IO-Link Product System Application

1. What is IO-Link

CONSUME

Cloud   PLC

DISTRIBUTE

CC-Link CC-Link IE Field
PROFIBUS PROFINET EtherCAT
DeviceNet EtherNet/IP

IO-Link

IO-Link Master

ACTUATOR

QDB50-IOL   QDT50L-IOL   QTG/QTC/QTR-IOL   QDML-IOL
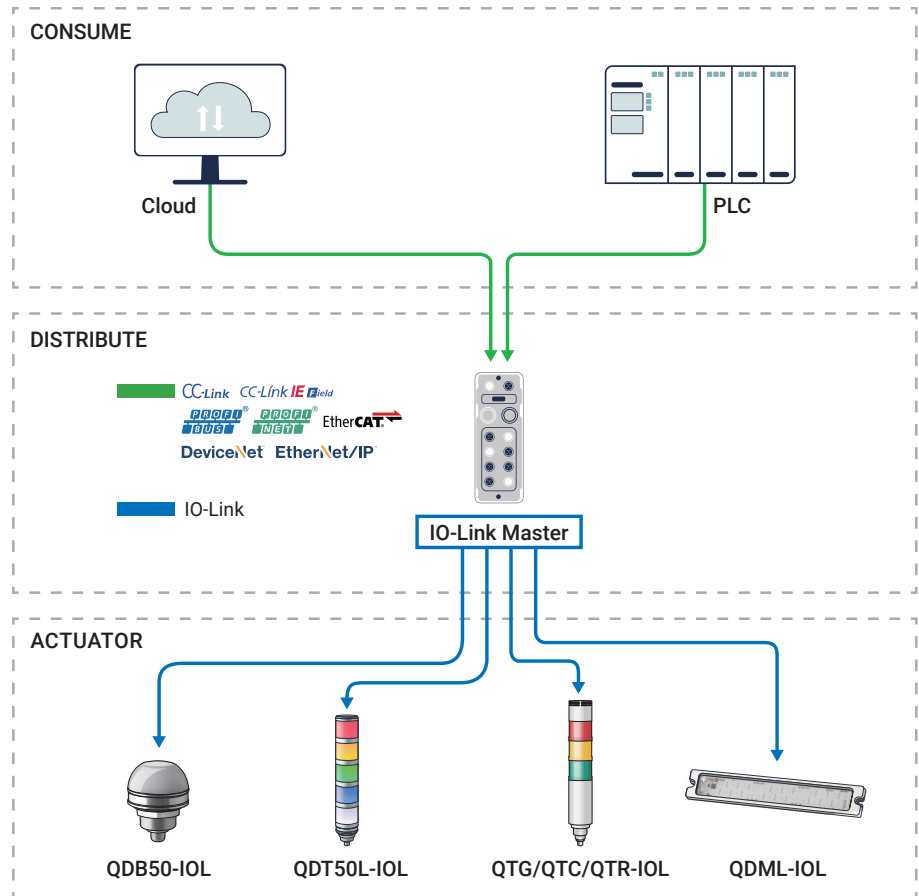
1) Serial Bidirectional Point-to-Point Connection
· IO-Link enables direct communication between sensors/actuators and the IO-Link master, simultaneously handling both signal transmission and power supply. No separate bus system is required.

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.

QTG-IOL Series

PRODUCT SPECIFICATION

QTG60L-IOL | QTG70L-IOL

Materials Housing-ABS, 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
- Excellent visibility from a distance with the use of a special color diffusing lens
- 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
- 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

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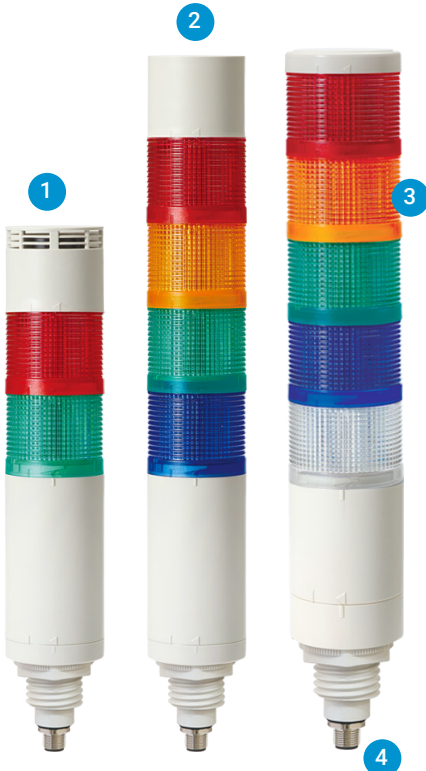
1 High volume buzzer(100dB) option can be fitted to the top of the product
High volume 100dB volume buzzer module fastened to the top of the product provides 360 degree buzzer signal output which cannot be achieved with the single directional buzzer.(Buzzer volume cannot be adjusted.)

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 Excellent visibility from a distance with the use of a special color diffusing lens
Color arrangement changes and module additions can be easily made without the use of tools by adopting a lock-type structure between lenses.

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.)

🔔 QTG60L-IOL Ø60mm IO-Link Programmable LED Tower Light

Model number	Layers	Voltage	Certificates	Weight	Color
	1			0.25kg	● R-Red
QTG60L-IOL Steady/Flashing	2			0.33kg	● R-Red ● G-Green
QTG60L-IOL-HBZ Steady/Flashing w/ built-in high volume buzzer	3	DC24V	◐ IO-Link CE	0.41kg	● R-Red ● A-Amber ● G-Green
QTG60L-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.

QTG60L-IOL

🔔 QTG70L-IOL Ø70mm IO-Link Programmable LED Tower Light

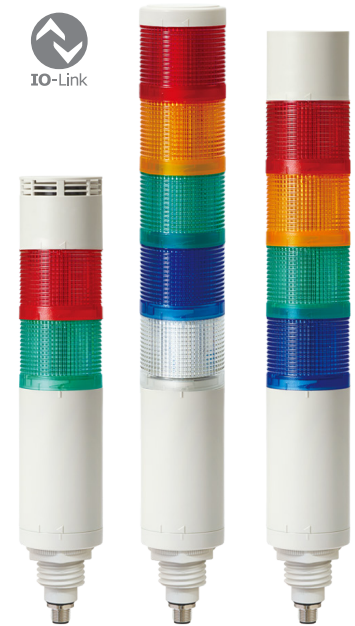| Model number	Layers	Voltage	Certificates	Weight	Color
	1			0.37kg	● R-Red
QTG70L-IOL Steady/Flashing	2			0.52kg	● R-Red ● G-Green
QTG70L-IOL-HBZ Steady/Flashing w/ built-in high volume buzzer	3	DC24V	◐ IO-Link CE	0.67kg	● R-Red ● A-Amber ● G-Green
QTG70L-IOL-WBZ Steady/Flashing w/ built-in waterproof 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.

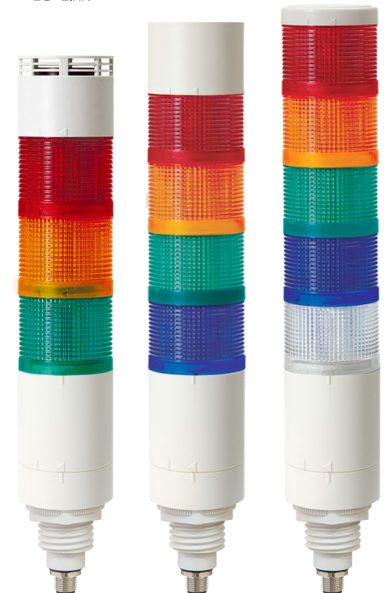### Light source/buzzer current of QTG60L-IOL and QTG70L-IOL (based on 1 layer)

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

QTG70L-IOL

Ordering Specification

QTG60L-IOL	-	3	-	24	-	RAG
[Model number]		[Layer]		[Voltage]		[Color]

[Model number]
QTG60L-IOL
QTG60L-IOL-HBZ
QTG60L-IOL-WBZ
QTG70L-IOL
QTG70L-IOL-HBZ
QTG70L-IOL-WBZ

[Layer]
1-1Layer
2-2Layers
3-3Layers
4-4Layers
5-5Layers(Excluding HBZ, WBZ)

[Voltage]
24-DC24V

[Color]
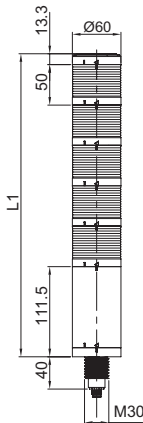● R-Red
● A-Amber
● G-Green
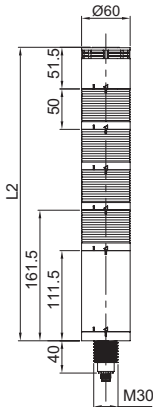● B-Blue
○ W-White

QTG-IOL Series

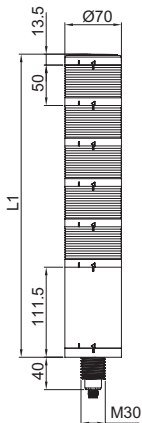## Technical Diagram
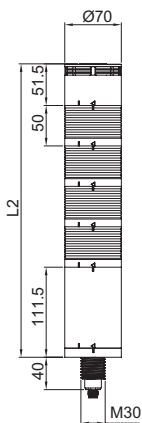
Units: mm

·QTG60L-IOL

·QTG60L-IOL-HBZ

·QTG60L-IOL-WBZ
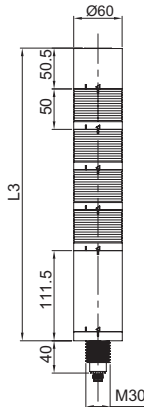
LAYER	L1	L2	L3
1	175	213	212
2	225	263	262
3	275	313	312
4	325	363	362
5	375	-	-

·QTG70L-IOL

·QTG70L-IOL-HBZ
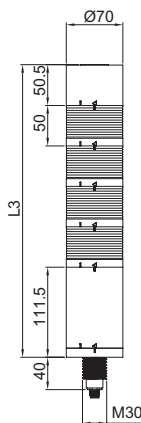
·QTG70L-IOL-WBZ

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.
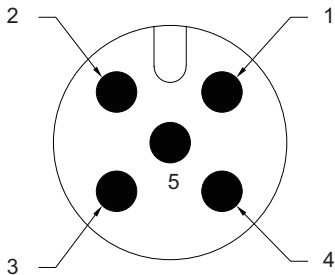
M12 connector PIN-MAP		
QTG60L-IOL QTG70L-IOL	**PIN**	**DESCRIPTION**
	1	Brown(L+)
	2	White(NC)
	3	Light Blue(L-)
	4	Black(C/Q)
	5	Gray(NC)