

Specification (Preliminary)

Product Name: LED Line Lighting

Model Name: SPX-TB80

Approval signature

Number of copies (including one for return)

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Approval	Checked	Checked	Prepared

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Revision history

No.	Description	Date	Approval	Prepared
01	Issued	2019.2.26	Horikawa	Matsuzawa

1. Product Outline

This specification applies to the LED Line Lighting SPX-TB80 consisting of 120-mm LED board(s). The lighting system configuration is as shown below.

Product name	Model No.	Description
LED Line Lighting	SPX-TB80	One SPX-TB80 realizes two types of dimming range. Full Dimming Range covering wide range from LOW (low illuminance) to High (high illuminance) and three Partial Dimming Ranges consisting of Low Dimming Range, Medium Dimming Range, and High Dimming Range which can be exclusively controlled. PWM mode (strobe control) is also available.
Dedicated Power Supply Unit	CB-TB	Dedicated Power Supply Unit for SPX-TB80. Two models, CB-TB600 and CB-TB1200 are available and should be selected in accordance with the light emitting length of SPX-TB.
Dedicated Connection Cable	CBL-TB CBLRB-TB (Under development)	Dedicated Connection Cable for SPX-TB80. The maximum length is 50 m. CBLRB-TB (flexible type) is currently under development.

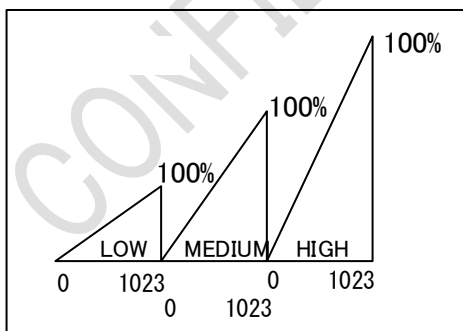
1.1. Outline of dimming range

Please select one of the following ranges and control the illuminance.

(Each range is exclusive.)

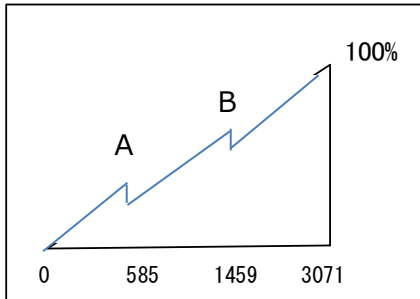
1.1.1. Partial Dimming Range

One of the three Partial Dimming Ranges, LOW(≒SPX-TA07), MEDIUM(≒SPX-TA30) and HIGH(≒SPX-TA70) can be exclusively selected.



1.1.2. Full Dimming Range

12-bit wide range dimming of 0 to 3071 steps from low illuminance (almost equivalent to Partial Range: LOW) to High illuminance (almost equivalent to Partial Range: HIGH) can be seamlessly supported.



The illuminance control is not linear at the two dimming level A and B shown above.

1.2. Save settings

Function to start up with the settings stored at power-on and to memorize the accumulated operation time is available. (For the control mode that can be saved and set, refer to "6.Control Mode.")

1.2.1. Data to be read from SPX-TB80 at power-on

- Control mode and dimming range
- Unit (Resolution and temperature)
- Network (IP, MASK, GATE, PORT)
- Logic (logic for signal input to external I/O)
- Dimming value (Panel, RS-232C and Ethernet))
- Accumulated operation time. Operation time of pulse drive is not accumulated.
- Key operation lock

1.2.2. Setting to be initialized at power-on

- LED ON/OFF (Default: LED OFF "Panel, RS-232C, Ethernet")
- Error information (Default: No error)
- Display screen (Default: Operation Screen ①)
- Temperature (Default: Not fixed. Sampling is immediately started after power is ON.)

1.3. LED board number and block number

To control and monitor SPX-TB80, the board number or block number can be specified.

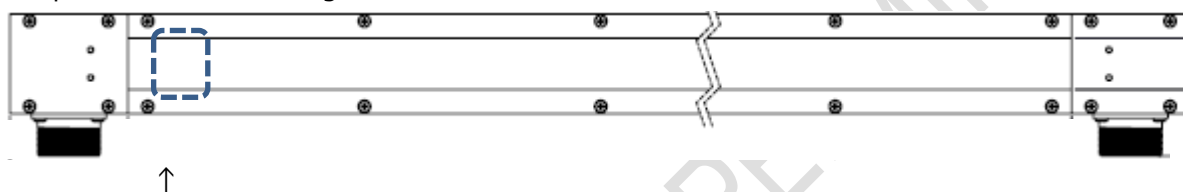
Figure of board number



Figure of block number



※ Both board number and block number are counted as (0),1, 2, 3 from the following positions in ascending order.



Board number 1 Block 0

1.4. Voltage adjustment (Mandatory)

Refer to "9.3.2. VOLTAGE setting screen" before operation and perform voltage adjustment.

2. Specification

2.1. LED Line Lighting SPX-TB80 series

Model No.	SPX-TB80
Light emitting length	120 mm to 3,960 mm (120-mm increment)
Power consumption (At maximum illuminance)	225 W/m
Dimensions Length × width × height (Except protrusions)	(Light emitting length + 120) × 50 × 70 mm
Weight	Refer to "14.1. Weight of SPX-TB by light emitting length."
Effective light emitting length	Light emitting length minus 160 mm (except emitting length less than 360 mm)
Expected Lifetime(LED)	50,000 hours *Calculated time until the light output decreases to 70% of the maximum light intensity at the time of shipment, under the specified environment and when the body temperature is from 0 to 50 degree C, and not guaranteed.
Cable length (Dedicated cable CBL-TB)	In pulse control: Maximum 20 m (maximum length to satisfy pulse response specification) In continuous lighting: Up to 50 m
Operating environment	5 to 40 degree C, 20 to 80% RH (noncondensing)
Storage environment	-10 to 60 degree C, 20 to 85% RH (noncondensing)

(2) Applicable power supply

Model No.	Light emitting length [mm]	Applicable power supply
SPX-TB80	120 to 2520	CB-TB600
	2640 to 3960	CB-TB1200

2.2. LED Line Lighting Dedicated Power Supply Unit CB-TB series

Model No.		CB-TB600	CB-TB1200
Dimensions Width× height × depth (Except protrusions)		140 × 177 × 250 (mm)	
Weight		Approx. 3.5 kg	Approx. 4.3 kg
Rated input		100 to 240VAC, 50/60 Hz ± 10%	
Power consumption (Varies in accordance with light emitting length and illuminance)		600 W max.	1200 W max.
Installation conditions (Clearance)		100 mm for top face and 180 mm for rear face	
Operating environment		5 to 40 degree C, 20 to 80% RH (noncondensing)	
Storage environment		-10 to 60 degree C, 20 to 85% RH (noncondensing)	
Control method	Input	· Manual control(With Operating Knob on Front Panel) · Analog 0-5V control · Digital control Partial Dimming Range:8-bit (256 steps) or 10-bit (1024 steps) Full Dimming Range: 12-bit (3072 steps) · RS232C control · Ethernet control · Dimming lock by external signal (only for analog 0-5V input) · ON/OFF pulse control by external signal (LVDS differential driver can be installed as an option)	
	Output	· LED open error output · LED Temperature abnormality output (When a thermistor temperature is over 120 degree C., abnormal status is output). · LED temperature warning (warning when the thermistor temperature reaches 108 degree C) · Communication error · Power supply abnormality · Voltage adjustment error (All error output is unavailable in high speed dimming described in Item 7.1.2.)	
AC power cable		One 2-m-long 3-pole AC power cable with ground terminal (125VAC)	
Power supply input terminal		AC input: 3P inlet	
Chemical substances		The amount of six substances (lead, mercury, cadmium, hexavalent chromium, PBB, PBDE) specified in "Directive 2002/95 / EC: RoHS 1" do not exceed the specified threshold.	

2.3. Dedicated Connection Cable CBL-TB series

Model No.	CBL-TB	
Electric wire used	AWG 16 (10 wires) / AWG 25 (Three twisted-pairs)	
Cable length	Pulse control	20 m max.
	Continuous lighting	50 m max.
Chemical substances	The amount of six substances (lead, mercury, cadmium, hexavalent chromium, PBB, PBDE) specified in "Directive 2002/95 / EC: RoHS 1" do not exceed the specified threshold.	

2.4. Dedicated Connection Cable CBLRB-TB series (flexible cable)

Model No.	CBLRB-TB	
Electric wire used	AWG 16 (10 wires) / AWG 24	
Cable length	Pulse control	20 m max.
	Normal lighting	50 m max.
Chemical substances	The amount of six substances (lead, mercury, cadmium, hexavalent chromium, PBB, PBDE) specified in "Directive 2002/95 / EC: RoHS 1" do not exceed the specified threshold.	

3. Optical specification (tentative)

* Standard for shipment inspection.

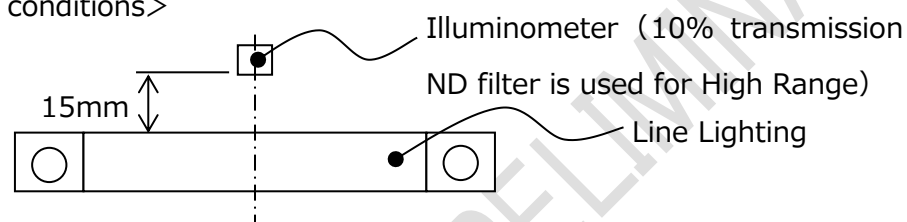
3.1. Illuminance

The illuminance measured at the position 15-mm above the center of the light emitting face should be the following value

※Illuminometer : Konica Minolta T-10M or T-10MA(φ14 probe diameter)

LED color	LOW Range [lx]	MEDIUM Range [lx]	HIGH Range [lx]
White	25,000 or more	200,000 or more	450,000 or more

<Measurement conditions>



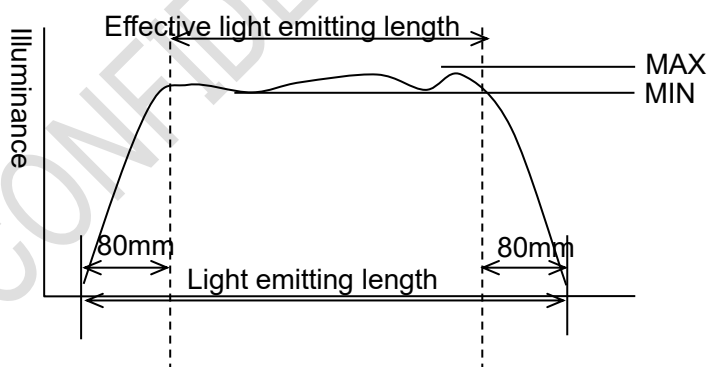
3.2. Illuminance uniformity (applied to 360mm or more light emitting length)

Illuminance at a distance of 15 mm within the effective light emitting surface should be as follows:

- Illuminometer : Konica Minolta T-10M/10MA(Probe dia. φ14)
 - Within plus or minus 10% for full effective light emitting length
 - Within plus or minus 5% for any range of 360-mm length of light emitting face

Condition of uniformity(1)

$$\text{Variation of uniformity} = \pm \frac{\text{MAX} - \text{MIN}}{\text{MAX} + \text{MIN}} \times 100(\%)$$



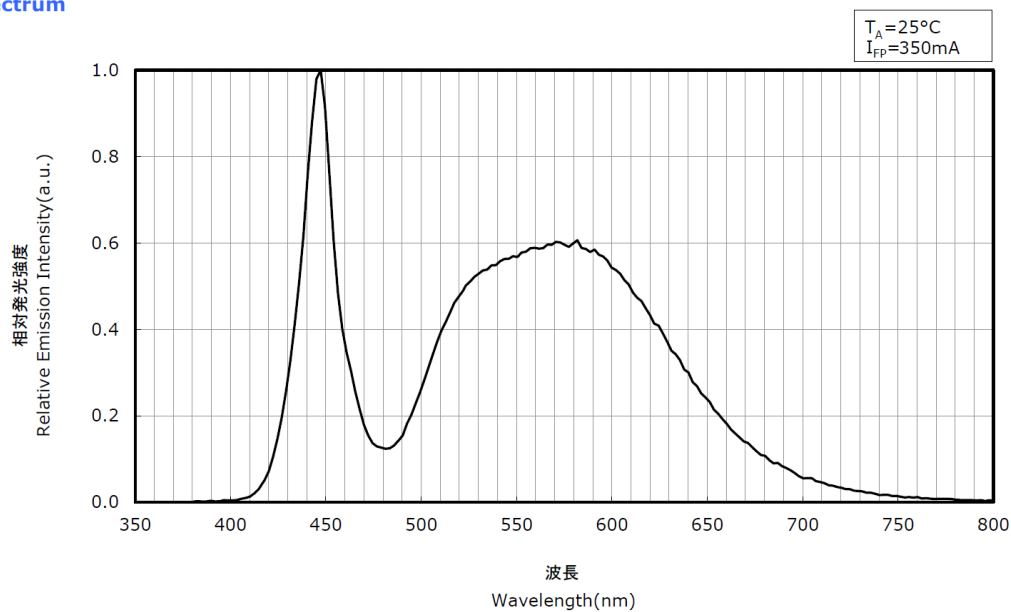
3.3. Dimming range

10 to 100% (Range in which the above condition of uniformity can be secured (1))

3.4. Spectral Distribution (Reference data)

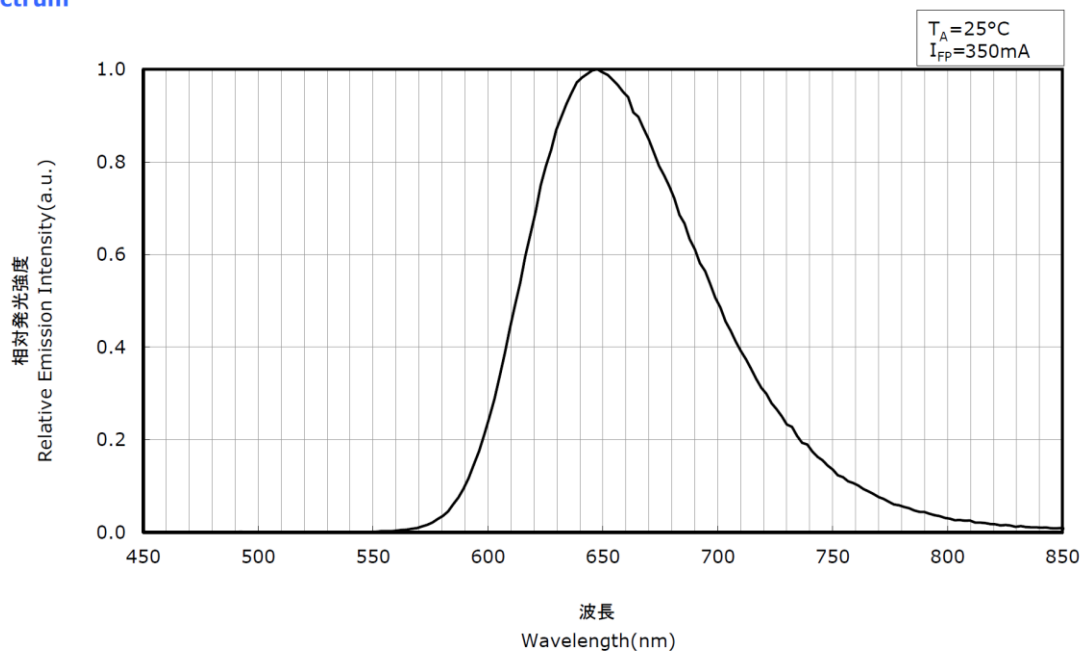
3.4.1.White

発光スペクトル
Spectrum

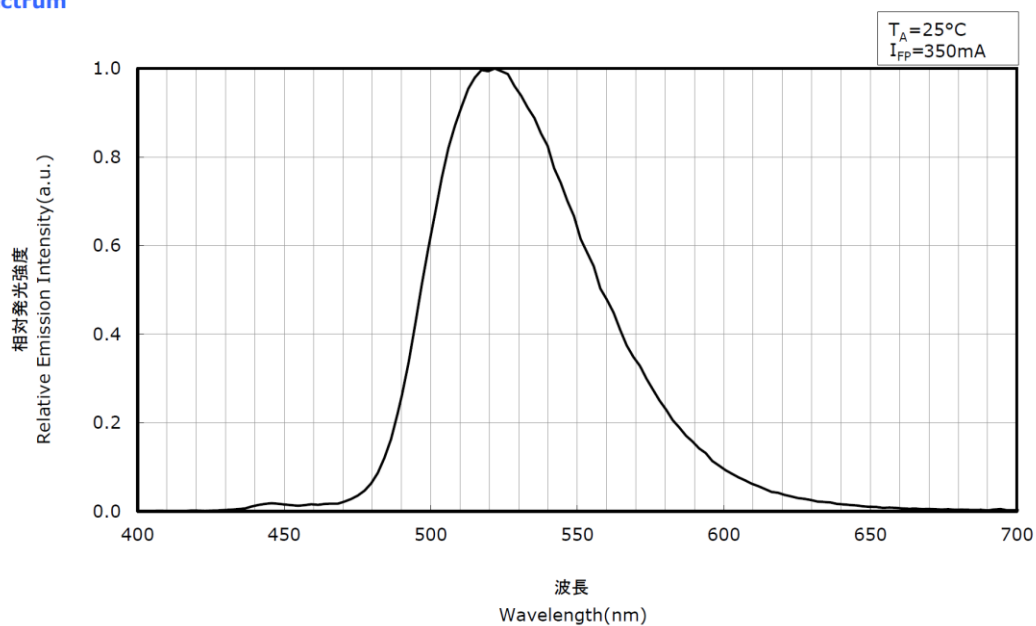


3.4.2.Red

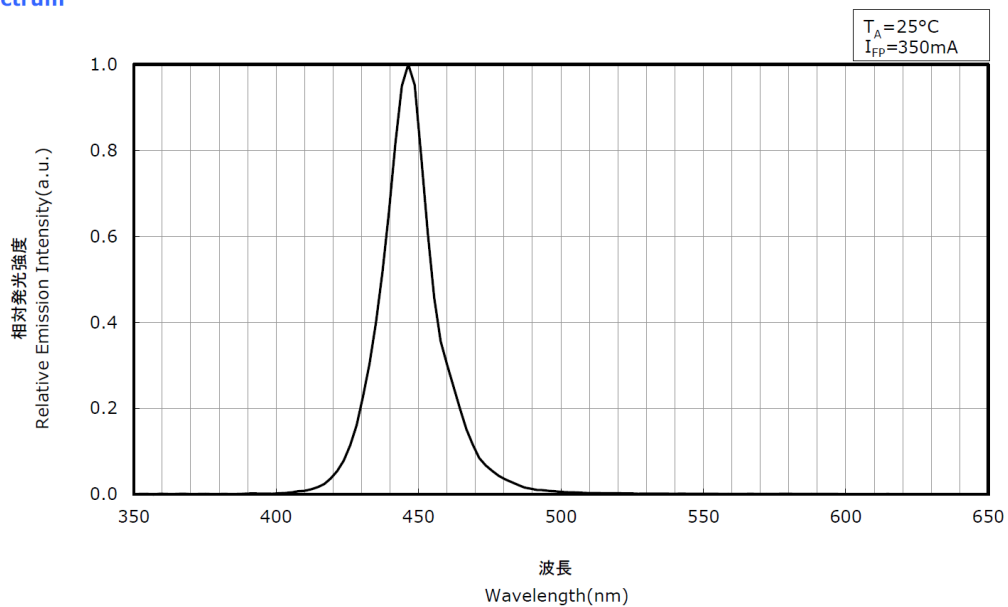
発光スペクトル
Spectrum



3.4.3.Green

発光スペクトル
Spectrum

3.4.4.Blue

発光スペクトル
Spectrum

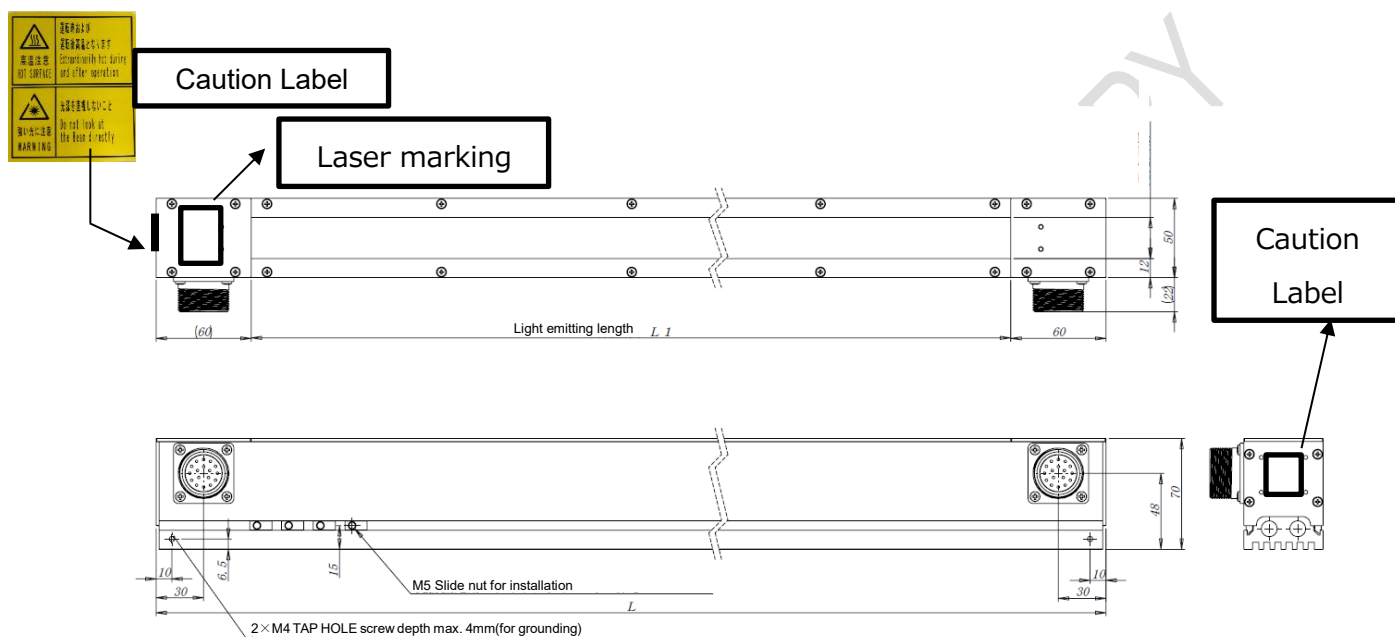
4.Appearance

4.1. LED Line Lighting SPX-TB80 Series

Label of caution for high-temperature and intense light is attached to the body..

4.1.1. Connector position: Standard

* Only one of the two connectors at both ends can be used.



Cover the connector on the side to which a connection cable is not connected with the receptacle cap attached.

※ Receptacle cap: N/MS25043-20D

* If a forced cooling (air cooling/water cooling) tube joint is required, contact us.
Refer to Item 4.1.4. for a recommended joint.

4.1.2. Connector position: End face (option: under development)

* Connector on one side

4.1.3. Connector Model No. and pin assignment

N/MS3102A20-29-P (Japan Aviation Electronics Industry, Ltd.)

Pin No.	Function	Pin No.	Function
A	ON / OFF (+)	K	LED power supply + 40V
B	GND	L	GND
C	GND	M	GND
D	GND 12	N	ON / OFF (-)
E	Control power supply + 12V	P	RESET (+)
F	NC	R	RESET (-)
G	NC	S	TxDATA (+)
H	LED power supply + 40V	T	TxDATA (-)
J	LED power supply + 40V		

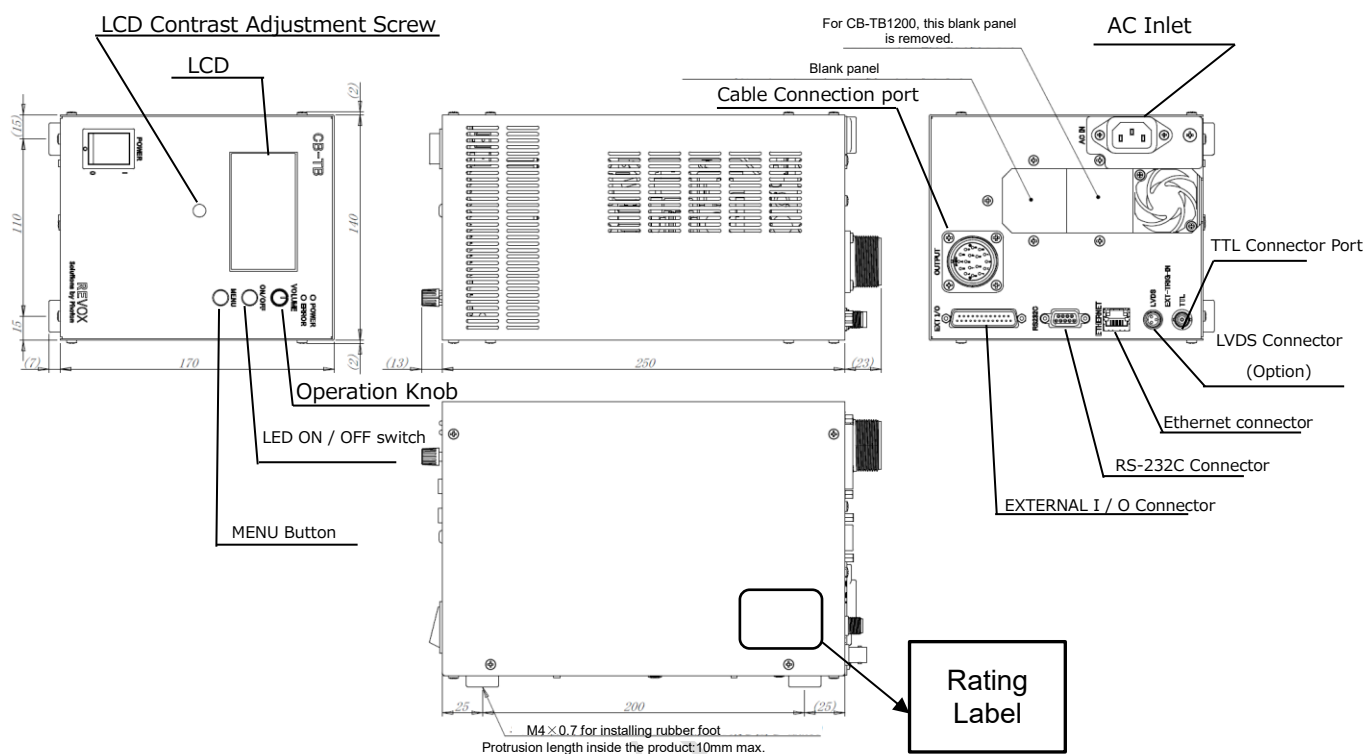
4.1.4. Tube for forced cooling

A tube with an outer diameter of 8 mm/inner diameter of 6 mm should be used.

* Recommended forced cooling tube joint: APC8-02 (option)

4.2. Dedicated Power Supply Unit CB-TB series for SPX-TB80

4.2.1. CB-TB600/1200

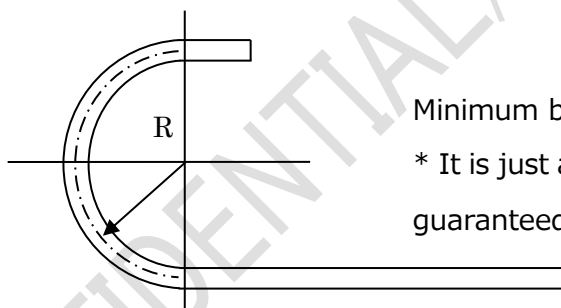
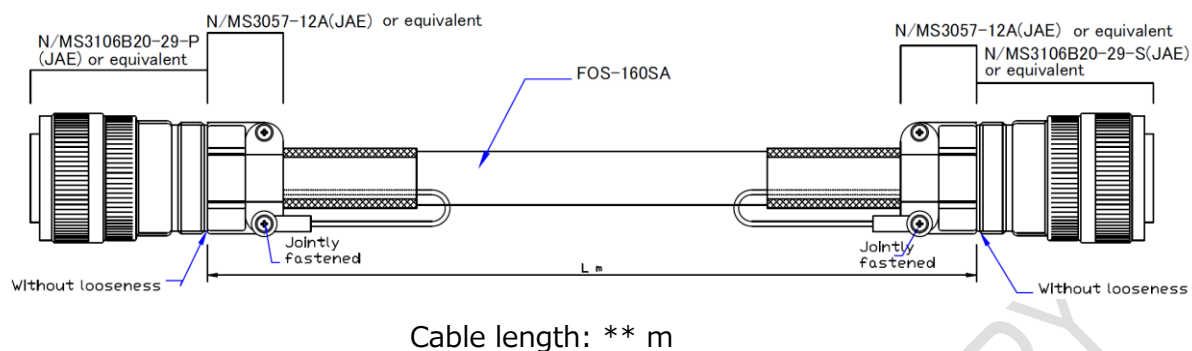


Dimensions (excluding protrusions)
Width × height × depth
[mm]

1400 × 177 × 250 (mm)

※Appearance and dimensions may be changed without notice.

4.3. Dedicated Connection Cable CBL-TB series



Minimum bending radius $R = 95.2\text{mm}$

* It is just a recommended value and not guaranteed.

- Bending conditions of a cable securely connected and not in motion.
- Be careful to prevent a cable from being damaged in use.

5. Model number/Labeling

5.1. LED Line Lighting SPX-TB80 series

The following information is laser-marked on the end cover for SPX-TB80.

(1) Model No.: SPX-TB80 ①-②-③

No.	Item	Description	Symbol
①	Cable connector position	Standard type :	None
	(option)	Two connectors on side face One connector on end face (TBD)	M (to be developed)
②	Light emitting length(mm)	120 to 3,960 (in 120-increment)	
③	Mounted LED color	White	W
		Red	R (to be developed)
		Green	G (to be developed)
		Blue	B (to be developed)

e.g.> SPX-TB80 -1200-W

Series name: TB80

Connector type: Standard

Light emitting length: 1200 mm

Mounted LED color: White (W)

(2) Serial No.: REVOX **** - ****

① ②

① 2-digit production year + 2-digit production month

(e.g. : 1904 = April, 2019)

② 4 digit production number

(3)Country of origin: MADE IN JAPAN

5.2. Dedicated Power Supply Unit CB-TB series

The following information will be shown on the rating label below on the side face of CB-TB Power Supply Unit.

(1) Model No.: CB – TB①-②

① Power supply capacity = 600/1200

② Without LVDS: None

With LVDS: LVDS

(2) Serial No.: ****_****

①

②

① 2-digit production year + 2-digit production month
(ex. : 1904=April, 2019)

② 4-digit production number

<Label example>

CB-TB 1200	
Rated voltage	: AC100-240V
Power consumption	: 1200W
Rated frequency	: 50/60Hz
MAC ADDRESS: XXXXX	
S/N : 1901-0001	
REVOX	
Solutions by Photon	

5.3. Dedicated Connection Cable CBL-TB Series

(1) Model No.: CBL-TB-①

① Cable length

<e.g.>

Cable length 5 m → CBL-TB-050

Cable length 10 m → CBL-TB-100

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6. Control Mode

One control mode from the followings can be selected.

The resolution for external interface is 12-bit (3072 steps) for Full Dimming Range, 8-bit (256 steps) or 10-bit (1024 steps) for Partial Dimming Range.

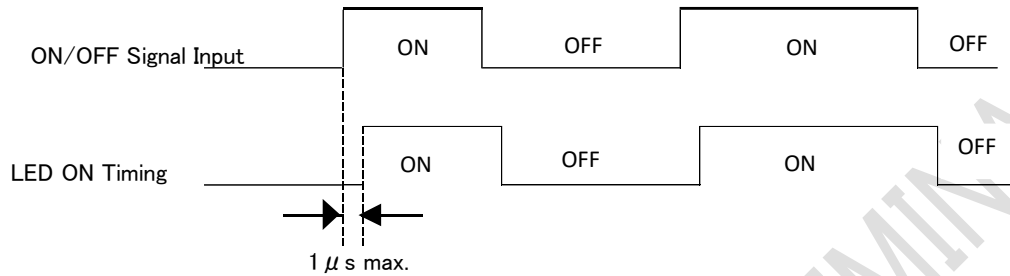
Dimming Mode	Selected on LCD	Dimming method	Setting storable
1. Panel Control Mode	Panel	Control with the Operating Knob on the Front Panel of the Power Supply Unit.	Yes
2. 0-5V Analog Control Mode	0-5V	Control by 0-5 V from an external device connected to EXTERNAL I/O.	No
3. Digital 8-bit Control Mode (Partial Range, LOW, MEDIUM, or HIGH)	Digital (8 bit)	Control by bit 0 to bit 7 digital signals from an external device connected to the EXTERNAL I/O	No
4. DIGITAL 10-bit Control Mode (Partial Range LOW, MEDIUM, or HIGH)	Digital (10 bit)	Control by bit 0 to bit 9 digital signals from an external device connected to the EXTERNAL I/O	No
5. DIGITAL 12bit Control Mode (Full dimming range)	Digital (12 bit)	Control by bit 0 to bit 11 digital signals from an external device connected to the EXTERNAL I/O	No
6. RS-232C Control Mode	RS-232C	Control by communication commands sent from an external device connected to the RS232C port	Yes
7. Ethernet Control Mode	Ethernet	Control by Ethernet communication commands sent from an external device connected to the Ethernet Port	Yes

7. PWM Mode (Strobe Mode)

Three modes, PWM Mode Disabled, External Pulse Control and High Speed Dimming, are available.

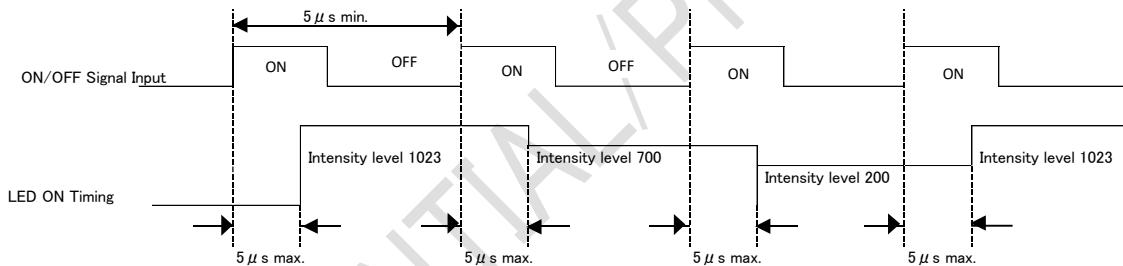
7.1 Pulse Control

7.1.1. External Pulse Control



7.1.2. High Speed Dimming

Three points (Intensity level 1023, 700, 20) Setting example (10-bit dimming)



In High-Speed Dimming, the intensity level set in advance at maximum 16 points in Panel Control, RS-232C Control or ETHERNET Control Modes is executed at the timing of the external pulse rising. **

* External timing pulse ($5 \mu\text{s}$ and more)

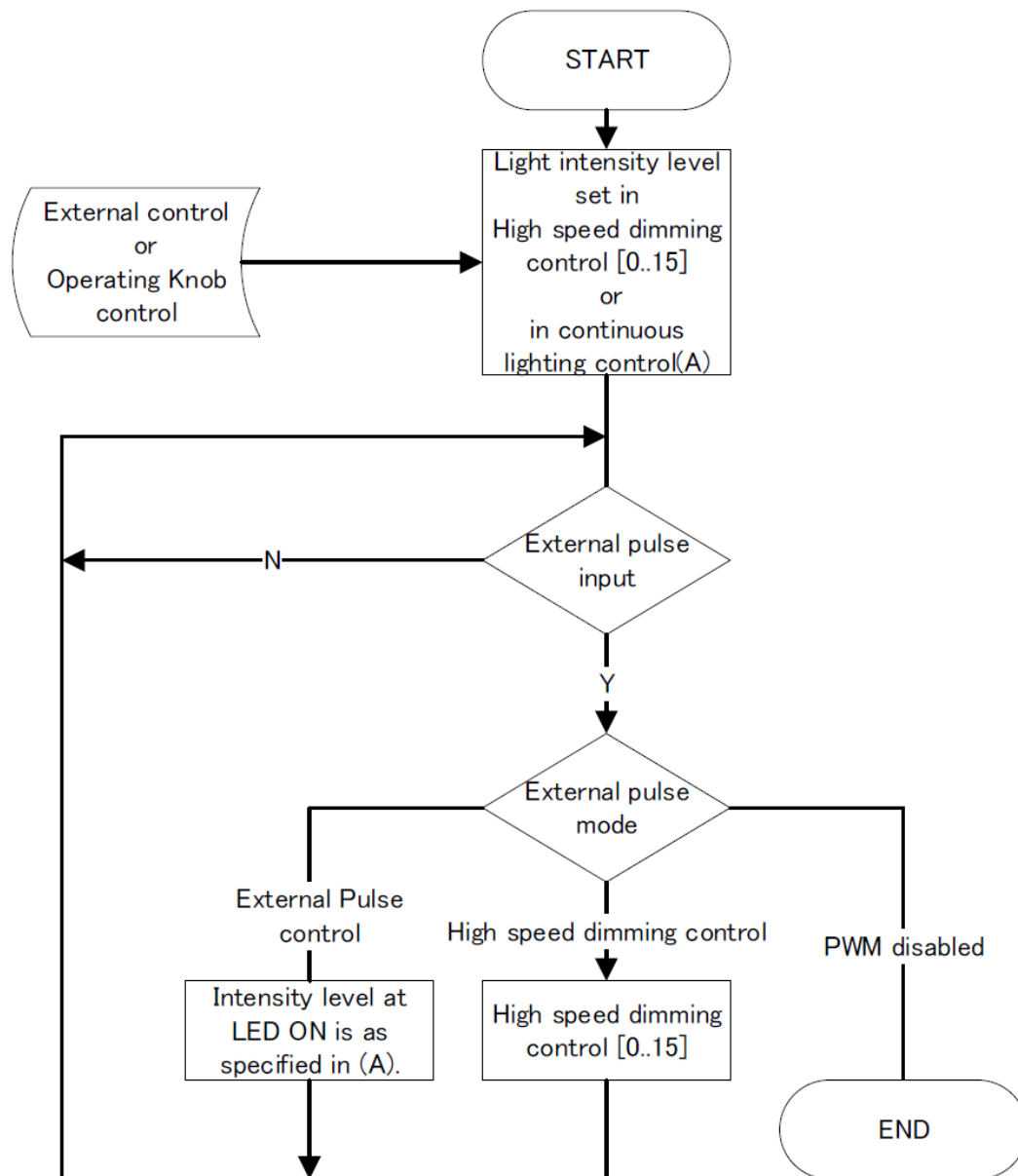
In High-Speed Dimming in Full Dimming Range, the response time will be longer than $5 \mu\text{s}$.

** After dimming at the last set point (16th maximum), same operation is repeated from the first set point (intensity level). The number of the set points under 16 points is also available.

Note:

All error detection and output is unavailable in High Speed Dimming, as communication between SPX-TB80 and CB-TB is not executed except for dimming control.

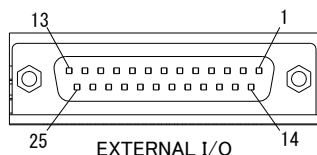
7.2. Operation Flowchart



8. Interface

8.1. External I/O

External I/O Cable length should be as short as possible. Especially for 0-5V Analog Control, it may be required to prevent light output from being affected by electric noise.

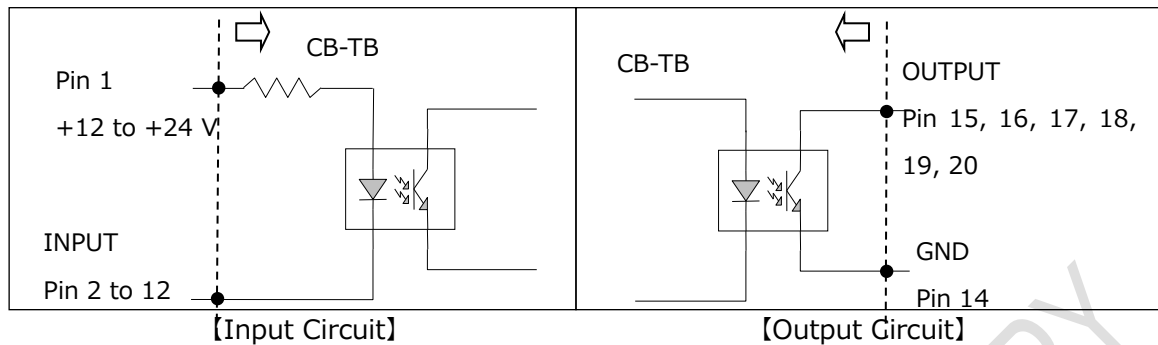


No.	SIGNAL		Panel	0-5V	DIGITAL	RS-232C / ETHERNET
1	+ 12 to 24 V	COM	-	●	●	-
2	bit 0	Input	-	-	●	-
3	bit 1	Input	-	-	●	-
4	bit 2	Input	-	-	●	-
5	bit 3	Input	-	-	●	-
6	bit 4	Input	-	-	●	-
7	bit 5	Input	-	-	●	-
8	bit 6	Input	-	-	●	-
9	bit 7	Input	-	-	●	-
10	bit 8	Input	-	-	●	-
11	bit 9	Input	-	-	●	-
12	0-5V Dimming Lock/bit 10	Input	-	Dimming lock	bit10	-
13	bit 11	Input				
14	GND	COM				
15	LED ON output	Output	●	●	●	●
16	Power supply abnormality	Output	●	●	●	●
17	LED lifetime warning	Output	●	●	●	●
18	Temperature warning	Output	●	●	●	●
19	Temperature abnormality	Output	●	●	●	●
20	OPEN error	Output	●	●	●	●
21	LED ON · OFF	Input	●	●	●	-
22	Output GND					
23	+ 5V		-	●	-	-
24	0-5V for analog dimming	Input	-	●	-	-
25	Analog GND for dimming	COM	-	●	-	-

Note) In PANEL Mode, if the LED ON/OFF input pin is connected and controlled to OFF, SPX-TB80 goes out and an OPEN error occurs.

In PANEL Mode, EXTERNAL I/O control is not available.

- When using input signal (bit 0 to 11, block), apply +12 to +24 V to Pin 1.
- For input signal (bit 0 to 11, dimming lock), LED is ON when photocoupler is ON

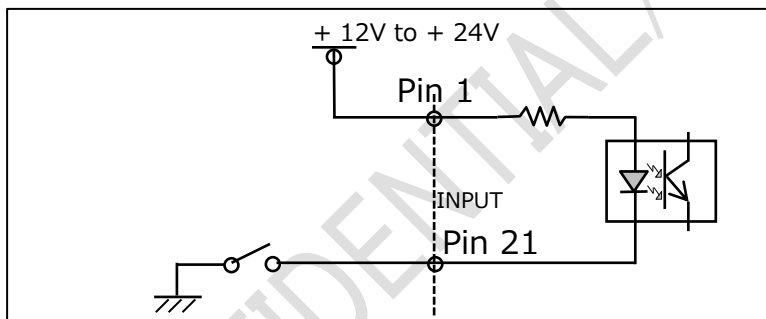


<Error output>

- For error output of Pin 16, 19, and 20, photocoupler is ON when an error occurs.
- Output signals are open collector output. Use the sink current at 25 mA or less.

<0-5V analog control>

- For the analog dimming signal, set Pin 25 (COM) to common (COM) and apply 5 VDC or less to Pin 24.
 - For analog control with a potentiometer, + 5 V is output from Pin 23.
 - The resistance of the potentiometer should be 10 K-ohm.
 - To turn ON/OFF LED, set Pin 22 as COM and use Pin 21 and 22.
- (Photocoupler ON: LED OFF, photocoupler OFF: LED ON)



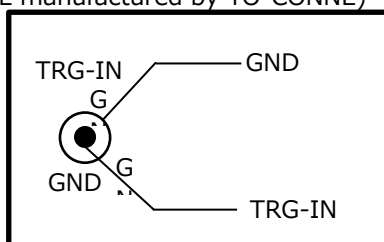
<8-bit/10-bit Digital Control >

- For 8-bit / 10-bit dimming (bit 0 to 9), apply +12 to +24 V to Pin 1.

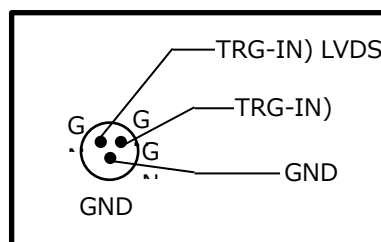
<Pulse lighting control by trigger input>

- Input trigger signal to TRG-IN(BNC) or LVDS(option) on the Rear Face of CB-TB.
- Input to both BNC and LVDS is invalid.

Connector on Rear Face of CB-TB(BNC - 31 - 10 L manufactured by TO-CONNE)



Connector on Rear Face of CB-TB(R03-R3M manufactured by TAJIMI ELECTRONICS)



8.2. RS-232C Control (Serial Communication Connector RS-232C)

RS-232C Control by an external device (PC and others) using RS-232C communication.

8.2.1. Communication Settings

Communication speed: 38400 bps

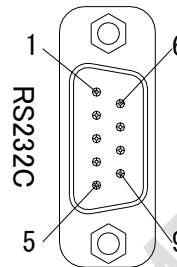
Data length: 8 bits

Parity: NONE

Stop bit: 2 bits

Flow control: None

No.	SIGNAL	No.	SIGNAL
1	NC	6	NC
2	Tx	7	NC
3	Rx	8	NC
Four	NC	9	NC
Five	GND		



Use a straight cable and inch-sized screws.

8.2.2. Control Commands

1. 8-bit Dimming Setting (WDA) (valid only in Partial Dimming Range)
2. 12/10 bit Dimming Setting(WDB)
(12 bits are valid only in the Full Dimming Range)
3. LED ON / OFF Setting (WDD)
4. Read 8-bit Light Intensity Data (RSA) (valid only with Partial Dimming Range)
5. Read 12/10-bit Light Intensity Data(RSB) (12 bits are valid only in Full Dimming Range)
6. LED Open Error Query (REF)
7. LED Temperature Abnormality Query(REG)
8. LED Temperature Query (RAT)
9. Soft Version Query(V)
10. Error Status Query (RST)
11. PWM Mode Setting (WSP)
12. Dimming Range Setting (WMD)
13. High-speed Dimming Level Setting (WHD)
14. High speed Dimming Level Query (RHD)
15. PWM Mode Query (RSP)
16. Dimming Range Query (RMD)
17. Internal AD Data Query (RAI)
18. External AD Data Query (RAE)
19. Illuminance Data Query (RIM)
20. Temperature Data Query (RXT)
21. Power Supply Abnormality Query (RIG)

- 22. LED Block Count (RLA)
- 23. Pseudo Error Setting (ERR)
- 24. Date/Time Setting(WDY)
- 25. Date/Time Query (RDY)
- 26. Query for Number of Error Occurrence (ELC)
- 27. Query for Error Log (ELD)

8.3. Communication Commands

Commands are exchanged by ASCII code in capital letters in the following procedure.

Command must begin with STX (0x02) and end with ETX (0x03).

The Response commands from CB-TB begin with ACK (0x06) and end with ETX (0x03).

In case communication abnormality occurs, response command begin with NAK (0x15) and end with ETX (0x03).

1. 8-bit Dimming Setting (valid only in Partial Dimming Range)

Invalid for Full Dimming Range Control

Partial Dimming Range (LOW, MEDIUM or HIGH): Set 8-bit (256 steps) dimming.

"xx" is 256 steps from 00 to FF.

Command from external device	[STX]	WDA	xx	[ETX]
Response from CB-TB	[ACK]	WDA	xx	[ETX]

2. 12/10 bit Dimming Setting

Full Dimming Range: Set 12 bit (3072 steps) dimming.

"xx" is 3072 steps from 000 to BFF.

Partial Dimming Range (LOW, MEDIUM or HIGH): Set 10 bit (1024 steps) dimming.

"xx" is 1024 steps from 000 to 3FF.

Command from external device	[STX]	WDB	xxx	[ETX]
Response from CB-TB	[ACK]	WDB	xxx	[ETX]

3. LED ON/OFF Setting

"x" is 0 or 1 to indicate the status. 0: LED OFF 1: LED ON

Command from external device	[STX]	WDD	x	[ETX]
Response from CB-TB	[ACK]	WDD	x	[ETX]

4. Read 8-bit Light Intensity Data

Invalid in Full Dimming Range

Partial Dimming Range (LOW, MEDIUM OR HIGH): Read 8 bit (256 step) dimming level.

“xx” is 256 step data from 00 to FF.

Command from external device	[STX]	RSA		[ETX]
Response from CB-TB	[ACK]	RSA	xx	[ETX]

5. Read 12/10-bit Light Intensity Data

Full Dimming Range: Read 12 bit (3072 step) dimming level.

“xxxx” is 1024 step data from 0000 to 0BFF.

Partial Dimming Range (LOW, MEDIUM OR HIGH): Read 10 bit (1024 steps) data for dimming setting.

“xxxx” is 1024 step data from 0000 to 03FF.

Command from external device	[STX]	RSB		[ETX]
Response from CB-TB	[ACK]	RSB	xxxx	[ETX]

6. LED Open Error Query

Read whether LED abnormality occurs or not.

“x” is 0 or 1 to indicate the status. 0: No abnormality 1: abnormality occurred

Command from external device	[STX]	REF		[ETX]
Response from CB-TB	[ACK]	REF	x	[ETX]

7. LED Temperature Abnormality Query

Read whether LED temperature abnormality occurs or not.

“x” is 0 or 1 to indicate the status. 0: No abnormality 1: abnormality occurred

Command from external device	[STX]	REG		[ETX]
Response from CB-TB	[ACK]	REG	x	[ETX]

8. LED Temperature Query

“xxxx” is from 0000 to FFFF (deg.C) to indicates the highest temperature among LED board blocks .

Command from external device	[STX]	RAT		[ETX]
Response from CB-TB	[ACK]	RAT	xxxx	[ETX]

9. Software Version Query

Read the software version.

Command from external device	[STX]	V		[ETX]
Response from CB-TB	[ACK]	V	Ver _ _ _ _ _ / _ / _ _ _ _	[ETX]

10. Error Status Query

Read error status.

“xx” is the status data from 00 to FF.

Command from external device	[STX]	RST		[ETX]
Response from CB-TB	[ACK]	RST	xx	[ETX]

* Status data is returned in hexadecimal.

Status bit arrangement

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
-	-	-	-	LED Open Error	LED Temperature Abnormality	Communication Error	Power Supply Abnormality

0: Normal 1: Error occurred

* RST command is returned in hexadecimal. Convert it to binary data for reference.

11. PWM Mode Setting

Set the PWM Mode.

“x” to indicate PWM Mode as below

0: PWM Mode invalid 1: External Pulse Control 2: High Speed Dimming

Command from external device	[STX]	WSP	x	[ETX]
Response from CB-TB	[ACK]	WSP	x	[ETX]

12. Dimming Range Setting

Set the dimming range.

“x” to indicate the range as below.

0: LOW (Partial Dimming Range) 1: MEDIUM(Partial Dimming Range 2: HIGH(Partial Dimming Range) 3: Full(Full Dimming Range)

Command from external device	[STX]	WMD	x	[ETX]
Response from CB-TB	[ACK]	WMD	x	[ETX]

13. High-speed Dimming Level Setting

Set high-speed dimming level for 1 to 16 points (maximum) with one command.

“XX” is the number of active points. (01 to 10 H)

Full Dimming Range:

“111, 222, 333, 444” to set 12-bit dimming level (000 - BFF) for 16 points maximum.

Partial Dimming Range:

“111, 222, 333, 444” to set 10-bit dimming level (000 - 3FF) 16 points maximum.

Command from external device	[STX]	WHD	XX,111,222,333,444	[ETX]
Response from CB-TB	[ACK]	WHD	XX,111,222,333,444	[ETX]

14. High speed Dimming Level Query

Read High-speed Dimming level

"XX" is the number of active points (01 to 10 H).

Full Dimming Range:

"111, 223, 334, 444" to read the 12-bit dimming level (000 to BFF) for the number of effective points.

Partial Dimming Range:

"111, 223, 334, 444" to read 10-bit dimming level (000 to 3FF) for the number of effective points.

Command from external device	[STX]	RHD		[ETX]
Response from CB-TB	[ACK]	RHD	XX,111,222,333,444	[ETX]

15. PWM Mode Query

Read PWM mode.

"x" to indicates the mode as below

0: PWM invalid 1: External Pulse Control 2: High Speed Dimming

Command from external device	[STX]	RSP		[ETX]
Response from CB-TB	[ACK]	RSP	x	[ETX]

16. Dimming Range Query

Read the dimming range.

"x" to indicate the range below.

0: LOW 1: MEDIUM 2: HIGH 3: FULL

Command from external device	[STX]	RMD		[ETX]
Response from CB-TB	[ACK]	RMD	x	[ETX]

17. Internal AD Data Query

Select the LED board number and read voltage of the even-numbered LED board block, voltage of the odd-numbered LED board block, and the voltage of 40-V power supply.

“aa” is the block number. “xxxxyyyyzzzz” is AD data (0000 to FFFF in 2 bytes)

Command from external device	[STX]	RAI	aa	[ETX]
Response from CB-TB	[ACK]	RAI	aaxxxx ... zzzz	[ETX]

18. External AD Data Query

By selecting the LED board number, illuminance data, LED thermistor temperature, FET temperature of the even-numbered block, and FET temperature of odd-numbered block as AD data.

“aa” is the block number. “vvvvxxxxyyyyzzzz” is AD data (0000 to FFFF in 2 bytes).

Command from external device	[STX]	RAE	aa	[ETX]
Response from CB-TB	[ACK]	RAE	aavvvv ... zzzz	[ETX]

19. Illuminance Data Query

Select the LED board number and read the illuminance value.

“aa” is the board number. “xxxx” is the illuminance value (0000 to FFFF in 2 bytes)

Command from external device	[STX]	RIM	aa	[ETX]
Response from CB-TB	[ACK]	RIM	aaxxxx	[ETX]

20. LED Temperature Query

Select the LED board block and check the LED thermistor temperature, FET temperature of even-numbered block and FET temperature of odd-numbered block.

“aa” is the board number. “xyyyzz” is the temperature data (00 to FF in 1 byte).

Command from external device	[STX]	RXT	aa	[ETX]
Response from CB-TB	[ACK]	RXT	aaxx ... zz	[ETX]

21. Power Supply Abnormality Query

Read power supply abnormality.

“x” to indicate the status. 0: No abnormality 1: Abnormality occurred

Command from external device	[STX]	RIG		[ETX]
Response from CB-TB	[ACK]	RIG	x	[ETX]

22. LED Block Count

Read the number of LED blocks.

“xx” is the number of blocks

Command from external device	[STX]	RLA		[ETX]
Response from CB-TB	[ACK]	RLA	x	[ETX]

23. Write pseudo error

Set a pseudo error as a test. Error content is shown in "10. Error Status Query."

Send an error shown in the table of Status bit Arrangement.

Command from external device	[STX]	ERR	nn	[ETX]
Response from CB-TB	[ACK]	ERR	nn	[ETX]

24. Date/Time Setting

Set date/time to the product. ("2019/01/01 00:00:00" is shown after turning on the power.)

Command from external device	[STX]	WDY	yyyy/mm/dd hh:mm:ss	[ETX]
Response from CB-TB	[ACK]	WDY	yyyy/mm/dd hh:mm:ss	[ETX]

25. Data/Time Setting Query.

Read the set date/time.

Command from external device	[STX]	RDY		[ETX]
Response from CB-TB	[ACK]	RDY	yyyy/mm/dd hh:mm:ss	[ETX]

26. Query for Number of Error Occurrence

Read the number of error occurrence counted from the date of shipment.

Command from external device	[STX]	ELC		[ETX]
Response from CB-TB	[ACK]	ELC	nnnnnn	[ETX]

"nnnnnn" is a 6-digit hexadecimal number.

27. Query for Error Log

Read error log. Maximum 32 errors are stored.

Command from external device	[STX]	ELD	nn	[ETX]
Response from CB-TB	[ACK]	ELD	(*)	[ETX]

(*) Error-logs are separated by commas and returned.

nn:Storage No. from 0 to 31

When nn is not specified, the latest error-log is returned.

Each of the following is the data for a LED board in case of error occurrence.

yyyy/mm/dd hh:mm:ss,aa,bb,cc,ddd,eee,ffff,gggg,hhhh,iiii,jj,kk,ll

yyyy/mm/dd hh:mm:ss Time of error occurrence

aa:Error classification* bb:No. of LED block for which error occurs

cc:Error code **

ddd:Dimming Value just before error occurrence

eee:Dimming value at the time of error occurrence

ffff:Voltage gggg:PD sensor feedback value

hhhh: Voltage of FET for even-numbered block

iiii: Voltage of FET for odd-numbered block

jj:LED thermistor temprature

kk:Temperature of FET for even-numbered block

ll:Temperature of FET for odd-numbered block

"aa" to "ll" is indicated as hexadecimal number.

* 【Error classification】

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
—	—	Initialization Error	Lifetime Warning	LED Open error	LED Temperature error	Communication error	Power supply error

0 : Normal 1 : Error occurred

*As RST command is returned in hexadecimal number, convert it into binary number for reference.

** 【Error code】

Item	Description	Code
Power supply	Power supply voltage cannot be adjusted.	20
	Capacity unconformity of CB-TB	10
Initialization	No response from LED	01
	Mismatch between SPX-TB and CB-TB.	02
Others	All items other than the above	00

8.4. Ethernet Communication Control

Light intensity can be controlled with Ethernet communication commands the same as those for RS-232C control.

(For the communication command, refer to “8.3. Communication Commands.”

Use the following cables for Ethernet communication control.

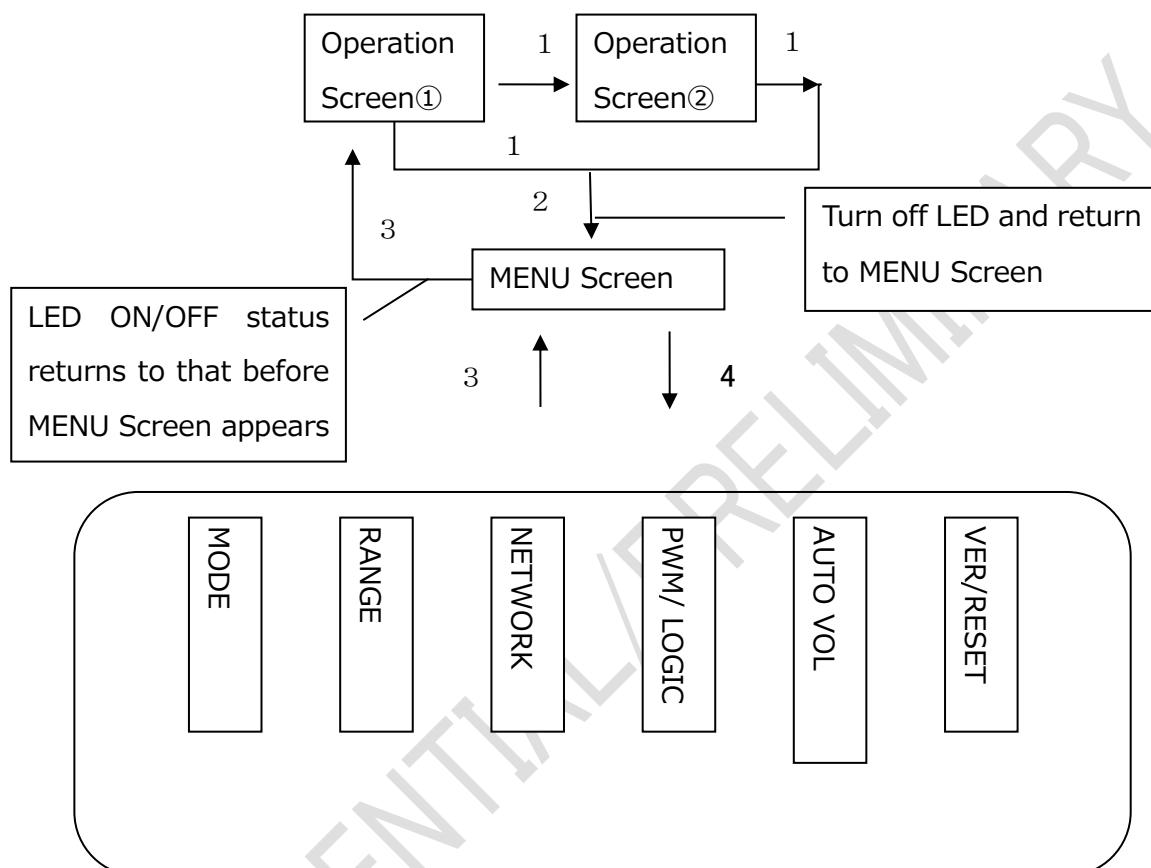
- Connector: RJ-45
- Cable: Cross cable or straight cable

Factory IP address	192.168.100.35 (Standard setting)
Port number	10001
Communication protocol	TCP / IP

9. LCD Screen

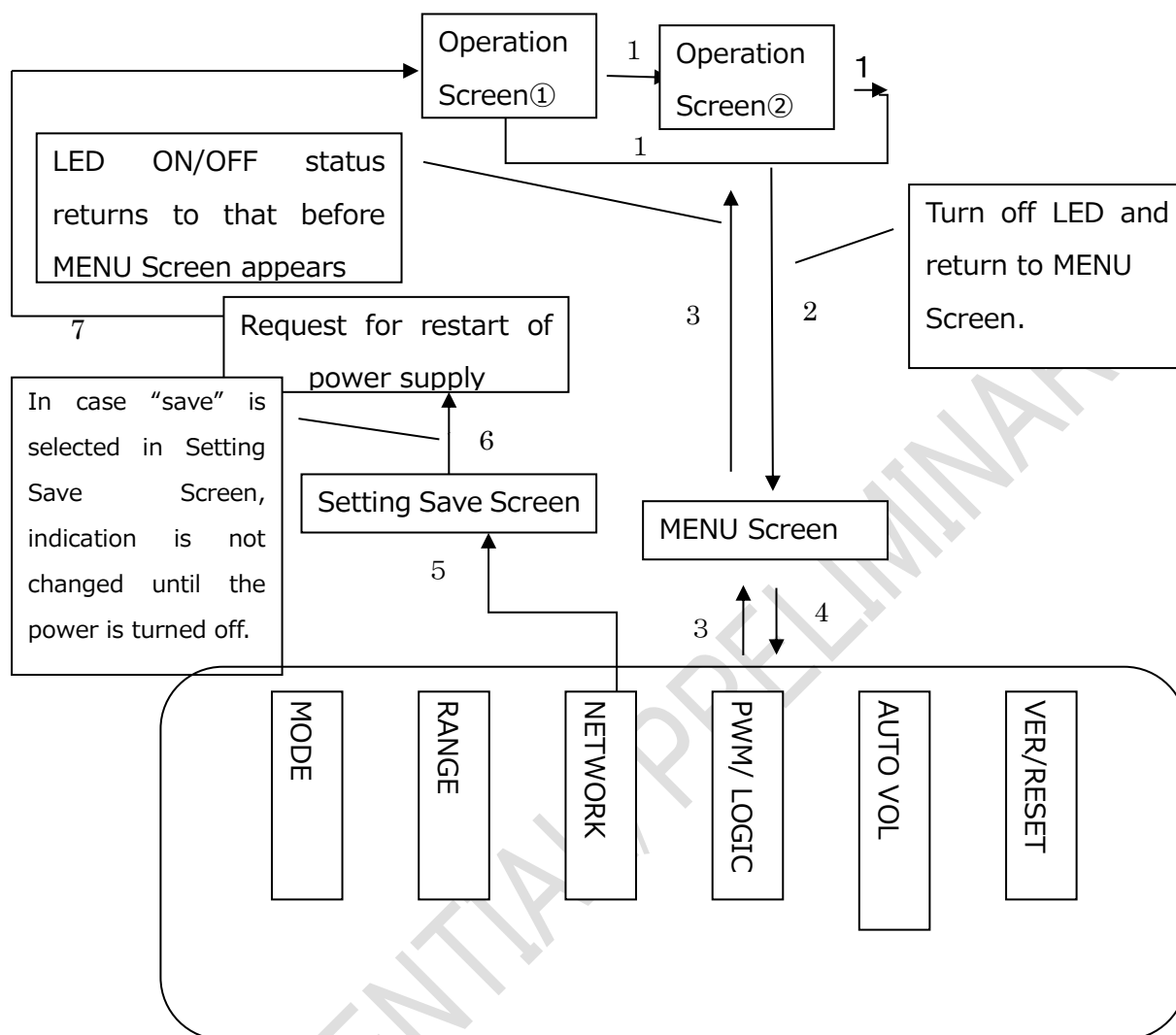
9.1. LCD screen transitions (Normal operation)

In normal operation when network settings are not changed.



	Description
1	Press MENU Button short.
2	Press and hold the MENU Button (for about 3 seconds).
3	Press MENU Button. / No key operation for 5 minutes.
4	Press Operating Knob (move to the selected item).

Normal Operation in case network setting(s) is changed

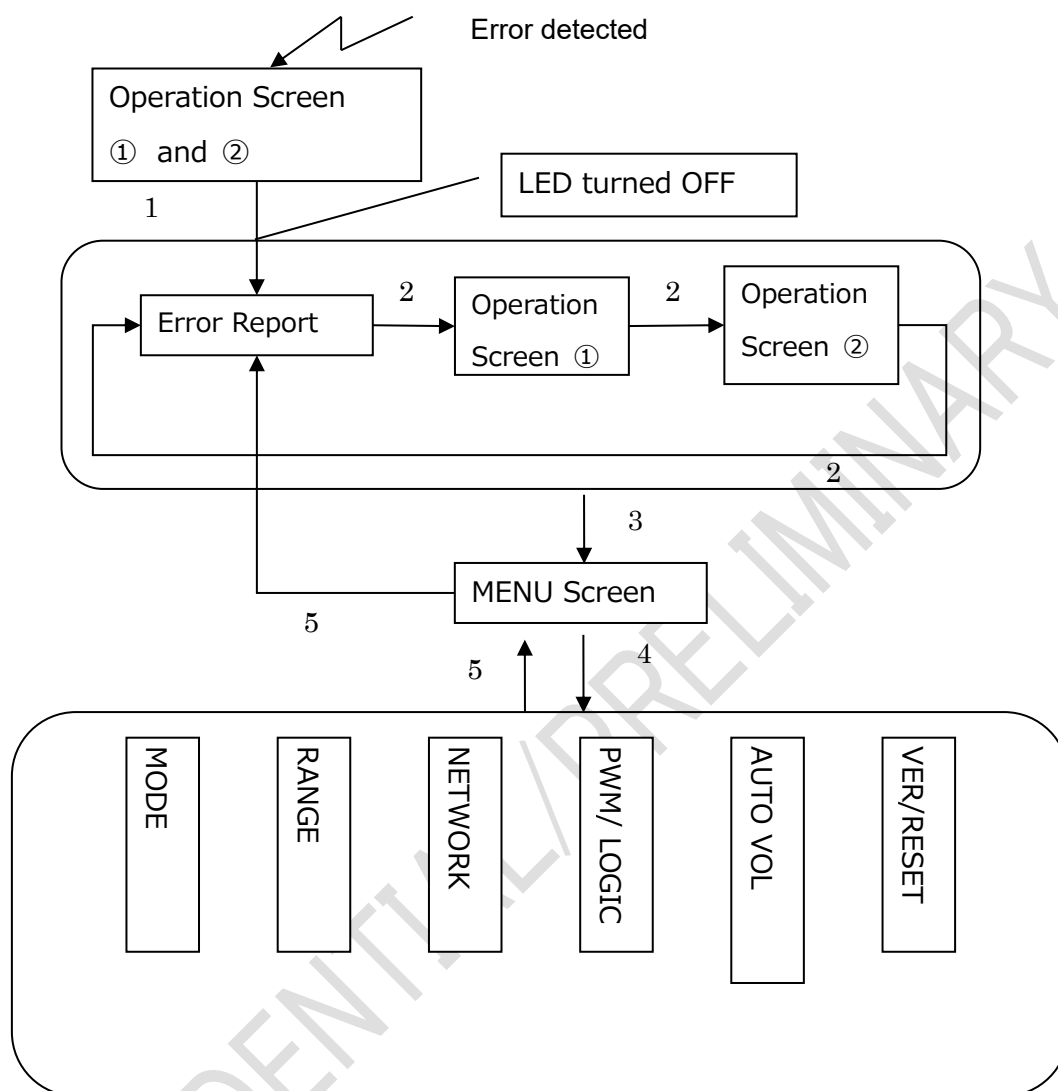


	Description
1	Press MENU Button short.
2	Press and hold the MENU Button (for about 3 seconds).
3	Press MENU Button. / No key operation for 5 minutes.
4	Press Operating Knob (move to the selected item).
5	Press MENU Button * When network setting(s) is changed.
6	Press Operating Knob. (SAVE / Y / N).
7	Cycle the power.

*Changed settings are saved in SPX-TB at the timing of moving to "MENU Screen".

* A request screen for prompting to save the change appears only when network settings are changed.

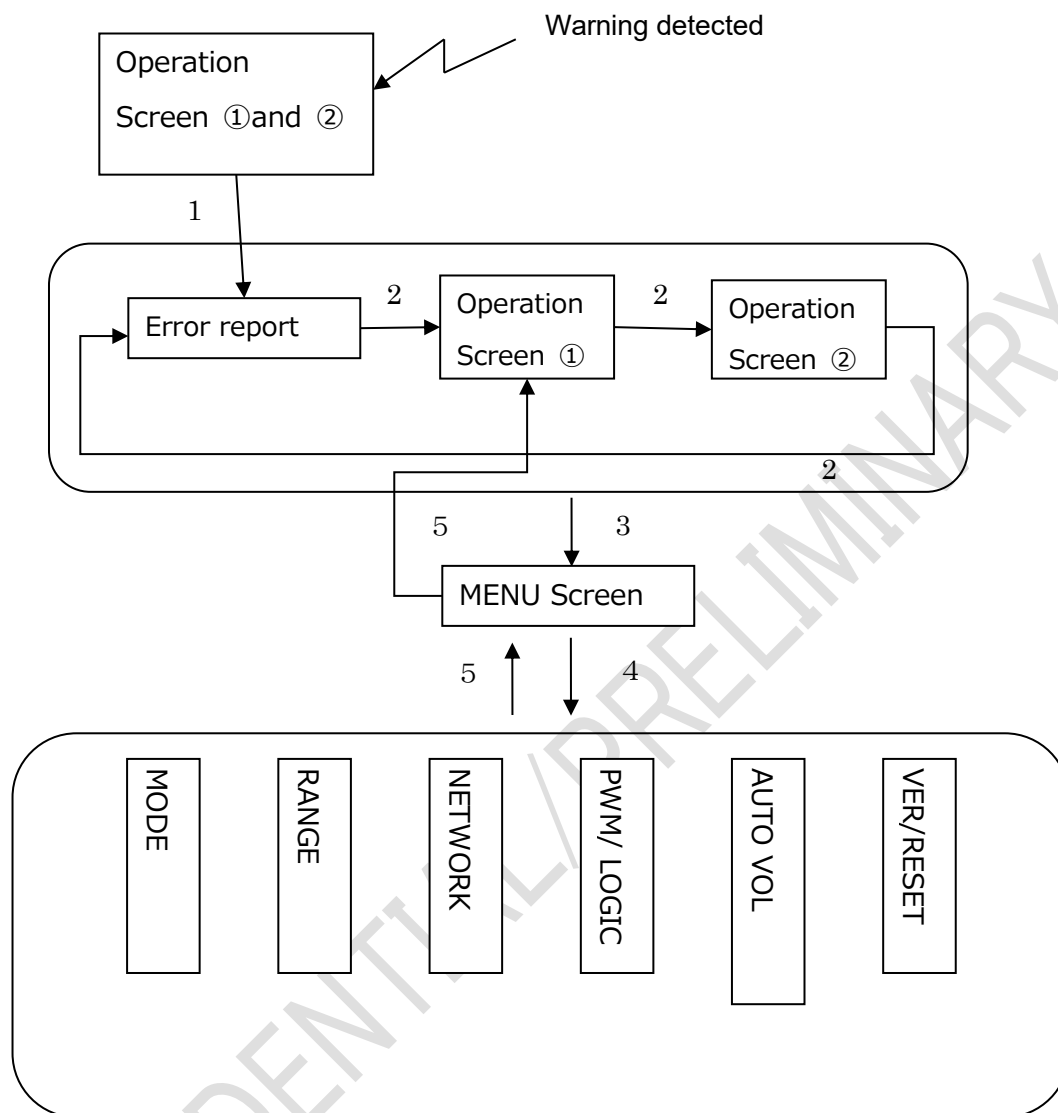
Abnormality reported in Operation Screen ① or ②



	Description
1	Automatically displayed when error is detected.
2	Press MENU Button short.
3	Press and hold the MENU Button.
4	Press Operating Knob (move to the selected item).
5	Press MENU Button./No key operation for 5 minutes.

* If warning(s) and error(s) occur at the same time, priority is given to error(s).

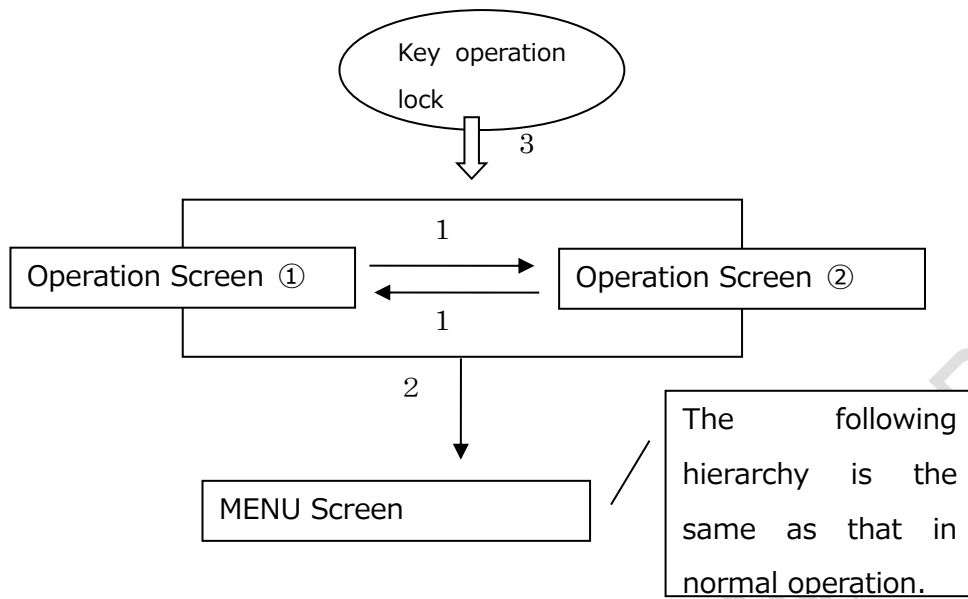
Warning detected on Operation Screen ① and ②



	Description
1	Automatically displayed when warning is detected
2	Press MENU Button short.
3	Press and hold the MENU Button
4	Press Operating Knob (move to selected item)
5	Press MENU Button. /No key operation for 5 minutes.

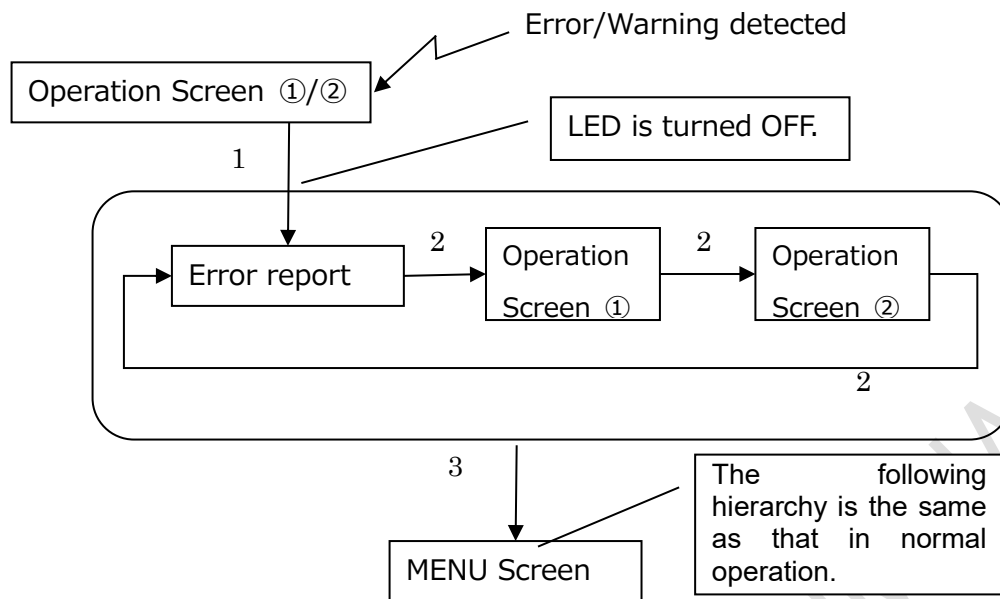
* If warning(s) and error(s) occur at the same time, priority is given to error(s).

Normal Operation with key operation lock



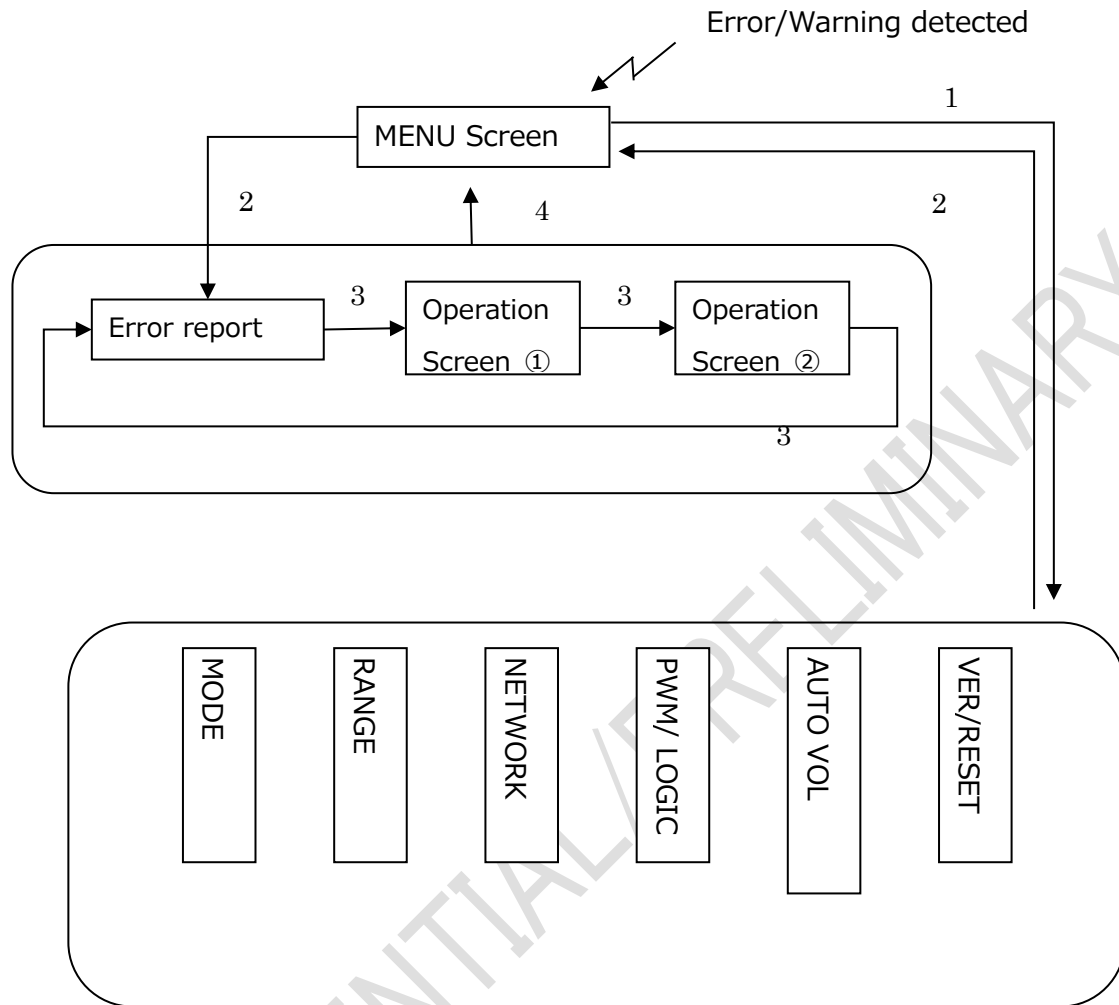
	Description
1	Press MENU Button short
2	Press and hold the MENU Button
3	Press and hold the Operation Knob (key operation lock/unlock)

Operation (error and warning detected during key operation lock)



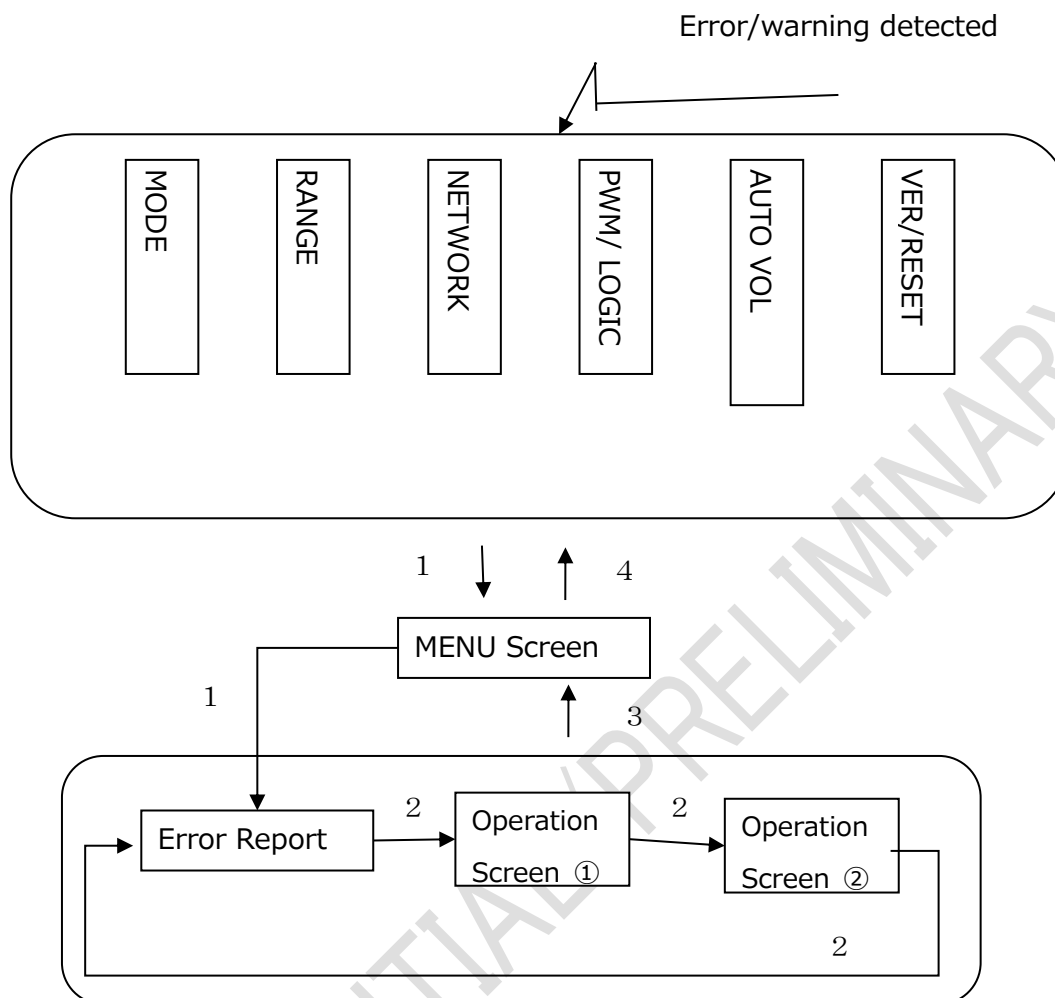
	Description
1	Automatically displayed when error is detected.
2	Press MENU Button short
3	Press and hold the MENU Button

Operation (Abnormality reported in MENU Screen)



	Description
1	Press Operating Knob (move to the selected item).
2	Press MENU Button/No key operation for 5 minutes.
3	Press MENU Button short.
4	Press and hold the MENU Button.

Operation (abnormality reported in each setting/check screen)



	Description
1	Press MENU Button/No key operation for 5 minutes.
2	Press MENU Button short
3	Press and hold the MENU Button
4	Press Operating Knob (move to the selected item).

9.2.LCD Screen(Initial Screen)

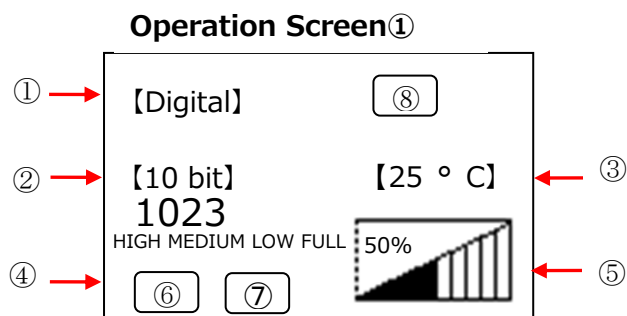
① Model No.

② Ver.

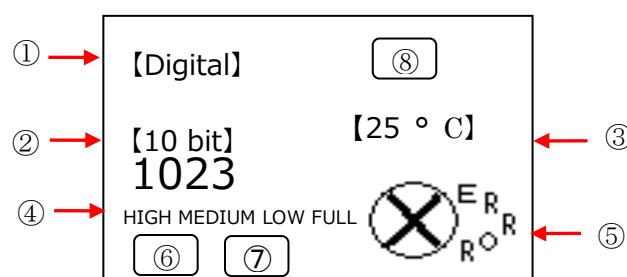
Presented by Revox

No	Indication	Description
①	Model No.	CB-TB600 or CB-TB1200
②	Ver.	Display software version

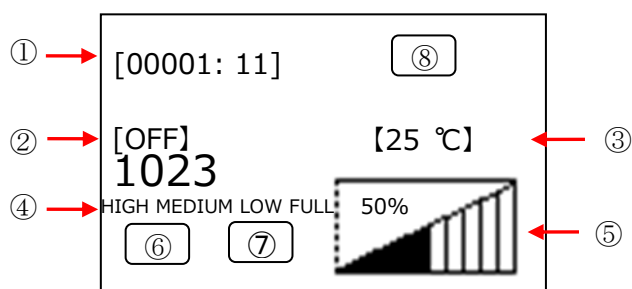
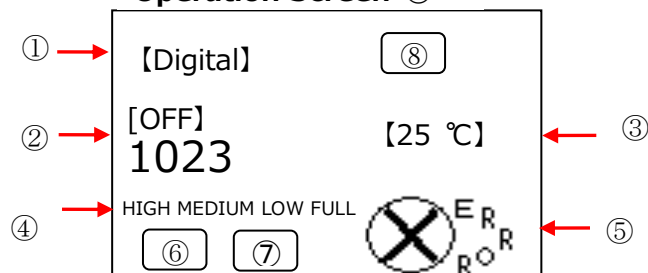
9.3.LCD Screen (Operation Screen)



Operation Screen① (Error detected)



No	Indication	Description	Application
①	Operation mode	Mode selected from the interface shown right is displayed.	Panel, RS-232C, ETHERNET, Digital and 0-5V analog
②	Resolution/Dimming range	The dimming resolution setting is displayed. Also, the dimming range is shown under the resolution.	12 bit /10 bit/8 bit HIGH/MEDIUM/ LOW/FULL
③	Temperature	The LED thermistor temperature is displayed.	0 to XX deg. C
④	Dimming level	The dimming level currently set is displayed. * The indicated dimming level varies in accordance with resolution.	0 to 3071, 0 to 1023, or 0 to 255
⑤	Dimming Level Indicator/Error Icon	The current dimming value is indicated in percentage(0 to 100%). When an error is detected, the Error Icon is displayed	Dimming graph 0 to 100% Displayed/Not displayed Default: Not displayed.
⑥	Key Operation Lock Icon	Key icon is displayed during key operation lock.	Displayed/Not displayed Default: Not displayed.
⑦	Magnification	Step magnification of dimming amount in Panel Mode is displayed (available only in Panel Mode)	× 1, × 10, × 100
⑧	LED ON/OFF setting	Icon is displayed when ON/OFF setting of SPX-TB50 is ON	Displayed/Not displayed Default: Not displayed

Operation Screen ②**Operation Screen ①**

No	Indication	Description	Application
①	Accumulated operation time	The accumulated time for LED-ON-status is displayed.	0 to 99999 hours 59 minutes
②	PWM / Dimming range	Display PWM mode Display Dimming range.	HSP/EXT/OFF HIGH/MEDIUM/LOW /FULL
③	Temperature	The LED thermistor temperature is displayed.	0 to XX deg. C
④	Dimming Level	Display the dimming value currently set. ※Dimming value range is determined by resolution	0 to 3071, 0 to 1023 Or 0 to 255
⑤	Dimming Value Indicator / Error Icon	The current dimming value is displayed in percentage (0 to 100%). When an error is detected, the Error Icon is displayed	• Value: 0 to 100% • Error Icon Displayed/Not displayed Default: Not displayed
⑥	Key operation lock icon	Key icon is displayed during key operation lock.	Displayed/Not displayed Default: Not displayed
⑦	Magnification	Step magnification of dimming amount in panel mode is displayed (available only in Panel Mode)	× 1, × 10, × 100 (initial value × 1)
⑧	LED ON/OFF setting	Icon is displayed when LED ON/OFF setting is ON.	Displayed/Not displayed Default: Not displayed

9.3.1.MENU Screen

MENU		
①	1.MODE	4. PWM/MENU ④
②	2. RANGE	5. AUTO VOL ⑤
③	3.NETWORK	6. VER/RESET ⑥

No	Indication	Description
①	MODE	Move to the Operation Mode Setting Screen
②	RANGE	One of the ranges, Full Dimming Range or Partial Dimming Range (Only one range from HIGH, MEDIUM or LOW) can be selected.
③	NETWORK	Move to Network Setting Screen
④	PWM/LOGIC	Move to PWM Mode Screen or Screen for setting logic of External I/O Input Signal.
⑤	AUTO VOL	Move to automatic voltage adjustment with turning LED on at maximum illuminance. After completing adjustment successfully, MENU Screen is automatically resumed.
⑥	VER/RESET	Move to the screen for checking software version and resetting accumulated operation time.

* The current cursor position is highlighted.(White letter on grey background)

* Cursor position can be changed by rotating the Operation Knob left or right

* By pressing the Operation Knob at the current cursor position, you can move to each setting screen.

9.3.2. AUTO VOLTAGE Adjustment Screen

In case a Cable of different length from that of the CBL-TB combined at the time of factory shipment is used, power voltage must be adjusted.

Monitoring the voltage value of each LED board, the lowest (minimum) voltage can be automatically adjusted to the one equivalent to the others, in the procedure below.

With this function, light quantity decrease due to voltage drop caused by variation in length of a lighting unit and a cable can be suppressed.

[AUTO VOLTAGE]		
V-OUT	XX.X	①
MIN - V =	X. XX	②
BOARD =	XX	③
SET	XX.X	④

No	Indication	Description
①	Switching Power Supply voltage value	SW Power Supply output voltage to the first decimal place is displayed.
②	LED board lowest (minimum)voltage value	The lowest voltage value of those output by all LED boards respectively is displayed up to the second decimal place. The voltage setting for SW Power Supply is automatically adjusted so that the value becomes 2.5 (V)*.
③	Number of LED board outputting lowest voltage	Number of the LED board which outputs the lowest voltage displayed in ②.
④	Voltage set for Switching Power Supply	The value is automatically adjusted so as to make the voltage value of LED boards appropriately.

* Value for white LED

Be sure to perform the adjustment of CB-TB when the LED lighting to be connected or the Cable are changed.

The value ④ will not go beyond the specified value (52 V:Upper limit).

If the AUTO VOLTAGE Screen is not closed automatically even if the voltage reaches the upper limit, an error is displayed. Cycle the power and try readjustment. If adjustment cannot be completed even after readjustment, contact us.

(Please refer to "13.Troubleshooting.")

9.3.3. RANGE Setting Screen

[RANGE]

① → LOW HIGH
 MEDIUM FULL

No	Indication	Description
①	RANGE	Selection of the dimming range (Select one from LOW, MEDIUM, HIGH and FULL)

9.3.4. Mode Setting Screen

【MODE SET】

① → Panel Digital ④
 ② RS232C 0 – 5 V ⑤
 ③ Ethernet

No	Indication	Description
①	Panel	Dimming controlled with Operating Knob on the Front Panel
②	RS232C	Dimming controlled with commands sent via RS-232C connector
③	Ethernet	Dimming controlled with commands sent via Ethernet connector.
④	Digital	Dimming controlled with digital dimming signals input via external I/O connector.
⑤	0-5V	Dimming controlled with 0-5 V signals input via external I/O connector

- ※ The item pointed with an arrow(→) is currently selected.
- ※ By pressing Operating Knob, the position of the cursor pointed with an arrow → and highlighted with grey color can be changed.
- ※ The setting is updated at the timing of moving to "MENU Screen," and it is also saved in SPX-TB simultaneously.

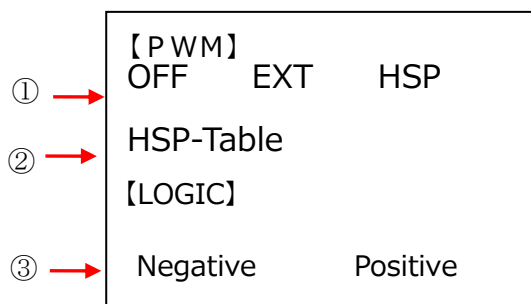
9.3.5. Network Setting Screen

【NETWORK】	
①	PORT xxxxx
②	MASK xxx.xxx.xxx.xxx
③	IP xxx.xxx.xxx.xxx
⑤	SAVE ④ RESET ⑥

No.	Indication	Description	Range of settings
①	PORT	Indicate the current PORT.	0 to 65535
②	MASK	Indicate the current subnet mask.	0 to 255
③	IP	Indicate the current IP address.	0 to 255
④	Magnification	Indicate the step magnification for the current PORT setting.	× 1、× 10、× 100 × 1000
⑤	SAVE	Save the settings from ① to ③ by selecting "SAVE" and pressing Operating Knob.	--
⑥	RESET	Restore the network settings to the factory default settings below. IP 192. 168. 100. 35 MASK 255 255 255 0 GATE 192. 168. 0. 1 PORT 10001	--

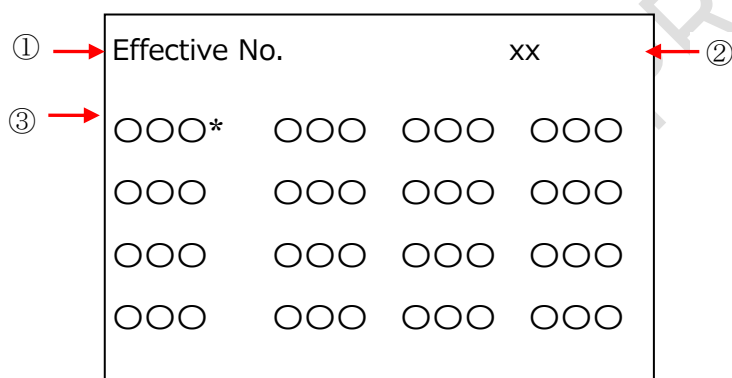
* By pressing Operating Knob when the port setting can be changed, the step magnification of ⑤ changes in the following order: × 1, × 10, × 100, and × 1000.

9.3.6. PWM/LOGIC Setting Screen



No	Indication	Description
①	OFF EXT HSP	Select one mode from PWM Mode OFF(OFF), External Pulse(EXT), and High Speed Dimming(HSP).
②	HSP-Table	Move to the High-Speed Dimming Setting Screen
③	LOGIC	Set input logic of external I/O.

9.3.7. High Speed Dimming Setting Screen



No	Indication	Description
①	Effective No.	While selected, you can move to the position② for selecting effective number of dimming setting by pressing Operating Knob.
②	Effective number of dimming setting	Turn Operating Knob to select the number from 0 to 16, and press the knob to set it.
③	○ ○ ○	Set high-speed dimming level in order from the upper left to the lower right. An asterisk "*" is displayed at the right of the dimming level selected, and you can move to the next dimming level by turning Operating Knob.(0 to 3FF or 0 to BFF)

* A selected item is highlighted.

* Press the MENU Button to return to the PWM/LOGIC Setting Screen.

9.3.8. VER/RESET screen

[RESET/VERSION]	
Ver 1.0.0.1//20:-	①
Block xx	②
Total hour ☐	③
System ☐	④
OK?	⑤

No	Indication	Description
①	Ver	Indicate software version. Ver nnnn // m: m
②	Number of blocks	Indicate total number of blocks for connected SPX-TB80.
③	Total hour	Reset accumulated operation time (Total operation time indicated on Operation Screen).
④	System	Restore MODE, UNIT, LOGIC, key operation lock, ON /OFF, dimming level to the factory default settings.
⑤	OK?	Perform reset.

※ When OK is executed, the item which check box is ticked is reset.

※ Even if a check box is ticked, reset cannot be performed when returning to the previous screen with the MENU Button.

※ Operation method and the timing stored in SPX-TB is the same as the Mode Setting Screen

9.3.9. Error Information Screen

[ERROR Report]	
① →	LED
② →	LED Open
③ →	Press MENU Button

No	Indication	Description
①	LED	Display abnormal temperature value of LED
②	LED	Display "Open" at any time.
③	Message indicated	Operation message to users.(Operation Screen ① indicated by pressing MENU Button.)

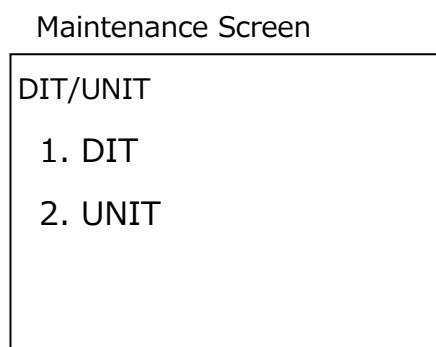
* Items for which error(s) occurs are highlighted.

9.4 LCD Screen (User Maintenance)

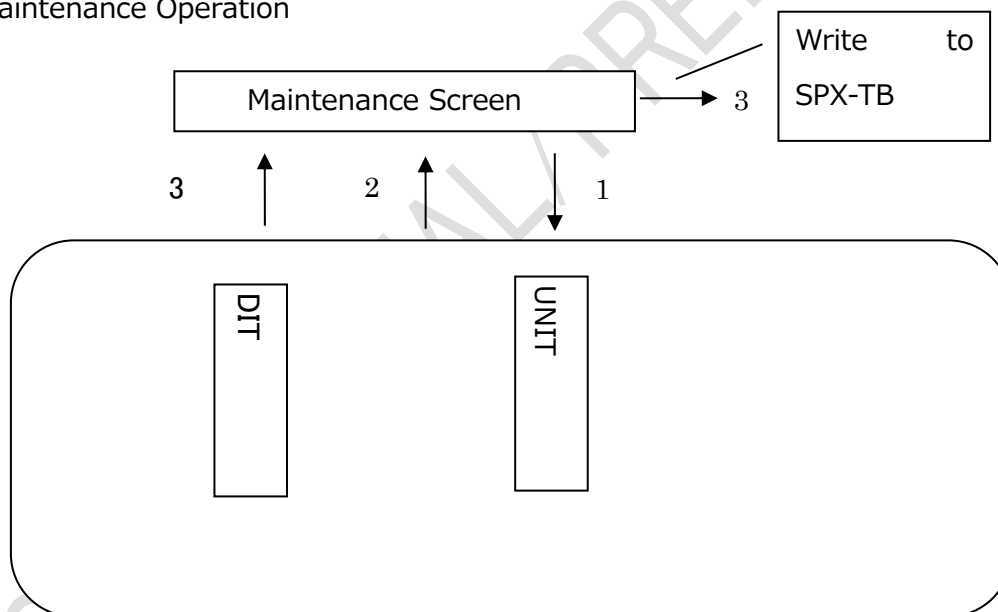
To display the Maintenance Screen, turn on the Power Switch holding down the MENU Button.

(When a beep sound is heard, release your hand from the MENU Button.)

9.4.1. Maintenance Screen



Maintenance Operation



	Description
1	Press Operating Knob (move to the selected item).
2	Press MENU Button.
3	Press MENU Button (After changing the maintenance settings, press MENU Button while Maintenance Screen is shown)

9.4.2. UNIT Setting Screen

Unit (Unit of resolution and temperature) Setting Screen

① **【RESOLUTION】**
8bit 10bit

② **【TEMPERATURE】**
°F → °C

No	Indication	Description	Initial value
①	RESOLUTION	Set the input resolution of dimming level to 8-bit or 10-bit (In Full Dimming Range, 12-bit setting is fixed.)	10 bit
②	TEMPERATURE	Set temperature displayed on Operation Screen to Celsius or Fahrenheit	Degree C

* The operation method and the timing saved in SPX-TB is the same as the Mode Setting Screen

9.4.3. DIT Selection Screen

【D I T】

① → LOW

HIGH

MEDIUM

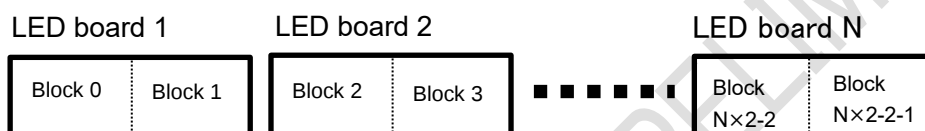
FULL

No	display	Description
①	DIT	Select the DIT value to edit

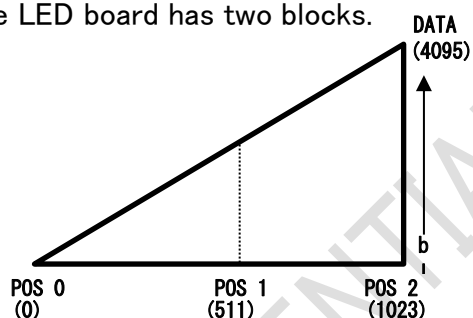
9.4.4.DIT Edit Screen

① →	DIT XXXX RANGE
② →	BLOCK 1
③ →	POS 3
④ →	VALUE 1
⑤ →	DATA 0

No	Indication	Description
①	Selected Range	Indicate one of the ranges, LOW, MEDIUM, HIGH or FULL.
②	BLOCK	LED board block number
③	POS	DIT position number (0 to 8)*
④	VALUE	DIT value (0000 to 4095)
⑤	DATA	Dimming value (0000 to 1023)

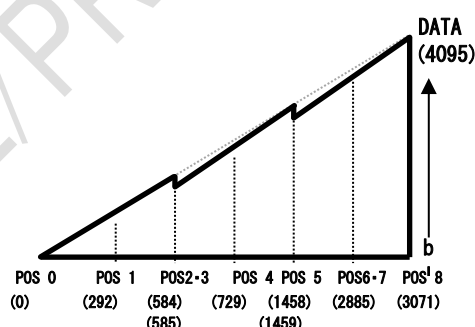


One LED board has two blocks.



Partial Dimming Range

Linearity for each LED block.



Full dimming range

[Details of position number for each range]

Full Dimming Range

POS	Dimming Level	Light intensity level
0	0000 (0000H)	L_MIN
1	0292 (0124H)	L_MID
2	0584 (0248H)	L_MAX
3	0585 (0249H)	M_MIN
4	0729 (02D9H)	M_MID
5	1458 (05B2H)	M_MAX
6	1459 (05B3H)	H_MIN
7	2885 (0B45H)	H_MID
8	3071 (0BFFH)	H_MAX

Partial Range

POS	Dimming Level	Partial Dimming Range
0	0000 (0000H)	MIN
1	0511 (01 FFH)	MID
2	1023 (03 FFH)	MAX

10. Packing

(1) Line Lighting SPX-TB series

Packed in 8-mm thick cardboard carton.

(2) Dedicated Power Supply CB - TB series

Packed in 8-mm thick cardboard carton.

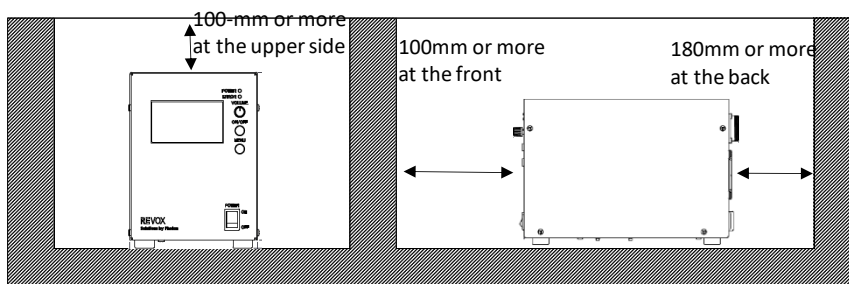
(3) Dedicated cable CBL-TB series

Packed in 8-mm thick cardboard carton.

11. Installation Instructions

The products are electronic devices. Use in an unsuitable environment may result in malfunction or shortening product life. Please observe the following conditions and use them properly.

- ① Install the products in well ventilated room. To install the Power Supply (CB - TB), secure the clearance of 100 mm and more for the front and top, and 180mm or more for the back.

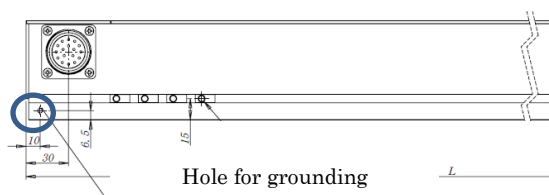


As long as the clearance above is secured, any installation posture of CB-TB is acceptable.

- ② When using exhaust ducts in the environment for installation of CB-TB, keep the air exhaust amount over 2.3 m³/min
- ③ The ambient temperature during operation should always be stable within the range of the specified values. Even if it is within the specification range, sudden change of temperature may cause variation of illuminance.
- ④ The products are not waterproof, Do not use the products in places subject to rain, dripping, or enclosed places where condensation could occur.
- ⑤ Be sure to install the products in a room that does not have high temperature, high humidity, high levels of dust or corrosive gas.
- ⑥ Be sure to keep the products and attached cables as far away from any electrical noise source as possible, such as inverter and high voltage cables. And shield the products from electrical noise source. A power cable or communication cables connected to the products should be shorter than 5m in order to reduce noise.
- ⑦ Please install CB-TB with the Power Switch always operable.
- ⑧ If the product is not operated for an extended period of time, it may malfunction. Operate the products at least once every six months, and perform periodical maintenance.
- ⑨ Grounding

Direct grounding to the lighting body is recommended to reduce the influence of electrostatic discharge on products.

※ Positions of screws for grounding marked with circles.



12. Warranty Terms and Conditions

(1) The warranty period under normal installation and handling conditions is one year from the date of purchase. Within the warranty period, Revox will repair or replace or adjust a defective product, provided the trouble is clearly due to a defect in Revox's design or manufacturing.

Even during the warranty period, charges will be made for repair service in the following cases:

- 1: Defects caused by improper use, remodeling or unauthorized repair
 - 2: Defects caused by modification (addition, change of part, and others) of product
 - 3: Defects caused by dropping the product or damage in transit.
 - 4: Defects caused by a fire, earthquake, flood, lighting or other natural disasters.
 - 5: Defects caused by external factors such as application of overvoltage and others.
 - 6: Regardless of domestic or overseas, if prohibition or regulation of the use of this product by the law established and enforced after product shipment occurs, defects is outside the scope of warranty.
- (2) The scope of warranty is limited to defects of the product. The loss caused by the failure cannot be guaranteed.
- (3) SPX-TB is intended to be used with general-use industry equipment or system. It is not designed or manufactured to be used with any equipment or system which will directly/indirectly affect(hurt) human body/life, or requires an extremely high level of reliability such as a medical instrument. If you consider using SPX-TB for any such special purpose, be sure to inform us in detail before purchasing.
- (4) Repairs of SPX-TB are basically acceptable by sending back the device. Services at your office or factory are not covered by the warranty. Charges may apply to repairs performed outside of Japan.
- (5) Please contact us for inquiry about the cost and availability of repair services outside of Japan. When sending a product for repair, please provide us with detailed information about the operating environment, external factors and malfunction description. If the information provided is insufficient, we could not offer a repair or maintenance service.
- (6) Maintenance will be available for five (5) years after the product is discontinued. In case a part or a component is discontinued, we will use a replacement part or a component. It might cause some difference in performance values available at the date of purchase.
- (7) Storage and operation in the environment with corrosive gas leads to breakage or deterioration of electric component which will be out of warranty.

13. Troubleshooting

Read the followings in case of problems, such as an error message indicated.

Correspondence against failures

If an error is displayed on the LCD, check "14.3.Error List" and take corrective action. If it still does not return to normal state, please check the followings.

- ① Make sure that the power supply unit is operating properly.
- ② Make sure that the connection cable and power cord are securely/properly connected.
- ③ Make sure that the power is properly supplied.
- ④ Make sure that communication cable is properly connected.

After checking the above, contact us with the following information.

- ① Serial numbers of SPX-TB80 and CB-TB.
- ② Accumulated operation time (Total time)
- ③ Indication on LCD and LED ERR indicator status (LED ON/OFF)
- ④ Power supply (commercial / UPS, Voltage, and others)
- ⑤ Operation environment (as detail as possible): Installation conditions, ambient temperature and presence of noise source
- ⑥ External situation at failure: lightning, earthquake, application of abnormality voltage, and others.
- ⑦ Condition of the product just before failure: Abnormal Heat generation, instable operation, and others

<Contact us>

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14. Reference data

14.1. Weight of SPX-TB80 by light emitting length

Light emitting length L1(mm) *1	Weight(Kg)
120	1.2
240	1.9
360	2.5
480	3.1
600	3.8
720	4.4
840	5.0
960	5.7
1080	6.3
1200	6.9
1320	7.6
1440	8.2
1560	8.8
1680	9.5
1800	10.1
1920	10.8
2040	11.4
2160	12.0
2280	12.7
2400	13.3
2520	13.9
2640	14.6
2760	15.2
2880	15.8
3000	16.5
3120	17.1
3240	17.7
3360	18.4
3480	19.0
3600	19.6
3720	20.3
3840	20.9
3960	21.5

*Only weight for SPX-TB80, and connection cable weight is not included.

14.2. Number of mounting nuts required by light-emitting length

Light emitting length L (mm)	Attachment for one side of SPX-TB body
120	2
240	2
360	2
480	3
600	4
720	4
840	4
960	4
1080	4
1200	4
1320	4
1440	4
1560	6
1680	6
1800	6
1920	7
2040	7
2160	8
2280	8
2400	8
2520	9
2640	9
2760	10
2880	10
3000	10
3120	11
3240	11
3360	12
3480	12
3600	12
3720	13
3840	13
3960	14

*Place the nuts evenly on the total length of SPX-TB80 side face.

※ The effective depth of the slide nut is 6 mm.

14.3. Error List

Error	Error details	Error output		Screen transitions	Recovery method	Presumed cause
		Status	LCD			
LED open error	LED is turned OFF by unit of a 60mm-long block.	Error output	【ERROR Report】 LED **°C INIT FAIL LED OPEN COMM POW LIFE BLOCK 0 Press MENU Button	Available	Cycle the power after the LED board replacement.	Defect of CPU board for CB-TB Defect of Terminal board of SPX-TB Defect of LED
LED temperature abnormality alarm/warning	LED temperature is beyond the threshold.	LED is turned off. Error output	【ERROR Report】 LED **°C INIT FAIL LED OPEN COMM POW LIFE BLOCK 0 Press MENU Button	Available	Cycle the power after the LED temperature drops into the range specified.	LED thermister temperature goes beyond the threshold.
Initialization error	Initialization error of LED Line Lighting	Error output	【ERROR Report】 LED **°C INIT FAIL LED OPEN COMM POW LIFE BLOCK 0 Press MENU Button	Available	Check the connection between SPX-TB and CB-TB. Replacement of Connection Cable or CPU board for CB-TB.	Connection cable between SPX-TB and CB-TB is detached or disconnected. Software is not written to FPGA. Defect of FPGA or peripheral components
Power supply error	Power consumption is beyond the capacity of the Power Supply Unit.	Error output	【ERROR Report】 LED **°C INIT FAIL LED OPEN COMM POW LIFE BLOCK 0 Press MENU Button	Available	Turn off CB-TB, and connect suitable SPX-TB for CB-TB.	CB-TB not specified in the Table in Item 2.1.(2) is connected with SPX-TB.
Power voltage adjustment error	Voltage adjustment cannot be successfully completed.	Error output	【ERROR Report】 LED **°C INIT FAIL LED OPEN COMM POW LIFE BLOCK 0 Press menu key	Not available	Turn Off the Power of CB-TB.	Power Supply abnormality
Communication error	Communication between SPX-TB and CB-TB failed.	Error output	【ERROR Report】 LED **°C INIT FAIL LED OPEN COMM POW LIFE BLOCK 0 Press MENU Button	Available	Turn Off the Power of CB-TB.	Defect of LED board or cables
Life time warning	Total operating time exceeds 30,000 hours.	Error output	【ERROR Report】 LED **°C INIT FAIL LED OPEN COMM POW LIFE BLOCK 0 Press MENU Button	Available	Contact us for maintenance.	Press MENU Button to return to MENU Screen.