# **PATLITE**®



#### **Notice to Customer**

Thank you very much for purchasing our PATLITE products.

- Request the installation and wiring be performed by a professional contractor if construction work is involved.
- Prior to installation, read this manual thoroughly before using this product to ensure correct use.
- If there are any questions concerning this product, refer to the contact information at the end of this document and contact your nearest PATLITE Sales Representative.

#### To the Contractor

- Read this manual carefully prior to installation.
- Be sure to return this manual to the customer.

# **○ IO**-Link Signal Tower TYPE LR6-IL

### Complete Operation Manual

Installation

Operation Maintenance

		Page
1	Read this First	2
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#### **Safety Precautions**

The safety precautions that should always be followed in order to prevent injury to user or other individuals as well as prevent damage to property are described below.

The level of injury or damage caused by ignoring these safety precautions and using the product improperly is categorized and described below.

Warning

This icon indicates an action with the potential to cause death or serious injury.

Caution

This icon indicates an action with the potential to cause injury, physical loss or damage.

#### A Warning

Request the installation and wiring be accompanied by a professional contractor. If installation is done improperly, it
may result in fire, electric shock, falling, or malfunction.

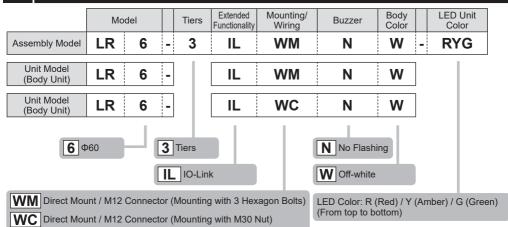
#### **≜**Caution

- Avoid long exposure to the Buzzer sound from a close distance. Failure to observe this may lead from irritation to permanent damage to the ears. (When Buzzer Unit is used)
- In order to maintain protection of this product against dust and waterproofing performance, be sure to use the head cover, LED unit and buzzer unit in the condition that it was originally attached.
- To ensure the waterproofing performance of this product, **do not remove the O-ring or the waterproof packing**. Dust and waterproofing performance will decrease.
- When removing covers or packing from the equipment, which is attached to this product, be careful **not to snag** the product. Failure to comply may result in damage to the product.

#### Notice

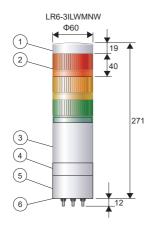
- To ensure proper safety while using the signal tower, observe the following:
  - Perform periodic pre-maintenance.
- As a precaution against problems occurring, use this product together with other equipment.
- Be sure to prevent electrostatic damage due to discharge when working with this product for wiring, exchanging units, setting up parameters, etc. by discharging static electricity on your body, etc.
   (To prevent damage from static electricity, touch hands or other body parts to metals or an earth ground to discharge the body from static charge.)
- Use a soft cloth, etc., dampened with water to wipe the product. Do not use cleaners containing thinner benzine gasoline, oil, Chemicals, etc., to wipe with. It may result in discoloration and deterioration.
  - To ensure safety when this product is installed onto equipment, observe the following:
  - Do not remove parts beyond those designed to be removed from this product.
  - Do not modify or disassemble this product.
  - Use only the specified replacement parts listed in this document.

### 2 Model Number Configuration



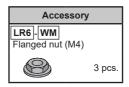
#### ■ WM Direct Mount/M12 Connector Specifications (3-point Foot Attachment)

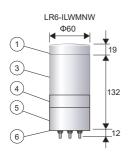
(Unit: mm)



No.	Part Name	Material
1	Head Cover	PC
2	LED Unit	Globe: PC
3	Body	PC
4	M12 Bracket	PC
5	Direct Mount Bracket	PC
6	Waterproof Packing	Silicone Rubber

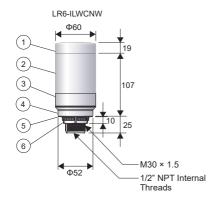
\* M12 connector cable is sold separately. (Please use an M12 connector of  $\Phi$ 16 or less.)





#### ■ WC Direct Mount/M12 Connector Specifications (M30 Nut Attachment)

#### (Unit: mm)



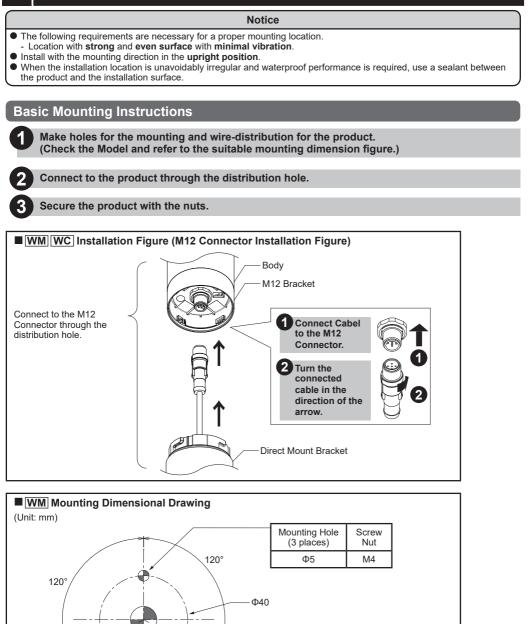
No.	Part Name	Material
1	Head Cover	PC
2	Body	PC
3	M12 Bracket	PC
4	Direct Mount Bracket	PC
5	Waterproof Packing	Silicone Rubber
6	M30 Nut	PC

 $^{*}$  M12 connector cable is sold separately. (Please use an M12 connector of Φ16 or less.)

### 4 Installation

Nameplate

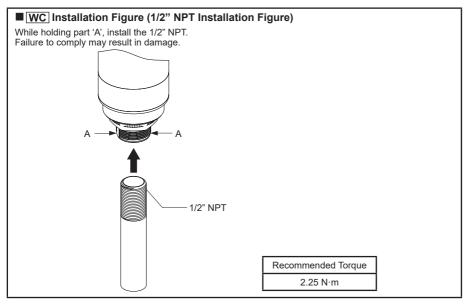
Position

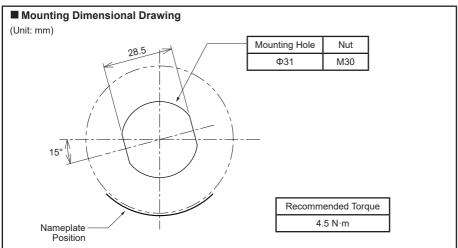


Wire Distribution Hole

(**Φ**20)

Recommended Torque 0.6 N·m





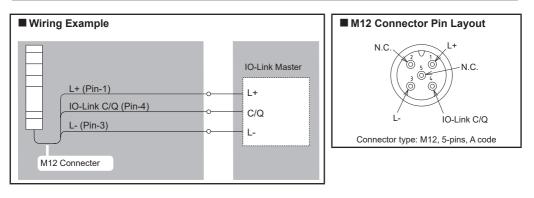
#### **Warning**

• Ensure **the proper working voltage** is used and that **direct current or alternating current** is properly applied. Any mistake in wiring may result in damage or fire.Any mistake in wiring may result in damage or fire.

#### **A**Caution

• Do not pull the wire, or stuff it inside of this product. Possible cause of failure may occur.

#### Wiring Example and M12 Connector Pin Layout



### 6 How to Use

This product is an IO-Link compliant product.

Connect this product by following the "5 Wiring" (p. 6).

The controller can light or flash the LEDs or control the buzzer.

Changing the "Operating Mode" settings enables the following modes:

- Simple Mode
- Advanced Mode

#### Simple Mode

This mode performs simple control by only turning ON and OFF each LED and the buzzer. Other settings are specified using the parameters. Send process data by referring to the table below.

	bit 0	bit 1	bit 2	bit 3	bit 4	bit 5	bit 6	bit 7
Byte 0 data	LED Unit (Red) ON / OFF							
Byte 1 data	LED Unit (Amber) ON / OFF							
Byte 2 data	LED Unit (Green) ON / OFF	Netwood	Not used					
Byte 3 data	LED Unit (Blue) ON / OFF	Not used						
Byte 4 data	LED Unit (White) ON / OFF							
Byte 5 data	Buzzer ON / OFF							

#### Advanced Mode

This mode performs advanced control such as lighting, flashing, and extinguishing each LED as well as sounding, intermittently beeping, or stopping the buzzer.

Other settings are specified using the parameters.

Send process data by referring to the table below.

Enable the intermittent buzzer settings to repeatedly sound the buzzer for 500 ms and stop the buzzer for 500 ms. Refer to (p. 8) for the pattern of each LED.

	bit 0	bit 1	bit 2	bit 3	bit 4	bit 5	bit 6	bit 7
Byte 0 data	LED Unit (Red) ON / OFF	Not used			LED pattern (Red)			Not used
Byte 1 data	LED Unit (Amber) ON / OFF		Not used			LED pattern (Amber)		
Byte 2 data	LED Unit (Green) ON / OFF	Not used			LED pattern (Green)			Not used
Byte 3 data	LED Unit (Blue) ON / OFF	Not used			LE	D pattern (Bl	ue)	Not used
Byte 4 data	LED Unit (White) ON / OFF		Not used		LEI	D pattern (Wł	nite)	Not used
Byte 5 data	Buzzer ON / OFF	Not used				Buzzer: Intermittent	Not	used

#### LED Pattern

Setting	Description
0	Lit
1	Flash (Slow)
2	Flash (Medium)
3	Flash (Fast)
4	Single Flash
5	Double Flash
6	Triple Flash

#### Notice

 Settings 4, 5 and 6 cannot be used with the Multicolor LR6-E-MZ of the LED Unit. Each LED may not light correctly.

 Settings 4, 5 and 6 cannot be used with the WD transmitter for the wireless data communication system. The correct data may not be acquired.

#### Parameter Settings

For information about the parameter settings, please download the IODD from the LR6-IL page on our homepage (https://www.patlite.com/).

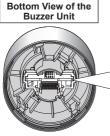
Please also download and use the parameter sheet in the same way.

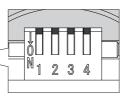
### 7 Setting the Buzzer

#### **∆**Caution

• Do not use excess force when performing operations. Failure to comply will result in damage due to breakage or deformation.

• Do not use sharp-pointed objects to perform operations. Failure to comply may result in damage and inoperative switches or hinder contact between contact parts.





■ indicates the switch of the DIP switch (lower to turn "ON").

#### Settings Table

Buzzer	DIP S	witch	Sound Pattern
Sound	Sound 1 2		Sound Pattern
No. 1	OFF 0	OFF 2	Intermittent tone
No. 2	ON 0	OFF	Continuous tone
No. 3	OFF	ON 1 2	High-low tone
No. 4		ON 2	Sweep sound

DIP Switch	Volume	
3	volume	
	Normal	
	Noise reduction	

Note: DIP Switch 4 is not used. The factory default settings have all of the DIP switches in the "OFF" position.

### 8 Unit Detachment Method

Follow the procedure below to detach a unit, such as when removing the Buzzer Unit or changing the layout of the LED Units.



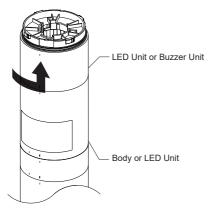
Caution
 Be sure that it is disconnected from the power source before working on it.
 Do not apply excessive torque or strong shock to each unit or body. Failure to comply will result in damage or malfunction.
 Do not touch the connector area or the inside of the body and LED unit. Failure to comply will result in damage or malfunction.
 Be sure to lock each unit securely when attaching. Failure to comply will result in damage or malfunction.
 Detach the unit in the following manner. Any other method may result in damaging the product. Attachment: Attach one unit at a time to the body.
 Removal: Firmly hold the bottom section while removing the upper section.

#### Notice

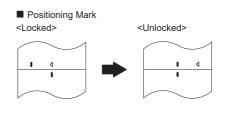
- The maximum number of attachment units per product are five LED units, plus one buzzer unit.
- When using Multi-Color LED Unit for LR6 60 mm Signal Towers LR6-E-MZ, the maximum number of attachment units per product are one LED unit, plus one buzzer unit.
- When using Wireless Data Acquisition System WD, the maximum number of attachment units per product are three LED units.

#### <LED/Buzzer Unit>

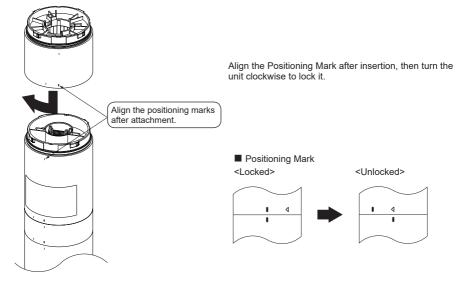
#### Removal



Turn the body or LED unit counter-clockwise to unlock, then raise upwards to remove it.

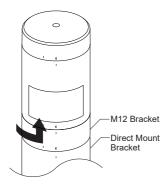


#### Attachment

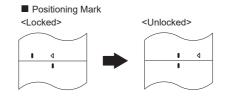


#### <Body Unit>

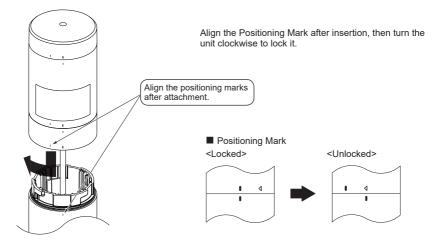
#### Removal



While holding the Direct Mount Bracket, turn the M12 Bracket counter-clockwise, until it unlocks, then pull it upwards to remove.

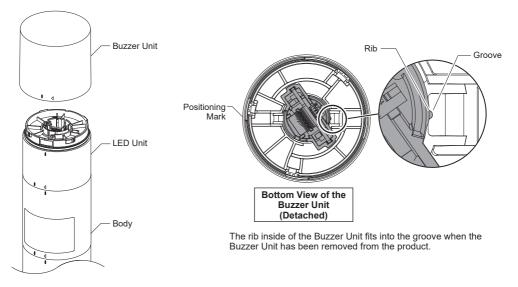


#### Attachment



#### <Troubleshooting the Buzzer Unit Attachment>

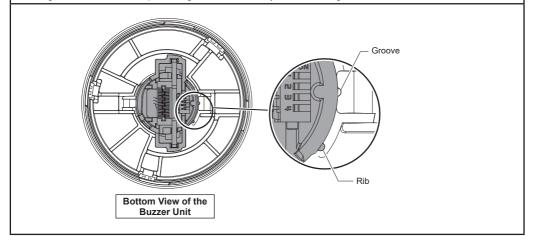
The Buzzer Unit is generally in the state shown in the diagram below after removal.



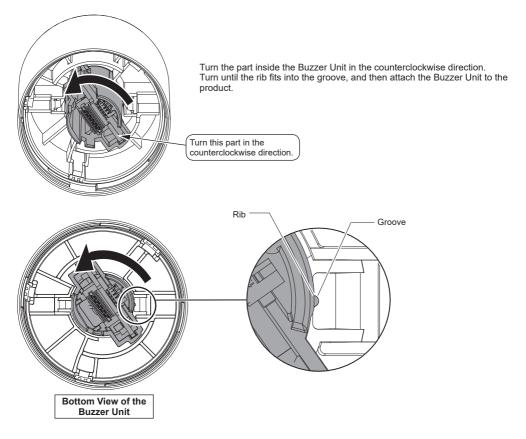
#### **∆**Caution

Check to make sure the rib inside of the Buzzer Unit fits into the groove if the Buzzer Unit does not attach properly. Attach the Buzzer Unit by referring to the next page if the rib does not fit into the groove as shown in the diagram below. In addition, the rib may slide out of the groove during removal as shown in the diagram below depending on how the Buzzer Unit was removed.

Attaching the Buzzer Unit to the product again in this state may result in damage.

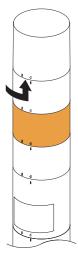


Use the procedure below if the Buzzer Unit does not attach properly.

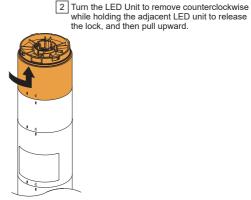


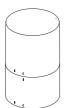
#### <Example for Changing the Configuration of the LED Units>

#### Lowering an LED Unit



1 Remove the LED Unit right above the LED Unit in the area to remove.

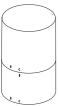




3 Align the positioning marks and insert the LED Unit that was removed in 1, and then turn the LED Unit clockwise to lock it in place.



#### Adding an LED Unit

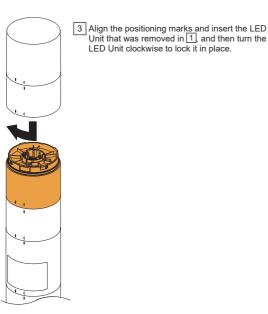




1 Remove the LED Unit above the area to attach an additional LED unit.

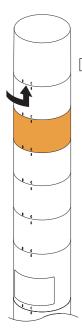


2 Align the positioning marks and insert the LED Unit, and then turn the LED Unit clockwise to lock it in place.



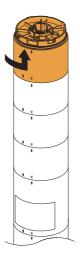
LED Unit clockwise to lock it in place.

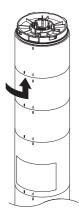
#### Changing the Position of an LED Unit



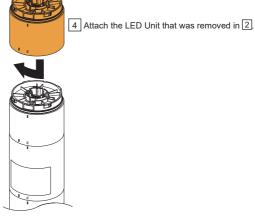
1 Remove the LED Unit right above the LED Unit that will change position.

2 Remove the LED Unit that will change position.

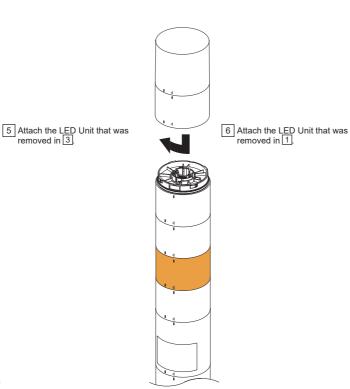




3 Remove the LED Unit right above the position to add the LED unit.

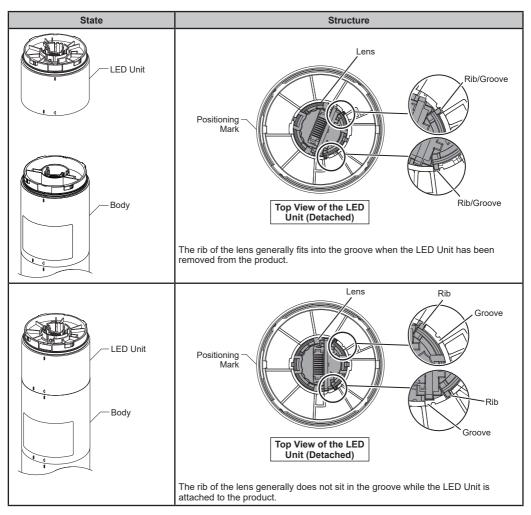


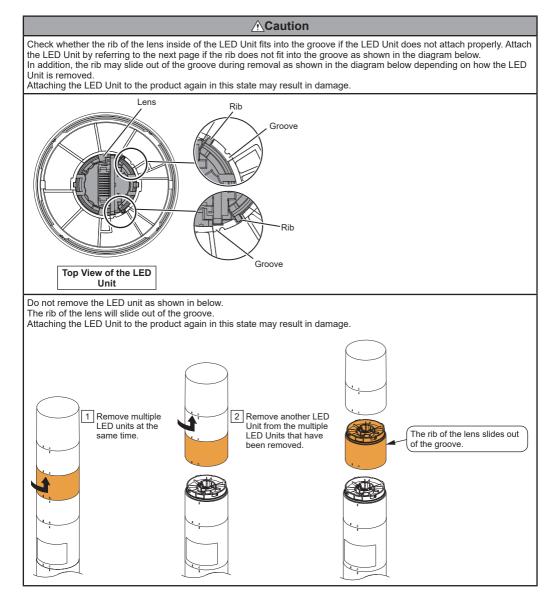




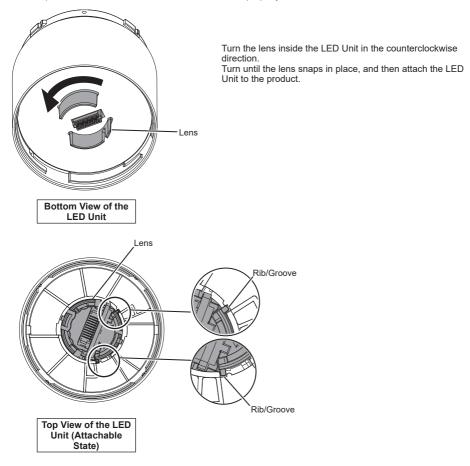
#### <Troubleshooting the LED Unit Attachment>

The LED Unit has the structure below.





Use the procedure below if the LED Unit does not attach properly.



### 9 Troubleshooting

Troubleshoot problems that occur by following the instructions in the table below.

No.	Problem	Confirmation	Remedy
1	1 The LED does not light.	Have the wiring been connected properly?	Wire the LED again while referring to the instructions in "S Wiring" (p. 6).
	The LED does not light.	Does the power source apply the proper voltage?	Check whether the IO-Link that is connected is outputting voltage.
	The color of the LED	Is the process data correct?	Send the process data while referring to the instructions in <b>6</b> How to Use" (p. 7-8).
2	differs from the desired color.	Is a custom independent color control unit being used?	Send process data compatible with the color selected in the control instead of the light color for the independent color control unit.
2	3 The LED does not flash.	Is the process data correct?	Send the process data while referring to the instructions in <b>"6</b> How to Use" (p. 7-8).
5		Are the parameters correct?	Specify the parameters while referring to the instructions in <b>6</b> How to Use" (p. 7-8).
4	The sound of the buzzer is low.	Are the volume settings of the buzzer set too low?	Adjust the volume while referring to the instructions in " Setting the Buzzer" (p. 9).
	5 The buzzer does not sound.	Is the process data correct?	Send the process data while referring to the instructions in <b>"6</b> How to Use" (p. 7-8).
5		Is the Buzzer Unit attached?	The Buzzer Unit is an optional part. Check "12 Optional Parts" (p. 27), and then attach the Buzzer Unit to the product by referring to "3 Unit Detachment Method" (p. 10-21).

Check the "Information for Inquiries," and then contact the nearest PATLITE Sales Representative if you cannot resolve the problem even after the above troubleshooting.

Information for Inquiries								
Product Name IO-Link Signal Tower Date of Purchase / /								
Model	(→ <b>2</b> Model Number Configuration [p. 2])	Problem	Please provide as much detail as possible.					

### **General Specifications**

Model			LR6-3ILWMNW-RYG		
Rated	Voltage		24 V DC		
Voltage tolerance range		)	18 V DC to 30 V DC		
		Standard	170 mA		
Rated current const	umption	Maximum	200 mA		
Rated power consu	mation	Standard	4 W		
Rated power const	Imption	Maximum	5 W		
Inrush	current		10 A / 0.3 msec		
Ambient operati	ng tempera	ture	-20 °C to +50 °C		
Ambient opera	ating humid	ity	90 % RH or less; make sure to eliminate condensation		
Ambient storag	je temperat	ure	-30 °C to +60 °C		
Ambient stor	age humidit	y	90 % RH or less; make sure to eliminate condensation		
Installati	ion area		Indoor		
Installation	n direction		Positive direction		
Protecti	on level		IP65, NEMA TYPE 4X, 13		
		nmental itions	When installed in the positive direction		
Insulation	resistance		5 Mohm or more at 500 V DC between charging parts and non-charging metal parts		
Withstandi	ng voltage		1 minute at 500 V AC between charging parts and non-charging metal parts		
Weight (Toler	ance: ±10 %	6)	0.38 kg		
Exterior di	mensions		See " S Names and Dimensions of Each Part"		
Compliance	e standards		UL 508, CSA-C22.2 No. 14, EMC Directive (EN 61000-6-4, EN 61000-6-2) RoHS Directive (EN 50581), FCC Part15 SubpartB Class A KC (KN 61000-6-4, KN 61000-6-2)		
No	tes		The brightness of each LED may differ according to the characteristics of the LED or color variations in each individual LED or the product.		
Function			LED control/Buzzer control Settings to switch the operational mode/pattern settings for the LED flashing/intermittent settings for the buzzer		
	IO-Link	revision	1.1		
Communication	Transmiss	sion speed	COM2 (38.4 kbps)		
Specification	Minimum	cycle time	8 ms		
	Process of	ata length	6 byte / 0 byte (input from master / output to master)		
Vend	or ID		763		
Devie	ce ID		80001		

The requirements in each law and regulation are only included in the language designated by each law and regulation. Check the instruction manuals published in each language.

Model			LR6-ILWMNW	LR6-ILWCNW	
Rated Voltage			24 V DC		
Voltage tolerance range			18 V DC to 30 V DC		
Detect comment com	4:	Standard	170 m	IA	
Rated current cons	sumption	Maximum	200 mA		
Rated power cons	umption	Standard	4 W		
Rated power cons	umpuon	Maximum	5 W		
Inrush	current		10 A / 0.3	msec	
Ambient opera	ting tempera	iture	-20 °C to +	-50 °C	
Ambient ope	rating humid	ity	90 % RH or less; make sure t	o eliminate condensation	
Ambient stora	ge temperat	ure	-30 °C to +	-60 °C	
Ambient sto	rage humidit	ty	90 % RH or less; make sure t	o eliminate condensation	
Installa	tion area		Indoc	or	
Installatio	on direction		Positive direction		
Protect	tion level		IP65, NEMA TYPE 4X, 13		
		nmental itions	When installed in the positive direction		
Insulation	resistance		5 Mohm or more at 500 V DC between charging parts and non-charging metal parts		
Withstand	ling voltage		1 minute at 500 V AC between charging parts and non-charging metal parts		
Weight (Tole	rance: ±10 9	6)	0.2 kg	0.16 kg	
Exterior of	dimensions		See "3 Names and Dimensions of Each Part"		
Complianc	e standards		UL 508, CSA-C22.2 No. 14, EMC Directive (EN 61000-6-4, EN 61000-6-2) RoHS Directive (EN 50581), FCC Part15 SubpartB Class A KC (KN 61000-6-4, KN 61000-6-2)		
Function			LED control/Buzzer control Settings to switch the operational mode/pattern settings for the LED flashing/intermittent settings for buzzer		
	IO-Link	revision	1.1		
Communication	Transmiss	sion speed	COM2 (38.4 kbps)		
Specification	Minimum	cycle time	8 ms	3	
	Process of	lata length	6 byte / 0 byte (input from master / output to master)		
Ven	dor ID		763		
Dev	ice ID		8000	1	

The requirements in each law and regulation are only included in the language designated by each law and regulation. Check the instruction manuals published in each language.

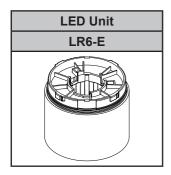
### 11 Service Parts

These are the various parts for the customer to use when repairing or replacing parts of the product.

O-ring 60	Head Cover 60 [W/A]	Pole Bracket 60 [W/A]	Shading Sheet 60
	<b>o</b>		
5 pcs.		Accessories: O-ring 60 1 pc. Binding-head Tapping Screws 2 pcs. Pole Water-resistant Ring 1 pc.	5 pcs.

### 12 Optional Parts

The optional parts for this product are listed below. (Top line: Part Name; Bottom: Model)

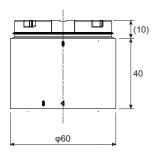


#### Model Number Configuration

	Model	LED Unit Color	Globe Color
Model Number	LR 6 - E	- ↓	$\downarrow$
* LR6 - Z	R : Red Y : Amber G : Green B : Blue C : White M : Multicolo	or*	
		: Colored Glob Clear Globe	e

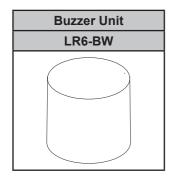
#### External Diagram

(Unit: mm)

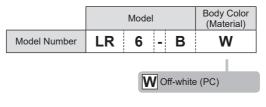


#### **General Specifications**

Model	LR6-E-□□	
Ambient operating temperature	-20 °C to +50 °C	
Ambient operating humidity	90 % RH or less; make sure to eliminate condensation	
Weight (Tolerance: ±10 %)	0.060 kg	
Compliance standards	UL508, CSA-C22.2 No. 14 EMC Directive (EN 61000-6-4, EN 61000-6-2) RoHS Directive (EN 50581)	
Notes	The brightness of each LED may differ according to the characteristics of the LED or color variations in each individual LED or the product.	

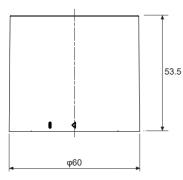


### Model Number Configuration



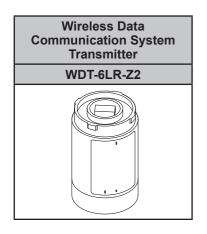
#### External Diagram



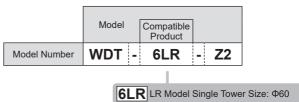


### General Specifications

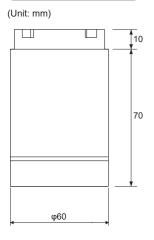
Model		LR6-BW		
Ambient operating temperature		-20 °C to +50 °C		
Ambient oper	Ambient operating humidity		90 % RH or less; make sure to eliminate condensation	
	Weight (Tolerance: ±10 %)		0.060 kg	
		No. 1	Intern	nittent tone / 3378 Hz
Buzzer sou	Buzzer sound/ frequency typ.		Continuous tone / 3378 Hz	
frequency t			High-low tone / 2016 Hz & 3012 Hz	
			Sweep sound / 1000 Hz - 4032 Hz	
Sound pre	Sound pressure level		Typ. 84 dB	Noise reduction approx10 dB Toggle with DIP switch See "7 Setting the Buzzer"
		nmental itions	Buzzer sound: No. 4 Sweep sound Total circumference from surface/at 1 m	
Compliance standards		UL508, CSA-C22.2 No. 14 EMC Directive (EN 61000-6-4, EN 61000-6-2) RoHS Directive (EN 50581) FCC Part15 SubpartB Class A		



#### Model Number Configuration



#### External Diagram



#### General Specifications

Model	WDT-6LR-Z2	
Ambient operating temperature	-20 °C to +50 °C	
Ambient operating humidity	85 % RH or less; make sure to eliminate condensation	
Weight (Tolerance: ±10 %)	0.085 kg	
Communication standard	IEEE 802.15.4 (Wireless communication)	
Communication frequency	2405 MHz to 2480 MHz (16 channels)	
Communication distance	Estimated to be approx. 30 m (Reference value)	
Compliance standards	UL508, CAN/CSA-C22.2 No.13-14 EMC Directive (EN 55032, EN 55024), EN 60950-1 RoHS Directive (EN 50581) FCC Part15 SubpartB	

The optional parts for attachment are listed in the following table:

Pole Bracket	Wall Mounting Bracket	Wall Mounting Bracket
SZP-004W	SZK-001U	SZK-003W
Mounting Bracket	Mounting Bracket	Aluminum Pole
SZ-010	SZ-016A	POLE-[100/300/800]A21

## PATLITE Corporation G2

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