# **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
2	Model Number Configuration	2
3	Names and Dimensions	3
4	Installation	4
5	Wiring	6
6	How to Use	7
7	Buzzer Settings	9
8	Detaching the Unit	10
9	Troubleshooting	22
10	Specifications	23
11	Service Parts	25
12	Optional Parts	26

# **Read this First**

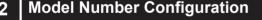
Γ.

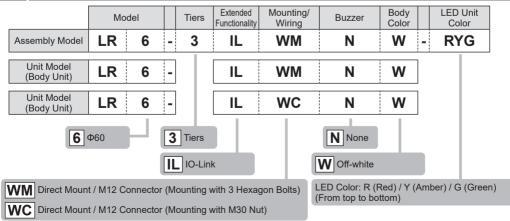
#### **Safety Precautions**

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. I e

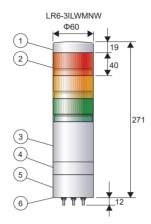
<b>AWarning</b> This icon indicates an action with the potential to cause death or serious injury.	<b>Caution</b> This icon indicates an action with the potential to cause injury, physical loss or damage.						
▲ Warning							
<ul> <li>Request the installation and wiring be accompanied by a p may result in fire, electric shock, falling, or malfunction</li> </ul>							
∭Ca	ution						
<ul> <li>Adhere to the items below to prevent a short or damage.</li> <li>Be sure that the product is disconnected from the power source when changing, replacing or adding a unit.</li> <li>Use this product in the proper state. (Replace parts such as the body or each unit if damaged.)</li> <li>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)</li> <li>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.</li> <li>To ensure the waterproofing performance of this product, do not remove the O-ring or the waterproof packing. Dust and waterproofing performance will decrease.</li> <li>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.</li> </ul>							
Notice							
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 main unit. If wiped with chemicals outside water (thinner, benzine, gasoline, oil, etc.), product damage may occur.         • 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.							
- Use only the specified replacement parts listed in this do	cument.						





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

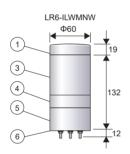
(Unit: mm)



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

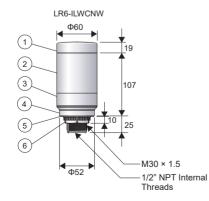
\*M12 connector cable is sold separately. (Please use an M12 connector of Φ16 or less.)





#### ■ 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

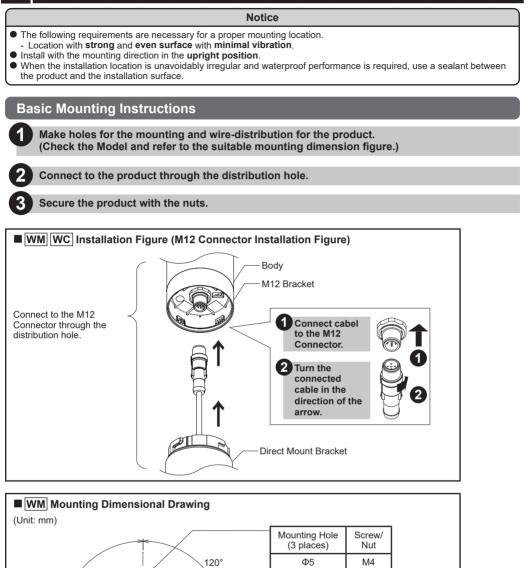
\*M12 connector cable is sold separately. (Please use an M12 connector of Φ16 or less.)

# 4 Installation

120

Nameplate

Position



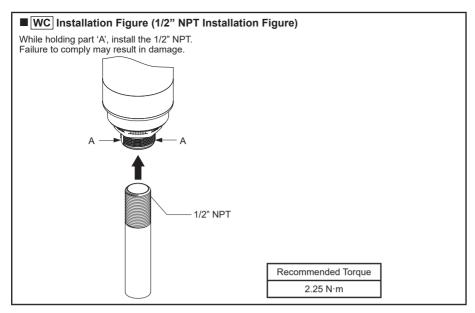
Wire Distribution Hole

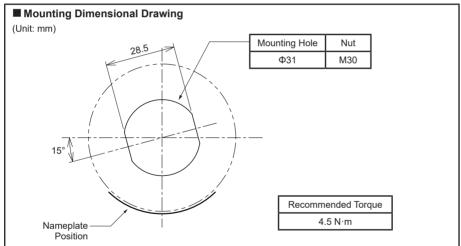
(Φ20)

**Recommended Torque** 

0.6 N·m

Φ40





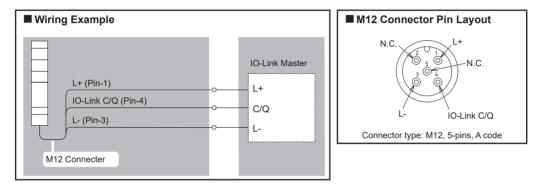
#### ▲ Warning

• 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.

<u>
<u>
</u>
<u>
</u>
Caution
</u>

• 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, flash or extinguish 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 the processed 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	Natural	Natural	Natural	Netword	Natural	Natural	Natural
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 turning off each LED as well as sounding, intermittently beeping, or stopping the buzzer.

Other settings are specified using the parameters.

Send the processed 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)		
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		LED pattern (Blue)		Not used		
Byte 4 data	LED Unit (White) ON / OFF	Not used		LED pattern (White)		Not used		
Byte 5 data	Buzzer ON / OFF	Not used			Intermittent Buzzer	Not	used	

Setting	Description
0	Lit
1	1 sec. Flash (Slow)
2	500 ms Flash (Medium)
3	250 ms Flash (Fast)
4	Single Flash
5	Double Flash
6	Triple Flash

Example:	Byte 0 data = 01h Red Light Byte 1 data = 11h Amber Flashing (1 sec Cycle)
	Byte 2 data = 31h Green Flashing
	(250 ms Cycle)
	Byte 3 data = 61h Blue Triple
	Flash
	Byte 4 data = 00h White OFF
	Byte 5 data = 11h Intermittent
	Buzzer

#### 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.

The intermittent buzzer and the LED pattern do not synchronize.

#### Parameter Settings

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

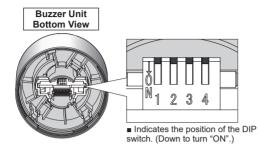
Please also download and use the parameter sheet in the same way.

# 7 Buzzer Settings

# **≜**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.



#### DIP Switch Configuration Table

Buzzer	DIP S	witch	Sound Pattern
Sound	1	2	Sound Pattern
No. 1	OFF	OFF 2	Rapid intermittent beep (call sign)
No. 2	ON 0	OFF 2	Continuous beep sound
No. 3	OFF	ON 1 2	Rapid hi-low
No. 4		ON 2	Sweep sound

DIP Switch	Volume	
3		
	Normal	
	Noise reduction	

Note: DIP Switch 4 is not used.

The factory default settings have all of the DIP switches in the "OFF" (Up) position.

# 8 Detaching the Unit

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

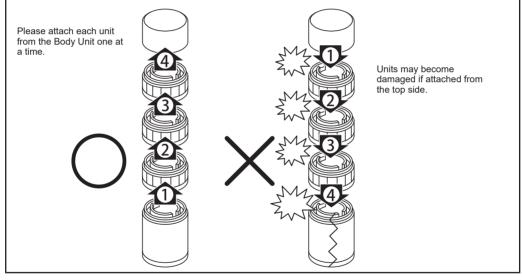


Link to Video

#### **∆**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.

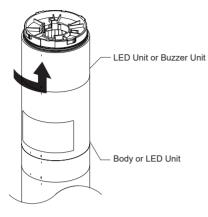


#### Notice

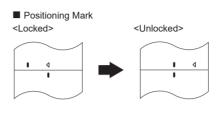
- The maximum number of attachment units per product are five LED units, plus one buzzer unit.
- When using the Multi-Color LED Unit LR6-E-MZ for the LR6 (60 mm) Signal Tower, the maximum number of attachment units per product is one LED unit and one buzzer unit.
- When using Wireless Data Acquisition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

#### <LED/Buzzer Unit>

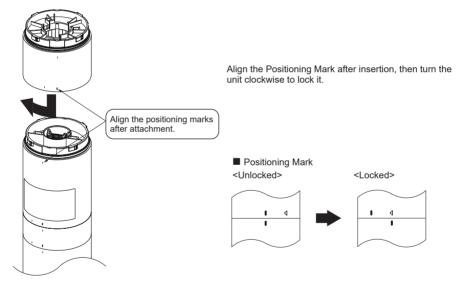
#### Removal



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

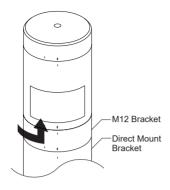


#### Attachment

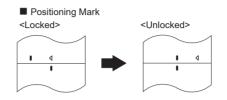


#### <Body Unit>

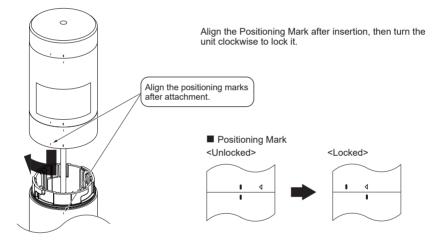
#### Removal



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

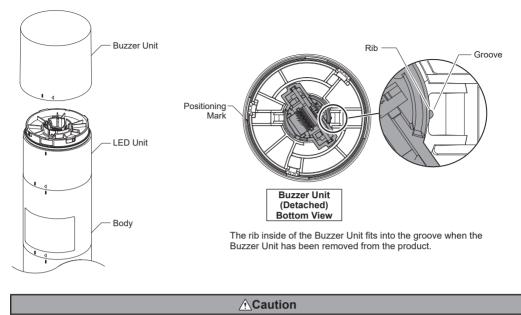


#### Attachment



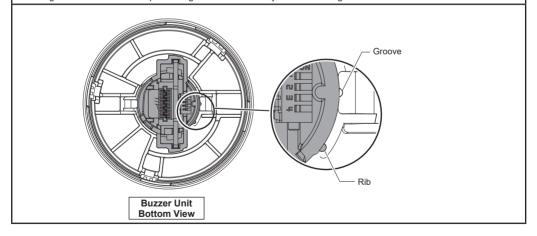
#### <Troubleshooting the Buzzer Unit Attachment>

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

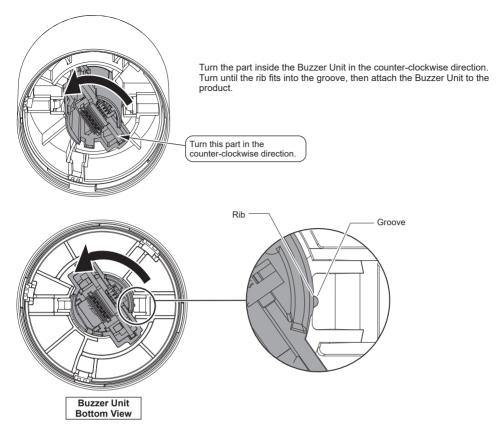


Check to make sure the rib inside of the Buzzer Unit fits into the groove if the Buzzer Unit does not attach properly. Attach the Buzzer Unit by referring to the next page if the rib does not fit into the groove as shown in the diagram below. In addition, the rib may slide out of the groove during removal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



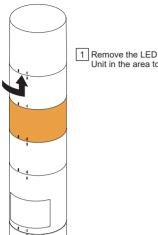


Use the procedure below if the Buzzer Unit does not attach properly.

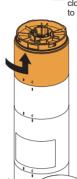


#### <Example for LED Unit Reconfiguration>

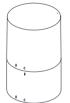
#### Moving an LED Unit lower



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

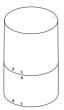


2 Turn the LED Unit to remove counterclockwise while holding the adjacent LED unit to release the lock, then pull upward.



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





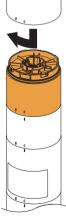
1 Remove the LED Unit above the area to attach an additional LED unit.



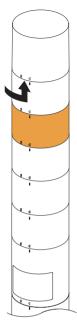
2 Align the positioning marks and insert the LED Unit, then turn the LED Unit clockwise to lock it in place.



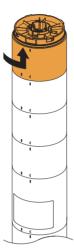
3 Align the positioning marks and insert the LED Unit that was removed in 1, then turn the LED Unit clockwise to lock it in place.

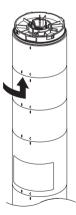


#### Changing the Position of an LED Unit



1 Remove the LED Unit right above the LED Unit that will be changing postitions.





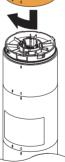
3 Remove the LED Unit right above the position to add the LED unit.



4 Attach the LED Unit that was removed in 2.

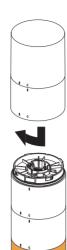
2 Remove the LED Unit that will be changing

positions.

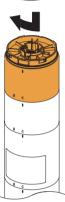




5 Attach the LED Unit that was removed in 3.

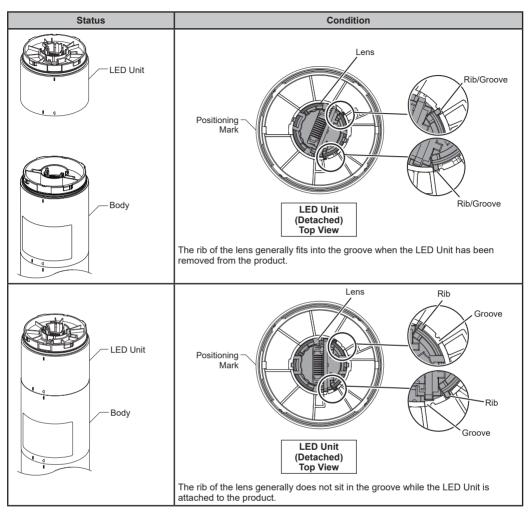


6 Attach the LED Unit that was removed in 1.



#### <Troubleshooting the LED Unit>

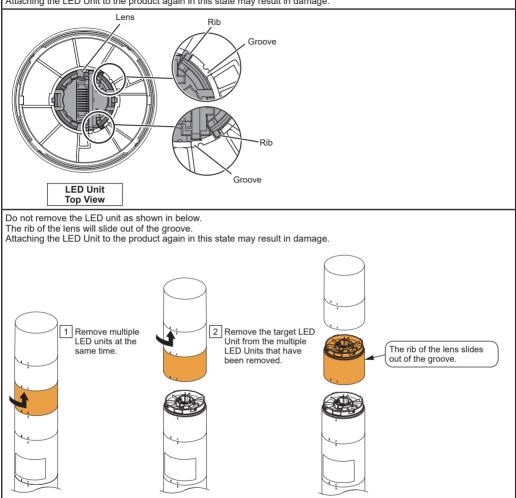
The structure of the LED Unit is indicated below.



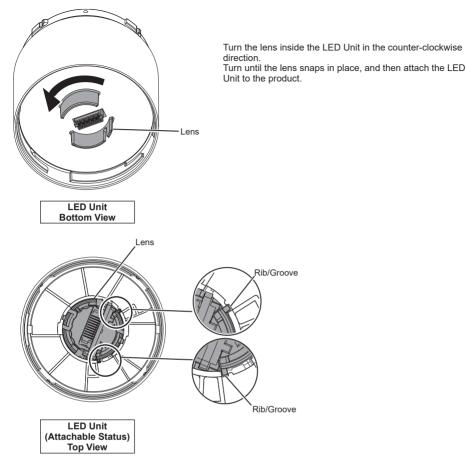
#### **A**Caution

Check whether the rib of the lens inside of the LED Unit fits into the groove if the LED Unit does not attach properly. Attach the LED 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 LED Unit is removed.

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



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	The LED does not light.	Has the wiring been connected properly?	Wire the LED again while referring to the instructions in "5 Wiring" (p. 6).
	The LED does not light.	Is the power source supplying the proper voltage and current?	Check whether the connected IO-Link is putting out the proper voltage.
	The color of the LED	Is the processing data correct?	Refer to the instructions in " How to Use" (p. 7-8). and resend the processing data.
2 dif	differs from the desired color.	Is a custom independent color control unit being used?	Send processing data compatible with the color selected in the control instead of the light color for the independent color control unit.
3	The LED does not flash.	Is the processing data correct?	Refer to the instructions in " How to Use" (p. 7-8). and resend the processing data.
		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 for the buzzer too low?	Adjust the volume while referring to the instructions in <b>"7</b> Buzzer Settings" (p. 9).
5	The buzzer does not sound.	Is the processing data correct?	Send the process data while referring to the instructions in "6 How to Use" (p. 7-8).
		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 "8 Detaching the Unit" (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	$(\rightarrow 2$ 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		
Rated current consumption	Standard	170 mA		
	Maximum	200 mA		
Rated power consumption	Standard	4 W		
Rated power consumption	Maximum	5 W		
Inrush current		10 A / 0.3 msec		
Ambient operating tempera	ture	-20 °C to +50 °C		
Ambient operating humid	ity	90 % RH or less; No condensation		
Ambient storage temperat	ure	-30 °C to +60 °C		
Ambient storage humidit	y	90 % RH or less; No condensation		
Installation location		Indoor		
Installation direction		Upright direction		
Protection Rating		IP65, NEMA TYPE 4X, 13		
	nmental itions	When installed in the upright direction		
Insulation resistance		5 M $\Omega$ or more at 500 V DC between charging parts and non-charging metal parts		
Withstanding voltage		1 minute at 500 V AC between charging parts and non-charging metal parts		
Mass (Tolerance: ±10 %	)	0.38 kg		
Exterior dimensions		See "3 Names and Dimensions"		
Compliance standards		UL 508, CSA-C22.2 No. 14, EMC Directive (EN 61000-6-4, EN 61000-6-2) RoHS Directive (EN IEC 63000), FCC Part 15 Subpart B Class A KC (KN 61000-6-4, KN 61000-6-2)		
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.		
Function		- LED control - Buzzer control - Operational mode/pattern settings - LED flashing/intermittent - Buzzer Pattern Settings		
IO-Link	revision	1.1		
Transmiss	sion speed	COM2 (38.4 kbps)		
Communication Specification Minimum	cycle time	8 ms		
Process	ing data gth	6 byte / 0 byte (input from master / output to master)		
Vendor ID		763		
Device 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		
Rated current consumption	Standard	170 mA			
	Maximum	200 mA			
Pated power const	Rated power consumption	Standard	4 W		
Rated power const	Impuon	Maximum	5 W		
Inrush	current		10 A / 0.3 msec		
Ambient operat	ing tempera	iture	-20 °C to +50 °C		
Ambient oper	ating humid	ity	90 % RH or less; N	No condensation	
Ambient storag	ge temperat	ure	-30 °C to	+60 °C	
Ambient stor	age humidit	y	90 % RH or less; N	No condensation	
Installatio	n location		Indoor		
Installation	n direction		Upright d	irection	
Protectio	n Rating		IP65, NEMA TYPE 4X, 13		
		nmental itions	When installed in the upright direction		
Insulation	resistance		$5\text{M}\Omega$ or more at 500 V DC between charging parts and non-charging metal parts		
Withstand	ng voltage		1 minute at 500 V AC between charging parts and non-charging metal parts		
Mass (Tolera	nce: ±10 %	)	0.2 kg	0.16 kg	
Exterior d	imensions		See "3 Names and Dimensions"		
Compliance standards			UL 508, CSA-C22.2 No. 14, EMC Directive (EN 61000-6-4, EN 61000-6-2) RoHS Directive (EN IEC 63000), FCC Part 15 Subpart B Class A KC (KN 61000-6-4, KN 61000-6-2)		
Function			- LED control - Buzzer control - Operational mode/pattern settings - LED flashing/intermittent - Buzzer Pattern Settings		
	IO-Link	revision	1.1		
Communication	Transmiss	sion speed	COM2 (38	3.4 kbps)	
Specification	Minimum	cycle time	8 m	15	
		ing data gth	6 byte / 0 byte (input from r	naster / output to master)	
Vendor ID			763		
Devi	Device 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.

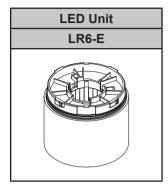
# 11 Service Parts

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

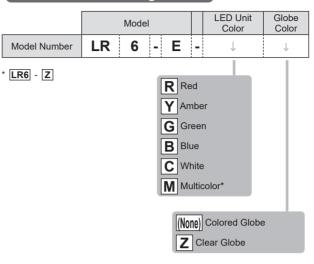
O-ring 60	-ring 60 Head Cover 60 [W/A]	
	0	
5 pcs.		5 pcs.

# 12 Optional Parts

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

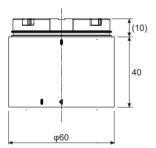


#### **Model Number Configuration**



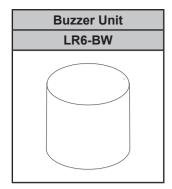
#### External Diagram

(Unit: mm)



# **General Specifications**

Model	LR6-E-□□	
Ambient operating temperature	-20 °C to +50 °C	
Ambient operating humidity	90 % RH or less; No condensation	
Mass (Tolerance: ±10 %)	0.060 kg	
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.	



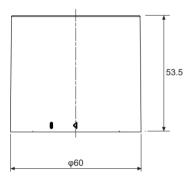
# Model Number Configuration

	Model			Body Color (Material)	
Model Number	LR	6	-	В	W
	W Off-white (PC)				

# **General Specifications**

## External Diagram

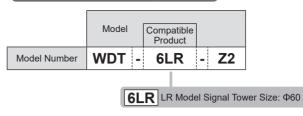




Model			LR6-BW		
Ambient operating temperature			-20 °C to +50 °C		
Ambient oper	ating hu	midity	90 % RH or less; No condensation		
Mass (Tolerance: ±10 %)			0.060 kg		
			Rapid intermittent beep (call sign) / 3378 Hz		
Buzzer sou	Buzzer sound/	No. 2	Continuous beep sound / 3378 Hz		
frequency (t	frequency (typ.)		Rapid hi-low / 2016 Hz & 3012 Hz		
		No. 4	Sweep sound / 1000 Hz - 4032 Hz		
Sound pre	Sound pressure level		Typ. 84 dB	Noise reduction approx10 dB Toggle with DIP switch See "7 Buzzer Settings"	
	Environmental conditions			4 Sweep sound measured from a total circumference from the buzzer source.	



### Model Number Configuration

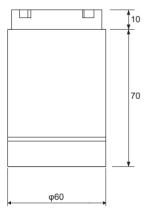


# General Specifications

Model	WDT-6LR-Z2	
Ambient operating temperature	-20 °C to +50 °C	
Ambient operating humidity	85 % RH or less; No condensation	
Mass (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)	

## External Diagram

#### (Unit: mm)



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
Mounting Bracket		
SZW-002W		

# **PATLITE** Corporation G2J

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