

Design Registration Pending

High-output White LED Light Units for Line Scan Applications

# LN<sup>SP</sup>

series

CCS Inc.

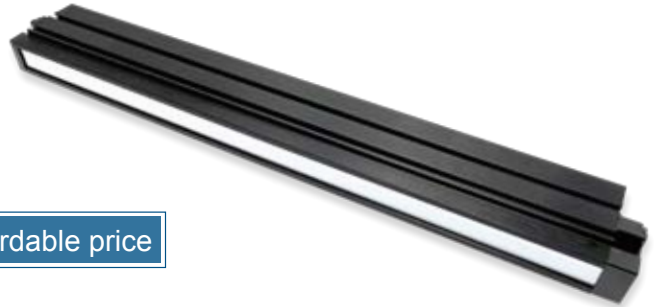


High-output  
White LED Light Units for  
Line Scan Applications

# LNSPseries

## Improving Performance

LED Light Units for line scan applications at an affordable price



Light Units with an emitting surface length of 100 mm to 1,000 mm are available at affordable prices.

Direct number	Model	Emitting surface length	Direct number	Model	Emitting surface length
1005084	LNSP-100SW	100mm	1005089	LNSP-600SW	600mm
1005085	LNSP-200SW	200mm	1005090	LNSP-700SW	700mm
1005086	LNSP-300SW	300mm	1005091	LNSP-800SW	800mm
1005087	LNSP-400SW	400mm	1005092	LNSP-900SW	900mm
1005088	LNSP-500SW	500mm	1005093	LNSP-1000SW	1,000mm

Product Number Guide: You can easily access the information page for any of our products by entering the item's 7-digit product number in the designated box on the CCS website (image processing page).

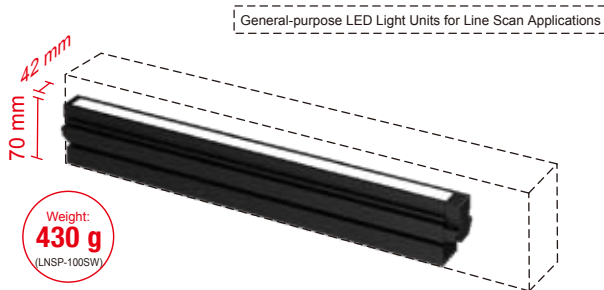
## Quality First

Utilizing our many years of technical expertise, we have successfully developed LED Light Units for high-performance line scan applications.

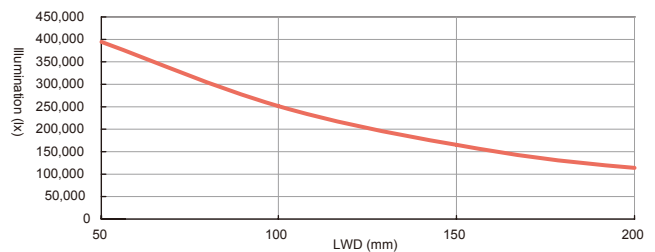
Compact Design: 70-mm height, 42-mm depth

Natural Cooling with a Brightness of 400,000 lx – Highest Level in the Industry

\*LWD = 50 mm \*According to CCS investigation in September 2011.



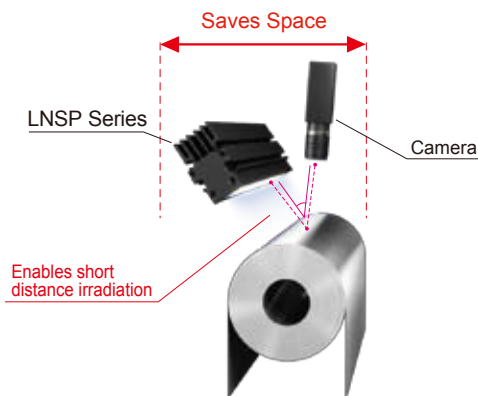
### ● Illuminance Graph



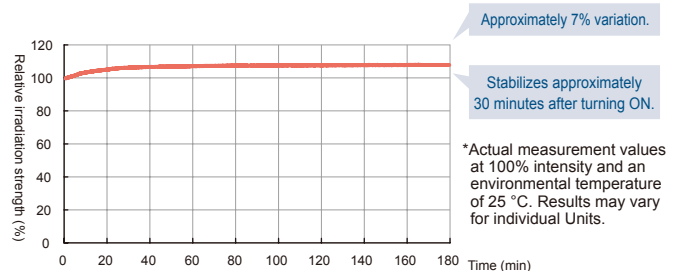
\*Actual measurement values at 100% intensity and LWD of 50 mm. Results may vary for individual Units.

Compact Design for Short Distance Illumination

Stable Brightness



### ● Intensity Changes over Time



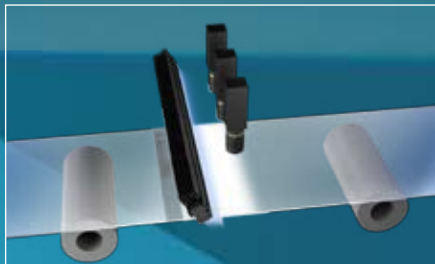
Approximately 7% variation.

Stabilizes approximately 30 minutes after turning ON.

\*Actual measurement values at 100% intensity and an environmental temperature of 25 °C. Results may vary for individual Units.

# Application Examples

LCDs, High-performance Film, Can Manufacturing, and More



Liquid crystal glass scratch detection



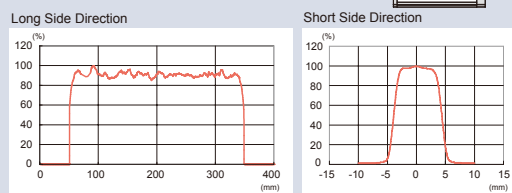
Visual inspection of cans



Detection of dents or deformation in metal sheets

## Uniformity Graph

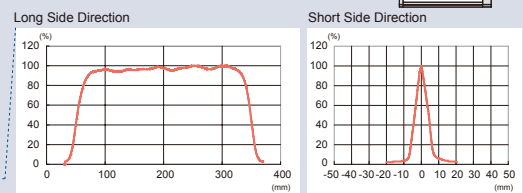
● **Brightness** LED Light Unit used: LNSP-300SW



LWD: 100 mm

\*Actual measurement values at 100% intensity and LWD of 100 mm. Results may vary for individual Units.

● **Illumination** LED Light Unit used: LNSP-300SW



LWD: 50 mm

LWD: 100 mm

LWD: 150 mm

LWD: 200 mm

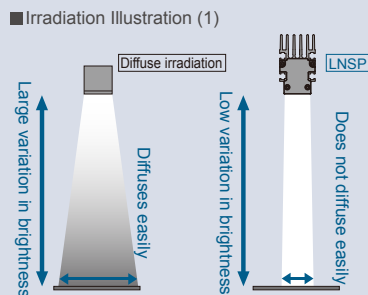
LWD: 400 mm

\*Actual measurement values at 100% intensity and the specified LWD. Results may vary for individual Units.

## Range of Irradiation Delivery

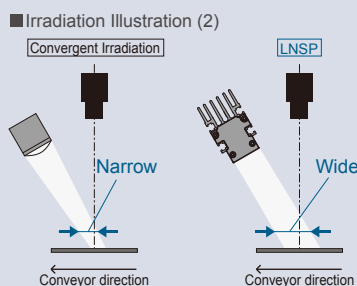
**Feature 1** Enables Long Distance Irradiation

The light intensity is not reduced even at longer distances.



**Feature 2** Easy Optical Axis Adjustment

The light convergence width has been made wider at the irradiating surface



# Order Emitting Surface Lengths from 100 mm to 1,000 mm

The right length of Light Unit is available for each applications



Lengths can be specified in 100-mm increments between 100 mm...



...and 1,000 mm.

Specify the emitting surface length in 100-mm increments.

Select from sizes ranging between 100 mm and 1,000 mm based on your specific needs for a variety of applications.



## Imaging Samples

1

Comparison of Imaging Captured with Diffuse Assembly Line Light Units and Our **New LNSP Series** Light Units

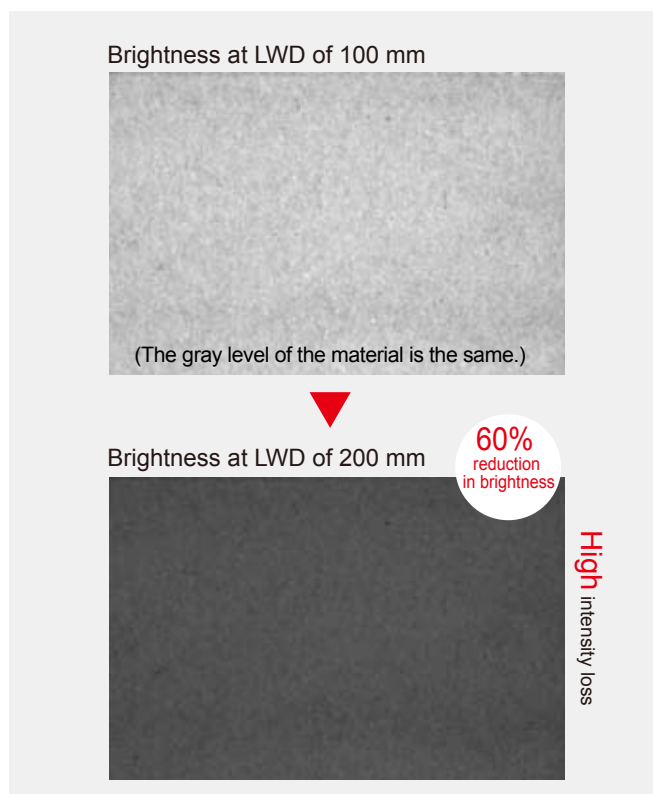
### Imaging Paper Materials

#### Strengths of LNSP Imaging

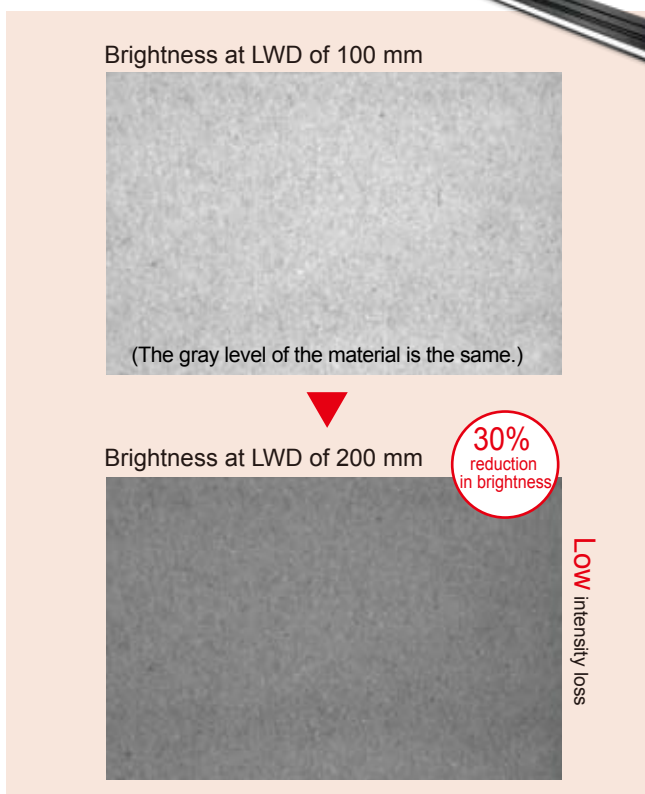
The light does not diffuse and little intensity is lost, which enables long-distance irradiation.



Diffuse Assembly Line Light Unit

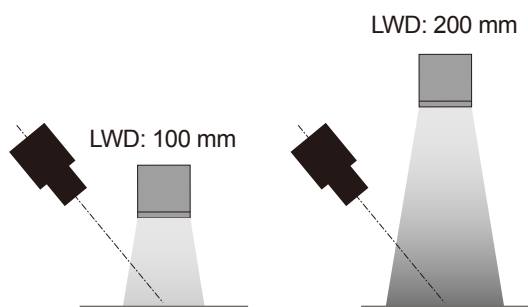


**New LNSP**

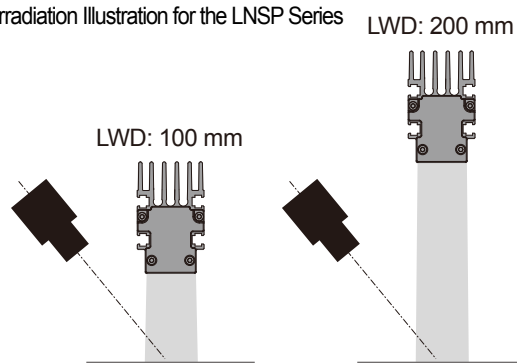


Difference in results under the same imaging conditions

■ Irradiation Illustration for Diffuse Assembly Line Light Unit



■ Irradiation Illustration for the LNSP Series



#### Imaging Results

High intensity loss is caused by the diffusion of the light.

#### Imaging Results

Low intensity loss results from the low amount of light diffusion.

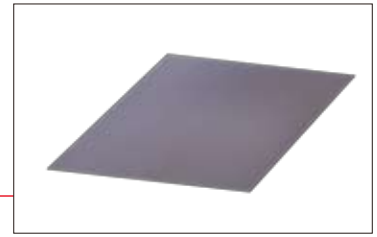
# 2

Comparison of Image Captured with Direct Assembly Line Light Units and Our **New LNSP** Series Light Units

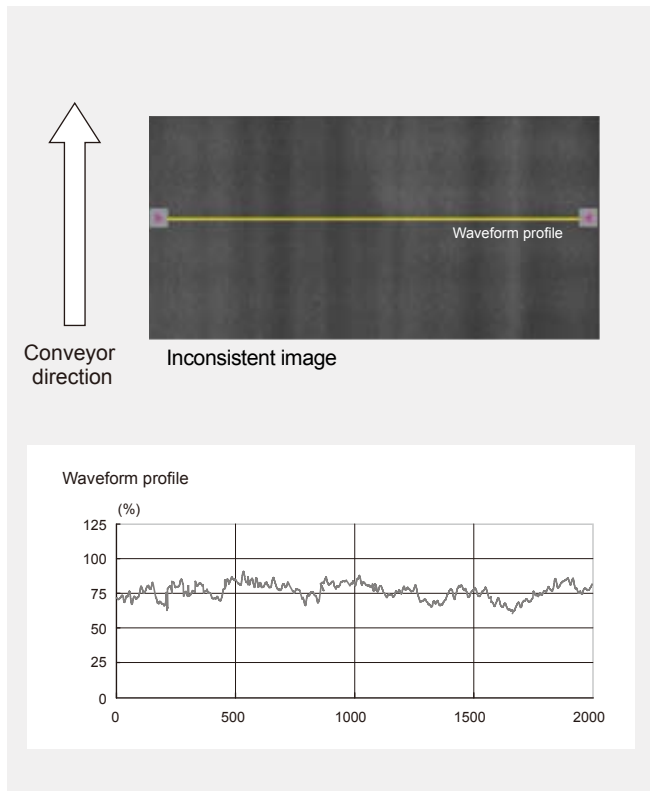
## Metal Sheet Imaging

### Strengths of LNSP Imaging

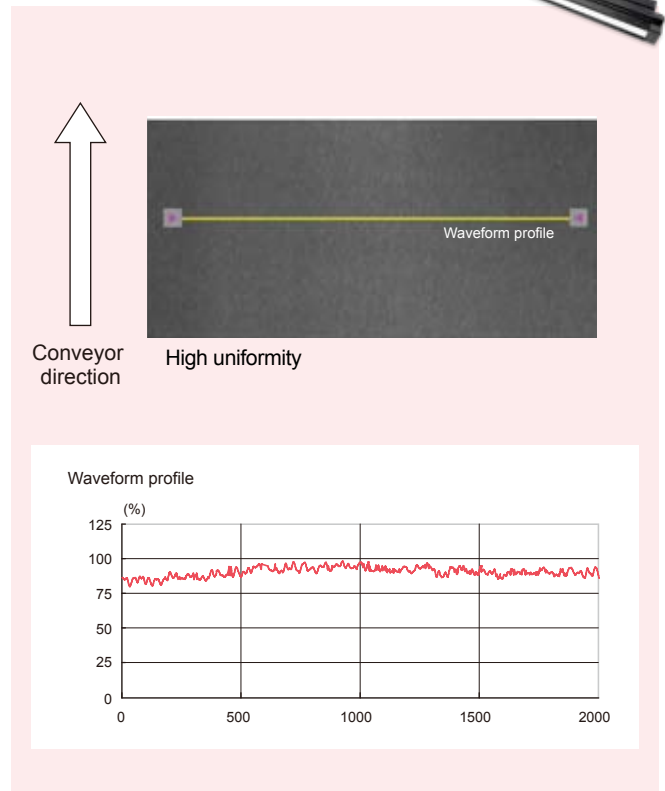
High uniformity along the long dimension for even, uniform imaging.



#### Direct Assembly Line Light Unit



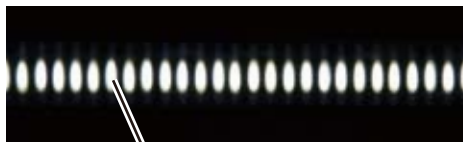
#### New LNSP



Difference in results under the same imaging conditions

#### ■ Emitting Surface of Direct Assembly Line Light Units

Magnified View



The LEDs are visible.

#### ■ Emitting Surface of the LNSP-series Light Units

Magnified View



The diffusion sheet hides the individual LEDs.

#### Imaging Results

Due to the individual LEDs, the captured image lacks uniformity along the long side direction.

#### Imaging Results

A diffusion sheet is included as a standard feature to improve uniformity along the long side direction in order to capture images with high uniformity even when working with shiny metals.

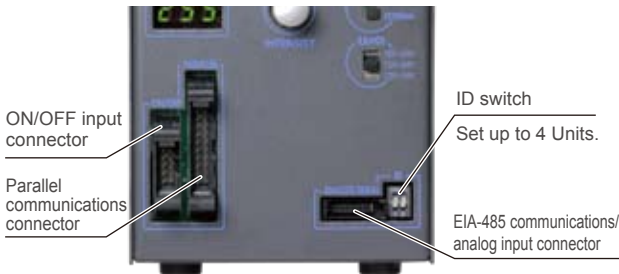


## Improving Performance

Parallel, serial, and analog control support all in a single Unit at an affordable price

### Includes External Control

Equipped for parallel, serial, and analog control all in a single Unit.



Control mode	Description	
Parallel communications	Light intensity control	Control the intensity to 256 levels via parallel signal inputs.
	Light intensity control	Command input for 256 levels of intensity via EIA-485 communications.
EIA-485 communications	ON/OFF control	Command input via EIA-485 communications
	Light intensity control	Control the intensity to 256 levels via an analog voltage (0 to 5 V).

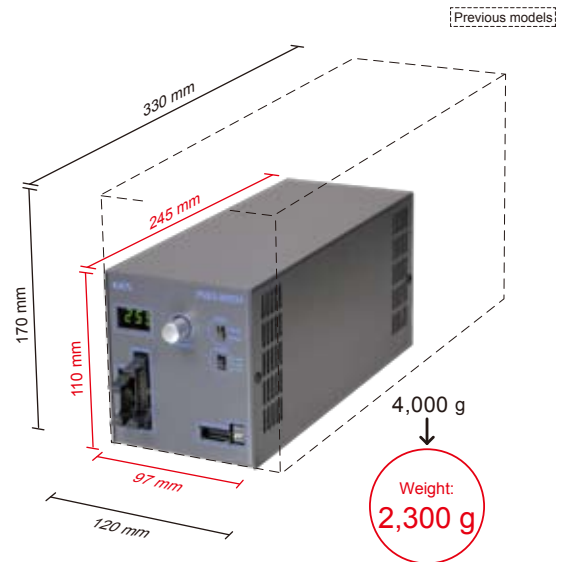
#### ON/OFF input connector

ON/OFF control is possible in combination with parallel, serial, or analog control.

ON/OFF control	ON/OFF control via OFF signal input (parallel bit method).
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### Compact, Lightweight Design

Compact design: 97-mm width, 110-mm height, 245-mm depth.



### Improved Usability

Supports the reproducibility of intensity values through a digital display.



Digital display

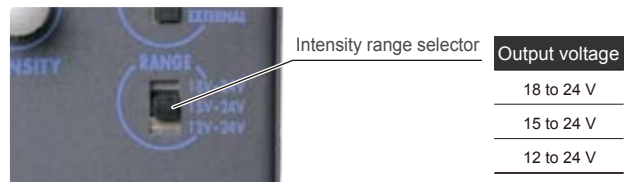
Setting switch

#### Quick Operation through a Pushbutton Dial

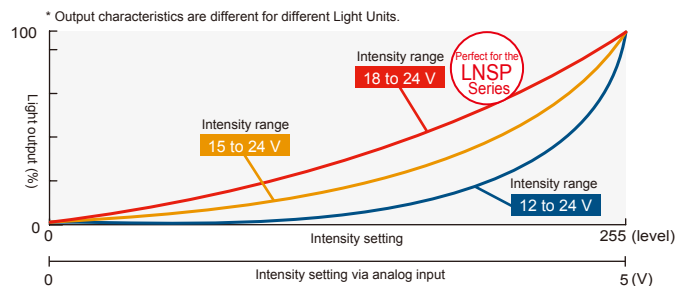
- Intensity setting to 256 levels.
- Turn ON the power supply while pressing the button for external control mode.
- Push and hold for two seconds to lock the intensity value.



### Optimal Intensity Settings through Minimum Intensity Value Switching



Select the intensity range that best suits the Light Unit.

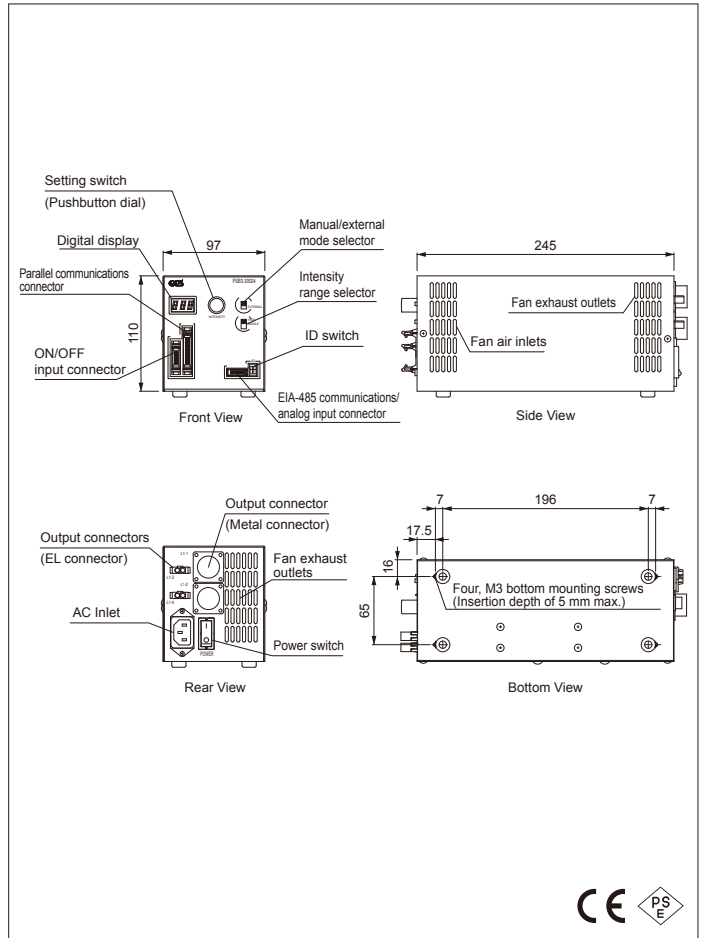


\*This graph is for illustration only.

## Specifications

Model	PSB3-30024	
Direct number	2000762	
Lighting method	Constant lighting	
Drive method	Constant-voltage system	
Light intensity control method	Variable-voltage control	
Number of channels	1 channel	
Applicable Light Unit rating	24 V 300 W	
Light intensity control	Manual and external intensity control	Front manual/external switch (MODE)
	Variable output voltage range	Select between 3 ranges via the front intensity range selector (RANGE).
	Manual	Set any of 256 levels via the setting switch. Press and hold the switch for 2 seconds to lock the intensity value.
	External	Parallel communications 8-bit intensity value setting (B0 to B7) and write signal (WR)
	Serial communications	Command input via EIA-485 communications
	Analog input	Analog voltage (0 to 5 V)
	External control mode	can be selected by pushing the setting switch while turning ON the power to the Control Unit.
Lighting control	Parallel bit input	Lighting signal (OFF)
	Serial communications	Command input via EIA-485 communications
EIA-485 communications settings	ID	Set via the front ID switch (00 to 03). Maximum of 4 connected Units.
	Terminating resistance	Set via the front ID switch (terminating resistance is ON only when the ID is 00).
Lighting delay (typ.)	0.1 s	
Error detection display	"Err" displayed on front-panel digital display	
Error detection output	Error is output and light output is stopped for internal AC/DC error.	
	External control connector	Error output terminal (0C, 0E), photocoupler insulation, open-collector output, alarm open (load current of less than 10 mA), and error status (serial communications)
Over current protection	Operation at 105% of the rated current. Protection reset after the power reactivation.	
Over voltage protection	Operation at 120% to 155% of the rated current. Protection reset after the power reactivation.	
Rated input voltage	100-240 VAC	
Power consumption (typ.)	410 VA	
Frequency	50/60 Hz	
Inrush current (typ.)	20 A/40 A (primary/secondary value at 100 VAC), 40 A/40 A (primary/secondary value at 240 VAC) * From a cold start	
Ground leakage current	3.5 mA max. (264 V AC, 60 Hz, with no load)	
Output voltage variation range (typ.)	Select between 3 ranges via the front intensity range selector.	
	12 to 24 V	*With no load.
	15 to 24 V	*With no load.
	18 to 24 V	*With no load.
Operating temperature and humidity	Temperature: 0 to 40°C, Humidity: 20% to 85%RH (with no condensation)	
Storage temperature and humidity	Temperature: -20 to 60°C, Humidity: 20% to 85%RH (with no condensation)	
Vibration resistance	Acceleration: 19.6 m/s <sup>2</sup> , frequency: 10 to 55 Hz, cycles: 3 minutes, sweep cycle: for 1 hour each in X, Y, and Z directions	
Cooling method	Forced air cooling	
CE Marking	Conforms to safety standard EN61010-1.	Conforms to EMC standard EN 61326-1, Class A.
Environmental regulations	RoHS compliant	
Material, coating and surface processing	Steel plate, thickness of cover: 1.0, thickness of chassis: 1.6, N3 leather tone finish	
Weight	2,300 g max.	
Accessories	2-meter long 3-prong power cord with ground terminal (1)	

## Dimension Diagrams (mm)



## Options

### External Control Cables

These cables are used for parallel communications, EIA-485 communications, and the analog input.

(mm)

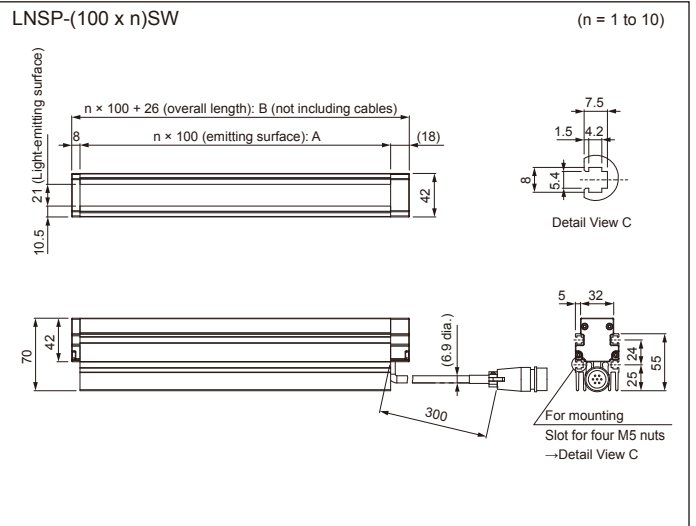
<p>■ Parallel Communications Cable</p> <p>Direct number: 3000683 Model: EXCB2-M20-3</p>	<p>■ ON/OFF Input Cable</p> <p>Direct number: 3000682 Model: EXCB2-M10-3</p>	<p>■ Parallel Communications and ON/OFF Input Branch Cable</p> <p>Direct number: 3000684 Model: EXCB2-M10M20-3</p>	<p>■ Analog Input Cable</p> <p>Direct number: 3000687 Model: EXCB2-E6AN-3</p>
<p>■ EIA-485 Communications Cable</p> <p>Direct number: 3000686 Model: EXCB2-E6SR-3</p>	<p>■ EIA-485 Communications Relay Cable</p> <p>Direct number: 3000717 Model: EXCB2-E6SR-E3-3</p> <p>Direct number: 3000721 Model: EXCB2-E3-E3-0-2</p> <p>Direct number: 3000720 Model: ECNR-E3CN4</p>	<p>■ EIA-485 Communications Relay Cable</p> <p>Direct number: 3000685 Model: EXCB2-E3-3</p> <p>This cable is used to connect to an external device when connecting two or more Control Units together.</p>	

## Specifications

### LNSP-series Common Specifications

Model	LNSP-□□□SW "□□□" is the length of emitting surface. Available in 100 mm increments up to 1,000 mm.
Direct number	1500
Input voltage	24 VDC
LED color	White
Correlated color temperature	5,800 K
Connector	SRCN1A16-7P Metal Connector (manufactured by Japan Aviation Electronics Industry, Limited)
Polarity and signals	1, 2, 3: (+) 4, 5, 6: (-) 7: NC
Cooling method	Natural air cooling
Case material	Emitting surface: Acrylic, Base: Aluminum alloy, Side plates: PC
Spectral distribution	

## Dimension Diagrams (mm)



### Model-specific Specifications

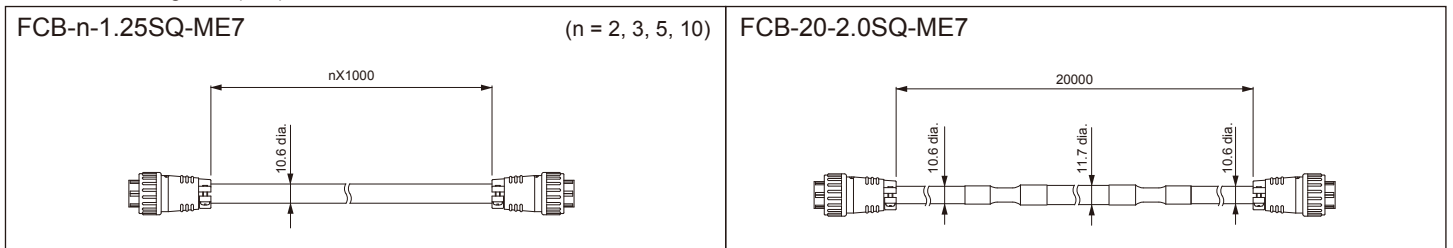
Model	Power consumption (W)	Weight (g)	Dimensions (See dimensions diagrams.)		
			n	A: Emitting surface (mm)	B: Overall length (mm) (Not including cables.)
LNSP-100SW	21	430	1	100	126
LNSP-200SW	41	760	2	200	226
LNSP-300SW	61	1,090	3	300	326
LNSP-400SW	81	1,420	4	400	426
LNSP-500SW	101	1,740	5	500	526
LNSP-600SW	121	2,070	6	600	626
LNSP-700SW	142	2,400	7	700	726
LNSP-800SW	162	2,730	8	800	826
LNSP-900SW	182	3,050	9	900	926
LNSP-1000SW	202	3,380	10	1,000	1,026

### Options LED Light Unit Cables

These cables are used to connect LED Light Units to Control Units. Select from 2 m, 3 m, 5 m, 10 m, and 20 m lengths.

Direct number	3000142	3000151	3000159	3000131	3000149
Model	FCB-2-1.25SQ-ME7	FCB-3-1.25SQ-ME7	FCB-5-1.25SQ-ME7	FCB-10-1.25SQ-ME7	FCB-20-2.0SQ-ME7
Cable length	2 m	3 m	5 m	10 m	20 m

### Dimension Diagrams (mm)



● CCS, LNSP, are all trademarks of CCS, Inc.

## NOTICE

- To ensure proper and safe use of the product, please read the Instruction Guide completely before using the product.
- For product improvement, specifications and designs are subject to change without notice.
- The workpiece imaging examples included in this pamphlet are intended to serve only as references to help you select a suitable LED Light Unit. Please verify the functionality and conditions required for your particular application before you make a final selection. The sample workpieces used in this pamphlet have been processed specifically for sample imaging. They are not intended to represent product quality and performance.

**CCS Inc.**  
CREATIVE CUSTOMER SATISFACTION

### Headquarters

Shimodachiuri-agaru, Karasuma-dori, Kamigyo-ku, Kyoto 602-8011 Japan  
Phone: +81-75-415-8284 / Fax: +81-75-415-8278  
URL: <http://www.ccs-grp.com> E-mail: [intlsales@ccs-inc.co.jp](mailto:intlsales@ccs-inc.co.jp)

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Descriptions in this catalog are based on information available as of January 2013. 02002-03-1109-LNSP