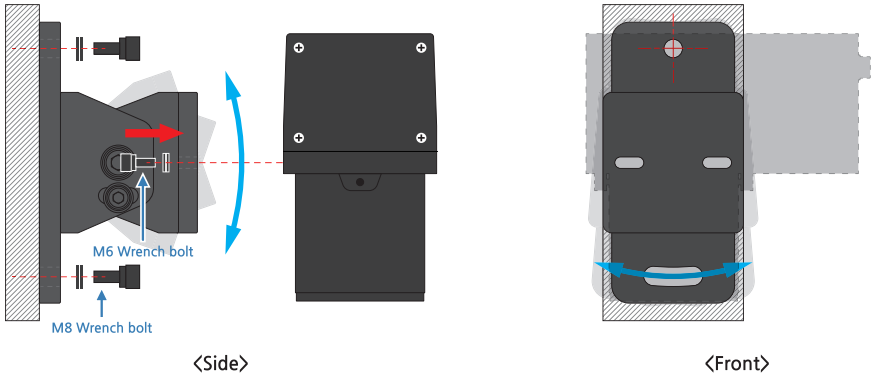


- Connect the bracket to the main body, and tighten screws to fix it in the desired position.

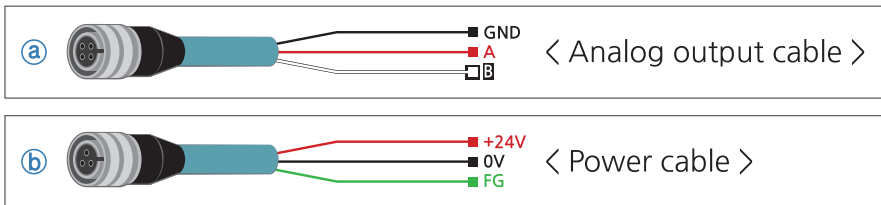
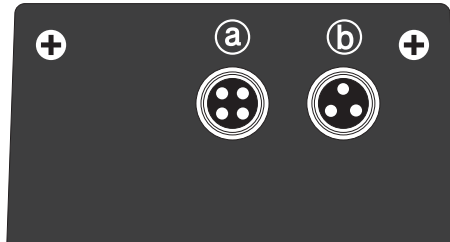


We recommend to install it in a position where is convenient and easy to maintain and repair.

General bracket



3) After installing camera sensors, connect cables.



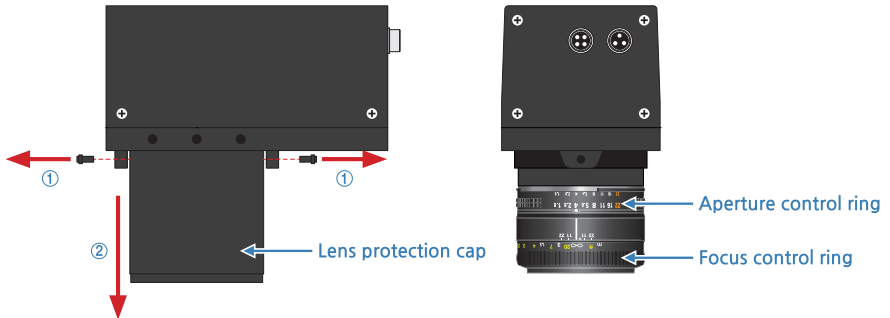
Caution : Check power input and wiring

Wrong connections of power terminals (be also careful of the sequence that normal loads use power), contacts of DC input/output wires and power wires, and short circuits of output wires etc. may be a cause of serious damages.

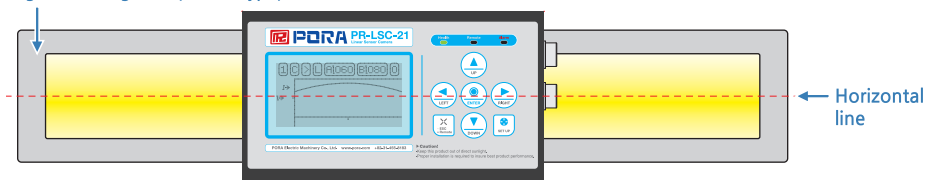
4) Fine control for camera sensors

(When performing the fine control, carry out it after removing materials from the light emitting unit.)

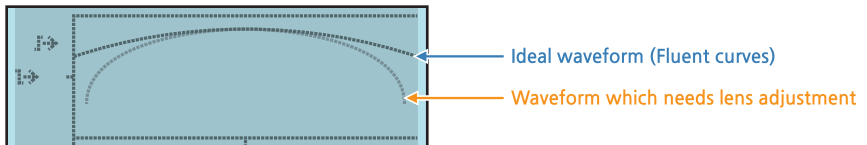
- (1) Remove the lens protection cap.



- (2) Adjust horizontality of Camera sensor (PR-LSC-21) and light emitting unit (PR-LD Type) as the below image.



- (2-1) Use an aperture adjustment ring attached to a camera sensor to adjust the waveform of a display to the maximum curve.

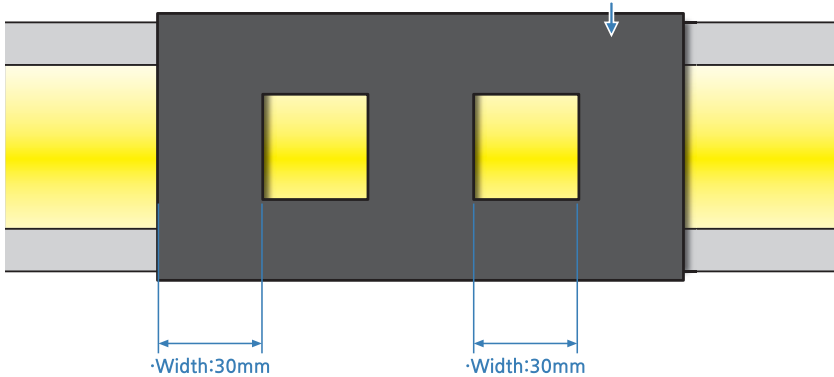


- (2-2) Control the camera sensor to the center of emitting unit.

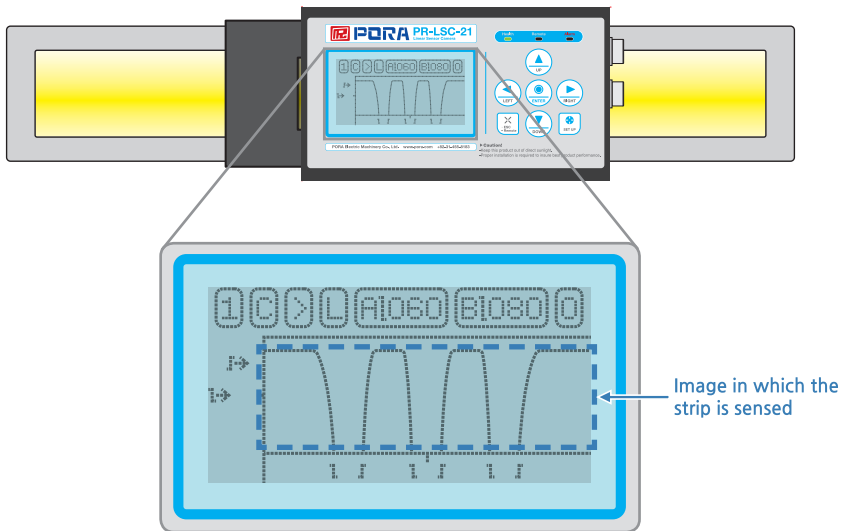


- (3) Place the strip for fine controlling camera sensors on the light emitting unit.

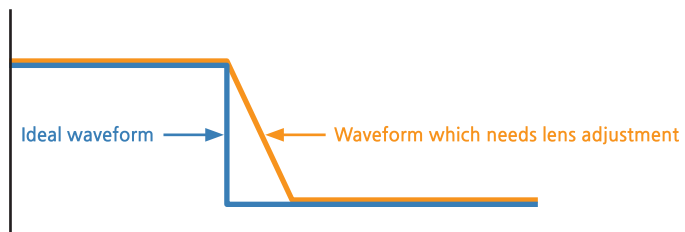
Strip for fine controlling camera sensors



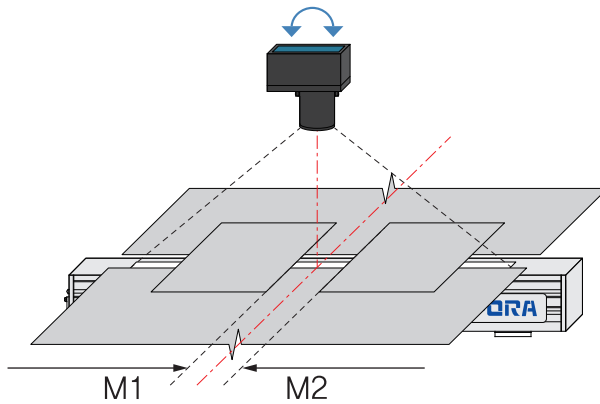
- (4) Rotate and adjust the 'Aperture control ring' and 'Focus control ring' to show an image on the display as below.



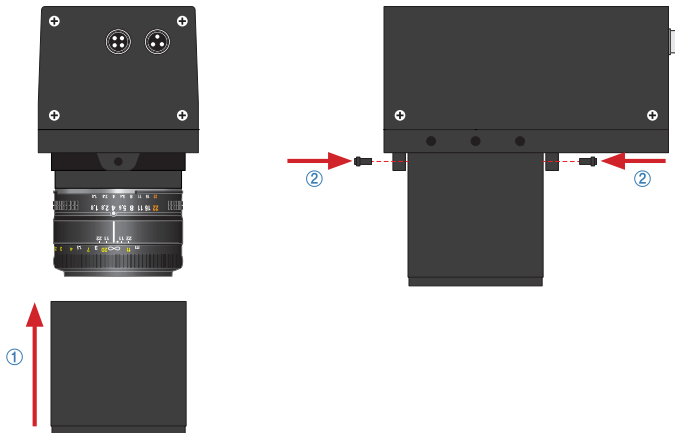
- (4-1) Use a focus adjustment ring of a camera lens to adjust tilt of waveform close to the vertical.



- (5) Cover light emitting unit as below and control the location of a camera sensor to set the waveform value of M1, M2 equally. (Width: $M1 = M2$)



- (6) After connecting the lens protection cap, finish the fine control for camera sensors.



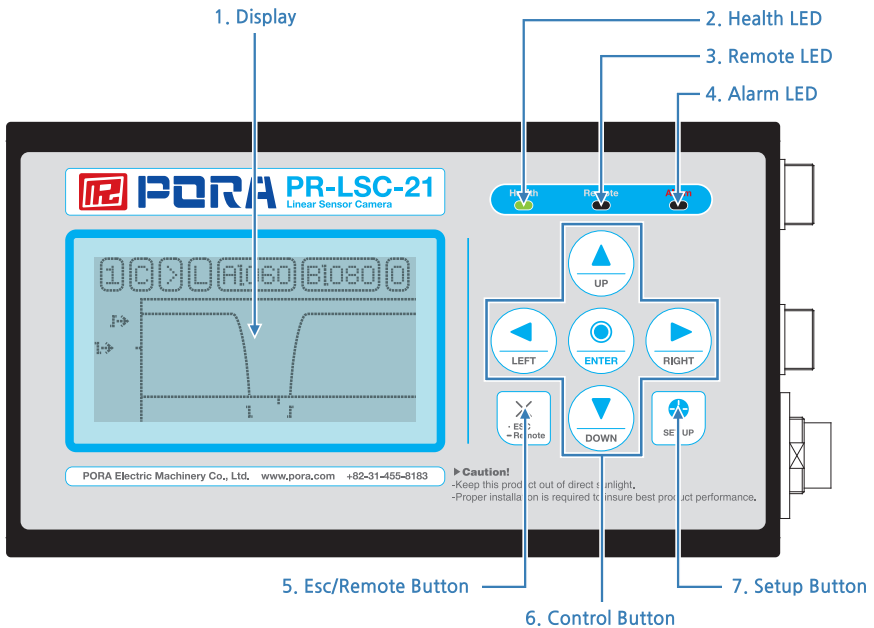
4. Specifications

Category	Specification
Model	PR-LSC-21 (Linear Scan Camera)
Display	128x64 Graphic LCD
Effective number of pixels	CCD 21360 (Color: 5340x3, B/W: 5430pixels)
Pixel size	5.25 μ m pitch
Output	CAN OPEN (Option) 4-20mA. (Analog Dual output)
Input Power	DC 24V
Ambient Temperature	0℃ ~ 50℃
Weight	1.8kg

* PR-LD Type Current consumption

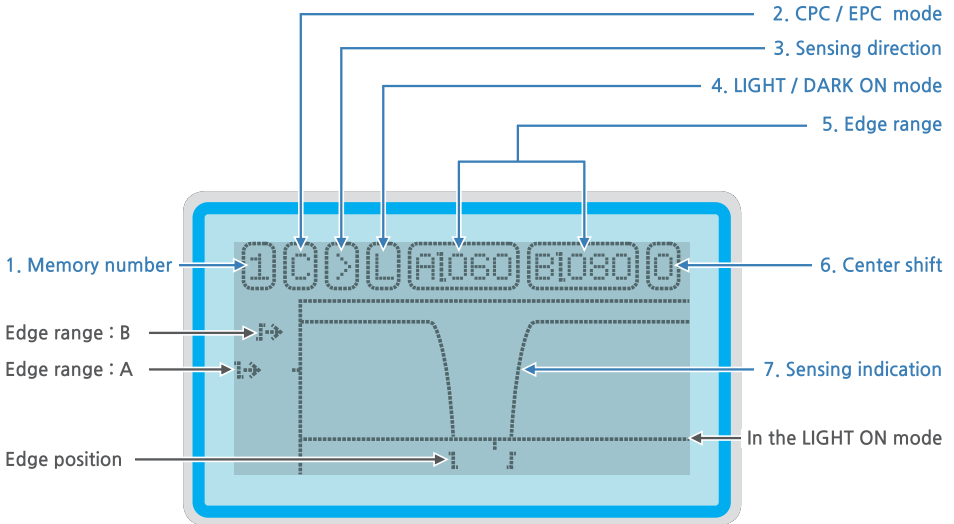
Model	Current consumption	
PR-LD-600	24Vdc	408mA
PR-LD-750		510mA
PR-LD-900		612mA
PR-LD-1050		714mA

5. Description of the Control Panel



	Designation	Description
1	Display	It displays the current condition, data setting values and output values etc.
2	Health LED	It indicates power ON/OFF (red LED).
3	Remote LED	It indicates remote ON/OFF (green LED).
4	Alarm LED	It turns on in case of an alarm (green LED).
5	Esc Button / Remote Button	<ul style="list-style-type: none"> ·Press once: Button to cancel the setup ·Press at length: Button to change into the Remote
6	Control Button	Up, down, left, right and setup value completion buttons
7	Setup Button	Setup menu button for sensors

6. Description of the Display

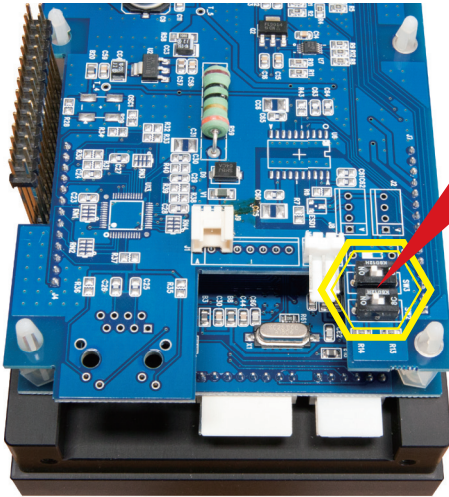


	Designation	Description
1	Memory number	Memory storage number (It can be stored from 1 to 8.)
2	CPC / EPC mode	[C] : CPC mode / [E] : EPC mode
3	Sensing direction	[>] : From left to right / [<] : From right to left
4	LIGHT / DARK ON mode	[L] : LIGHT ON mode / [D] : DARK ON mode
5	Edge range	<ul style="list-style-type: none"> ·It indicates both A and B edge ranges in the CPC mode ·It indicates edge A or B range in the EPC mode [A / 1 ~ 126] : The range can be set from 1 to 126. [B / 1 ~ 126] : The range can be set from 1 to 126.
6	Center shift (-9 ~ +9)	It sets the center shift value (only in the CPC mode).
7	Sensing indication	It indicates the sensed object.

7. OUTPUT SIGNAL - DIP switch Setting

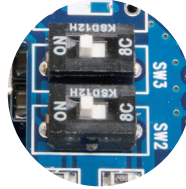
You can set output signal by setting up DIP switch.

- SW2, SW3 DIP switch ON: It outputs voltage & electric current simultaneously.
- SW2, SW3 DIP switch OFF: It outputs electric current only.

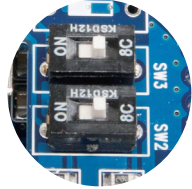


〈PR-LSC-21 PCB〉

Dip Switch Setting



[ON]
Voltage,
Current
Output



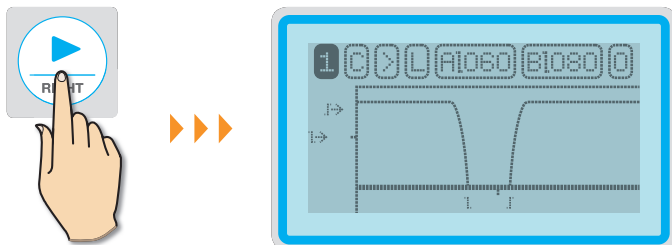
[OFF]
Current
Output

Simple Setup

Before operating the product, set the items basically required.

Simple setup method

When pressing the "RIGHT button" on the front control panel at length, the followings are indicated on the display.



1) Memory number assignment (1)

Press the "UP/DOWN button" on the front control panel to set it. (It can be set and stored from 1 to 8.)

▼ (Press the RIGHT button to move on to the next setup.)

2) CPC / EPC mode setup (CPC : ☐ EPC : ☐)

Press the "UP/DOWN button" on the front control panel to set it. (The CPC / EPC mode can be set.)

▼ (Press the RIGHT button to move on to the next setup.)

3) Sensing direction setup (Right : ☐ Left : ☐)

Press the "UP/DOWN button" on the front control panel to set it. (The right / left can be set.)

▼ (Press the RIGHT button to move on to the next setup.)

4) LIGHT / DARK ON setup (Light on : ☐ Dark on : ☐)

Press the "UP/DOWN button" on the front control panel to set it. (The Light on / Dark on can be set.)

▼ (Press the RIGHT button to move on to the next setup.)

5) Edge range setup (A : ☐ B : ☐)

Press the "UP/DOWN button" on the front control panel to set it.

▼ (Press the RIGHT button to move on to the next setup.)

6) Center calibration (0)

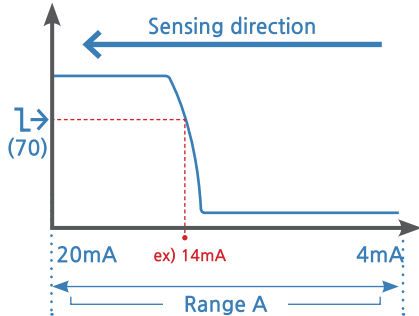
Press the "UP/DOWN button" on the front control panel to set it. (It can be set in the CPC mode.)

(When pressing the ENTER button, the SAVING.... phrase is displayed on the screen for a moment and the setup is completed.)

EPC / CPC mode's signals

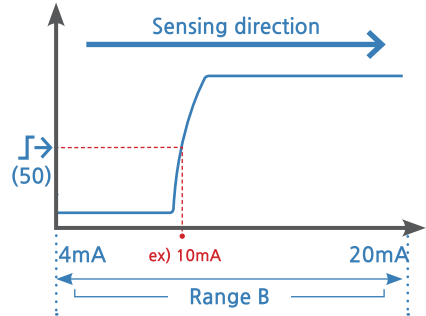
EPC Mode

1 E > L A1070



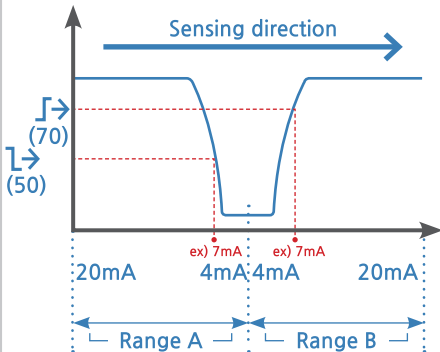
1 E < L

B1050

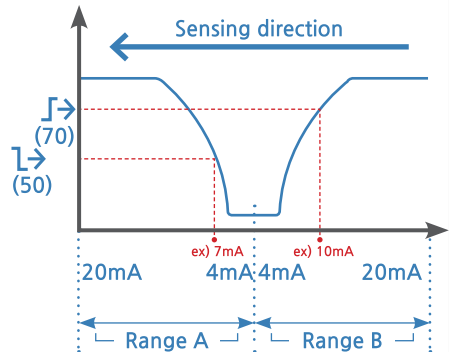


CPC Mode

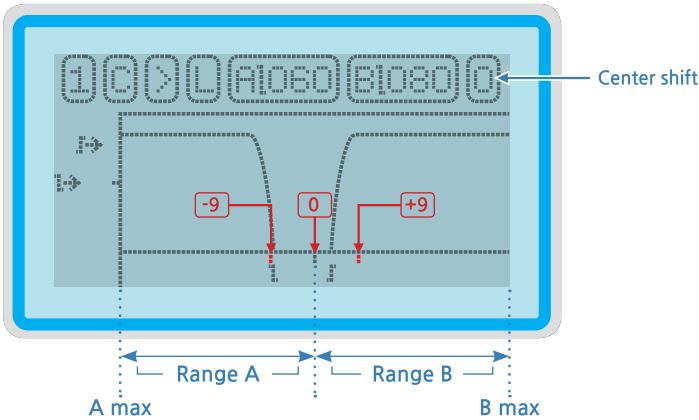
1 C > L A1050 B1070 0



1 C < L A1050 B1070 0



Maximum output change by the center shift values



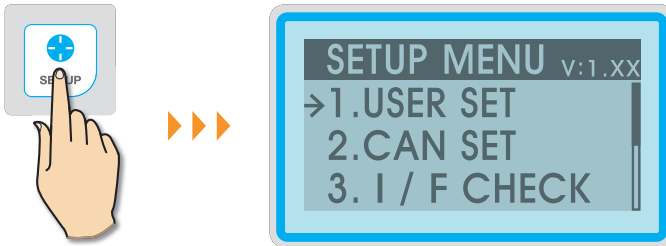
Maximum output	Center shift value																		
	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9
A max (Unit :mA)	15.54	15.79	16.04	16.29	16.53	16.78	17.03	17.28	17.52	20.00	18.02	18.27	18.51	18.76	19.01	19.26	19.50	19.75	20.00
B max (Unit :mA)	20.00	19.75	19.50	19.26	19.01	18.76	18.51	18.27	18.02	20.00	17.52	17.28	17.03	16.78	16.53	16.29	16.04	15.79	15.54

Detailed setup

If an additional setup is needed while using under the basic setup, you can set to be suitable to the service environment through the detailed setup.

Menu setup

When pressing the “SET UP button” on the front control panel at length, the following items are indicated on the display.



1. USER SET

- 1) CURE MODE
 - .. DOT : Display signals are indicated as dots.
 - .. LINE : Display signals are indicated as lines.
- 2) OUT FILTER : The sensitivity of current filter A and B is set. (It can be set from 0 to 3 seconds.)
- 3) REMOTE SET : It is set to use the retaining or pulse mode when using the remote.
- 4) LCD CONTRAST : The display brightness is set.
- 5) EDGE N/P
 - .. POSITIVE : The output signal is indicated.
 - .. NAGATIVE : The output signal is reversed to indicate.
- 6) A/B OUT SET
 - .. CPC SET : It indicates that the CPC mode is not available.
 - .. A / B : It indicates that the EPC mode is available.
 - .. A = B : It indicates that the EPC mode is available.

2. CAN SET

- 1) CAN ID : The CAN ID is set. (It can be set from 1 to 10.)
- 2) CAN BAURATE : The CAN communication speed is set. (100K, 250K and 500K can be set.)

3. I / F CHECK

1) mA A/B OUT : It can setup from 0 to 100%. (4.00mA ~ 20mA)

2) CONTACT I / O : ?

RMT : IN 1 () / IN 2 ()
IN 3 ()

> OUT 1 (X) OUT 2 (X)
OUT 3 (X)

4. LANGUAGE

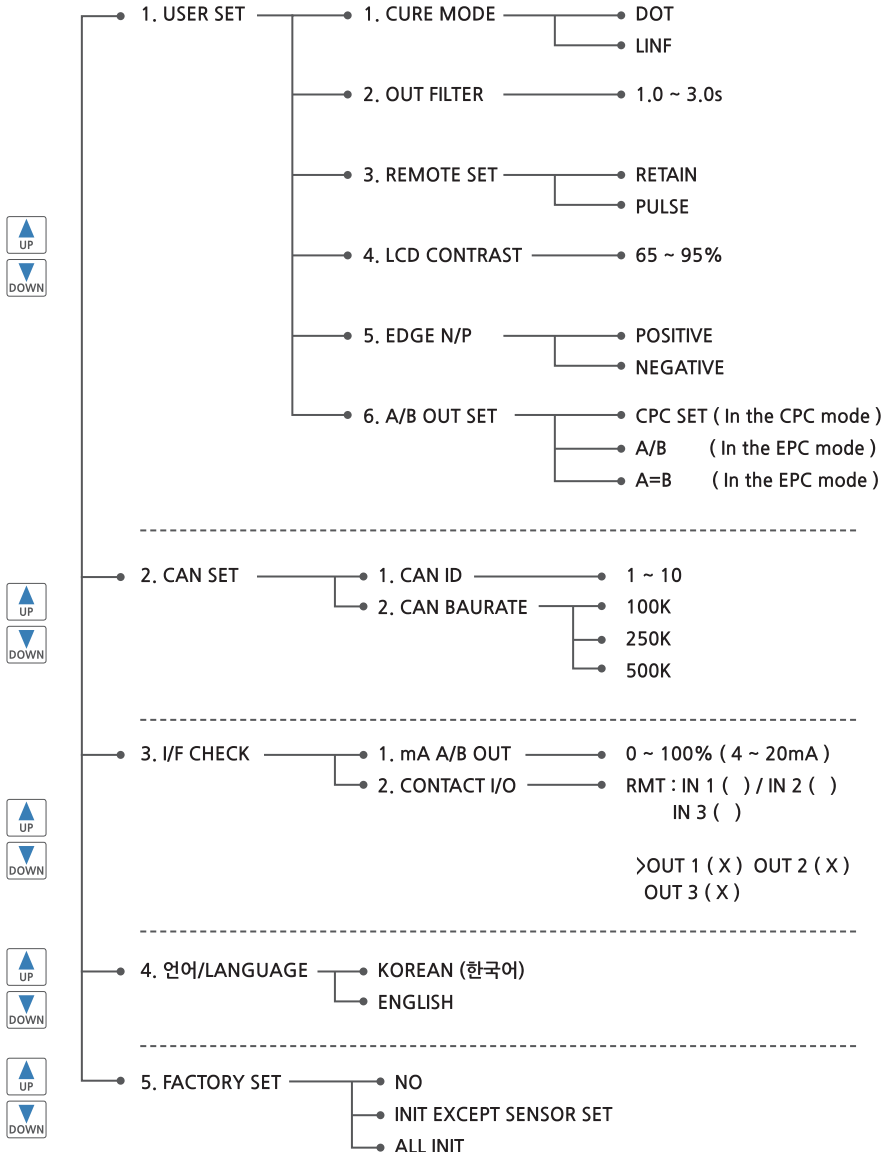
- KOREAN (한국어) : The setup menu is set in Korean.
- ENGLISH : The setup menu is set in English.

5. FACTORY SET

- NO : The product is not initialized.
- INIT EXCEPT SENSOR SET : Every function is initialized except the communication setup.
- ALL INIT : Every setup value for the product is initialized.

Configuration settings

SETUP



Trouble shooting

PR-LSC-21 does not contain short-term consumables, but regular checks in accordance with the followings are highly recommended.

- 1) Has the inner temperature excessively risen due to the exposure to an exothermic body or direct sunlight?
- 2) Are any foreign or conductive objects inside the unit?
- 3) Has any wiring or terminal loosened, or any other trouble occurred?

Trouble	Phenomenon	Trouble shooting
Power Short-Circuit	Controller does not work	<ul style="list-style-type: none">● Check whether the power voltage is set at 22~26V and ensure proper wiring.● The fuse may have blown due to foreign objects or abnormal load. Please contact Pora

MEMO

A series of horizontal dotted lines for writing.

MEMO

A series of horizontal dotted lines for writing.

Terms of Quality Assurance

1. Every purchaser of Pora's products is eligible for complimentary after-sales services for any defects or errors that may have occurred under the normal conditions of use for the prescribed period of time.
2. Pora's products are guaranteed for one year (12 months) from the time of purchase.
3. If you want to have your serviced as per this certificate, please contact your nearest dealer or Pora's head office.
Provided, you are responsible for all the expenses that may be incurred by sending, bringing or transporting the product to your dealer or to us.
4. You may not be eligible for our complimentary services even within the complimentary service period under the following cases.
 - 1) Troubles or damages caused by the mishandling or incorrect use of the product.
 - 2) Troubles or damages caused by the maintenance, modifications or disassembling by any other than our designated dealers or Pora's head office.
 - 3) Troubles or damages caused by fire, earthquakes, floods, thunderbolts or other natural disasters.
 - 4) Troubles or damages caused by the dropping, shocks, excessive pressure and vibrations, dusts, sinking under water or other improper handling.
 - 5) Troubles or damages caused by the use of other expendables or parts than the regular ones approved by Pora.
 - 6) In can the purchaser fails to present this certificate for service.
 - 7) Troubles or damages caused by other products connected with the product.
 - 8) In case this certificate is not filled with such descriptions as the purchase date and company name (supplier), or such descriptions including the purchase date are either forged or fabricated.
5. This certificate shall not be applicable to the parts (housing, glass, connectors, etc.) or expendables (oil, filter, fuse, lamp, etc.)
6. Pora shall not be responsible for any damages incidental to the troubles or damages of the product. (expenses incurred or the loss of profits due to the missed use of the product, or the damages to other devices that replaced Pora's product)
7. Pora's products have gone through extensive precision manufacturing processes and tests, and any errors for the products ranging from ± 1 to 2mm shall not constitute any request for the replacement of the product.

Service Certificate

Customer	Name		Company	
	Telephone		E-mail	
	Address			
Dealer	Name		Telephone	
	Address			
Product Name				
Purchase Date				
Problem				

- Thank you purchasing this product.
- This certificate guarantees our complimentary after-sales services for our products
- Please keep this certificate properly as we may reject to offer complimentary services if you fail to present this certificate to us.

 **PORA Electric Machinery Co., Ltd.**

Founder: Jung Kweon Kim

As to the latest information, please refer to the Website of Pora.

1. The content of this manual may be changed without prior notice, for which we request your kind understanding.
2. Be sure to read the catalog and user manual of each product before use.
3. Please accurately send a request for product specification, and check the content.



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Product Purchase Inquiry

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