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 Configurat	ion 2
3	Names and Dimensions of Part	f Each
4	Installation	4
5	Wiring	6
6	How to Use	7
7	Setting the Buzzer	9
8	Unit Detachment Method	10
9	Troubleshooting	22
10	Specifications	23
11	Service Parts	25
12	Optional Parts	26

1 Read this First

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.

▲ 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

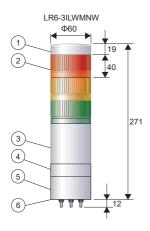
- To ensure proper safety while using the signal tower, observe the following:
 - Perform periodic pre-maintenance.
 - As a precaution against problems occurring, use this product together with other equipment.
- Be sure to prevent electrostatic damage due to discharge when working with this product 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.

Model Number Configuration Extended LED Unit Mounting/ Body Model Tiers Buzzer Functionality Color Color Wiring 3 Ш W **RYG** Assembly Model LR 6 WM Ν Unit Model LR Ш WM W 6 Ν (Body Unit) Unit Model LR IL WC 6 Ν (Body Unit) **6** Φ 60 Tiers No Flashing IO-Link W Off-white WM Direct Mount / M12 Connector (Mounting with 3 Hexagon Bolts) LED Color: R (Red) / Y (Amber) / G (Green) (From top to bottom) WC Direct Mount / M12 Connector (Mounting with M30 Nut)

3 Names and Dimensions of Each Part

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

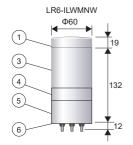
(Unit: mm)



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

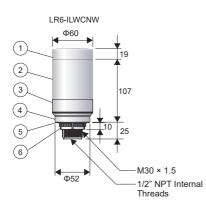
* M12 connector cable is sold separately. (Please use an M12 connector of Φ16 or less.)

Accessor	у
LR6 - WM Flanged nut (M4)	
	3 pcs.



■ 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.)

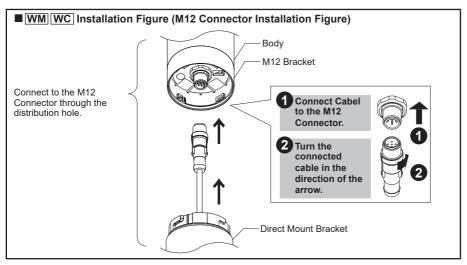
4 Installation

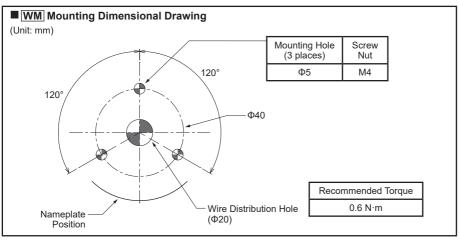
Notice

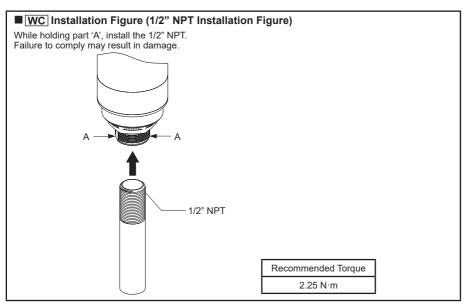
- The following requirements are necessary for a proper mounting location.
 - Location with strong and even surface with minimal vibration.
- Install with the mounting direction in the upright position.
- When the installation location is unavoidably irregular and waterproof performance is required, use a sealant between the product and the installation surface.

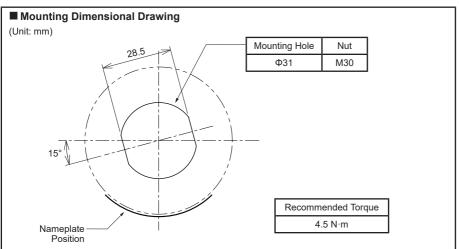
Basic Mounting Instructions

- Make holes for the mounting and wire-distribution for the product. (Check the Model and refer to the suitable mounting dimension figure.)
- 2 Connect to the product through the distribution hole.
- 3 Secure the product with the nuts.









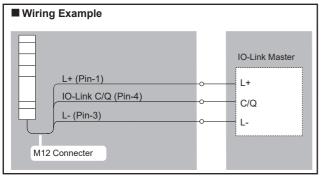
▲ Warning

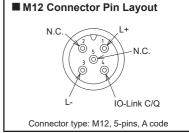
Ensure the proper working voltage is used and that direct current or alternating current is properly applied.
 Any mistake in wiring may result in damage or fire. Any mistake in wiring may result in damage or fire.

↑ 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		ed Not used	Not used		ed Not used	Not used	Not used
Byte 1 data	LED Unit (Amber) ON / OFF	Not used						
Byte 2 data	LED Unit (Green) ON / OFF				Not used			
Byte 3 data	LED Unit (Blue) ON / OFF				Not used	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			LED pattern (Blue)			Not used
Byte 4 data	LED Unit (White) ON / OFF	Not used			LEI	D pattern (Wh	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

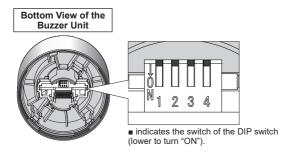
For information about the parameter settings, please download the IODD from the LR6-IL page on our homepage (https://www.patlite.com/).

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.



■ Settings Table

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

DIP Switch	Volume	
3		
OFF N 3	Normal	
ON TO 3	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.

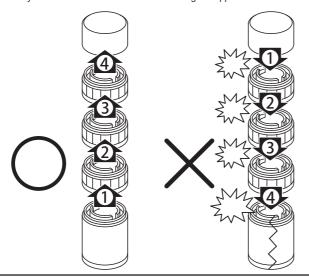


Link to Video

∧ 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.

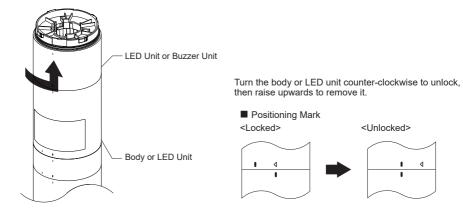


Notice

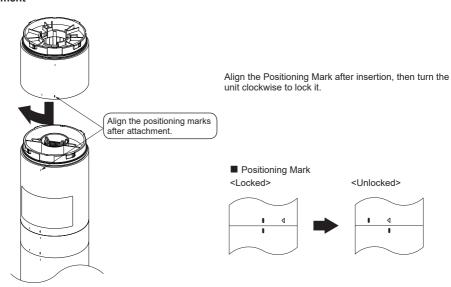
- The maximum number of attachment units per product are five LED units, plus one buzzer unit.
- When using Multi-Color LED Unit for LR6 60 mm Signal Towers LR6-E-MZ, the maximum number of attachment units per product are one LED unit, plus one buzzer unit.
- When using Wireless Data Acquisition System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

<LED/Buzzer Unit>

■ Removal

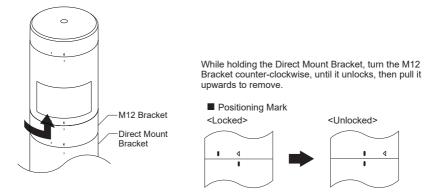


■ Attachment

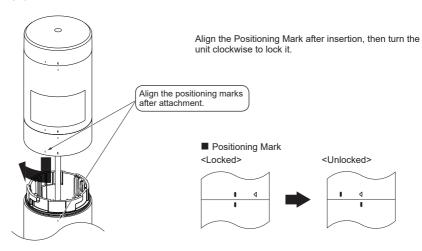


<Body Unit>

■ Removal

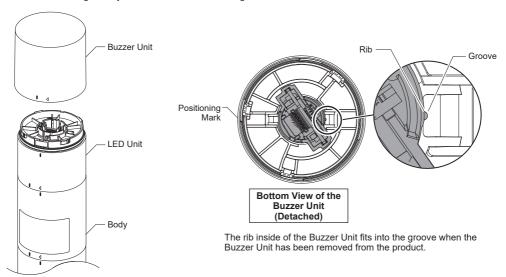


■ Attachment



<Troubleshooting the Buzzer Unit Attachment>

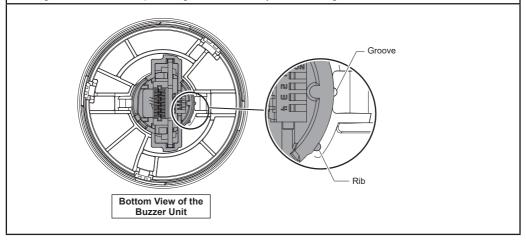
The Buzzer Unit is generally in the state shown in the diagram below after removal.



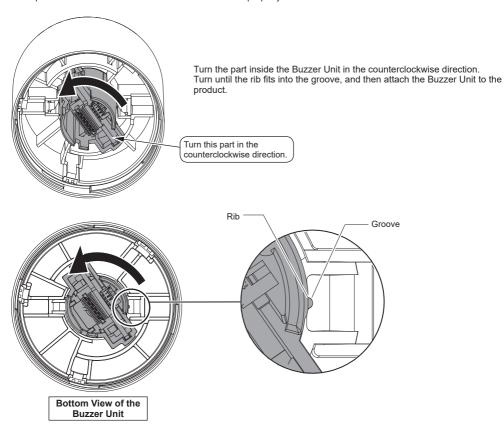
↑ Caution

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.

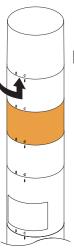


Use the procedure below if the Buzzer Unit does not attach properly.

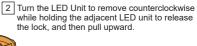


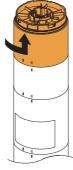
<Example for Changing the Configuration of the LED Units>

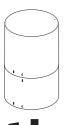
■ Lowering an LED Unit



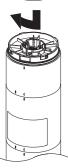
1 Remove the LED Unit right above the LED Unit in the area to remove.



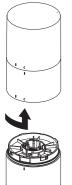




Align the positioning marks and insert the LED Unit that was removed in 1, and then turn the LED Unit clockwise to lock it in place.



■ Adding an LED Unit



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



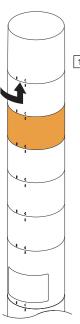
Align the positioning marks and insert the LED Unit, and then turn the LED Unit clockwise to lock it in place.



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

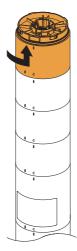


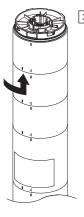
■ Changing the Position of an LED Unit



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

2 Remove the LED Unit that will change position.

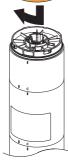


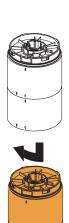


Remove the LED Unit right above the position to add the LED unit.

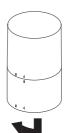


4 Attach the LED Unit that was removed in 2.

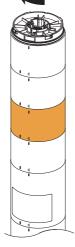




5 Attach the LED Unit that was removed in 3.

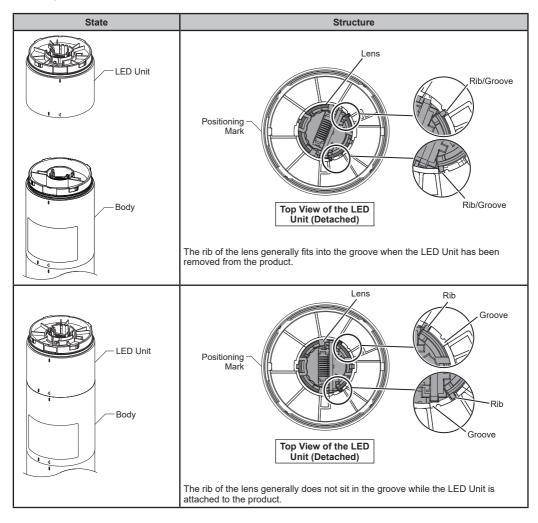


6 Attach the LED Unit that was removed in 1.



<Troubleshooting the LED Unit Attachment>

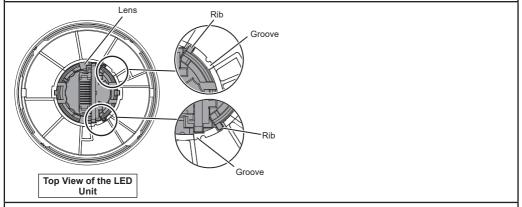
The LED Unit has the structure below.



∧ 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.

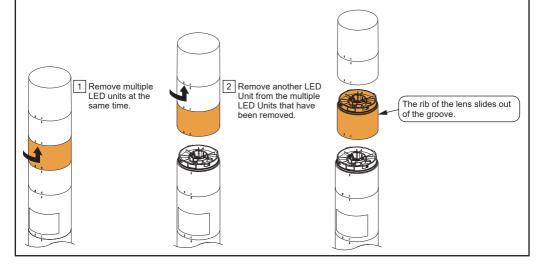
Attaching the LED Unit to the product again in this state may result in damage.



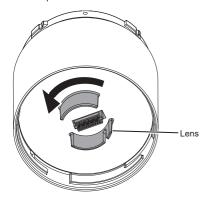
Do not remove the LED unit as shown in below.

The rib of the lens will slide out of the groove.

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



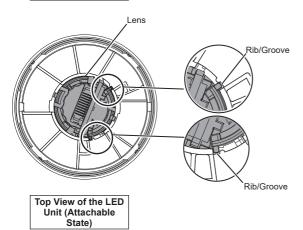
Use the procedure below if the LED Unit does not attach properly.



Turn the lens inside the LED Unit in the counterclockwise direction.

Turn until the lens snaps in place, and then attach the LED Unit to the product.





9 Troubleshooting

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

No.	Problem	Confirmation	Remedy
1	The LED does not light.	Have the wiring been connected properly?	Wire the LED again while referring to the instructions in "5 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 "6 How to Use" (p. 7-8).
	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.
3	The LED does not flash.	Is the process data correct?	Send the process data while referring to the instructions in " 6 How to Use" (p. 7-8).
3		Are the parameters correct?	Specify the parameters while referring to the instructions in " 6 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 " T Setting the Buzzer" (p. 9).
	The buzzer does not sound.	Is the process data correct?	Send the process data while referring to the instructions in " 6 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 "8 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	1 1		
Model	(→ 2 Model Number Configuration [p. 2])	Problem	Please provide as much detail as possible.		

10 Specifications

General Specifications

Model			LR6-3ILWMNW-RYG		
Rated V	Rated Voltage		24 V DC		
Voltage tolera	Voltage tolerance range		18 V DC to 30 V DC		
Rated current consu	mntion	Standard	170 mA		
Rated current consu	приоп	Maximum	200 mA		
Rated power consu	motion	Standard	4 W		
Rated power consul	приоп	Maximum	5 W		
Inrush c	current		10 A / 0.3 msec		
Ambient operatir	ng tempera	ture	-20 °C to +50 °C		
Ambient opera	iting humid	ity	90 % RH or less; make sure to eliminate condensation		
Ambient storage	e temperat	ure	-30 °C to +60 °C		
Ambient stora	age humidit	у	90 % RH or less; make sure to eliminate condensation		
Installatio	on area		Indoor		
Installation	direction		Positive direction		
Protection	n level		IP65, NEMA TYPE 4X, 13		
		nmental itions	When installed in the positive direction		
Insulation re	esistance		5 Mohm or more at 500 V DC between charging parts and non-charging metal parts		
Withstandin	ng voltage		1 minute at 500 V AC between charging parts and non-charging metal parts		
Weight (Tolera	ance: ±10 %	6)	0.38 kg		
Exterior dir	mensions		See "3 Names and Dimensions of Each Part"		
Compliance	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)		
Note	es		The brightness of each LED may differ according to the characteristics of the LED or color variations in each individual LED or the product.		
Func	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	ion speed	COM2 (38.4 kbps)		
Specification	Minimum	cycle time	8 ms		
	Process d	ata length	6 byte / 0 byte (input from master / output to master)		
Vendor ID			763		
Device	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				
Rated current cons	umption	Maximum	200 mA				
Rated power consu		Standard	4 W				
Rated power const	ampuon	Maximum	5	W			
Inrush	current		10 A / 0	.3 msec			
Ambient operat	ing tempera	ature	-20 °C t	o +50 °C			
Ambient oper	ating humid	lity	90 % RH or less; make sur	e to eliminate condensation			
Ambient storag	ge temperat	ure	-30 °C t	o +60 °C			
Ambient stor	age humidit	ty	90 % RH or less; make sur	e to eliminate condensation			
Installat	ion area		Indoor				
Installatio	n direction		Positive direction				
Protecti	on level		IP65, NEMA TYPE 4X, 13				
	Environmental conditions		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	ing voltage		1 minute at 500 V AC between charging parts and non-charging metal parts				
Weight (Toler	ance: ±10 9	%)	0.2 kg	0.16 kg			
Exterior d	imensions		See "3 Names and Dimensions of Each Part"				
Compliance	Compliance 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)				
Fun	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		revision	1.1				
Communication	Transmiss	sion speed	COM2 (3	88.4 kbps)			
Specification	Minimum	cycle time	8 ms				
	Process of	lata length	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.

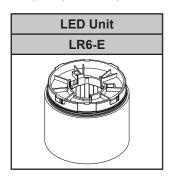
11 Service Parts

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
	o		
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

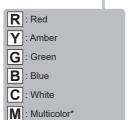
The optional parts for this product are listed below. (Top line: Part Name; Bottom: Model)



Model Number Configuration

	Model				LED Unit Color	Globe Color	
Model Number	LR	6	-	Е	-	1	↓
							100

* LR6 - Z

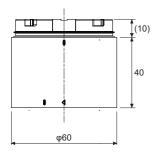


(None): Colored Globe

Z: Clear Globe

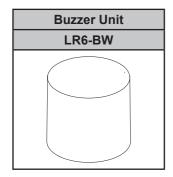
External Diagram

(Unit: mm)

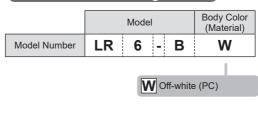


General Specifications

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.		

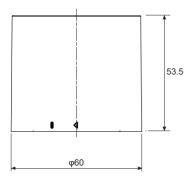


Model Number Configuration



External Diagram

(Unit: mm)



General Specifications

Model			LR6-BW		
Ambient operating temperature			-20 °C to +50 °C		
Ambient oper	ating hu	midity	90 % RH or less; make sure to eliminate condensation		
We (Tolerand	ight e: ±10 %	6)	0.060 kg		
		No. 1	Intermittent tone / 3378 Hz		
Buzzer sou	nd/	No. 2	Continuous tone / 3378 Hz		
frequency t	yp.	No. 3	High-low tone / 2016 Hz & 3012 Hz		
		No. 4	Sweep sound / 1000 Hz - 4032 Hz		
Sound pre	ssure le	vel	Typ. 84 dB	Noise reduction approx10 dB Toggle with DIP switch See "7 Setting the Buzzer"	
	Environmental conditions		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		

Wireless Data Communication System Transmitter WDT-6LR-Z2

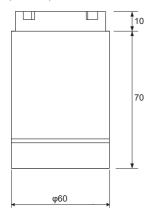
Model Number Configuration

	Model	Compatible Product		
Model Number	WDT -	6LR	- Z2	

6LR LR Model Single Tower Size: Φ60

External Diagram

(Unit: mm)



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	
		SZIV-OUGH	
Mounting Bracket	Mounting Bracket	Aluminum Pole	
SZ-010	SZ-016A	POLE-[100/300/800]A21	

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