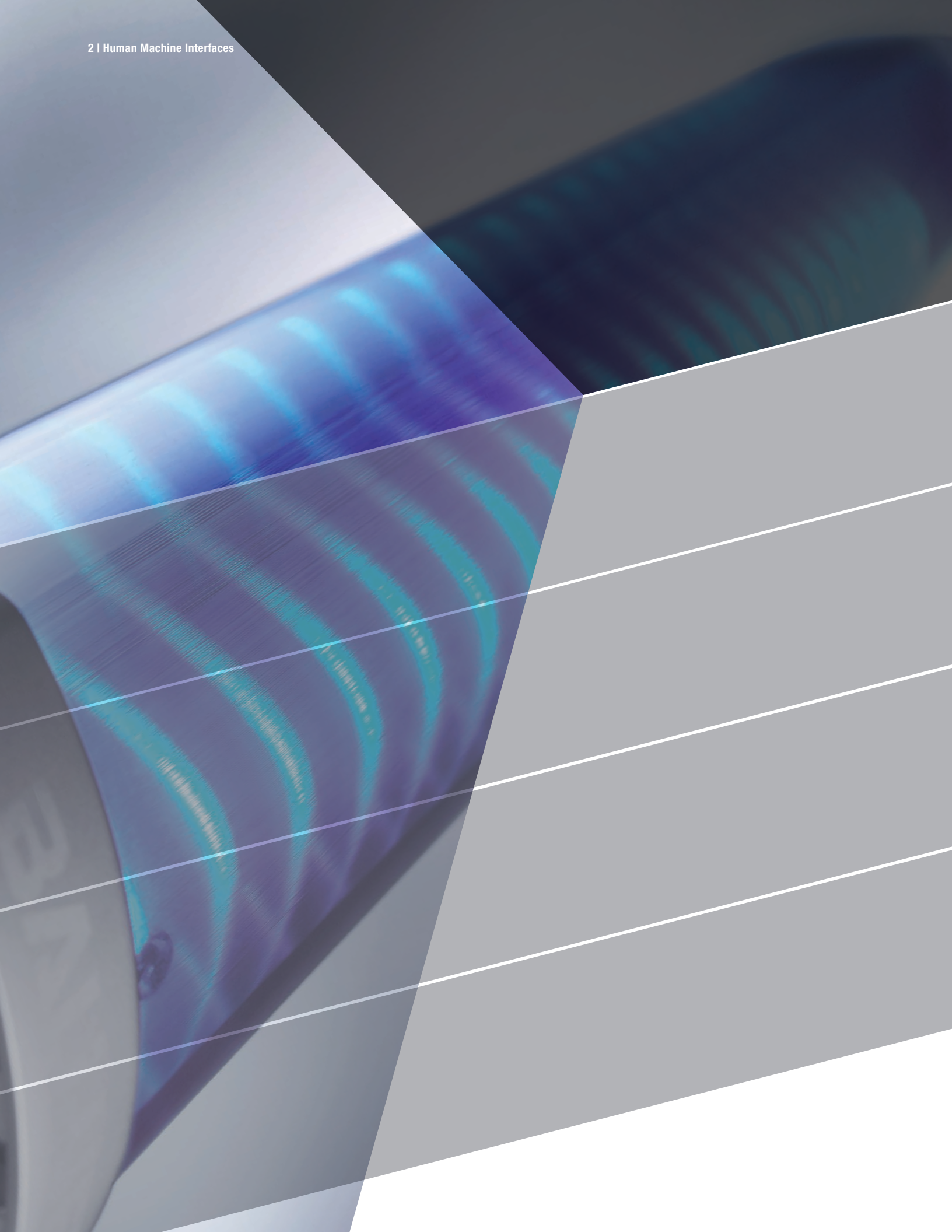


BALLUFF

Human
Machine
Interfaces

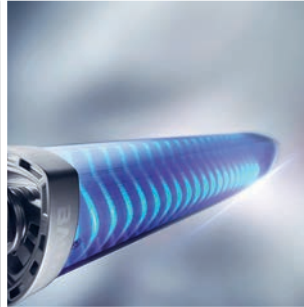
THE FUTURE OF TOWER LIGHTS AND PROCESS VISUALIZATION

 *innovating automation*



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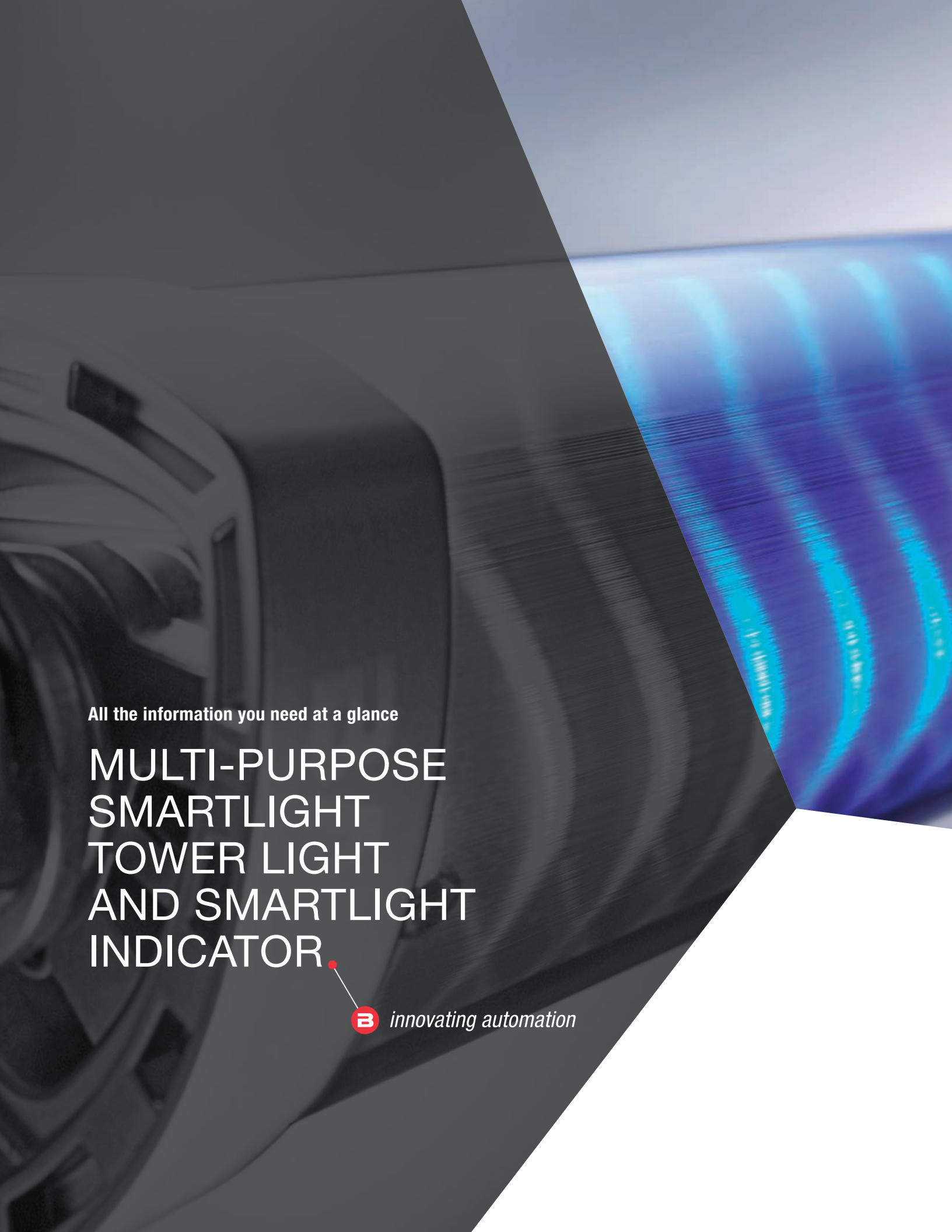


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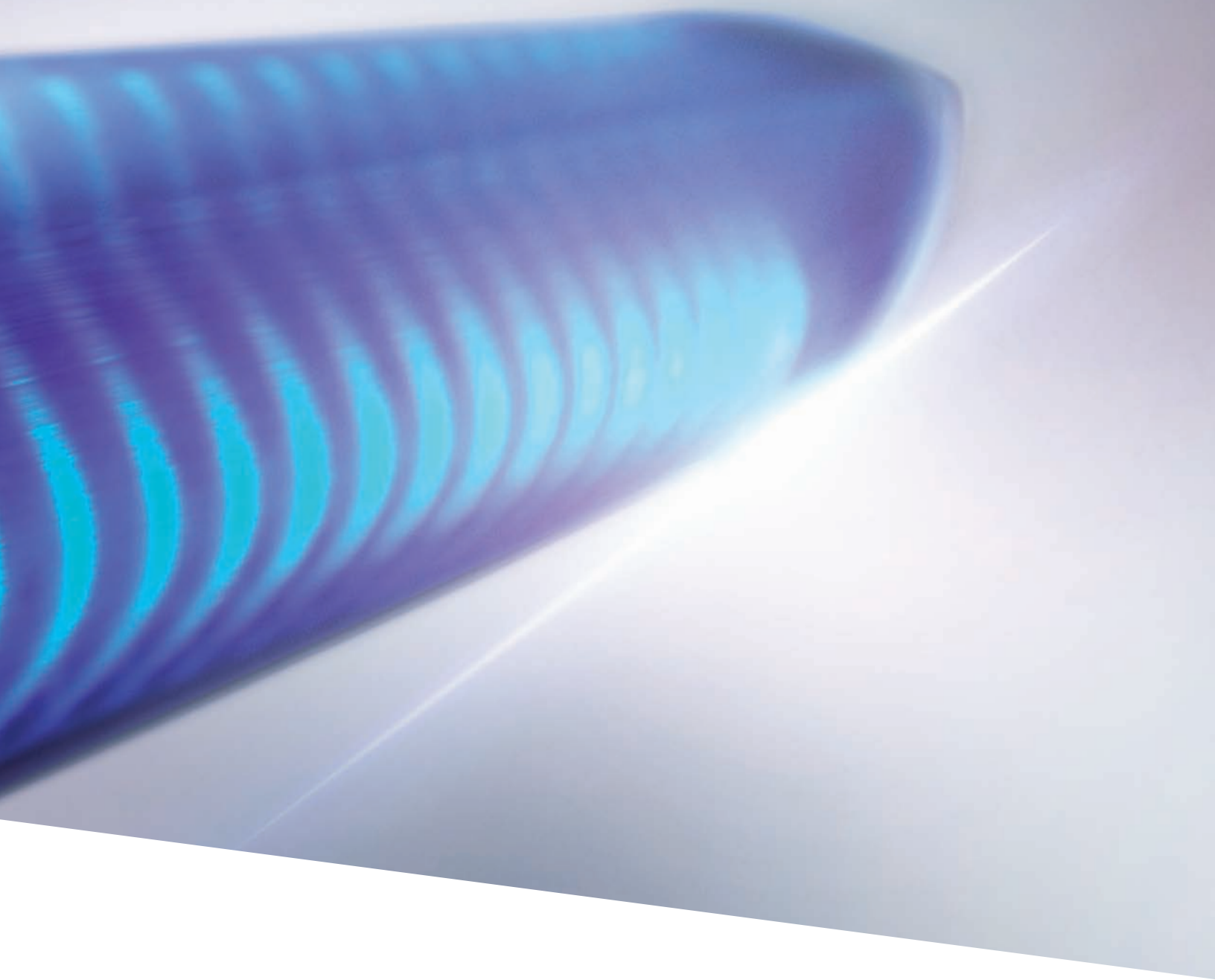


All the information you need at a glance

MULTI-PURPOSE SMARTLIGHT TOWER LIGHT AND SMARTLIGHT INDICATOR.

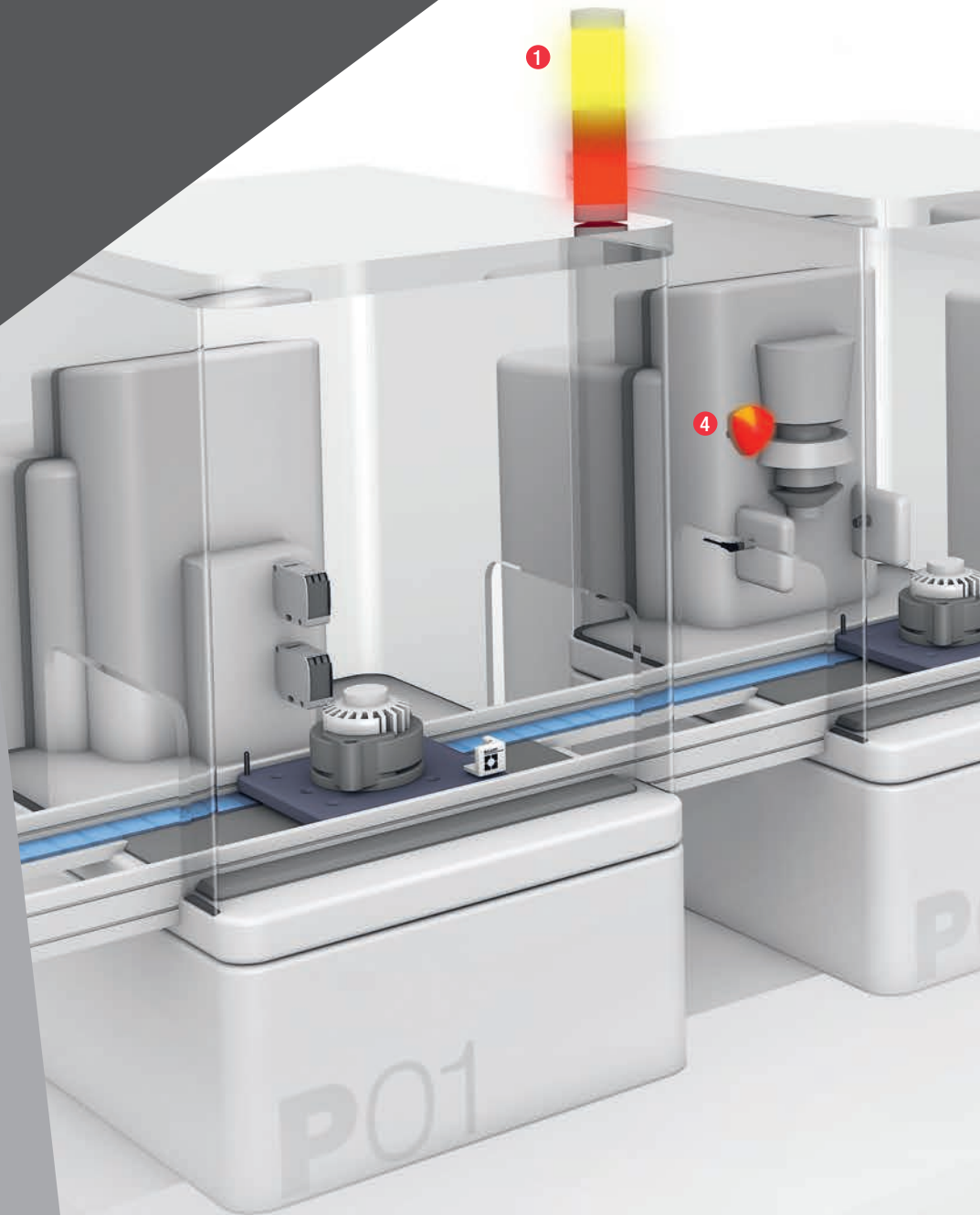


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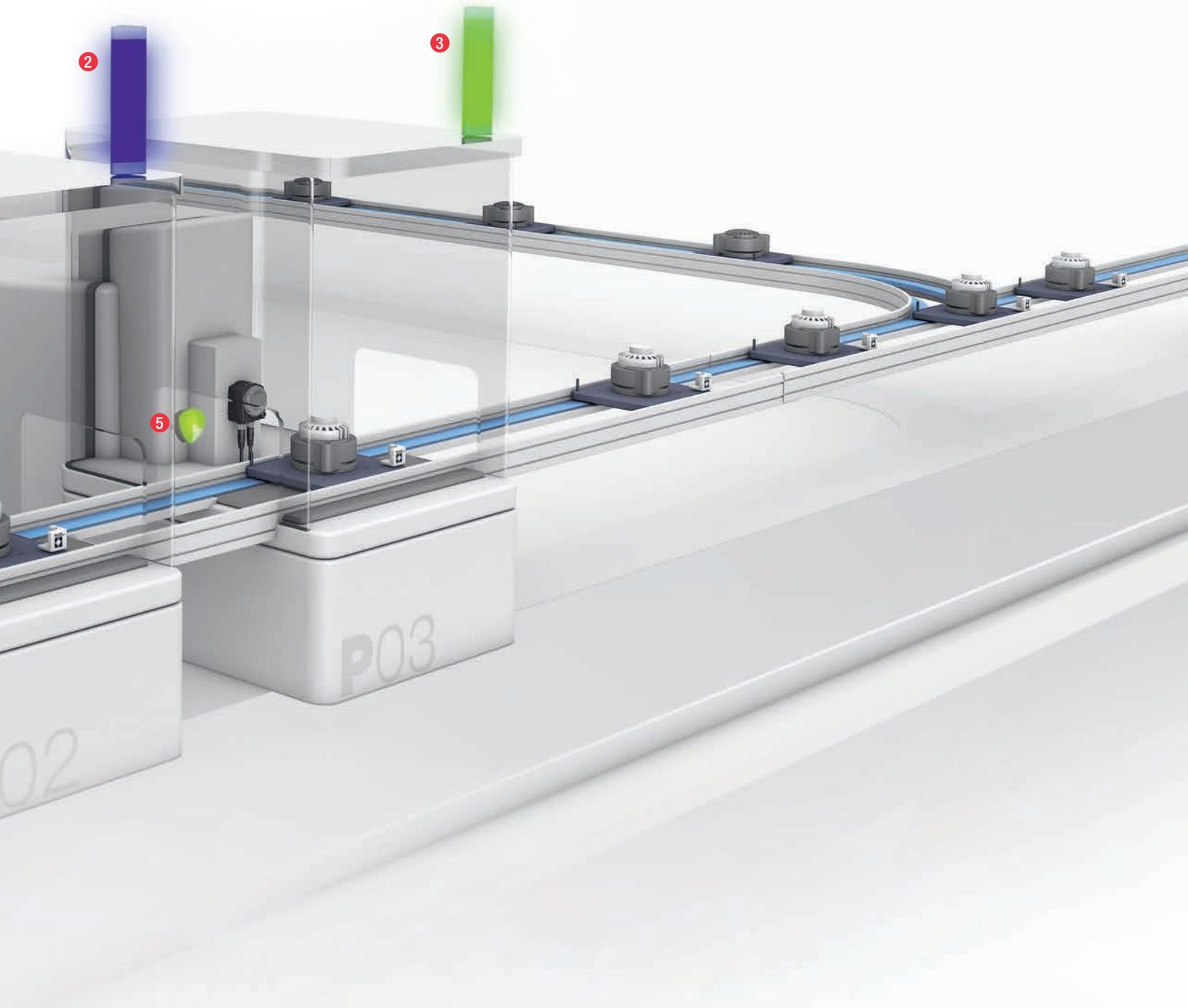


SmartLight is the first programmable LED tower light. With a rich color spectrum, adjustable light intensity and the ability to program individual configurable segments, the Balluff SmartLight can display various machine or process status information instantaneously. The mode of operation can be switched based on programmed conditions so that a single SmartLight can be used as a multi-function tower light.

Solutions at the cell level



Process monitoring and machine status at the cell level is an integral part of manufacturing operations. Instantaneous visual feedback enables plants to operate efficiently. SmartLight adds tremendous value to the plant floor as it combines multiple modes of operations and functions in a single programmable tower light. With the SmartLight tower light and SmartLight indicator there are unlimited possibilities!



1 Light and sound indicators

- Programmable intensity and customizable bright colors
- Audible 95db sound modules

2 Simplified use

- Standard M12 sensor cable connection reduces need for special spare parts, no assembly required
- Mount exactly where needed with wall, ceiling or pole mounting options

3 Maintenance friendly design

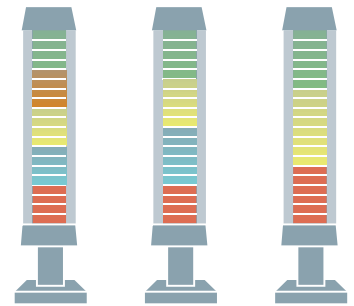
- Maintenance-free, long work life with LED segments to power the lights
- Built-in diagnostics with IO-Link

4 Point-of-use pressure indicator

5 Point-of-use reject indicator

Flexible, scalable, intelligent tower light for cell level information

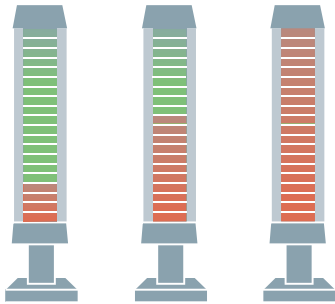
The SmartLight tower light offers four programmable modes of functionality: segment or stack light, level indication, run light, and flexible mode. Additionally, a SmartLight tower light with a buzzer option is available for audible feedback.



STACK LIGHT MODE

SmartLight's segment or stack light mode is feature-rich compared to a standard stack light. The number of segments and color for each segment can be programmed and changed on demand. Individual segments can be set for blinking or flashing mode, and the frequency of blinking can be programmed as well.

- 1 – 5 segments
- Programmable, customizable colors for each segment
- Blinking mode with programmable frequency

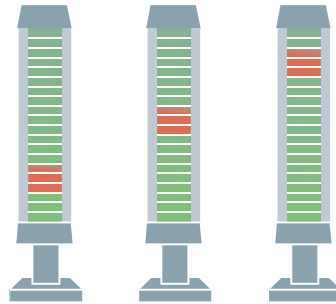


LEVEL MODE

When using the SmartLight as a level indicator, the resolution of input level can be mapped from an 8-bit to a 16-bit integer number and displays a bar graph.

The input could be a position of an object on a linear track or liquid level in a tank. Colors of the LEDs can be changed to signify the importance of the level as well. For example, if the level or the pressure in the tank is closer to the extreme, the SmartLight will display in red.

- Individual LEDs light up to display level
- Level input mapped directly to SmartLight
- Programmable, customizable colors for level indication

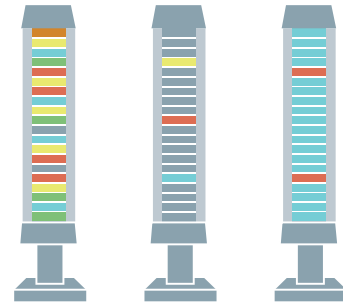


RUN LIGHT MODE

SmartLight, in a run light mode, allows using different programmable colors for the background and for the running segment. The length of the running segment and the speed of the running mode is configurable and can be switched to express different conditions.

As with any other mode, the intensity or brightness can be configured to ensure noticeable performance.

- Complete module displays the running light effect
- Programmable colors of running segment and background
- Programmable speed for running segment



FLEXIBLE MODE


Flexible mode allows every LED segment to be controlled individually. The color and intensity of each LED element can be individually defined. Patterns and moving functions are then handled by the control system. This mode allows for the most creativity and unique indication solutions available.

- Complete control of each LED element
- Define your own segment structure (i.e., six segments)
- Program unique movement patterns (in control system)

Flexible, scalable, intelligent pick-to-light indication

At the heart of most lean initiatives is the desire for more flexibility with increased productivity. Traditional pick-to-light systems can provide that productivity but fall short on flexibility...until now.

The SmartLight indicator with integrated photoelectric sensors is the most innovative pick-to-light product available. All the functions from the indicator only unit are available in this unit. Integrated into flow-racks and supermarkets on the manufacturing floor, it can direct different types of personnel including multiple assemblers, part runners, maintenance and others. One indicator can orchestrate an entire assembly cell or kitting station. All at an affordable price due to the innovative use of IO-Link.

- 
- 1 Solid red**
Bin needs to be replenished
 - 2 Solid green**
Bin is stocked and ready for a call
 - 3 Yellow/green**
Bin is ready and calling for a pick from the yellow operator
 - 4 Blue/green**
Bin is ready and calling for a pick from the blue operator



2

3

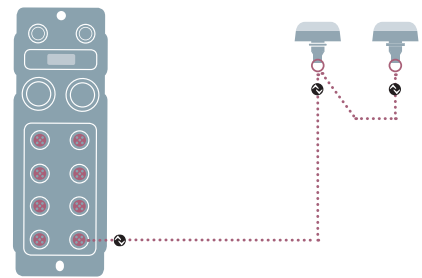
4

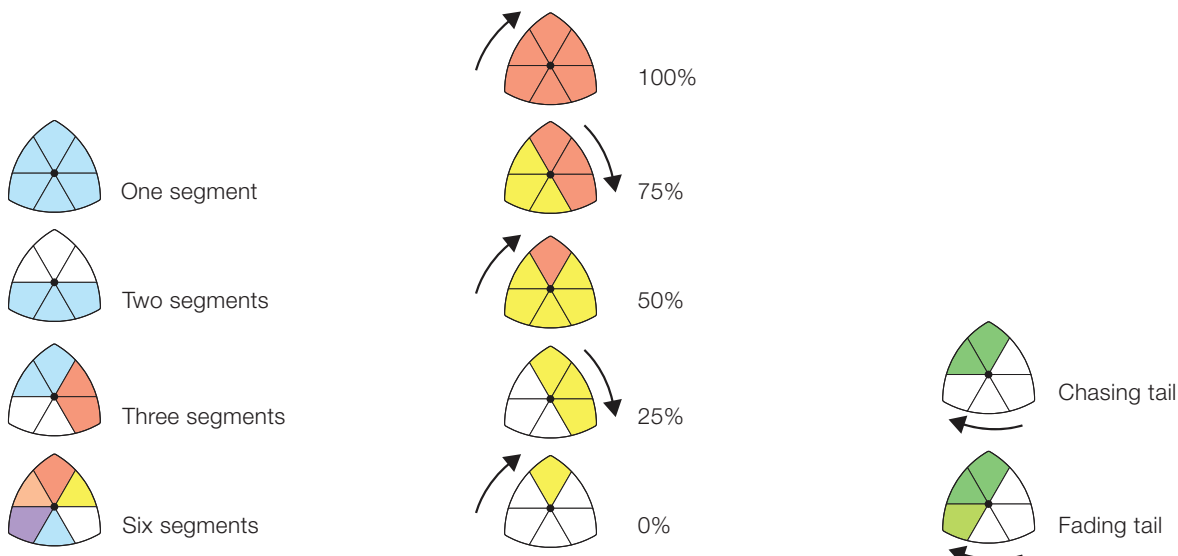
Flexible, scalable, intelligent point-of-use indication

The SmartLight indicator line consists of only two parts: an indicator only version and indicator with an integrated photoelectric sensor for Pick-to-Light applications. Both share the same powerful LED indication functions and an IO-Link interface with Balluff's innovative expansion mode. This expansion mode allows two indicators to be connected to one IO-Link port.

The LED indication functions are divided into six unique segments. Each segment can be individually controlled or utilize a variety of pre-programmed operating modes. Due to the shape, directional indication is easily achieved.

The photoelectric sensor version has an infrared, time-of-flight laser with a default 100mm range. This sensor has a sharp cutoff and tolerance to texture/color changes making it ideal for Pick-to-Light applications. The sensing range can be reduced for tighter applications or small bias.





SEGMENT MODE

In segment mode, you are in complete control over the SmartLight indicator. Each of the six segments are freely programmable for color and intensity. Operate the indicator as a segmented light or develop your own unique functions utilizing your control system.

- Operates in 1, 2, 3 or 6 segments
- Full control of color and blink mode
- Indication direction
- Mix your own color

LEVEL MODE

In level mode, the resolution of input level can be mapped from an 8-bit to a 16-bit integer number. The input could be a pressure value, countdown timer, object position, tank level or any other continuously variable value.

Colors of the LEDs can be changed to signify the importance of the level as well. For example, if the level or the pressure in the tank is closer to the extreme, the SmartLight indicator will display in red.

- Dual color mode for low and high values
- Two rotations (720°) represents full swing
- Can also use one rotation (360°)
- Rotation direction control
- Fading transition control

RUN LIGHT MODE

Run light mode allows different programmable colors for the background and for the running segment. The length of the running segment, speed of rotation and trailing effect is configurable and can be switched to express different conditions.

As with any other mode, the intensity or brightness can be configured to ensure noticeable performance.

- Indicate run or wait condition
- Define foreground and background color to indicate different run/wait conditions
- Fully programmable for speed, number of segments, color and direction
- Two display versions: Fading tail and chasing tail

Reduce complexity; reduce risk

Doing more with less is the foundation of our SmartLight product line. With one part number and one standard M12 cable you can fulfill nearly every task in your plant for cell level and point-of-use indication.

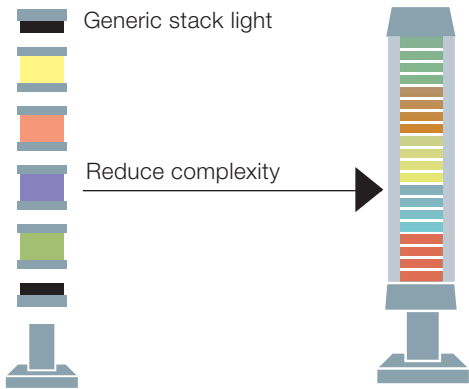
One part number

The days of purchasing and stocking multiple stack light segments, lamps, bases and caps are over. Building up a unit to a specific task is also over. No more wasted time configuring and building a stack light that limits flexibility and expansion.

The SmartLight tower light product line is comprised of only six part numbers—three sizes, with or without an audio alarm. That's it.

One standard M12 cable

No more wiring, period. All SmartLight products utilize IO-Link for simple, low-cost connections. The standard IO-Link interface ensures interoperability and provides unique, never-before-seen capability. The physical connection uses the industry standard M12 sensor-type cables which are economical and readily available.



ONE PART NUMBER

No need to build your own stack light anymore. One part does it all and much more.

- Single part number
- Tamper resistant design
- Programmable colors, intensity, and blinking
- Configurable modes of operation with on-demand change of mode
- Programmable buzzer for continuous chopped or beeping sounds



ONE STANDARD M12 CABLE

No need to terminate individual wires. Simply plug in a standard M12 cable.

- Eliminate wiring problems
- Enable the convenience of quick disconnect
- Gain functionality
- Reduce the volume of I/O points required in the PLC

IO-Link distributed modular I/O

IO-Link is a fieldbus and manufacturer independent communications standard defined by the international communications standard IEC 61131-9. IO-Link enables seamless integration of a variety of actuators while maintaining scalability for future adaptability in the controls architecture. IO-Link is universal and adaptable to any major industrial network protocol, such as EtherNet/IP, Profinet, EtherCAT, CC-Link ie field, DeviceNet, Profibus, or CC-Link.

A multitude of actuators or devices can be connected without complex wiring. Devices include discrete I/O (e.g., prox switches), analog I/O devices, smart sensors (e.g., pressure sensors, linear position sensors), and specialty devices (e.g., RFID, non-contact connections).

IO-Link has built in scalability to add more devices to the existing network without adding more network nodes in the architecture thus providing ease of operation and a cost-effective solution for automation.

IO-LINK MASTERS

- 4-port and 8-port versions
- Parameter server functionality
- Industrial IoT ready



SMARTLIGHT TOWER LIGHT

- Stack light mode: 1-5 zones
- Level mode: high/low levels
- Configure: colors, brightness, levels, etc.



DISCRETE AND ANALOG I/O

- Up to 240 discrete I/O per IP address
- Up to 64 channels configurable analog I/O
- IP67 metal or plastic, M8 or M12
- Inputs, outputs, configurable
- PNP or NPN, 2-wire DC, analog, thermocouple



SMART SENSORS

- Photoeye, prox, ultrasonic, pressure sensors
- Software storable and programmable parameters
- Diagnostics and digital measurements



LINEAR TRANSDUCERS

- No shielded cable runs and 32-bit signed integer
- Programmable stroke and set points
- Available from 2" to 180"
- Reports diagnostics and engineering units (mm)



RFID TRACEABILITY

- Simple to implement, easy to use
- 10-byte or 32-byte read/write versions
- Enables flexibility and visibility in the machine



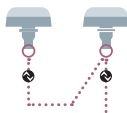
VALVE MANIFOLD CONTROL

- Compatible with most major manifold brands
- 24 VDC, up to 1.1 amps active at one time
- Up to 24 position controls via 25 pin D-sub



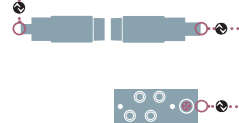
SMARTLIGHT INDICATOR

- Point-of-use indicator with six segments
- Photoelectric sensor for pick operations
- Expansion mode allows two indicators on one port



NON-CONTACT COUPLERS

- Power and signal transmission over the air gap
- Power: 24 VDC, up to 0.5 amps transmitted
- Signal: any IO-Link device, appears transparent





Capture operating status with displays and SmartLight tower light

SIGNALING AND DISPLAY DEVICES

The SmartLight tower light, a LED signal light, displays physical variables that allow you to know the status of your machine at a glance. The SmartLight visualizes progressions and trends and allows you to personalize colors and modes without any mechanical modifications. Through the IO-Link interface, it is easy to install and configure.

- Flexible
- Easy to install
- No assembly required

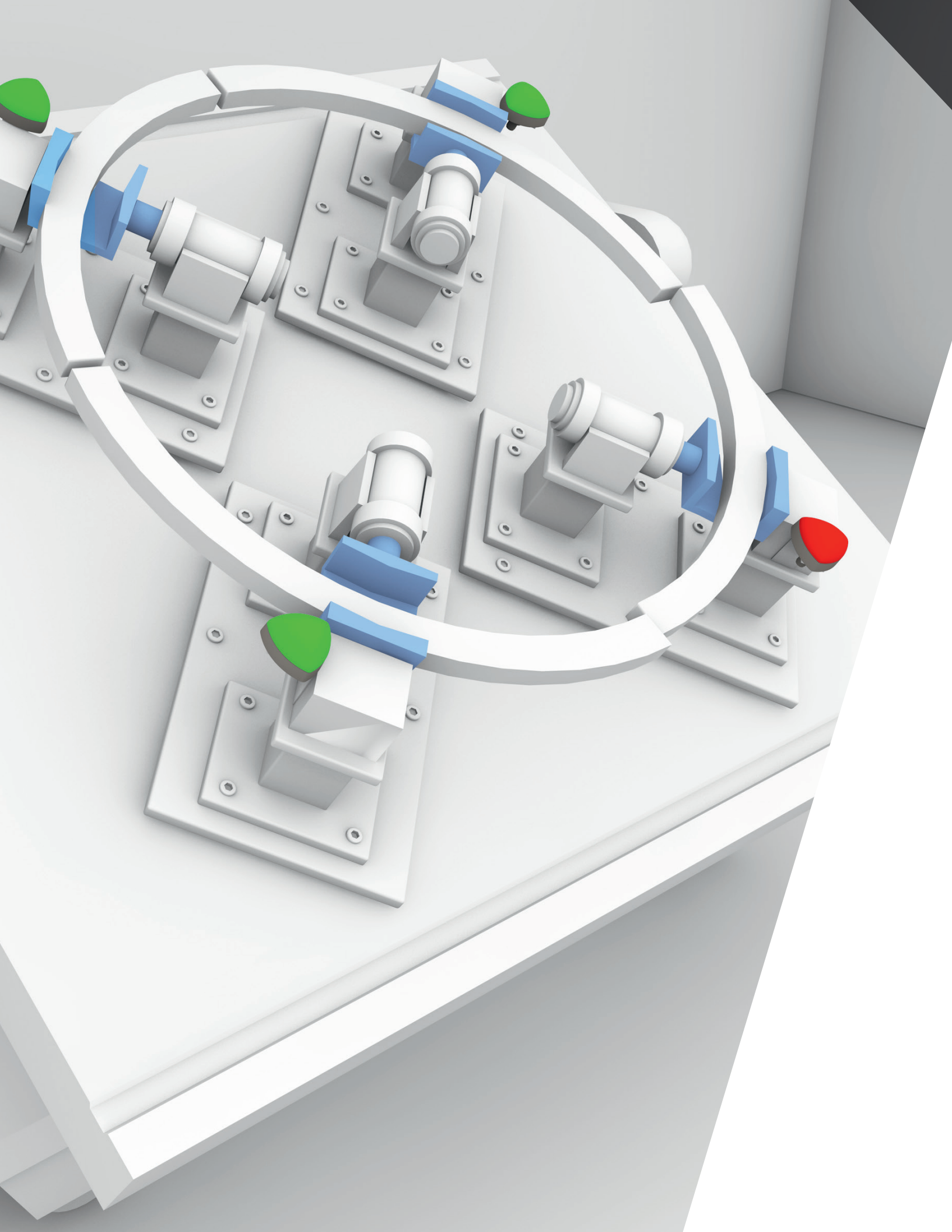

**SMARTLIGHT TOWER LIGHT
WITH IO-LINK**


With sound module (buzzer)	BNI0085 BNI IOL-802-102-Z037	BNI008A BNI IOL-801-102-Z037	BNI0087 BNI IOL-800-000-Z037
Without sound module	BNI0082 BNI IOL-802-102-Z036	BNI0088 BNI IOL-801-102-Z036	BNI007T BNI IOL-800-000-Z036
Number of default segments max.	5	3	1
Number of LED segments	20	12	4
Color spectrum per segment	Red, green, yellow, blue, white, orange, user defined	Red, green, yellow, blue, white, orange, user defined	Red, green, yellow, blue, white, orange, user defined
Mode	Stack, run, level, flex	Stack, run, level, flex	Stack, run, flex
Supply voltage U_D	18...30V DC	18...30V DC	18...30V DC
Connection: IO-Link	M12, A-coded, male	M12, A-coded, male	M12, A-coded, male
Communication	IO-Link	IO-Link	IO-Link
Configurable	Yes	Yes	Yes
Max. load current	0.5 A	0.25 A	0.25 A
Degree of protection per IEC60529	IP30 (with buzzer), IP65 (without buzzer)	IP30 (with buzzer), IP65 (without buzzer)	IP30 (with buzzer), IP65 (without buzzer)
Operating/Storage temperature	-5...+55 °C / -25...+70 °C	-5...+55 °C / -25...+70 °C	-5...+55 °C / -25...+70 °C
Mounting	M18 thread	M18 thread	M18 thread
Dimension (LxWxH) mm	60x60x330.5 (with buzzer), 60x60x309 (without buzzer)	60x60x234.5 (with buzzer), 60x60x213 (without buzzer)	60x60x138.5 (with buzzer), 60x60x117 (without buzzer)
Housing material	Transparent plastic	Transparent plastic	Transparent plastic
Approval/Conformity	CE, cULus	CE, cULus	CE, cULus
IO-Link Version 1.1			
Transfer rate	COM 2 (38.4 kBaud)		
Cycle time	7.2 ms with IO-Link 1.1 Master		
IO-Link process data length	8-byte output, 1-byte input		
Communication indicators	Green LED		

WARNING

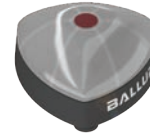
- Read, understand, and follow warnings and manual. Failure to do so could result in serious injury or death.
- NEVER USE AS A SENSING DEVICE FOR PERSONNEL PROTECTION
- Does NOT include self-checking redundancy circuitry required for use in personnel safety applications
- Does NOT meet OSHA and ANSI standards for point-of-operation devices

Balluff, Inc. - www.balluff.com - 1-800-543-8390





SMARTLIGHT INDICATOR
WITH IO-LINK



	BNI100CZ BNI IOL-803-102-R036	BNI100E0 BNI IOL-803-103-R036
Number of segments max.	6	6
Color spectrum per segment	Red, green, yellow, blue, white	Red, green, yellow, blue, white
Supply voltage U_D	18...30V DC	18...30V DC
Function indicator IO-Link	Green LED or Segment 1 (Fail Safe)	Green LED or Segment 1 (Fail Safe)
Connection: IO-Link	M12, A-coded, male	M12, A-coded, male
Max. load current	<100 mA	<100 mA
Degree of protection per IEC60529	IP 65	IP 65
Operating/Storage temperature	-5...+55 °C / -15...+70 °C	-5...+55 °C / -15...+70 °C
Mounting	M22x1 thread with key	M22x1 thread with key
Dimension (LxWxH) mm	60x60x30	60x60x30
Base housing material	Fortron	Fortron
Lens material	Polycarbonate	Polycarbonate
Sensor type	None	IR laser, time-of-flight
Sensor range	None	100mm adjustable down
Approval/Certificates	CE, cULus	CE, cULus
IO-Link Version 1.1		
Cycle time	7.2 ms with IO-Link 1.1 Master	7.2 ms with IO-Link 1.1 Master
IO-Link process data length	8-byte output, 1-byte input	8-byte output, 1-byte input

A close-up, high-angle photograph of an industrial control panel. The panel is dark grey or black and features several circular IO-Link connectors. The connectors are arranged in a grid pattern. The lighting is dramatic, with a strong blue and white light source from the upper right, creating a bright glow and casting deep shadows. The background is a gradient of dark grey to black.

IO-LINK MASTERS

 *innovating automation*



Balluff offers IO-Link master blocks for all major networks and fieldbus protocols. With built-in expandability, IO-Link blocks can significantly increase the I/O count served by a single network node. Each IO-Link port is configurable to be used as either IO-Link or as input or output providing flexibility for scalable and modular controls architecture.

EtherNet/IP™

IO-LINK MASTER
ETHERNET/IP



4 IO-Link / 8 Configurable	BNI009T BNI EIP-507-005-Z040		
4 IO-Link / 12 Configurable		BNI004A BNI EIP-502-105-Z015	
8 IO-Link / 16 Configurable			BNI006A BNI EIP-500-105-2015
Network Protocol	EtherNet/IP	EtherNet/IP	EtherNet/IP
Addressing	Software	Display	Display
Approval/Conformity	cULus	cULus	cULus

DeviceNet™

IO-LINK MASTER
DEVICENET



4 IO-Link / 12 Configurable	BNI005A BNI DNT-502-100-Z001		
Network Protocol	DeviceNet		
Addressing	Display		



IO-LINK MASTER
PROFINET



4 IO-Link / 8 Configurable	BNI0092 BNI PNT-507-005-Z040			
4 IO-Link / 12 Configurable		BNI004U BNI PNT-502-105-Z015		
8 IO-Link / 16 Configurable			BNI005H BNI PNT-508-105-Z015	
16 IO-Link / 32 Configurable				BNI007M BNI PNT-509-105-Z033
Network Protocol	Profinet	Profinet	Profinet	Profinet
Addressing	Software	Software	Software	Software
Approval/Conformity	cULus	cULus	cULus	cULus



IO-LINK MASTER
PROFIBUS



4 IO-Link / 8 Configurable	BNI0030 BNI PBS-502-101-Z001	
4 IO-Link / 12 Configurable		BNI005R BNI PBS-504-001-K008
Network Protocol	Profibus	Profibus
Addressing	Rotary Dials	Display

CC-Link

IO-LINK MASTER
CC-LINK



4 IO-Link / 12 Configurable	BNI0040 BNI CCL-502-100-Z001
Network Protocol	CC-Link
Addressing	Display
Approval/Conformity	cULus

CC-Link IE Field

IO-LINK MASTER
CC-LINK IE FIELD



8 IO-Link / 16 Configurable	BNI008C BNI CIE-508-105-Z015
Network Protocol	CC-Link IE/Field
Addressing	Display
Approval/Conformity	CE

EtherCAT 

IO-LINK MASTER
ETHERCAT




8 IO-Link / 16 Configurable	BNI0077 BNI ECT-508-105-Z015
Network Protocol	EtherCAT
Addressing	Software
Approval/Conformity	cULus

IO-LINK MASTER
USB INTERFACE



1 IO-Link	BNI0073 BNI USB-901-013-A501
Input power	110V AC with converter
Load Current Max	40mA via USB, 1.6A with supply



High-quality gear for
virtually any application

ACCESSORIES.

 *innovating automation*



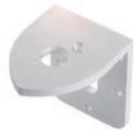
Balluff offers a wide variety of accessories designed specifically for the SmartLight to optimize its performance and make the most of your investment.

TOWER LIGHT
MOUNTING PEDESTALS



	BAM026K BAM MB-NI-017-100-1	BAM034C BAM MB-NI-017-250-1	BAM026L BAM MB-NI-017-400-1
Description	Pedestal mounting	Pedestal mounting	Pedestal mounting
Material	Aluminum anodized, natural	Aluminum anodized, natural	Aluminum anodized, natural
Dimensions	H 110 mm x Ø 70 mm	H 250 mm x Ø 70 mm	H 400 mm x Ø 70 mm
Mounting hardware	M5 screws	M5 screws	M5 screws

TOWER LIGHT
MOUNTING BRACKET



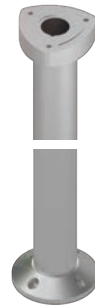
	BAM0255 BAM MB-NI-016-800-1
Description	Angled wall mount
Material	Aluminum anodized, natural
Dimensions	80 x 6 x 62 mm

TOWER LIGHT
MOUNTING KITS



	SET016U BAV BP-PH-00105-01	SET011M BAV BP-PH-00065-01
Description	Pole or wall mounting Kit contains: 150 mm rod, knuckle, foot, sensor holder	Pole or wall mounting Kit contains: 2x150 mm rod, knuckle, joint, foot, sensor holder

INDICATOR
MOUNTING PEDESTALS



	BAM0358 BAM MB-NI-039-100-1	BAM0359 BAM MB-NI-039-400-1
Description	Pedestal mounting	Pedestal mounting
Material	Aluminum anodized	Aluminum anodized
Dimensions	H 100 mm x Ø 70mm	H 400 mm x Ø 70mm
Mounting hardware	M5 screws	M5 screws

INDICATOR
MOUNTING BRACKETS



	BAM0353 BAM MB-NI-041-803-5	BAM0352 BAM MB-NI-040-803-5
Description	Right angle bracket with keyway	Straight bracket with keyway
Material	Stainless	Stainless
Dimensions	M22	M22

INDICATOR
MOUNTING BRACKETS



	BAM0350 BAM MB-NI-042-803-5	BAM0354 BMS CS-M-D12-ID22-01
Description	Tube mount bracket with keyway	Rod system mounting bracket
Material	Stainless	Stainless
Dimensions	M22	M22

Standardized and tailor-made connection components

CONNECTIVITY.

 *innovating automation*



To make the most of your investment, Balluff offers an optional array of connectivity solutions perfectly tailored to the SmartLight.

DOUBLE ENDED CABLES
4-WIRE, NON-LED



	BCC M415-M414-3A-304-*X44T2-__**__	BCC M425-M414-3A-304-*X44T2-__**__	
Type	M12 Female – M12 Male	M12 Female – M12 Male	
Configuration	Straight – Straight	Right angle – Straight	
Voltage rating	250 VAC/VDC	250 VAC/VDC	
Amperage	4 A	4 A	
Approval/Conformity	cULus	cULus	

* Standard Cable Jackets: V=PVC, P=PUR, E=TPE

** Standard Lengths Available: 003=0.3 m, 006=0.6 m, 010=1.0 m, 015=1.5 m, 020=2 m, 030=3 m, 050=5 m

DOUBLE ENDED CABLES
4-WIRE, NON-LED



	BCC M415-M414-3A-304-PW0434-__**__	BCC M425-M414-3A-304-PX0434-__**__	
Type	M12 Female – M12 Male	M12 Female – M12 Male	
Configuration	Straight – Straight	Right angle – Straight	
Voltage rating	250 VAC/VDC	250 VAC/VDC	
Amperage	4 A	4 A	
Approval/Conformity	cULus	cULus	

** Standard Lengths Available: 003=0.3 m, 006=0.6 m, 010=1.0 m, 015=1.5 m, 020=2 m, 030=3 m, 050=5 m

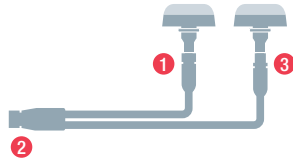
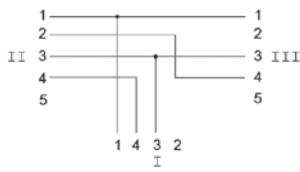


BCC M415-M424-3A-304-*_X44T2-__**	BCC M425-M424-3A-304-*_X44T2-__**
M12 Female – M12 Male	M12 Female – M12 Male
Straight – Right angle	Right angle – Right angle
250 VAC/VDC	250 VAC/VDC
4 A	4 A
cULus	cULus



BCC M415-M424-3A-304-PX0434-__**	BCC M425-M424-3A-304-PX0434-__**
M12 Female – M12 Male	M12 Female – M12 Male
Straight – Right angle	Right angle – Right angle
250 VAC/VDC	250 VAC/VDC
4 A	4 A
cULus	cULus

WIRING DIAGRAM



EXPANSION PORT
WIRING CABLES
FOR INDICATOR



	BCC0K7C BCC M413-M415-M415-U2095-003/006	BCC0K7E BCC M413-M415-M415-U2095-003/010	
Type	1: M12 Female 2: M12 Male 3: M12 Female	1: M12 Female 2: M12 Male 3: M12 Female	
Length, Connector 1	0.3M	0.3M	
Length, Connector 3	0.6M	1.0M	
Material	Yellow TPE	Yellow TPE	
Voltage	250 VAC/VDC	250 VAC/VDC	
Amperage	4A	4A	

EXPANSION PORT
WIRING CABLES
FOR INDICATOR



	BCC0K6M BCC M413-M415-M415-U2096-003/006	BCC0K6N BCC M413-M415-M415-U2096-003/010	
Type	1: M12 Female 2: M12 Male 3: M12 Female	1: M12 Female 2: M12 Male 3: M12 Female	
Length, Connector 1	0.3M	0.3M	
Length, Connector 3	0.6M	1.0M	
Material	Black PUR	Black PUR	
Voltage	250 VAC/VDC	250 VAC/VDC	
Amperage	4A	4A	

**BCC0K7F**

BCC M413-M415-M415-U2095-006/010

1: M12 Female
2: M12 Male
3: M12 Female

0.6M

1.0M

Yellow TPE

250 VAC/VDC

4A

BCC0K7H

BCC M413-M415-M415-U2095-010/020

1: M12 Female
2: M12 Male
3: M12 Female

1.0M

2.0M

Yellow TPE

250 VAC/VDC

4A

**BCC0K6P**

BCC M413-M415-M415-U2096-006/010

1: M12 Female
2: M12 Male
3: M12 Female

0.6M

1.0M

Black PUR

250 VAC/VDC

4A

BCC0K6R

BCC M413-M415-M415-U2096-010/020

1: M12 Female
2: M12 Male
3: M12 Female

1.0M

2.0M

Black PUR

250 VAC/VDC

4A



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OPENING NEW PERSPECTIVES



B *innovating automation*

Balluff is one of the leading suppliers of high-quality sensor, identification and network solutions for your automation requirements. Family-owned and led for more than 90 years, Balluff today employs more than 3600 workers in 63 subsidiaries and nine production facilities around the world each with the goal of providing the highest quality product and service to you, our client. With Balluff you always get the best.

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