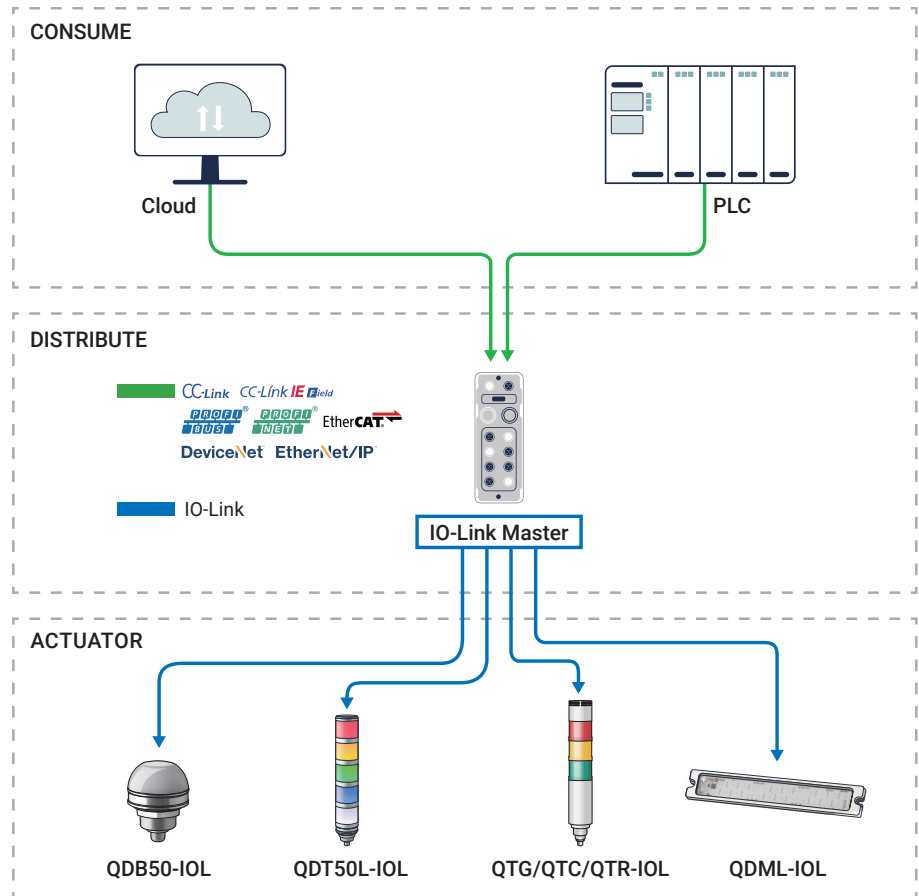


IO-Link Product System Application

1. What is IO-Link



1) Serial Bidirectional Point-to-Point Connection

- IO-Link enables direct communication between sensors/actuators and the IO-Link master, simultaneously handling both signal transmission and power supply. No separate bus system is required.

2) Operation Modes Supported

- IO-Link devices support both trigger (standard I/O) mode and IO-Link mode, offering flexible application across diverse operational environments. (Note: QT(G/C/R)-IOL series does not support trigger mode.)

3) Data Transmission Speed: 38,400 bps (COM2)

4) Connection Cables

- IO-Link uses standard unshielded industrial cables with M12 plug connectors, allowing easy installation and maintenance without the need for special cables.

5) Intelligent Diagnostics and Maintenance

- Predictive Maintenance: Real-time monitoring of device status allows for early failure warnings.
- Event logging in millisecond resolution enables rapid and accurate fault tracing.

6) Economic Efficiency

- IO-Link communication can reduce setup and operation costs by approximately 30–50% compared to analog communication. Its standardized specifications also help minimize \ maintenance time and expenses.

2. Benefits of IO-Link

Digital Communication

Bi-directional communication is enabled through a simple three-wire cable consisting of power, ground, and signal lines.

Parameterization and Diagnostic Functions

IO-Link enables detailed parameter configuration of sensors and actuators, and provides diagnostic data such as device status and fault information.

Integration with Industrial Ethernet

IO-Link can be flexibly integrated with higher-level communication protocols such as PROFINET, EtherNet/IP, and Modbus TCP/IP.

Enhanced Flexibility and Efficiency

Smart sensors and actuators can be seamlessly integrated into the Industrial Internet of Things (IIoT) environment, enabling data-driven analysis and predictive maintenance.

3. USE IO-Link & Application Report

IO-Link provides a global communication standard designed to enhance equipment efficiency in manufacturing facilities worldwide, enabling the construction of a cost-effective and standardized system.

1) Simplified Wiring and Cost Reduction

- Use of Standard Cables: IO-Link uses standardized unshielded 3- or 4-wire cables with M12 connectors, allowing for easier installation and maintenance.
- Reduced Control Cabinet Space: IP67-rated decentralized master modules can be installed directly on the production floor, eliminating the need for large control cabinets.
- Integration of Existing Devices: Existing digital sensors and actuators can be integrated into the IO-Link system using I/O hubs, streamlining system expansion and reducing wiring complexity.

2) Bidirectional Communication and Data Transparency

- Global Standard Protocol: IO-Link complies with the IEC 61131-9 international standard and supports point-to-point digital communication between sensors/actuators and PLCs. This allows bidirectional transmission of switching signals, parameters, and diagnostic data.
- Multiple Data Types: IO-Link supports the separate handling of cyclic data (e.g., real-time process values) and acyclic data (e.g., configuration information, event logs), enabling transparent and structured data exchange.

3) Flexible System Integration

- IO-Link offers flexible integration with higher-level fieldbus systems such as PROFINET, EtherCAT, Ethernet/IP, and Modbus TCP, making it highly compatible with a wide range of industrial automation systems.

4) Enabler for Digital Transformation and Industry 4.0

- IO-Link provides a standardized data communication method that enables seamless connectivity with higher-level systems, including MES and cloud-based analytics platforms. This supports the realization of Industry 4.0 by enabling process optimization, energy efficiency, and quality improvement.



PRODUCT SPECIFICATION

QTC60L-IOL | QTC70L-IOL

Materials Housing-ABS, Filter lens-PC, Lens-PC

Ambient operating temperature 30°C to +50°C

Sound volume High-volume buzzer Max.100dB at 1m

Waterproof buzzer Max.85dB at 1m

Protection rating

Standard/Waterproof Buzzer-IP65

High-Volume Buzzer-Non-Waterproof

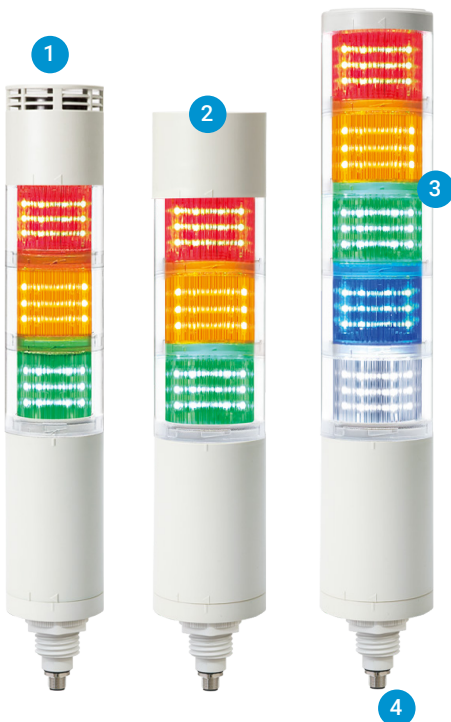
- Modular LED steady/flashing type signal tower lights
- Added a separate color filter lens inside the outer lens to help provide a clear signal
- Can select from size selections of Ø60mm and Ø70mm to fit your sophisticated application needs
- The addition of modules and change in color arrangement can be achieved without the use of tools by using the Lock-type structure
- When it is turned off the milky color filter provides comfortable viewing at close proximity for the operator
- Advanced LED signal tower light integrated with IO-Link technology
- Ideal for next-generation smart manufacturing systems (Industry 4.0)
- Plug & Play functionality enabled by international standard M12 connector
- IO-Link Version: V1.1
- Data transmission speed: 38,400 bps (COM2)
- Connector: M12-5Pin(Male)-Class A



Each modular color lens can be added without additional tools



QTC model uses a special contact structure for stable operation, the lens modules lock into place by rotating the modular structures together. This allows for easy changes to the color arrangement without any tools. Additional modules can be added.



1 High volume buzzer(100dB) option can be fitted to the top of the product

High volume 100dB volume buzzer module fastened to the top of the product provides 360 degree buzzer signal output which cannot be achieved with the single directional buzzer.(Buzzer volume cannot be adjusted.)

2 Waterproof buzzer (85dB) option can be fitted to the top of the product

Waterproof 85dB buzzer module fastened to the top of the product features an IP65-rated sealed structure and offers improved sound dispersion compared to conventional front-directional buzzers. (White light module cannot be applied when using the waterproof buzzer type.)

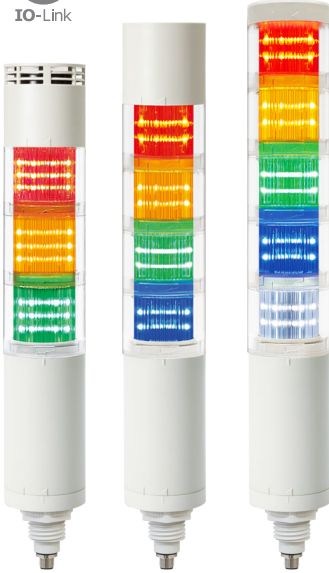
3 QTC Series Special Lens

QTC Series added a separate color filter lens inside the outer lens to help provide a clear signal.

4 M12 connector attached type

The application of the IO-Link standard M12 connector allows for convenient installation and maintenance.(Only direct mounting installation is supported.)

QTC-IOL Series



QTC60L-IOL



QTC60L-IOL Ø60mm IO-Link Programmable LED Tower Light

Model number	Layers	Voltage	Certificates	Weight	Color
	1			0.25kg	● R-Red
QTC60L-IOL Steady/Flashing	2			0.33kg	● R-Red ● G-Green
QTC60L-IOL-HBZ Steady/Flashing w/ built-in high volume buzzer	3	DC24V	IO-Link CE	0.41kg	● R-Red ● A-Amber ● G-Green
QTC60L-IOL-WBZ Steady/Flashing w/ built-in waterproof buzzer	4			0.49kg	● R-Red ● A-Amber ● G-Green ● B-Blue
	5			0.57kg	● R-Red ● A-Amber ● G-Green ● B-Blue ○ W-White

※ Simultaneous use of the white color LED module with high volume buzzer (HBZ) or waterproof buzzer (WBZ) is not supported.



QTC70L-IOL Ø70mm IO-Link Programmable LED Tower Light

Model number	Layers	Voltage	Certificates	Weight	Color
	1			0.37kg	● R-Red
QTC70L-IOL Steady/Flashing	2			0.52kg	● R-Red ● G-Green
QTC70L-IOL-HBZ Steady/Flashing w/ built-in high volume buzzer	3	DC24V	IO-Link CE	0.67kg	● R-Red ● A-Amber ● G-Green
QTC70L-IOL-WBZ Steady/Flashing w/ built-in waterproof buzzer	4			0.82kg	● R-Red ● A-Amber ● G-Green ● B-Blue
	5			0.97kg	● R-Red ● A-Amber ● G-Green ● B-Blue ○ W-White

※ Simultaneous use of the white color LED module with high volume buzzer (HBZ) or waterproof buzzer (WBZ) is not supported.

Light source/buzzer current of QTC60L-IOL and QTC70L-IOL (based on 1 layer)

Voltage	Light source current (1 layer)	High volume buzzer current	Waterproof buzzer current
DC24V	70mA	90mA	90mA

Ordering Specification

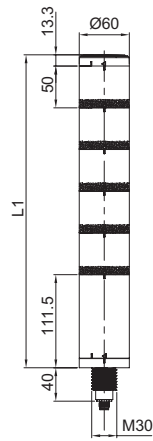
QTC60L-IOL	-	3	-	24	-	RAG
[Model number]		[Layer]		[Voltage]		[Color]
QTC60L-IOL		1-1Layer		24-DC24V		● R-Red
QTC60L-IOL-HBZ		2-2Layers				● A-Amber
QTC60L-IOL-WBZ		3-3Layers				● G-Green
QTC70L-IOL		4-4Layers				● B-Blue
QTC70L-IOL-HBZ		5-5Layers(Excluding HBZ, WBZ)				○ W-White
QTC70L-IOL-WBZ						



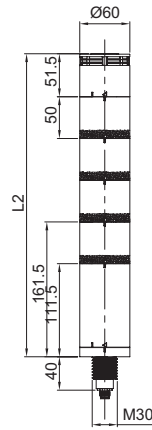
Technical Diagram

Units: mm

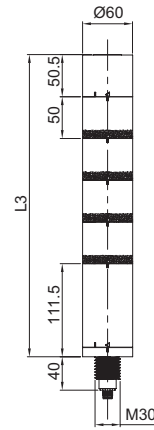
·QTC60L-IOL



·QTC60L-IOL-HBZ

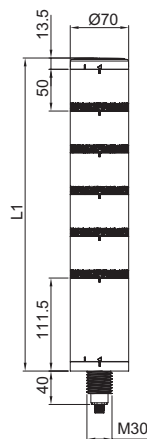


·QTC60L-IOL-WBZ

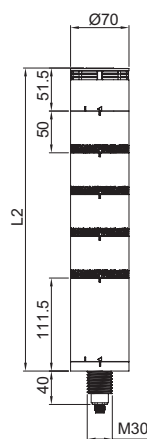


LAYER	L1	L2	L3
1	175	213	212
2	225	263	262
3	275	313	312
4	325	363	362
5	375	-	-

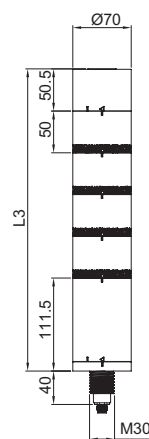
·QTC70L-IOL



·QTC70L-IOL-HBZ



·QTC70L-IOL-WBZ



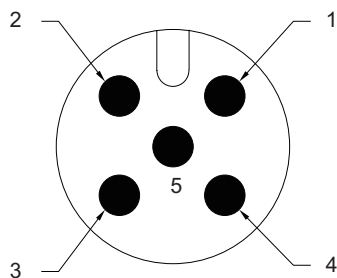
LAYER	L1	L2	L3
1	175	213	212
2	225	263	262
3	275	313	312
4	325	363	362
5	375	-	-

Wiring Instructions

· Please follow the IO-Link M12 wiring standard.

M12 connector PIN-MAP

QTC60L-IOL
QTC70L-IOL



PIN	DESCRIPTION
1	Brown(L+)
2	White(NC)
3	Light Blue(L-)
4	Black(C/Q)
5	Gray(NC)