BN series IO-Link control device units

General data



The modular control device units of Pizzato Elettrica's BN IO-Link series introduce IO-Link technology to the control device units of the BN series.

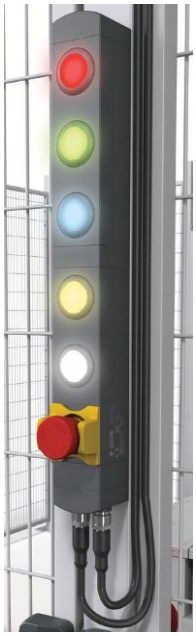
BN control device units with IO-Link technology enable accurate monitoring of all operating phases, immediate detection of any anomalies and quick and easy wiring thanks to plug & play technology.

The illuminated control device units of the BN series device with IO-Link, equipped with RGB LEDs, can be configured to emit the preferred colours with varying levels of light intensity, to blink at various frequencies or to fade out. The buttons are equipped with removable lenses that can be laser-marked for a resistant, indelible engraving. This allows customization of the lenses with a wide range of text and symbols, and replacement with lenses of a different colour or with different markings.

IO-Link

IO-Link is an open communication standard for sensors and actuators, defined by the PROFIBUS User Organization (PNO). IO-Link technology is a point-to-point communication standard that connects sensors and actuators to the control system. As well as the cyclic operating data of the connected sensors and actuators, parameter and diagnostic data is also sent.

Custom colour and RGB LEDs



The control devices of the BN series IO-Link control device unit can be illuminated, a solution to meet any requirements. As they have RGB LEDs, the buttons can be configured in a vast range of colours: red, green, blue, yellow, cyan, magenta and white. There are also 4 colours that can be configured by the user to customise the appearance of the control device unit to suit your own aesthetic and functional preferences. The brightness of the RGB LEDs can be adjusted via IO-Link to adapt to various environmental conditions, and the LEDS can also be set to blink at various frequencies and fade out.

Removable and laser-markable lenses



With all product configurations, a number of devices can be installed that can also be illuminated via LEDs integrated in the device.

The buttons are equipped with removable lenses that can be laser-marked for a resistant, indelible engraving. This allows customization of the lenses with a wide range of text and symbols, and replacement with lenses of a different colour or with different markings. For a full list of available markings, see the Accessories chapter on page 379.

Protection guard for emergency stop button



The mushroom-shaped emergency stop button is provided with a yellow protection guard that serves to protect the device from shocks. The protection guard can also be provided with laser engraving in accordance with EN ISO 13850.

Data and configuration



The BN Series control device unit exchanges with the IO-Link master data on the surrounding environment, such as:

- State of the buttons (or the different types of devices);
- State of the LEDs;
- Supply voltage;
- Temperature;
- Device usage time.

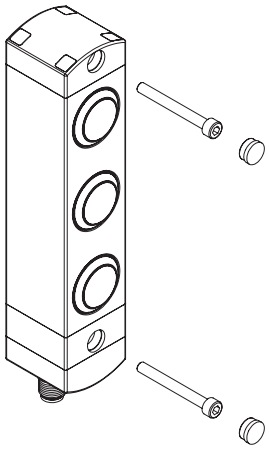
The system detects any out-of-range values in the monitored data. Device data can be displayed in real time.

Plug & Play



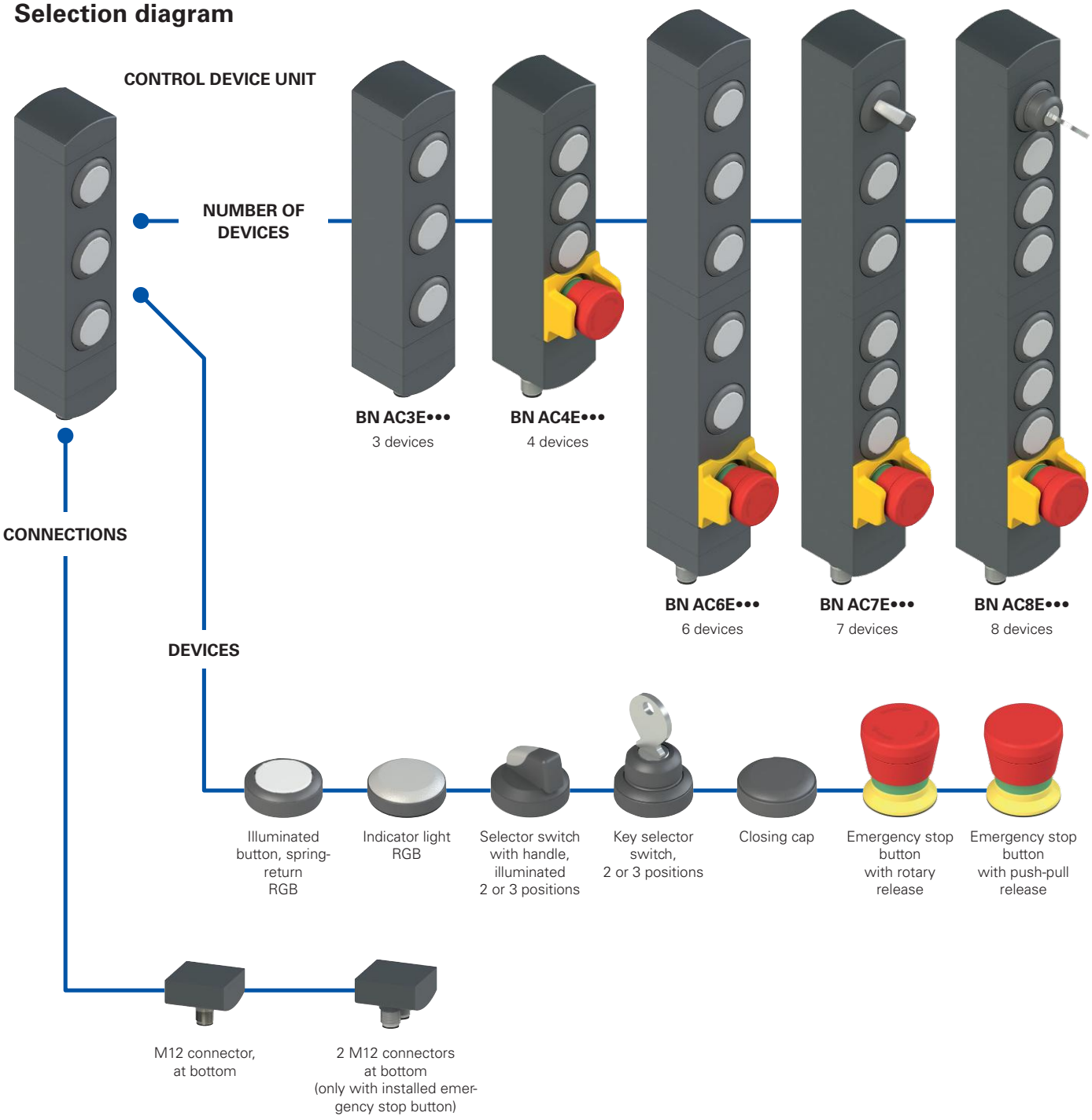
The BN series IO-Link control device unit offers numerous advantages compared to traditional wired solutions. The Plug & Play technology makes the device easy to install without complex, time-consuming and costly wiring. This also means the device can be quickly replaced if it gets damaged or malfunctions, without having to dismantle whole parts of the plant.

Protection against tampering



Each control device unit of the BN series is supplied complete with snap-on protection caps to be applied on the holes of the fixing screws. Not only do the caps prevent deposits of dirt from accumulating and simplify cleaning, they also prevent access to the fixing screws of the device, thereby offering increased protection against tampering.

Selection diagram



Code structure

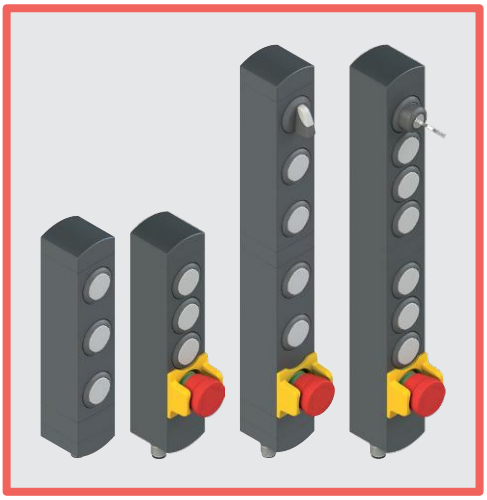
Attention! The feasibility of a code number does not mean the effective availability of a product. Please contact our sales office.

BN AC3EA01

Number of devices	
3	3 devices
4	4 devices
6	6 devices
7	7 devices
8	8 devices

Operation	
E	IO-Link

Button configuration	
A01	A01 configuration
A02	A02 configuration
...	other configurations on request



Main features

- Modular control device unit with 3, 4, 6, 7 or 8 devices
- Rotatable fixing position
- Flush-mounted control devices
- Compact dimensions, minimal housing width
- Numerous control devices available

Quality marks:

UL approval: E131787

Features approved by UL

Electrical ratings: 24 Vdc Class 2, 0,2 A

Model BN with base module dimensions 40 mm by 38.5 mm by 145.5 mm:

Input Supplied by 24 Vdc, "Class 2" Source or limited voltage limited energy, 0.2 A max. (Maximum eight leds).

Output IO-Link (Serial data) 24 V dc, "Class 2".

Emergency Stop Button 24 Vac/dc "Class 2" 0.25 A Pilot Duty (Maximum one provided, silver contacts).

Emergency Stop Button 24 Vac/dc "Class 2" 0.1 A (Maximum one provided, golden contacts).

Model BN with base module dimensions 40 mm by 38.5 mm by 82.1 mm:

Input Supplied by 24 Vdc, "Class 2" Source or limited voltage limited energy, 0.2 A max. (Maximum four leds).

Output IO-Link (Serial data) 24 V dc, "Class 2".

Emergency Stop Button 24 Vac/dc "Class 2" 0.25 A Pilot Duty (Maximum one provided, silver contacts).

Emergency Stop Button 24 Vac/dc "Class 2" 0.1 A (Maximum one provided, golden contacts).

Environmental ratings: Type 1

Technical data

Housing made of glass fibre reinforced technopolymer, self-extinguishing and shock-proof.
Versions with integrated single or double M12 stainless steel connector.

Protection degree:	IP65 acc. to EN 60529

General data

Ambient temperature:	-20°C … +50°C
Storage temperature:	-40°C … +80°C
Fixing screws for the housing:	2 x M5, tightening torque 3 Nm
Fixing screws for turnable modules:	Tightening torque of 0.8 … 1.2 Nm
External protection fuse:	1 A type Gg or equivalent device

Electrical data

Rated operating voltage U_e:	24 Vdc ±25% SELV/PELV
Max. operating current:	200 mA

IO-Link specifications

Interface version and system specifications: see "Manufacturer declaration" available for download at https://ioddfinder.io-link.com/

The IODD and the IO-Link interface description are available for download at www.pizzato.com

Technical data of control devices

Mechanical endurance:		
Spring-return button (RGB):	1 million operating cycles	
Emergency stop button:	50,000 operating cycles	
Selector switch:	300,000 operating cycles	
Key selector switch:	50,000 operating cycles 30,000 operating cycles including removal of the key	
Safety parameter B_{10D}:	130,000 (emergency stop button)	
Actuating force:		
Spring-return button (RGB):	min. 2.9 N	max. 4 N
Emergency stop button:	min. 20 N	max. 100 N
Selector switch:	min. 0.1 Nm	max. 1.5 Nm
Key selector switch:	min. 0.1 Nm	max. 1.3 Nm

Technical data of contact blocks for emergency stop buttons (2NC)

Material of the contacts:	gold-plated contacts
Contact type:	Self-cleaning contacts with double interruption
Thermal current I_{th}:	0.1 A
Rated insulation voltage U_i:	32 Vac/dc
Rated impulse withstand voltage U_{imp}:	0.5 kV
Utilization category of the contact block:	DC13; U_e = 24 Vdc; I_e = 0.1 A

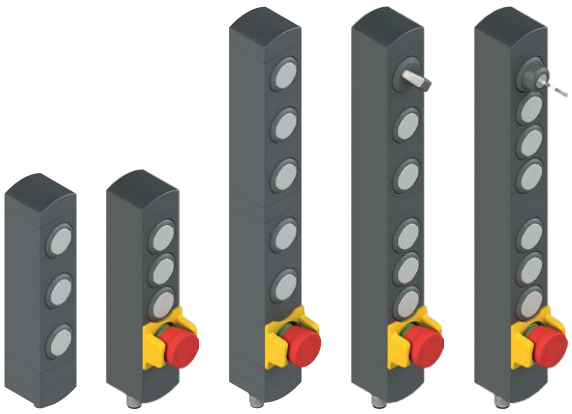
In compliance with standards:

IEC 60947-5-1, IEC 60947-5-5, EN ISO 13850, EN IEC 61131-9, UL 508, CSA C22.2 No.14

Compliance with the requirements of:

Machinery Directive 2006/42/EC, Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU, RoHS Directive 2011/65/EU.

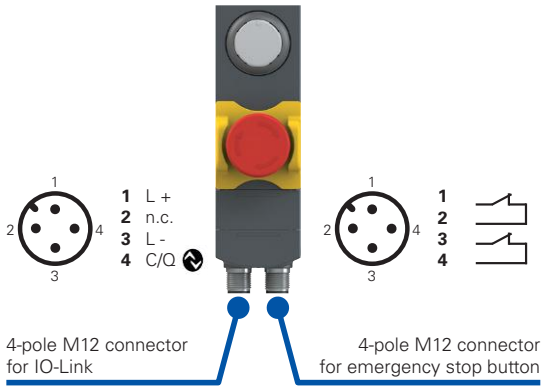
Description



There's a new version of the Pizzato BN series control device unit that supports the modern IO-Link communication standard, opening the doors to new configuration, customisation and control options. The unit is quick and easy to update.

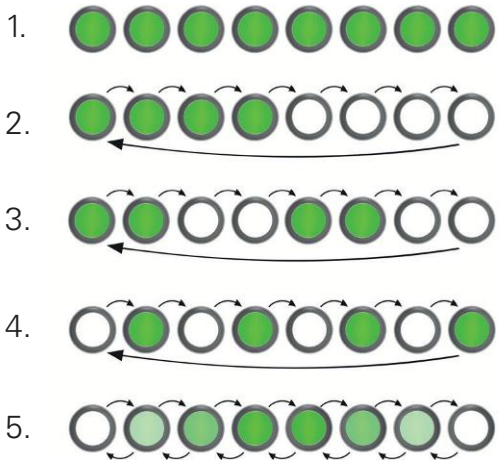
BN series IO-Link control device units can consist of one or two interconnected and rotatable modules: a distinctive feature of BN series control device units. Each module can take 3 or 4 control devices (e.g. buttons, emergency stop buttons, selectors) so up to 8 devices can be installed in a single control device unit. The buttons have RGB LEDs, while the selector has a white LED.

Connection and power supply



The standard version of the BN series IO-Link control device unit comes with a 4-pole M12 connector for communicating with the IO-Link master. If an emergency stop button is installed, a second 4-pole M12 connector must be used for the relevant voltage-free contacts. The 4-pole M12 connector used to communicate with the IO-Link master has just 3 wires (positive and negative for the power supply, and the data connection). The supply voltage of the IO-Link master (24 VDC) also supplies power to the BN series control device unit. The cable can also be unscreened. It must have a max. length of 20 m.

Customisable LED mode

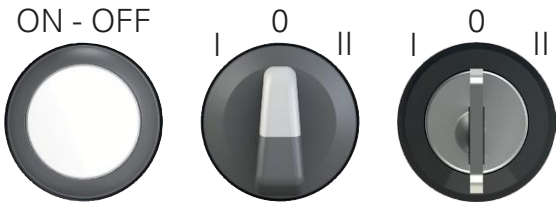


The state and colour of the RGB LEDs on the butt of the BN series IO-Link control device unit can be set to different modes, including:

1. Fixed light on;
2. Light blinking at 0.5 Hz;
3. Light blinking at 1 Hz;
4. Light blinking at 2 Hz;
5. Light fading out.

Night mode can also be set on the above types, dimming the brightness from "HIGH" to "LOW".

IO-Link control devices



The following types of control devices can be connected via IO-Link:
- White spring-return button that can be illuminated with RGB LED;
- Two- or three-position selector switch with handle that can be illuminated with a white LED;
- White indicator light with RGB LED;
- Two- or three-position key selector;
- Emergency stop button with rotary or push-pull release;
- Hole blanking plug.

Examples of available configurations

Configuration with spring-return buttons only



		Connection	M12 connector, 4-pole
IO-Link	L +	+24 Vdc power supply	A1
	/	Not connected	A2
	L -	Power supply 0 V	A3
	C/Q	IO-Link data	A4

Description	Diagram	Connections
Illuminated button, spring-return white with RGB LED	/	L+ A1, N.C. A2, L- A3, C/Q A4
Illuminated button, spring-return white with RGB LED	/	
Illuminated button, spring-return white with RGB LED	/	
Connector: M12, 4-pole		

Configuration with 1 emergency stop button and spring-return buttons



		Connection	M12 connector, 4-pole
IO-Link	L +	+24 Vdc power supply	A1
	/	Not connected	A2
	L -	Power supply 0 V	A3
	C/Q	IO-Link data	A4

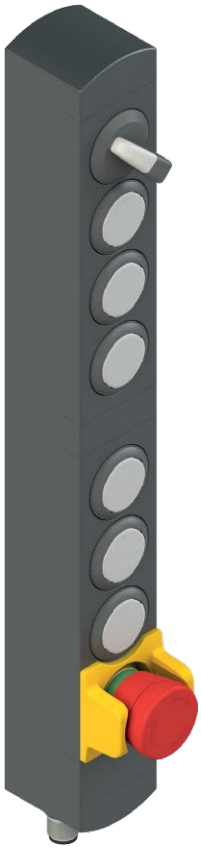
Description	Diagram	Connections
Illuminated button, spring-return white with RGB LED	/	L+ A1, N.C. A2, L- A3, C/Q A4, B1, B2, B3, B4
Illuminated button, spring-return white with RGB LED	/	
Emergency stop button with rotary release 2NC and guard	B1–B2, B3–B4	
Connector: 2 x M12, 4-pole	A, B	

3 devices	4 devices	6 devices	7 devices	8 devices
				
BN AC3EA08	BN AC4EA02	BN AC6EA09	BN AC7EA02	BN AC8EA02

3 devices	4 devices	6 devices	7 devices	8 devices
				
BN AC3EA09	BN AC4EA01	BN AC6EA07	BN AC7EA01	BN AC8EA01

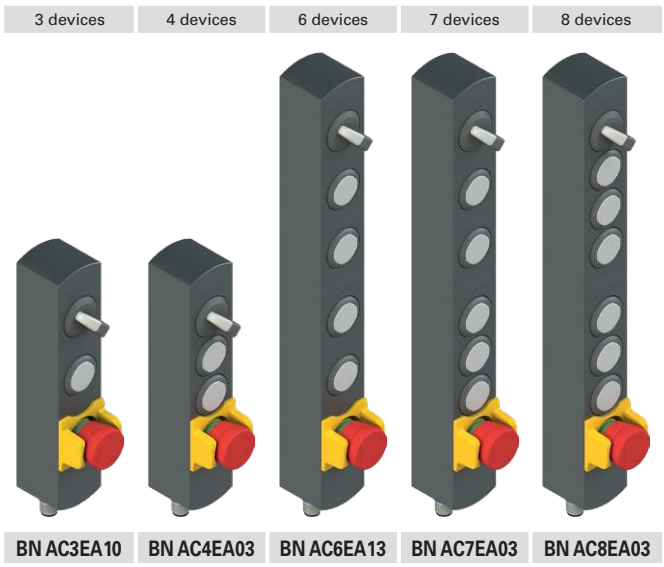
Examples of available configurations

Configurations with 1 two-position selector, 1 emergency stop button and spring-return buttons



		Connection	M12 connector, 4-pole
IO-Link	L +	+24 Vdc power supply	A1
	/	Not connected	A2
	L -	Power supply 0 V	A3
	C/Q	IO-Link data	A4

Description	Diagram	Connections
Illuminated two-position selector switch with handle, with white LED	/	L+ A1, N.C. A2, L- A3, C/Q A4
Illuminated button, spring-return white with RGB LED	/	B1, B2, B3, B4
Emergency stop button with rotary release 2NC and guard	B1 B2 B3 B4	
Connector: 2 x M12, 4-pole	A B	



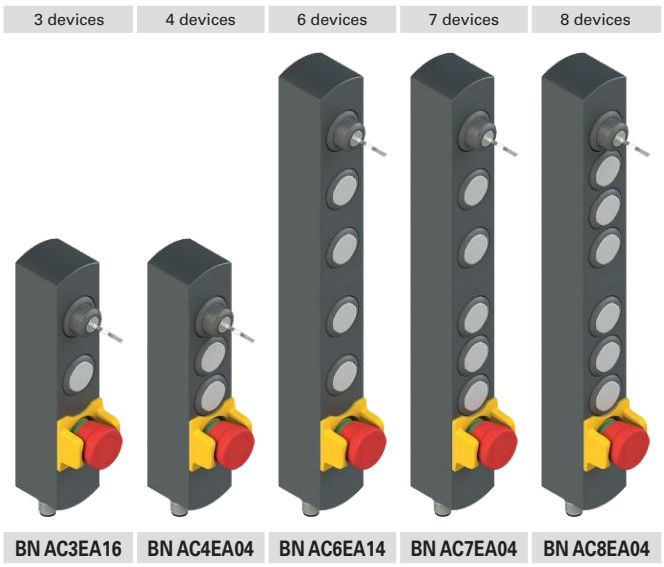
3 devices	4 devices	6 devices	7 devices	8 devices
BN AC3EA10	BN AC4EA03	BN AC6EA13	BN AC7EA03	BN AC8EA03

Configurations with 1 two-position key selector, 1 emergency stop button and spring-return buttons



		Connection	M12 connector, 4-pole
IO-Link	L +	+24 Vdc power supply	A1
	/	Not connected	A2
	L -	Power supply 0 V	A3
	C/Q	IO-Link data	A4

Description	Diagram	Connections
Two-position key selector switch	/	L+ A1, N.C. A2, L- A3, C/Q A4
Illuminated button, spring-return white with RGB LED	/	B1, B2, B3, B4
Emergency stop button with rotary release 2NC and guard	B1 B2 B3 B4	
Connector: 2 x M12, 4-pole	A B	



3 devices	4 devices	6 devices	7 devices	8 devices
BN AC3EA16	BN AC4EA04	BN AC6EA14	BN AC7EA04	BN AC8EA04

Examples of available configurations

Configurations with 1 three-position selector, 1 emergency stop button and spring-return buttons



		Connection	M12 connector, 4-pole
IO-Link	L +	+24 Vdc power supply	A1
	/	Not connected	A2
	L -	Power supply 0 V	A3
	C/Q	IO-Link data	A4

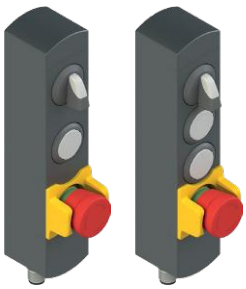
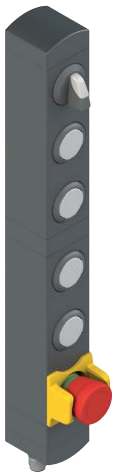
Description	Diagram	Connections
Three-position selector switch with handle that can be illuminated with a white LED	/	L+ A1, N.C. A2, L- A3, C/Q A4
Illuminated button, spring-return white with RGB LED	/	B1, B2, B3, B4
Emergency stop button with rotary release 2NC and guard	B1–B2, B3–B4	
Connector: 2 x M12, 4-pole	A, B	

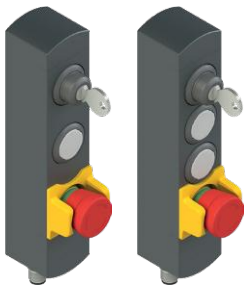
Configurations with 1 two-position key selector, 1 emergency stop button and spring-return buttons



		Connection	M12 connector, 4-pole
IO-Link	L +	+24 Vdc power supply	A1
	/	Not connected	A2
	L -	Power supply 0 V	A3
	C/Q	IO-Link data	A4

Description	Diagram	Connections
Three-position key selector switch	/	L+ A1, N.C. A2, L- A3, C/Q A4
Illuminated button, spring-return white with RGB LED	/	B1, B2, B3, B4
Emergency stop button with rotary release 2NC and guard	B1–B2, B3–B4	
Connector: 2 x M12, 4-pole	A, B	

3 devices	4 devices	6 devices	7 devices	8 devices
				
BN AC3EA17	BN AC4EA05	BN AC6EA08	BN AC7EA05	BN AC8EA05

3 devices	4 devices	6 devices	7 devices	8 devices
				
BN AC3EA18	BN AC4EA06	BN AC6EA10	BN AC7EA06	BN AC8EA06

Examples of available configurations

BN AC3EA13



	Connection		M12 connector, 4-pole
IO-Link	L +	+24 Vdc power supply	A1
	/	Not connected	A2
	L -	Power supply 0 V	A3
	C/Q	IO-Link data	A4

	Description	Diagram	Connections
Device 1	Illuminated button, spring-return white with RGB LED	/	L+ A1 N.C. A2 L- A3 C/Q A4
Device 2	Three-position selector switch with handle that can be illuminated with a white LED	/	
Device 3	Illuminated button, spring-return white with RGB LED	/	
Connector	M12, 4-pole		

BN AC3EA14

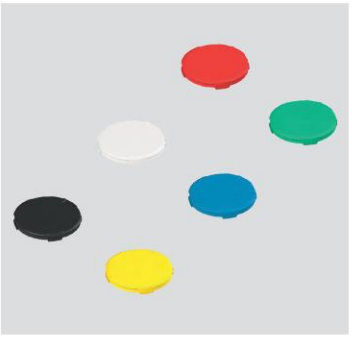


	Connection		M12 connector, 4-pole
IO-Link	L +	+24 Vdc power supply	A1
	/	Not connected	A2
	L -	Power supply 0 V	A3
	C/Q	IO-Link data	A4

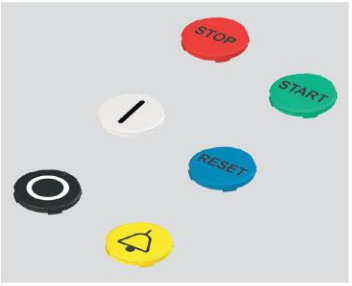
	Description	Diagram	Connections
Device 1	Illuminated two-position selector switch with handle, with white LED	/	L+ A1 N.C. A2 L- A3 C/Q A4
Device 2	Illuminated button, spring-return white with RGB LED	/	
Device 3	Illuminated button, spring-return white with RGB LED	/	
Connector	M12, 4-pole		

For dimensional drawings see page 322

Lenses for VN NG-AC•• series buttons



Lenses without engraving			
Article	Description	Colours	Pieces/ package
VN NG-AC01	Lens for flush button, black, without engraving	●	10
VN NG-AC02	Lens for flush button, white, without engraving	○	10
VN NG-AC03	Lens for flush button, red, without engraving	●	10
VN NG-AC04	Lens for flush button, green, without engraving	●	10
VN NG-AC05	Lens for flush button, yellow, without engraving	●	10
VN NG-AC06	Lens for flush button, blue, without engraving	●	10
VN NG-ACA0	6 lenses for flush button without engraving, colours: black, white, red, green, yellow and blue	●○●●●●	1



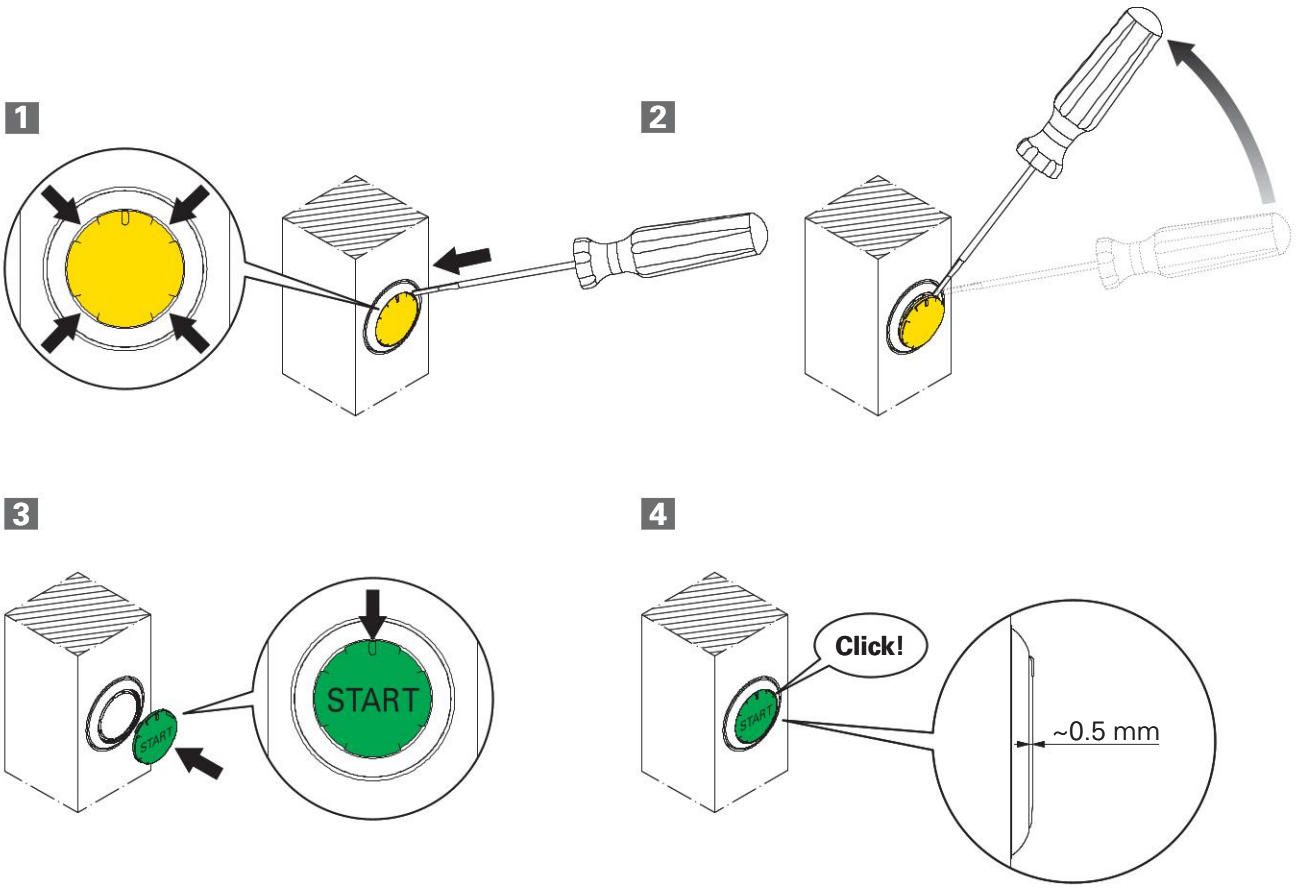
Lenses with engraving			
Article	Description	Colours	Pieces/ package
VN NG-AC01-●●●●	Lens for flush button, black, with engraving	●	1
VN NG-AC02-●●●●	Lens for flush button, white, with engraving	○	1
VN NG-AC03-●●●●	Lens for flush button, red, with engraving	●	1
VN NG-AC04-●●●●	Lens for flush button, green, with engraving	●	1
VN NG-AC05-●●●●	Lens for flush button, yellow, with engraving	●	1
VN NG-AC06-●●●●	Lens for flush button, blue, with engraving	●	1

The black lens cannot be used with illuminated buttons.
For ordering engraved lenses for buttons: replace the dots ●●●● in the article codes with the engraving code reported in the chapter Accessories on page 379.
Example: white lens for flush button with "O" engraving. VN NG-AC02-●●●● → VN NG-AC02-L1

How to replace lenses on buttons

The buttons in the BN series control device units feature replaceable lenses. When replacing the lens on a button, work must be performed with care to avoid irreversibly damaging the button. It is therefore recommended to carefully follow the sequence of steps described below for replacing the button lenses, and to avoid applying excessive force:

1. Locate one of the four slots on the lens.
2. Insert a small flathead screwdriver or cutter into one of the slots and gently pry off the old lens. Be careful not to scratch or damage the button during this step.
3. Position the new lens parallel to the button, using the reference notch on the button to align the lens correctly. For proper lens installation, make sure the reference notch faces upwards, as shown in the figure, or turn the lens in 90° steps with respect to the vertical axis. If the notch is not positioned correctly, the lens will not fit into the button and could be damaged.
4. Press down lightly and evenly on the lens until you hear a "click" confirming that the lens has snapped into place. Once properly installed, the lens should be perfectly horizontal and slightly raised — about 0.5 mm — above the edge of the button.



Spare part codes for control devices

	Description	Colour	Spare part number	Protrusion (x) mm
	Illuminated button, spring-return	White	VN NG-AC28121	3
	Indicator light	White	VN NG-AC26064	2.7
	Emergency stop button acc. to. EN ISO 13850 Rotary release Push-pull release	 Red Red	 VN NG-AC26052 VN NG-AC26055	26.4
	Illuminated selector switch with handle with 2 or 3 positions and transparent lens for LED    	 Black Black Black Black	 VN NG-AC26033 VN NG-AC26030 VN NG-AC26034 VN NG-AC26031	16.8
	Key selector switch, 2 or 3 positions   	 Black Black Black	 VN NG-AC26043 VN NG-AC26040 VN NG-AC26041	39 (a) 14 (b)
	Closing cap	Black	VN NG-AC26020	2.7
	Fixing key	Black	VN NG-AC26080	/

Legend:  Maintained  Spring-return Key extraction position (a) with key (b) without key

The codes in the table refer exclusively to spare parts for the same control device. They should not be understood as codes for alternative devices to modify the configuration of controls on the BN IO-Link control device unit.

To order buttons with engraving:
add the engraving code indicated in the chapter Accessories on page 379 to the article codes.
Example: Spring-return button with "O" engraving.
VN NG-AC28121 → VN NG-AC28121-L1