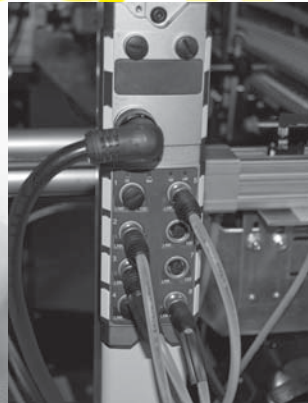
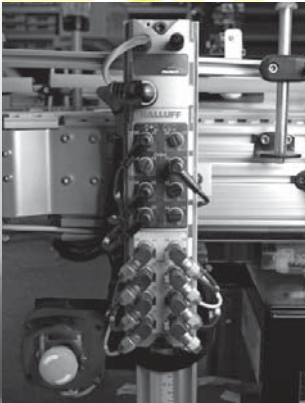




# *EtherNet/IP*<sup>TM</sup>



# EtherNet/IP

## Contents

In many areas, Ethernet/IP has replaced DeviceNet and has become a globally recognized standard for network technology. Based on Ethernet, Ethernet/IP is considerably faster than DeviceNet and facilitates the integration of drive technology.

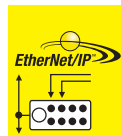
Furthermore, Ethernet/IP can be quickly installed and integrated in existing networks.

In addition to time savings and considerable cost savings comes the added benefit of ease of operation. Only Balluff products can block IP addresses on Ethernet modules with a display and protect against accidental changes. As a result, you not only increase safety, but also simplify maintenance. The innovative address plug also guarantees simple exchange of modules.

Use the extensive line of Ethernet/IP products for your high-performance system. Because only an optimized network guarantees maximum efficiency.



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### Shock and vibration

- EN 60068-2-6 Vibration (sinusoidal)
- EN 60068-2-27 Shocks
- EN 60068-2-29 Continuous shocks
- EN 60068-2-64 Broadband random noise

### Approvals



# Ethernet/IP

## Product topology



### Input

- 16 or 32 PNP inputs
- Short-circuit protected
- Short-circuit diagnostics



### Input/output

- 8 PNP inputs and 8 outputs or 16 PNP inputs and 16 outputs
- Short-circuit protected
- Short-circuit diagnostics
- Overload protection on point level
- Rated output current 2 A
- Overload diagnostics
- Resettable, latching overload diagnostics



### Output

- 8 or 16 outputs
- Overload protection on point level
- Rated output current 2 A
- Overload diagnostics
- Resettable, latching overload diagnostics



### Unmanaged switches

- Unmanaged switch with 9 ports
- Dual power sources
- 10/100 base Tx ports
- Supports half/full duplex
- Overload diagnostics
- M12 female, D-coded
- Store-and-Forward technology

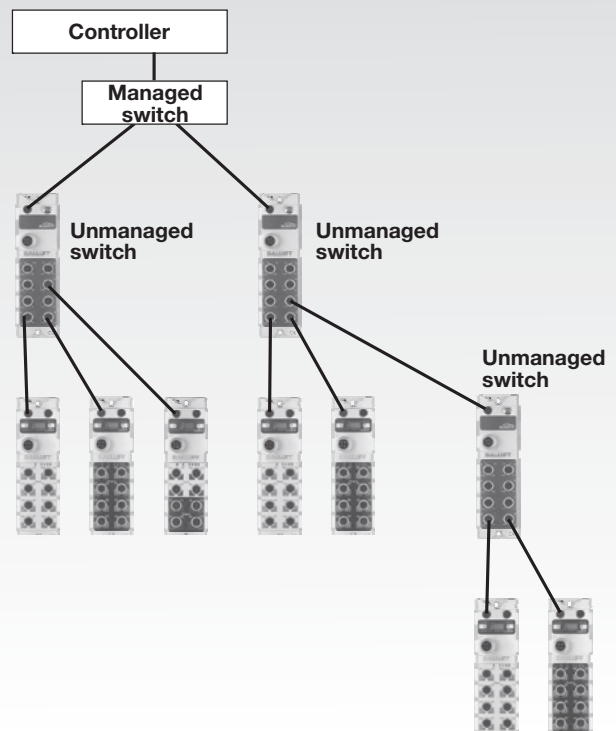
## Advantages of star topology

In industrial Ethernet networks, star topologies have prevailed over daisy chain topologies. Balluff only offers star topologies due to their greater reliability.

### The advantages in detail:

- Elimination of the single point of failure on the I/O-block and cable level
- Direct segment notification for rapid fault location
- Managed switches use IGMP snooping to increase the control efficiency of multicast traffic
- Managed switch functions are not available when integrating on device level

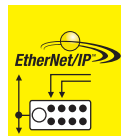
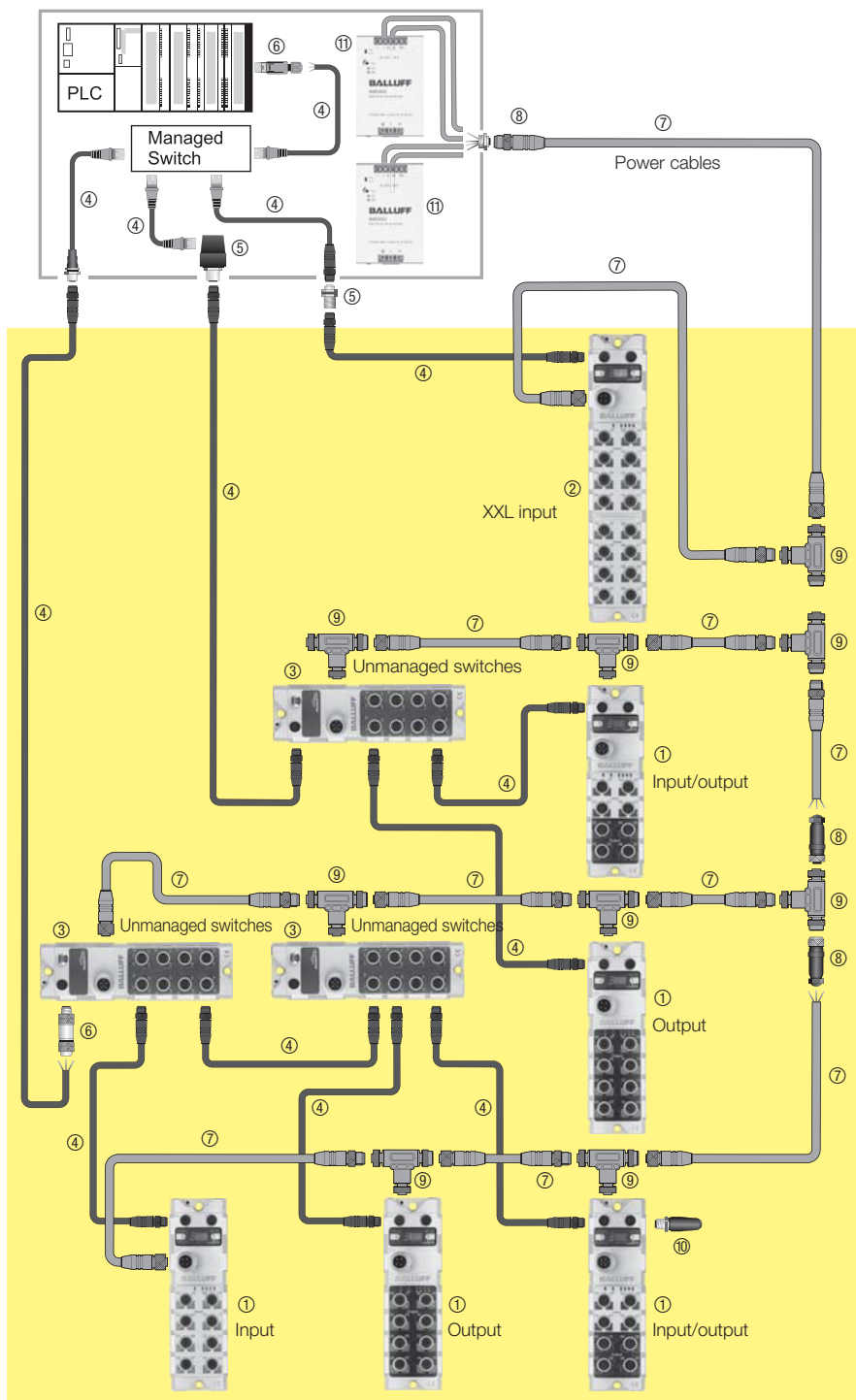
At first glance, the daisy chain topology appears to save money. However, implementing this topology requires the installation of a switch in each I/O block. This increases the cost of each I/O block, even if not all blocks (e.g. the last in a chain) can use this function. At the cost of modern dedicated switches, the cost savings are negligible. All possible savings are offset by technical disadvantages.



### Consistent communication all the way to the sensor

No other industrial network has seen the explosive level of growth experienced by Industrial Ethernet. Because consistent communication all the way to the sensor/actuator offers security. With the deterministic high-speed throughput and the proven reliability of the physical layer, Industrial Ethernet will continue to grow further in the coming years.

At Balluff, you will find a high-performance range of permanently mountable I/O blocks with compatible cables and accessory parts.



### Product topology

- Modules
- Unmanaged switches
- Bus connection cables
- Bus couplings
- Bus connectors
- Bus tee
- Bus device connectors
- Power cables
- Accessories
- Bitmaps and technical accessories

- ① **Ethernet/IP modules**  
Page 90
- ② **Ethernet/IP-XXL modules**  
Page 91
- ③ **Ethernet/IP unmanaged switch**  
Page 95
- ④ **Bus cables**  
Page 96
- ⑤ **Bus couplings and pass-thrus**  
Page 98
- ⑥ **Field-attachable bus connectors**  
Page 100
- ⑦ **Power cables**  
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- ⑧ **Accessories**  
Page 112
- ⑨ **Bus tee**  
Page 102
- ⑩ **IPAP**  
Page 110
- ⑪ **BAE power supplies**  
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# Ethernet/IP

## Integrated communication saves costs

Ethernet/IP has developed into a globally recognized standard for network technology that links field devices to centralized control solutions. Ethernet/IP can be quickly installed and integrated in existing networks.

Balluff Ethernet/IP comprises two versions of permanently mountable I/O blocks, unmanaged switches, network cables and accessories. At the heart of the extensive line of Balluff products are I/O blocks. They are characterized by low startup costs per point and are designed to save money through maximum system readiness and simple maintenance throughout the entire service life of the system.

### I/O-block network functions

- Simple, flexible IP addressing method
- – BOOTP/DHCP
  - IP 67 address plug (IPAP) for fast changes
  - Addressable display (Series 100 only)
  - Web server interface
- Certified by ODVA to ensure reliable operation and full interoperability
- Operation with transfer rates of 10 Mbit/s and 100 Mbit/s for maximum throughput (automatic detection)
- Robust M12 Ethernet connection (D-coded)
- Supports star topology for increased reliability, exact troubleshooting and fast commissioning

### Clearly visible status LEDs

Low-quality LEDs that are often difficult to identify under demanding production conditions perform poorly when used in high-speed applications. Unlike Balluff status LEDs, which are large, bright, highly visible and provide maximum assistance. Balluff quality will help you complete setup and maintenance tasks and reduce machine downtimes with ease.



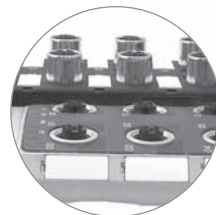
### Robust, full-metal housing

The fully encapsulated housing can withstand impacts, shaking, corrosive fluids, incorrect assembly as well as people treading on it and costs the same as a plastic housing.



### Innovative housing design

The extra-flat profile reduces potential dangers posed by cables. Rounded corners offer highly visible locations for channel markers and two mounting points are sufficient to secure the robust metal housing.



### Powerful and safe outputs

With an output current of up to **2 amps**, Balluff output modules are capable of driving almost any load. Each output also offers an overload protection with LED indicator and a memory feature for easy troubleshooting.

### Local storage of IP addresses

An IP address, subnet mask and gateway address of the module are stored in an IP 67 address plug (IPAP). The IPAP incorporates user-defined LEDs that offer additional functions (for support during troubleshooting) and a strap for attachment to the network cable.

### User-defined LEDs (100 series)

Like the IPAP, the display has red and green LEDs for simplifying troubleshooting.

### Addressable display (Series 100 only)

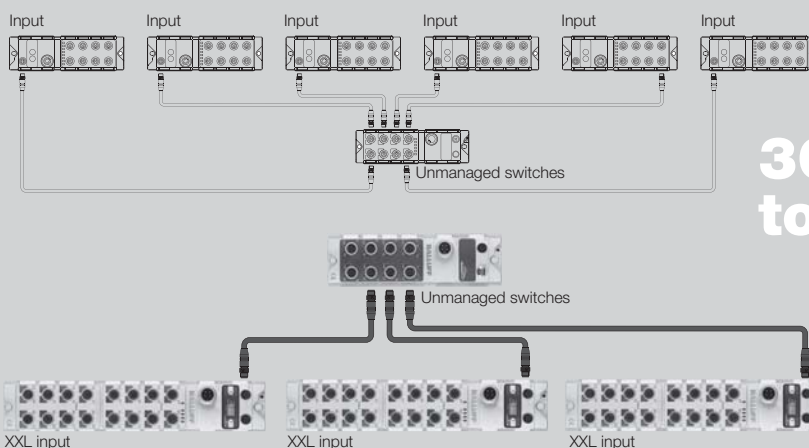
IP address, subnet mask and gateway address appear on the illuminated display. Push buttons can be used to set each octet of the addresses specified above. The display can be disabled via the PLC (controller).

## High-density XXL-I/O blocks reduce costs

High-density I/O blocks reduce per point costs because they consolidate communication hardware costs in a single unit. For example, if two 16-point input blocks are replaced by a 32-point input block, the cost for each point is reduced by 30% for the I/O blocks alone!

### More savings

- Switch utilization reduced by 13 % – renders one port superfluous
- Network cables are unnecessary
- Auxiliary power cables no longer needed
- 20 % smaller mounting surface



Product topology

### Modules

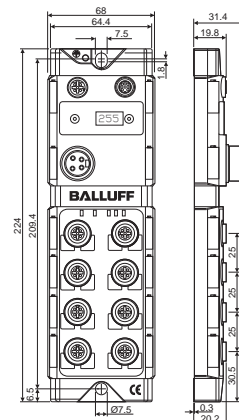
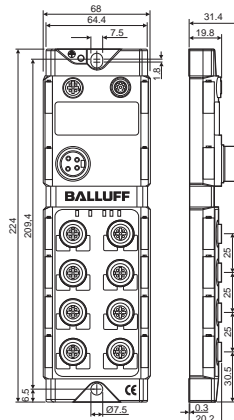
- Unmanaged switches
- Bus connection cables
- Bus couplings
- Bus connectors
- Bus tee
- Bus device connectors
- Power cables
- Accessories
- Bitmaps and technical accessories

**more added value**  
With diagnostics and address settings!



IP  
SN = 168  
GW 3 2 1 0

P/N	16 inputs	16 inputs	
Display	No	Yes	
<b>Ordering code</b>	<b>BNI0010</b>	<b>BNI0014</b>	
Part number	BNI EIP-104-000-Z016	BNI EIP-104-100-Z016	
Power supply U <sub>B</sub>	24 V DC	24 V DC	
Module current consumption	120 mA...130 mA	120 mA...130 mA	
AUX input/output power status: U <sub>A</sub> LED	U <sub>S</sub> /no	U <sub>S</sub> /no	
Module status indicator: Mod LED	Yes	Yes	
Network status indicator: Net LED	Yes	Yes	
Port status indicator	Black, red, yellow	Black, red, yellow	
Connection: Fieldbus	M12, D-coded, female	M12, D-coded, female	
Connection: AUX power	7/8", male, 4-pin	7/8", male, 4-pin	
Connection: I/O ports	M12, A-coded, female	M12, A-coded, female	
No. of I/O ports	8	8	
No. of inputs	16	16	
No. of outputs			
Max. load current/channel	200 mA	200 mA	
Current rating/channel			
Total sensor current/module	9 A	9 A	
Total actuator current/module			
Degree of protection	IP 67	IP 67	
Operating temperature	-5...+55 °C	-5...+55 °C	
Storage temperature range	-25...+70 °C	-25...+70 °C	
Housing material	Nickel-plated Gd-Zn	Nickel-plated Gd-Zn	
Transfer rates	10/100 Mbps, autom. detection, full-duplex		
IP address space	IPv4	IPv4	
Addressing methods	BOOTP, DHCP, IP address plug, USB tool, function block	BOOTP, DHCP, IP address plug, USB tool, function block, display	
Max. switching frequency	100 Hz ohm active load, 1...10 Hz inductive load		
Outputs reset using software			
Overload protection			
Short-circuit protected	Yes	Yes	
Input/output type	PNP inputs	PNP inputs	
Approvals	ODVA, UL-CUL, CSA, CE	ODVA, UL-CUL, CSA, CE	



All modules include  
4 screw plugs  
and 1 label set.

# Ethernet/IP Modules

**more added value**

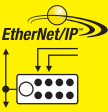
Up to 30 % cost savings!  
With easy, flexible IP addressing, a display for enhanced user comfort and a diagnostic function, the Balluff Ethernet/IP XXL offers more than other systems.



IP  
SN  
GW  
168  
3 2 1 0



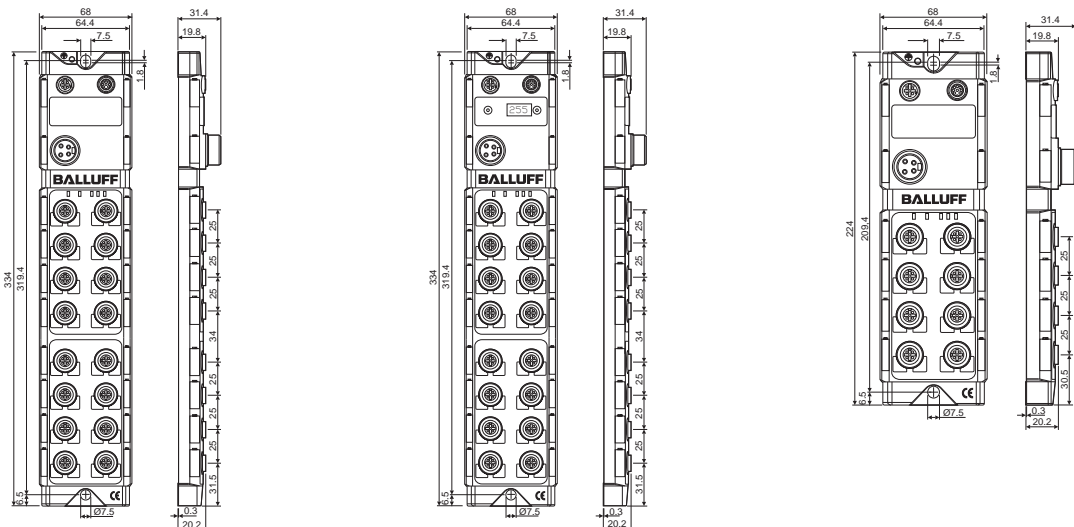
32 inputs XXL	32 inputs XXL	8 outputs
No	Yes	No
<b>BNI000M</b>	<b>BNI0018</b>	<b>BNI0011</b>
BNI EIP-105-000-Z010	BNI EIP-105-100-Z010	BNI EIP-202-000-Z016
24 V DC	24 V DC	24 V DC
120 mA...130 mA	120 mA...130 mA	
U <sub>S</sub> /no	U <sub>S</sub> /no	U <sub>S</sub> /U <sub>A</sub>
Yes	Yes	Yes
Yes	Yes	Yes
Black, red, yellow	Black, red, yellow	Black, red, yellow
M12, D-coded, female	M12, D-coded, female	M12, D-coded, female
7/8", male, 4-pin	7/8", male, 4-pin	7/8", male, 4-pin
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
16	16	8
32	32	8
		8
200 mA	200 mA	2 A
9 A	9 A	9 A
IP 67	IP 67	IP 67
-5...+55 °C	-5...+55 °C	-5...+55 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C
Nickel-plated Gd-Zn	Nickel-plated Gd-Zn	Nickel-plated Gd-Zn
10/100 Mbps, autom. detection, full-duplex		
IPv4	IPv4	IPv4
BOOTP, DHCP, IP address plug, USB tool, function block	BOOTP, DHCP, IP address plug, USB tool, function block, display	BOOTP, DHCP, IP address plug, USB tool, function block
		Yes
		Yes
Yes	Yes	
PNP inputs	PNP inputs	Outputs
ODVA, UL-CUL, CSA, CE	ODVA, UL-CUL, CSA, CE	ODVA, UL-CUL, CSA, CE



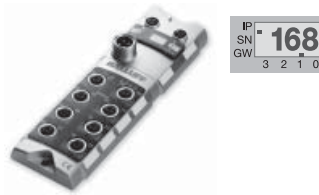
Product topology

### Modules

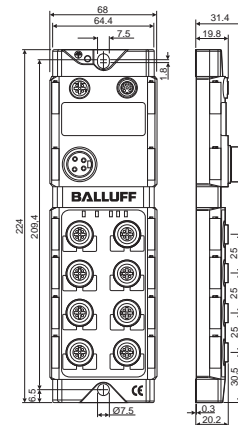
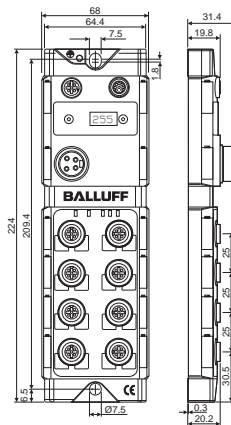
- Unmanaged switches
- Bus connection cables
- Bus couplings
- Bus connectors
- Bus tee
- Bus device connectors
- Power cables
- Accessories
- Bitmaps and technical accessories





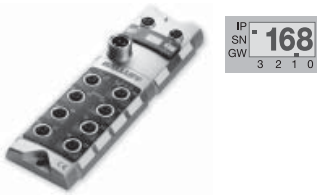


P/N	8 outputs	16 outputs	
Display	Yes	No	
<b>Ordering code</b>	<b>BNI0015</b>	<b>BNI0012</b>	
Part number	BNI EIP-202-100-Z016	BNI EIP-206-000-Z016	
Power supply $U_B$	24 V DC	24 V DC	
Module current consumption	120 mA...130 mA	120 mA...130 mA	
AUX output power status: $U_A$ LED	Yes	Yes	
Module status indicator: Mod LED	Yes	Yes	
Network status indicator: Net LED	Yes	Yes	
Port status indicator	Black, red, yellow	Black, red, yellow	
Connection: Fieldbus	M12, D-coded, female	M12, D-coded, female	
Connection: AUX power	7/8", male, 4-pin	7/8", male, 4-pin	
Connection: I/O ports	M12, A-coded, female	M12, A-coded, female	
No. of I/O ports	8	8	
No. of inputs			
No. of outputs	8	16	
Max. load current/channel			
Current rating/channel	2 A	2 A	
Total sensor current/module	9 A	9 A	
Total actuator current/module	9 A	9 A	
Degree of protection	IP 67	IP 67	
Operating temperature	-5...+55 °C	-5...+55 °C	
Storage temperature range	-25...+70 °C	-25...+70 °C	
Housing material	Nickel-plated Gd-Zn	Nickel-plated Gd-Zn	
Transfer rates	10/100 Mbps, autom. detection, full-duplex		
IP address space	IPv4	IPv4	
Addressing methods	BOOTP, DHCP, IP address plug, USB tool, function block, display	BOOTP, DHCP, IP address plug, USB tool, function block	
Max. switching frequency	100 Hz ohm active load, 1...10 Hz inductive load		
Outputs reset using software	Yes	Yes	
Overload protection	Yes	Yes	
Short-circuit protected			
Input/output type	Outputs	Outputs	
Approvals	ODVA, UL-CUL, CSA, CE	ODVA, UL-CUL, CSA, CE	



All modules include  
4 screw plugs  
and 1 label set.

# Ethernet/IP Modules

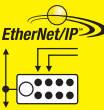


IP  
SN  
GW  
= 168  
3 2 1 0



IP  
SN  
GW  
= 168  
3 2 1 0

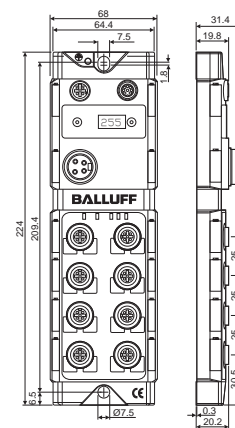
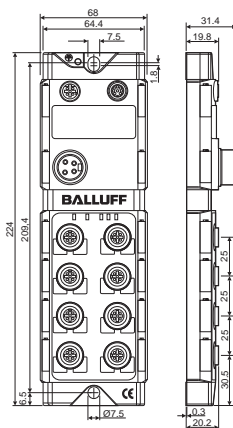
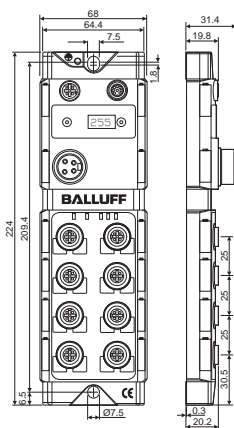
16 outputs	8 inputs/8 outputs	8 inputs/8 outputs
Yes	No	Yes
<b>BNI0016</b>	<b>BNI0013</b>	<b>BNI0017</b>
BNI EIP-206-100-Z016	BNI EIP-305-000-Z016	BNI EIP-305-100-Z016
24 V DC	24 V DC	24 V DC
120 mA...130 mA	120 mA...130 mA	120 mA...130 mA
Yes	Yes	Yes
Yes	Yes	Yes
Yes	Yes	Yes
Black, red, yellow	Black, red, yellow	Black, red, yellow
M12, D-coded, female	M12, D-coded, female	M12, D-coded, female
7/8", male, 4-pin	7/8", male, 4-pin	7/8", male, 4-pin
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
8	8	8
16	8	8
2 A	200 mA	200 mA
9 A	2 A	2 A
9 A	9 A	9 A
9 A	9 A	9 A
IP 67	IP 67	IP 67
-5...+55 °C	-5...+55 °C	-5...+55 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C
Nickel-plated Gd-Zn	Nickel-plated Gd-Zn	Nickel-plated Gd-Zn
10/100 Mbps, autom. detection, full-duplex		
IPv4	IPv4	IPv4
BOOTP, DHCP, IP address plug, USB tool, function block, display	BOOTP, DHCP, IP address plug, USB tool, function block	BOOTP, DHCP, IP address plug, USB tool, function block, display
Yes	Yes	Yes
Yes	Yes	Yes
	Yes	Yes
Outputs	PNP inputs/outputs	PNP inputs/outputs
ODVA, UL-CUL, CSA, CE	ODVA, UL-CUL, CSA, CE	ODVA, UL-CUL, CSA, CE

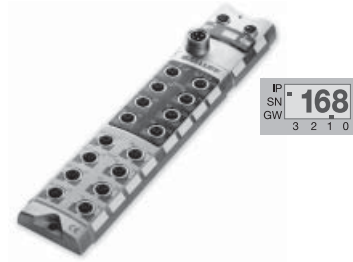


Product topology

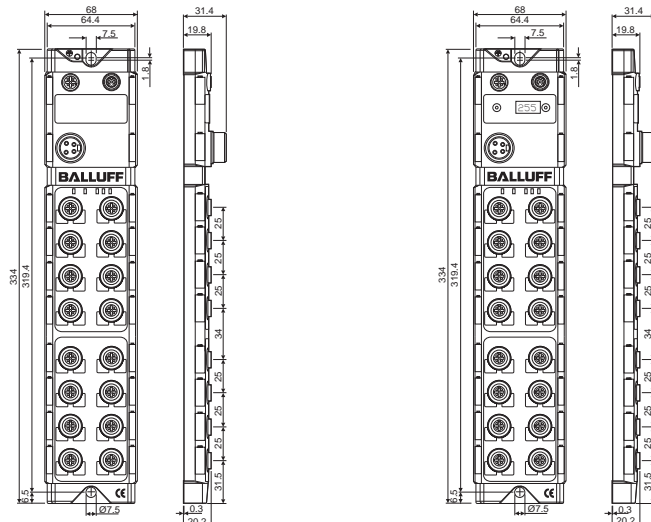
## Modules

- Unmanaged switches
- Bus connection cables
- Bus couplings
- Bus connectors
- Bus tee
- Bus device connectors
- Power cables
- Accessories
- Bitmaps and technical accessories





P/N	16 inputs/16 outputs XXL	16 inputs/16 outputs XXL
Display	No	Yes
<b>Ordering code</b>	<b>BNI000L</b>	<b>BNI0019</b>
Part number	BNI EIP-306-000-Z010	BNI EIP-306-100-Z010
Power supply $U_B$	24 V DC	24 V DC
AUX output power status: $U_A$ LED	Yes	Yes
Module status indicator: Mod LED	Yes	Yes
Network status indicator: Net LED	Yes	Yes
Port status indicator	Black, red, yellow	
Connection: Fieldbus	M12, D-coded, female	M12, D-coded, female
Connection: AUX power	7/8", male, 4-pin	7/8", male, 4-pin
Connection: I/O ports	M12, A-coded, female	M12, A-coded, female
No. of I/O ports	16	16
No. of inputs	16	16
No. of outputs	16	16
Max. load current/channel	200 mA	200 mA
Current rating/channel	2 A	2 A
Total sensor current/module	9 A	9 A
Total actuator current/module	9 A	9 A
Module current consumption	120 mA...130 mA	120 mA...130 mA
Degree of protection	IP 67	IP 67
Operating temperature	-5...+55 °C	-5...+55 °C
Storage temperature range	-25...+70 °C	-25...+70 °C
Housing material	Nickel-plated Gd-Zn	Nickel-plated Gd-Zn
Transfer rates	10/100 Mbps, autom. detection, full-duplex	
IP address space	IPv4	IPv4
Addressing methods	BOOTP, DHCP, IP address plug, USB tool, function block	BOOTP, DHCP, IP address plug, USB tool, function block, display
Max. switching frequency	100 Hz ohm active load, 1...10 Hz inductive load	
Outputs reset using software	Yes	Yes
Overload protection	Yes	Yes
Short-circuit protected	Yes	Yes
Input type	PNP	PNP
Approvals	ODVA, UL-CUL, CSA, CE	ODVA, UL-CUL, CSA, CE



All modules include  
4 screw plugs  
and 1 label set.



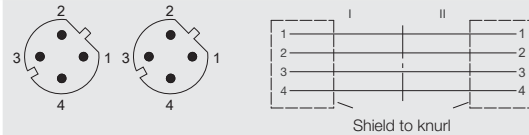
# Ethernet/IP

M12 and RJ45 bus connection cables

**more added value**  
From module to module

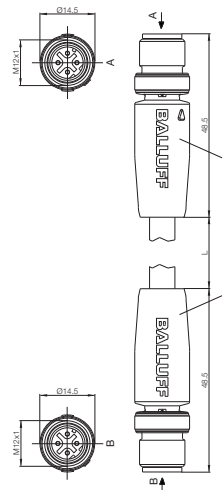


Pin diagram



P/N	M12 male straight/M12 male straight
Coding	D-coded
Nominal voltage	60 V AC/DC
No. of wires × cross-section	4 × 22 AWG
Degree of protection	IP 68
Cable	Molded connector
Ambient operating temperature	-20...+60 °C

Cable material	Color	Length	Ordering code
PUR shielded	Green	0.6 m	<b>BCC04K0</b> Part number BCC M414-M414-6D-331-PS54T2-006
PUR shielded	Green	2 m	<b>BCC04K1</b> BCC M414-M414-6D-331-PS54T2-020
PUR shielded	Green	5 m	<b>BCC04K2</b> BCC M414-M414-6D-331-PS54T2-050
PUR shielded	Green	10 m	<b>BCC04K3</b> BCC M414-M414-6D-331-PS54T2-100
PUR shielded	Green	15 m	<b>BCC04ZH</b> BCC M414-M414-6D-331-PS54T2-150
PUR shielded	Green	20 m	<b>BCC04K4</b> BCC M414-M414-6D-331-PS54T2-200
PUR shielded	Green	30 m	<b>BCC04K5</b> BCC M414-M414-6D-331-PS54T2-300

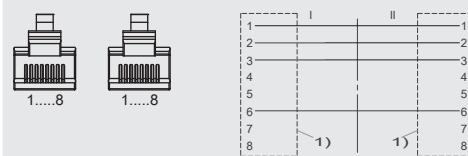
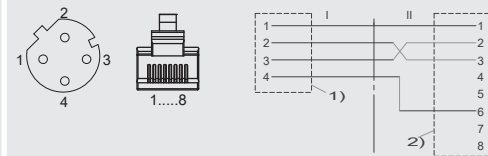


# Ethernet/IP

## M12 and RJ45

### bus connection cables

**more added value**  
From bus to controller



M12 male straight/RJ45 male straight  
D-coded/no coding  
60 V AC/DC  
4x 22 AWG  
IP 68/IP 20  
Molded connector/field-attachable  
-20...+60 °C

RJ45 male straight/RJ45 male straight  
No coding  
60 V AC/DC  
4x 22 AWG  
IP 20  
Molded connector  
-20...+60 °C

#### Ordering code

Part number

**BCC04K6**  
BCC M414-E834-8G-668-PS54T2-006

**BCC04K7**  
BCC M414-E834-8G-668-PS54T2-020

**BCC04K8**  
BCC M414-E834-8G-668-PS54T2-050

**BCC04K9**  
BCC M414-E834-8G-668-PS54T2-100

**BCC04ZJ**  
BCC M414-E834-8G-668-PS54T2-150

**BCC04KA**  
BCC M414-E834-8G-668-PS54T2-200

**BCC04KC**  
BCC M414-E834-8G-668-PS54T2-300

**BCC06LN**  
BCC E834-E834-90-334-PS54T-006

**BCC06LP**  
BCC E834-E834-90-334-PS54T2-020

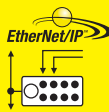
**BCC06LR**  
BCC E834-E834-90-334-PS54T2-050

**BCC06LT**  
BCC E834-E834-90-334-PS54T2-100

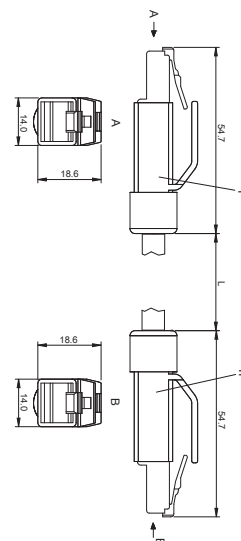
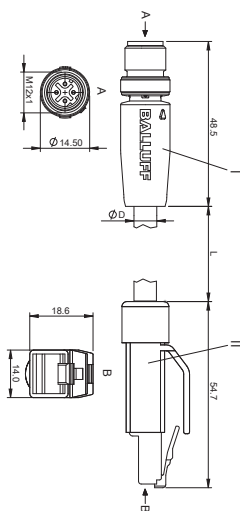
**BCC06LU**  
BCC E834-E834-90-334-PS54T2-150

**BCC06LW**  
BCC E834-E834-90-334-PS54T2-200

**BCC06LY**  
BCC E834-E834-90-334-PS54T2-300



Product topology  
Modules  
Unmanaged switches  
**Bus connection cables**  
Bus couplings  
Bus connectors  
Bus tee  
Bus device connectors  
Power cables  
Accessories  
Bitmaps and technical accessories





Pin diagram		
P/N	M12 female straight/RJ45 female straight, pass-thru	M12 female straight/RJ45 right angle, pass-thru
Coding	D-coded/no coding	D-coded/no coding
Nominal voltage	60 V AC/DC	60 V AC/DC
No. of wires × cross-section		
Degree of protection	IP 20	IP 20
Ambient operating temperature	-25...+85 °C	-25...+85 °C
Mounting thread	PG9	PG9

**Ordering code**

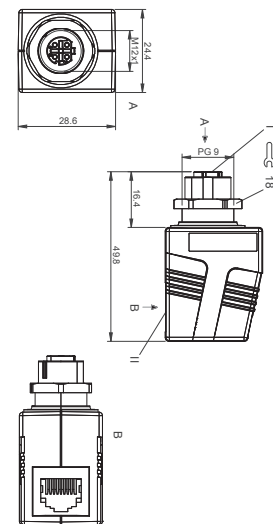
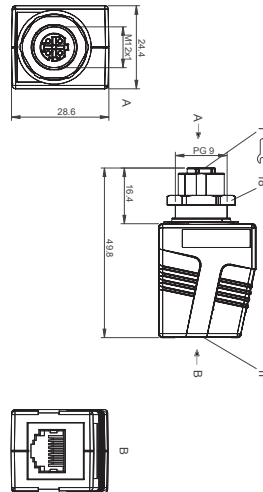
Part number

**BCC03WW**

BCC M414-E814-BG-RM003-000

**BCC03WY**

BCC M424-E814-BG-RM003-000



# Ethernet/IP

## Bus couplings and pass-thrus



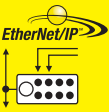
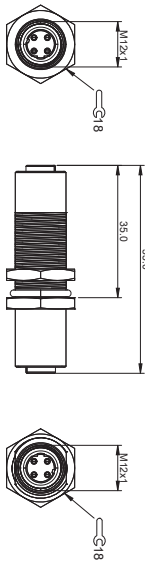
M12 female straight/M12 female straight,  
pass-thru  
D-coded  
60 V AC/DC  
  
IP 67  
-20...+60 °C  
PG9

### Ordering code

Part number

**BCC03WU**

BCC M414-M414-5D-RM002-000



- Product topology
- Modules
- Unmanaged switches
- Bus connection cables
- Bus couplings**
- Bus connectors
- Bus tee
- Bus device connectors
- Power cables
- Accessories
- Bitmaps and technical accessories



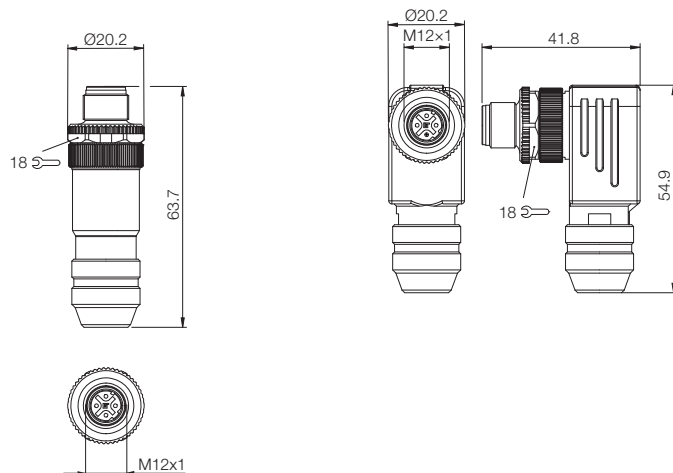
# Ethernet/IP

M12 bus connector, 4-pin, D-coded, customized assembly, shieldable



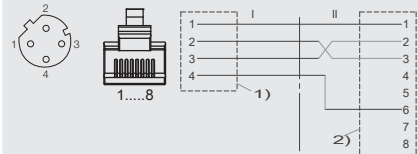
View of female/male side			
Connector	Male straight M12	Male right-angle M12	
Version	D-coded, 4-pin	D-coded, 4-pin	
<b>Ordering code</b>	<b>BCC03WZ</b>	<b>BCC03Y0</b>	
Part number	BCC M474-0000-2D-000-51X475-000	BCC M484-0000-2D-000-51X475-000	
Nominal voltage	60 V AC/DC	60 V AC/DC	
Number of connections	4	4	
No. of wires × cross-section	4×0.75 mm <sup>2</sup>	4×0.75 mm <sup>2</sup>	
Cable diameter	Max. 8.0 mm	Max. 8.0 mm	
Connection	Cage clamp	Screw plug	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature range T <sub>a</sub>	-25...+85 °C	-25...+85 °C	
Housing material	Brass	Brass	
Shielded version	Yes*	Yes*	

\*Knurled ring used for shielding



# Ethernet/IP

M12 bus connector, 4-pin, D-coded, customized assembly, shieldable



Female straight M12  
D-coded,  
4-pin

Female right-angle M12  
D-coded,  
4-pin

Male straight RJ-45  
No coding

**BCC03Y1**

**BCC03Y2**

**BCC06FH**

BCC M474-0000-1D-000-51X475-000

BCC M484-0000-1D-000-51X475-000

BCC E834-0000-20-000-53X4T2-000

60 V AC/DC

60 V AC/DC

60 V AC/DC

4

4

8

4x0.75 mm<sup>2</sup>

4x0.75 mm<sup>2</sup>

Max. 8.0 mm

Max. 8.0 mm

Cage clamp

Screw plug

Insulation displacement IDC

IP 67

IP 67

IP 20

-25...+85 °C

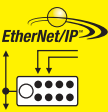
-25...+85 °C

Brass

Brass

Yes\*

Yes\*



Product topology

Modules

Unmanaged switches

Bus connection cables

Bus couplings

**Bus connectors**

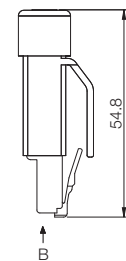
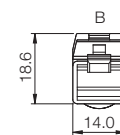
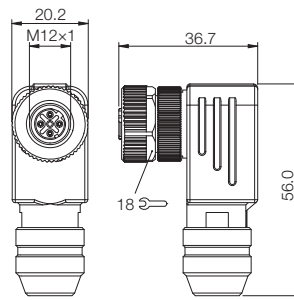
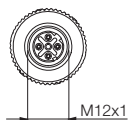
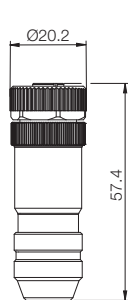
Bus tee

Bus device connectors

Power cables

Accessories

Bitmaps and technical accessories

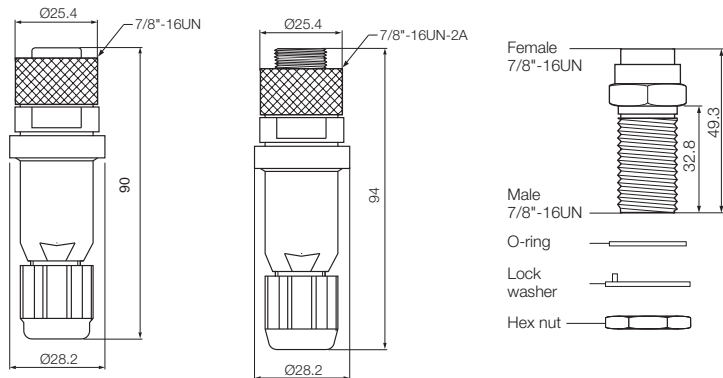


# Ethernet/IP

Bus tee, field-attachable bus connector, 7/8", 4-pin



P/N	Tee	Field attachable Connector	Field attachable connectors	Female/male bulkhead
Configuration	Mini pass-thru, mini drop	Female mini	Male mini	Mini pass-thru
Connector	Female/male, 4-pin, mini size A 7/8" Female mini size A 7/8"	Female 4-pin, mini size A 7/8"	Male 4-pin, mini size A 7/8"	Female mini size A 7/8" Male mini size A 7/8"
<b>Ordering code</b>	<b>BCC07WW</b>	<b>BCC06LA</b>	<b>BCC06LC</b>	<b>BCC029K</b>
Part number	BDN T-PTE-AA-01	C05 AN-A4-13	C05 CN-A4-13	R05 EN-04-T
Nominal voltage	50 V	600 V	600 V	600 V
Current rating	8 A	8 A	8 A	10 A
Housing material	TPE	Polyamide	Polyamide	Epoxide-coated zinc
Connections		Screw terminals	Screw terminals	
Ambient temperature range T <sub>a</sub>	-20...+ +80 °C	-40°C... +80 °C	-40°C... +80 °C	-28°C... +40 °C
Max. cable cross-section		24...15 AWG	24...15 AWG	16 AWG
Cable diameter		5...12 mm	5...12 mm	
Mounting thread				1/2"-14 NPT



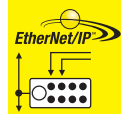
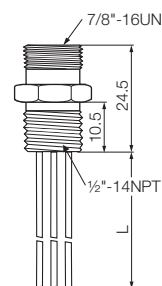
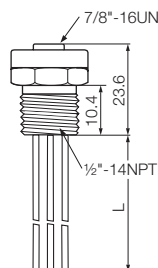
# Ethernet/IP

Bus device connectors, 7/8", 4-pin



P/N	Female receptacle	Male receptacle
Configuration	Mini female	Mini male
Connector	Female 4-pin, mini size A 7/8"	Male 4-pin, mini size A 7/8"
Nominal voltage	600 V	600 V
Current rating	10 A	10 A
Housing material	Epoxide-coated zinc	Epoxide-coated zinc
Ambient temperature range T <sub>a</sub>	-28...+40 °C	-28...+40 °C
Max. cable cross-section	16 AWG	16 AWG
Mounting thread	1/2"-14 NPT	1/2"-14 NPT

Standard lengths	Ordering code	
	Part number	
0.3 m	<b>BCC06LF</b> R05 AA-04-B-16A-003M	<b>BCC06LK</b> R05 CA-04-B-16A-003M
1 m	<b>BCC06LH</b> R05 AA-04-B-16A-010M	<b>BCC06LL</b> R05 CA-04-B-16A-010M
2 m	<b>BCC06L5</b> R05 AA-04-B-16A-020M	<b>BCC06LM</b> R05 CA-04-B-16A-020M



- Product topology
- Modules
- Unmanaged switches
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- Bus connectors**
- Bus tee**
- Bus device connectors**
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- Accessories
- Bitmaps and technical accessories

# Ethernet/IP

Power cables 7/8", 4-pin

**more added value**

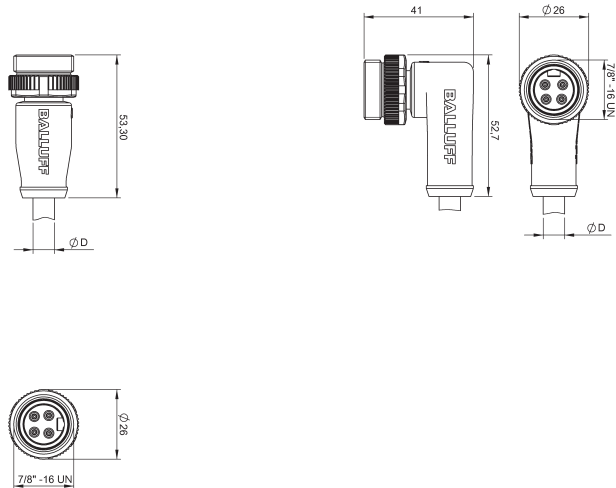
For improved fitting accuracy!  
 Connector with metal thread – adapted perfectly to  
 Ethernet/IP modules. Metal on metal guarantees durability  
 and a high degree of protection in all applications!



Connector diagram and wiring	<p>PIN 1: brown              PIN 2: white              PIN 3: blue              PIN 4: black</p>	<p>PIN 1: brown              PIN 2: white              PIN 3: blue              PIN 4: black</p>	
Version	<b>Male</b>	<b>Male</b>	
Power supply max. $U_B$ /current rating	300 V DC/9 A	300 V DC/9 A	
Cable	PUR	PUR	
No. of wires × cross-section	4×1.5 mm <sup>2</sup>	4×1.5 mm <sup>2</sup>	
Degree of protection as per IEC 60529	IP 68	IP 68	
Ambient temperature range $T_a$	-25...+80° C	-25...+80° C	
Housing material	PUR	PUR	
Knurled ring	Brass	Brass	

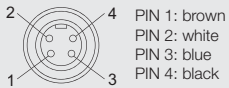
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	<b>BCC06HL</b>	<b>BCC06HP</b>
			BCC A314-000-20-003-PX04A5-020	BCC A324-0000-20-003-PX04A5-020
PUR	Black	5 m	<b>BCC06HM</b>	<b>BCC06HR</b>
			BCC A314-000-20-003-PX04A5-050	BCC A324-0000-20-003-PX04A5-050
PUR	Black	10 m	<b>BCC06HN</b>	<b>BCC06HT</b>
			BCC A314-000-20-003-PX04A5-100	BCC A324-0000-20-003-PX04A5-100

Other cable materials, colors and lengths on request.

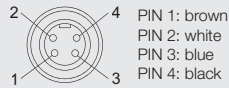


# Ethernet/IP

## Power cables 7/8", 4-pin



PIN 1: brown  
PIN 2: white  
PIN 3: blue  
PIN 4: black



PIN 1: brown  
PIN 2: white  
PIN 3: blue  
PIN 4: black

### Female

300 V DC/9 A

PUR

4x1.5 mm<sup>2</sup>

IP 68

-25...+80° C

PUR

Brass

### Female

300 V DC/9 A

PUR

4x1.5 mm<sup>2</sup>

IP 68

-25...+80° C

PUR

Brass

### Ordering code

Part number

#### BCC06HU

BCC A314-0000-10-003-PX04A5-020

#### BCC06HW

BCC A314-0000-10-003-PX04A5-050

#### BCC06HY

BCC A314-0000-10-003-PX04A5-100

#### BCC06HZ

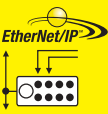
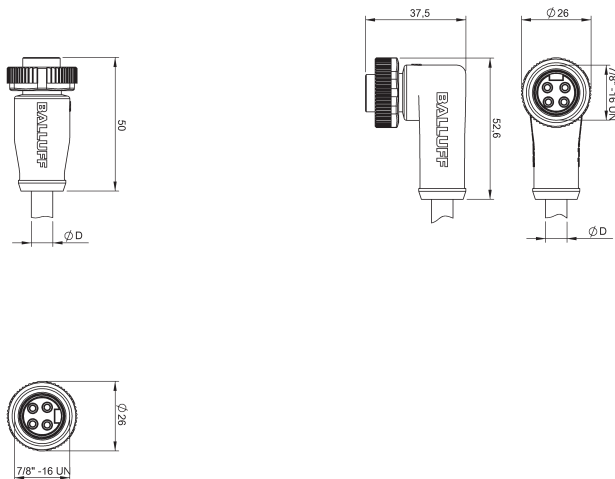
BCC A324-0000-10-003-PX04A5-020

#### BCC06J0

BCC A324-0000-10-003-PX04A5-050

#### BCC06J1

BCC A324-0000-10-003-PX04A5-100



- Product topology
- Modules
- Unmanaged switches
- Bus connection cables
- Bus couplings
- Bus connectors
- Bus tee
- Bus device connectors
- Power cables**
- Accessories
- Bitmaps and technical accessories

# Ethernet/IP

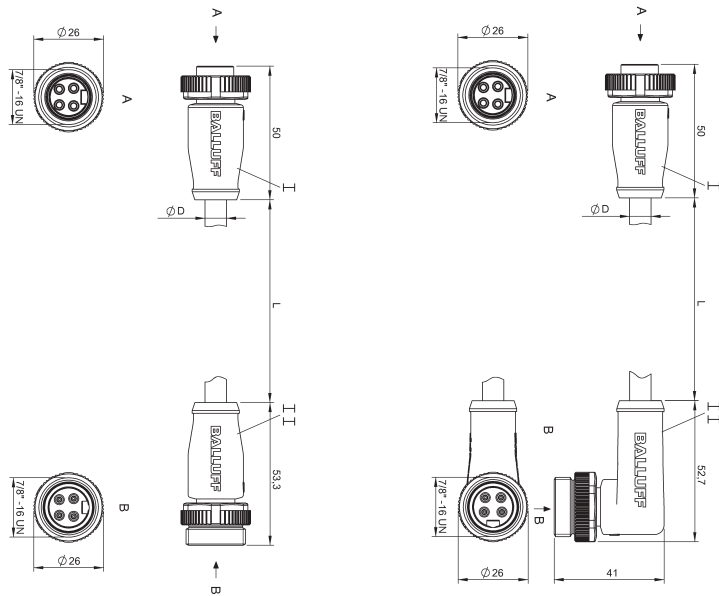
Power connection cables 7/8", 4-pin



Connector diagram and wiring		
Version	<b>Female/male</b>	<b>Female/male</b>
Power supply max. $U_B$ /current rating	300 V DC/9 A	300 V DC/9 A
Cable	PUR	PUR
No. of wires $\times$ cross-section	4 $\times$ 1.5 mm <sup>2</sup>	4 $\times$ 1.5 mm <sup>2</sup>
Degree of protection as per IEC 60529	IP 68	IP 68
Ambient temperature range $T_a$	-25...+80° C	-25...+80° C
Housing material	PUR	PUR
Knurled ring	Brass	Brass

Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	0.6 m	<b>BCC06J2</b>	<b>BCC06J7</b>
			BCC A314-A314-30-304-PX04A5-006	BCC A314-A324-30-304-PX04A5-006
PUR	Black	2 m	<b>BCC06J3</b>	<b>BCC06J8</b>
			BCC A314-A314-30-304-PX04A5-020	BCC A314-A324-30-304-PX04A5-020
PUR	Black	5 m	<b>BCC06J4</b>	<b>BCC06J9</b>
			BCC A314-A314-30-304-PX04A5-050	BCC A314-A324-30-304-PX04A5-050
PUR	Black	10 m	<b>BCC06J5</b>	<b>BCC06JA</b>
			BCC A314-A314-30-304-PX04A5-100	BCC A314-A324-30-304-PX04A5-100
PUR	Black	15 m	<b>BCC06J6</b>	<b>BCC06JC</b>
			BCC A314-A314-30-304-PX04A5-150	BCC A314-A324-30-304-PX04A5-150

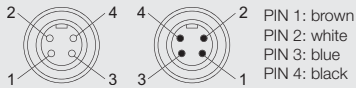
Other cable materials, colors and lengths on request.



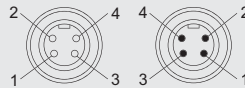
**more added value**  
 For improved fitting accuracy!  
 Connection cable with metal thread –  
 adapted perfectly to Ethernet/IP modules.  
 Metal on metal guarantees durability  
 and a high degree of protection in all  
 applications!

# Ethernet/IP

Power connection cables 7/8", 4-pin



PIN 1: brown  
PIN 2: white  
PIN 3: blue  
PIN 4: black



PIN 1: brown  
PIN 2: white  
PIN 3: blue  
PIN 4: black

### Female/male

300 V DC/9 A

PUR

4x1.5 mm<sup>2</sup>

IP 68

-25...+80° C

PUR

Brass

### Female/male

300 V DC/9 A

PUR

4x1.5 mm<sup>2</sup>

IP 68

-25...+80° C

PUR

Brass

### Ordering code

Part number

#### BCC06JE

BCC A324-A314-30-304-PX04A5-006

#### BCC06JF

BCC A324-A314-30-304-PX04A5-020

#### BCC06JH

BCC A324-A314-30-304-PX04A5-050

#### BCC06JJ

BCC A324-A314-30-304-PX04A5-100

#### BCC06JK

BCC A324-A314-30-304-PX04A5-150

#### BCC06JL

BCC A324-A324-30-304-PX04A5-006

#### BCC06JM

BCC A324-A324-30-304-PX04A5-020

#### BCC06JN

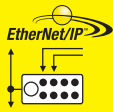
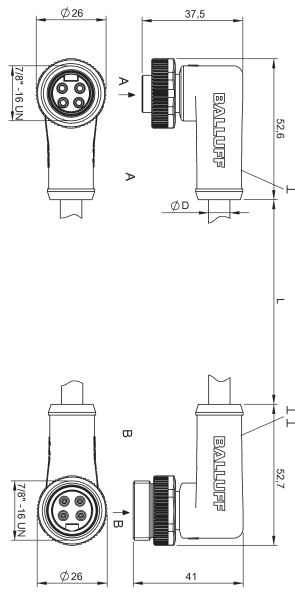
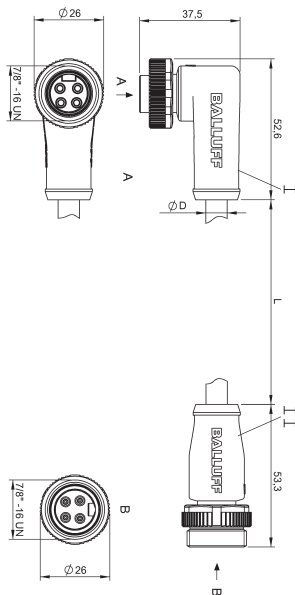
BCC A324-A324-30-304-PX04A5-050

#### BCC06JP

BCC A324-A324-30-304-PX04A5-100

#### BCC06JR

BCC A324-A324-30-304-PX04A5-150



Product topology

Modules

Unmanaged switches

Bus connection cables

Bus couplings

Bus connectors

Bus tee

Bus device connectors

### Power cables

Accessories

Bitmaps and technical accessories



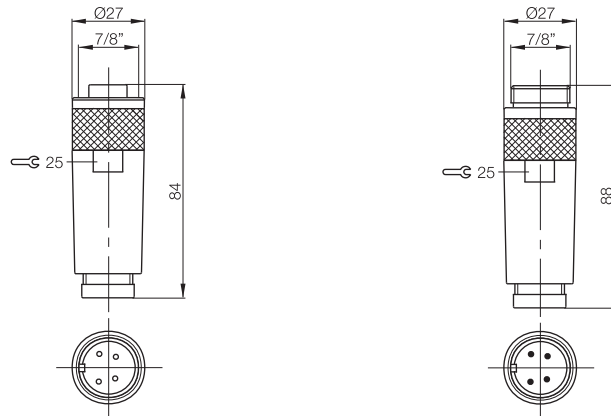
# Ethernet/IP

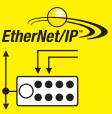
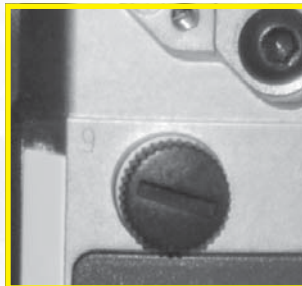
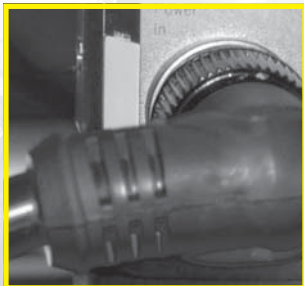
Bus connectors, 7/8", 4-pin



Connector diagram and wiring		
Version	<b>Female</b>	<b>Male</b>
Power supply max. $U_B$ /current rating	250 V	250 V
No. of wires $\times$ cross-section	4 $\times$ 1.5 mm <sup>2</sup>	4 $\times$ 1.5 mm <sup>2</sup>
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature range $T_a$	-25...+80 °C	-25...+80 °C
Housing material	PBT	PBT
Knurled ring	Brass	Brass
Screw terminal	max. 1.5 mm <sup>2</sup>	max. 1.5 mm <sup>2</sup>

Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	<b>BCC0706</b>	<b>BCC0709</b>
6-8 mm			BCC A334-0000-10-000-51X4A5-000	BCC A334-0000-20-000-51X4A5-000
PUR	Black	2 m	<b>BCC0707</b>	<b>BCC070A</b>
8-10 mm			BCC A334-0000-10-000-61X4A5-000	BCC A334-0000-20-000-61X4A5-000
PUR	Black	2 m	<b>BCC0708</b>	<b>BCC070C</b>
10-12 mm			BCC A334-0000-10-000-71X4A5-000	BCC A334-0000-20-000-71X4A5-000





- Product topology
- Modules
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# Ethernet/IP

Accessories and addressing methods

**more added value**

Customized components for quick and easy Ethernet/IP installation!



P/N	IPAP	Module programming cable	IPAP programming cable
<b>Ordering code</b>	<b>BNI002L</b>	<b>BCC06FK</b>	<b>BCC06FL</b>
Part number	BNI ACC-P01-001	BCC M418-U024-8F-670-PX04T8-018	BCC M418-U024-AF-671-PX04T4-018
Status indicators	Red = error, yellow, green = addressing status protection acc. to IEC 60529: IP 67		
Connection	M12 male 8-pin A-coded	M12 female 8-pin A-coded at connector USB A	M12 male 8-pin A-coded at connector USB A
PC interface	USB and serial	USB	USB
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Operating temperature	-25...+70 °C	-20...+80 °C	-20...+80 °C
Weight	10.7 g	64.4 g	85 g
Housing material	PUR	PUR	PUR
IP address space	IPv4	IPv4	IPv4
Address types	IP address, subnet mask, gateway address	IP address, subnet mask, gateway address	IP address, subnet mask, gateway address
Accessories		Incl. software package	Incl. software package

## Addressing methods

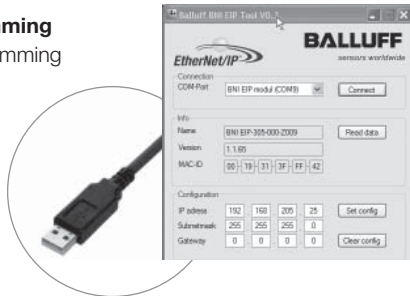
All of the methods specified below can be used to program IP address, subnet mask and gateway.

### DHCP/BOOTP

Ethernet/IP blocks from Balluff can be configured via a DHCP standard server.

### USB module programming

With the module programming cable and the supplied software, the module addresses can be programmed in just a few minutes.



### IPAP connector

The supplied software combined with the IPAP programming cable enables simple programming of the IPAP address plug. The block configuration is then physically connected and stored there instead of in the module itself.



### Web server

For those who prefer a web interface, Ethernet/IP blocks from Balluff are equipped with a simple, integrated web server. The module addresses can be programmed and several of the user-defined functions set via this web page.



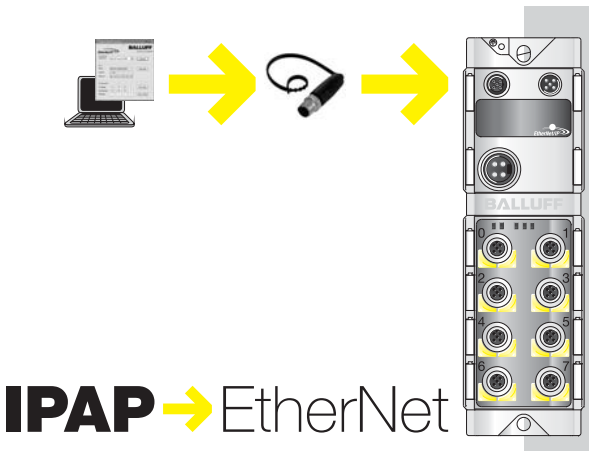
### Display with operating buttons

The series 100 modules offer the advantage that all octets of the module addresses can be programmed easily at the installation points. Additional bonus: no extra parts are required. User-defined LEDs for troubleshooting and a rotary knob disable function are available via the controller.



# Ethernet/IP

## 3 methods of addressing

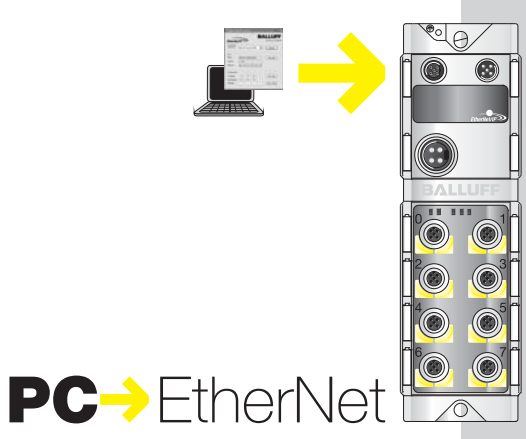


IPAP stands for **IP Address Plug**.  
 Function: the IPAP is programmed using the BCC06FL programming cable. When the IPAP is attached to the Ethernet IP module, the address stored in the IPAP is transferred directly to the Ethernet IP module. The IPAP has address priority.

- Advantages include:**
- Fast module changes – extremely easy repairs
  - High degree of system availability

- Diagnostic information:**  
 LEDs provide a clear indication of the IPAP status:
- IPAP not programmed
  - IPAP maintains a valid address.

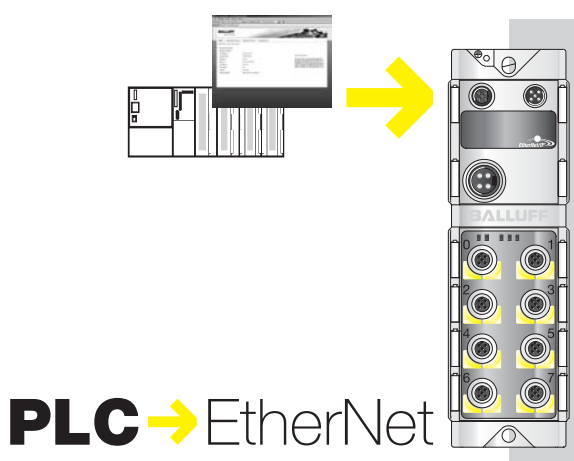
**More added value**  
 An additional LED can be activated directly via the PLC to indicate system specifics or additional diagnostic information.



In combination with the BCC06FK programming cable, this software tool allows you to view or allocate an Ethernet IP address/subnet/gateway.

- Status information**
- Ethernet IP address/subnet/gateway
  - MAC-ID
  - Data transfer rate
  - Module: software version
  - Module: hardware version

- Configuration menu**
- Address allocation principle, ... DHCP, static IP, ...
  - Ethernet IP address/subnet/gateway setting



The web server allows specific access to individual BNI modules connected to the network, which can be then used to display or modify module-specific data.

- Status information**
- Ethernet IP address/subnet/gateway
  - MAC-ID
  - Data transfer rate
  - Module: software version
  - Module: hardware version

- Diagnostic information**
- Module status
  - Port status

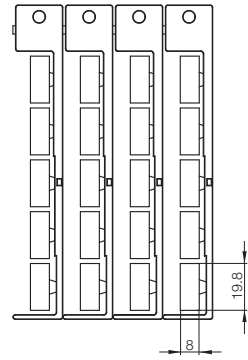
- Configuration menu**
- Address allocation principle, ... DHCP, static IP, ...
  - Ethernet IP address/subnet/gateway setting

**EtherNet/IP**






- Product topology
- Modules
- Unmanaged switches
- Bus connection cables
- Bus couplings
- Bus connectors
- Bus tee
- Bus device connectors
- Power cables
- Accessories**
- Bitmaps and technical accessories

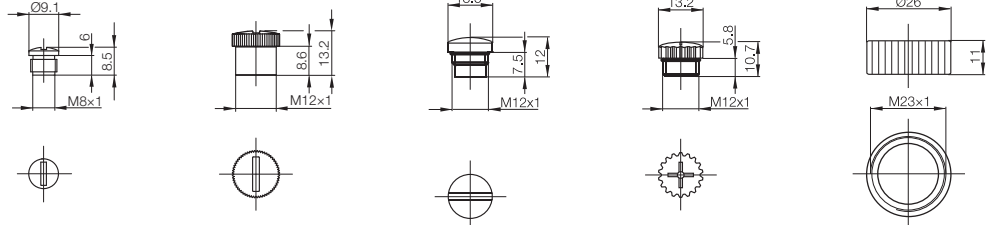


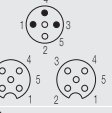
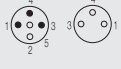
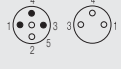
Description	Tamperproof cover with 3 openings	Marking sleeve For labeling connectors	Label set Labeling the ports for modules BNI PBS..., BNI PNT..., BNI DNT..., BNI EIP..., BNI CCL...	
Version				
<b>Ordering code</b>			<b>BAM01AT</b>	
Part number	BAM FK-NI-003-DNT-01	BAM IA-CC-002-01	BNI ACC-L01-000	
Housing material			Plastic	

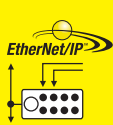
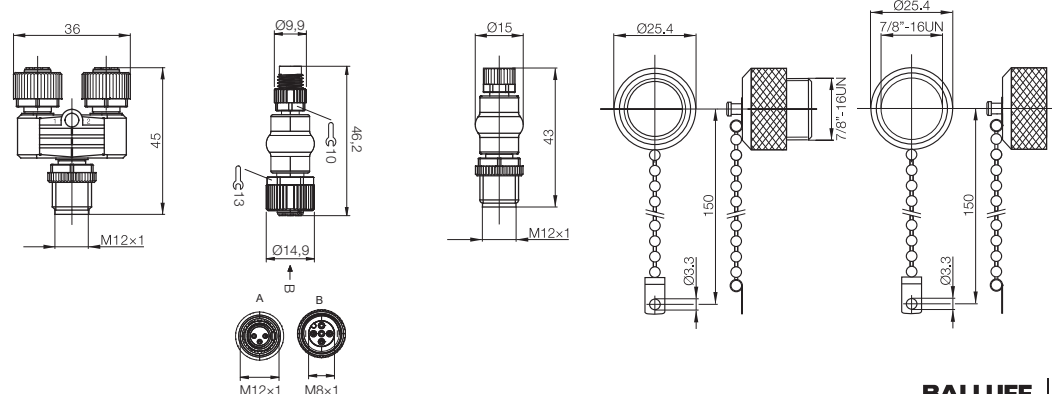


**more added value**  
Customized components for  
quick and easy Ethernet installation!

					
Description	M8 screw plug	M12 screw plug	M12 screw plug	M12 screw plug	M23 screw plug
Version	IP 65 screw plug for unused ports	IP 65 screw plug for unused ports	IP 65 screw plug for unused ports	IP 65 screw plug for unused ports	IP 65 screw plug for unused ports
<b>Ordering code</b>	<b>BAM01C1</b>	<b>BAM01C2</b>	<b>BAM0114</b>	<b>BAM0115</b>	<b>BAM012P</b>
Part number	BAM CS-XA-001-M8-C	BAM CS-XA-002-M12-A	BKS 12-CS-01	BKS 12-CS-02	BKS 23-CS-00
Ambient temperature $T_a$	-20...+80 °C	-20...+80 °C	-20...+80 °C	-20...+80 °C	-20...+80 °C
Housing material	Plastic	Plastic	Nickel-plated brass	PA 6	Nickel-plated brass



View of female/male side					
Description	Tee	Adapter	Adapter	Screw plug 7/8"	Screw plug 7/8"
Version	M12 male to M12 female 2x 2 signals to one port	M8 male 3-pin to M12 female 3-pin	M12 male 3-pin to M8 female 3-pin	Cover for the power ports	Cover for the power ports
<b>Ordering code</b>	<b>BCC02CL</b>	<b>BCC007W</b>	<b>BCC02CK</b>		
Part number	BKS-S4-TM1-01	BKS-S49-GM1/S4	BKS-S4-GM1-01/S49	BKS-7/8-CS-00-A	BKS-7/8-CS-00-I
Power supply $U_B$	Max. 24 V DC	Max. 24 V DC	Max. 24 V DC		
Rated operating current $I_B$	Max. 4 A per contact	Max. 4 A per contact	Max. 4 A per contact		
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67		
Ambient temperature range $T_a$	-25...+90 °C	-25...+85 °C	-25...+85 °C	-20...+80 °C	-20...+80 °C
Housing material	Nickel-plated Gd-Zn	Nickel-plated Gd-Zn	Nickel-plated Gd-Zn	Nickel-plated brass	Nickel-plated brass



- Product topology
- Modules
- Unmanaged switches
- Bus connection cables
- Bus couplers
- Bus connectors
- Bus tee
- Bus device connectors
- Power cables
- Accessories**
- Bitmaps and technical accessories

### 16 inputs

		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Byte 1/Byte 0	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Byte 3/Byte 2	S-15	S-14	S-13	S-12	S-11	S-10	S-9	S-8	S-7	S-6	S-5	S-4	S-3	S-2	S-1	S-0
	Byte 4															SP	
OUT	Byte 1/Byte 0	Display (Series 100 only)								IPAP							

### 8 outputs

		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Byte 1/Byte 0	OL-7	OL-6	OL-5	OL-4	OL-3	OL-2	OL-1	OL-0	HS-7	HS-6	HS-5	HS-4	HS-3	HS-2	HS-1	HS-0
	Byte 2																AP
OUT	Byte 1/Byte 0	R-7	R-6	R-5	R-4	R-3	R-2	R-1	R-0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
	Byte 3/Byte 2	Display								IPAP							

### 16 outputs

		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Byte 1/Byte 0	HS-15	HS-14	HS-13	HS-12	HS-11	HS-10	HS-9	HS-8	HS-7	HS-6	HS-5	HS-4	HS-3	HS-2	HS-1	HS-0
	Byte 3/Byte 2	OL-15	OL-14	OL-13	OL-12	OL-11	OL-10	OL-9	OL-8	OL-7	OL-6	OL-5	OL-4	OL-3	OL-2	OL-1	OL-0
	Byte 4																AP
OUT	Byte 1/Byte 0	O-15	O-14	O-13	O-12	O-11	O-10	O-9	O-8	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
	Byte 3/Byte 2	R-15	R-14	R-13	R-12	R-11	R-10	R-9	R-8	R-7	R-6	R-5	R-4	R-3	R-2	R-1	R-0
	Byte 5/Byte 4	Display								IPAP							

### 8 inputs/8 outputs

		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Byte 1/Byte 0	S-7	S-6	S-5	S-4	S-3	S-2	S-1	S-0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Byte 3/Byte 2	OL-7	OL-6	OL-5	OL-4	OL-3	OL-2	OL-1	OL-0	HS-7	HS-6	HS-5	HS-4	HS-3	HS-2	HS-1	HS-0
	Byte 4															SP	AP
OUT	Byte 1/Byte 0	R-7	R-6	R-5	R-4	R-3	R-2	R-1	R-0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
	Byte 3/Byte 2	Display								IPAP							

### 32 inputs

		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Byte 1/Byte 0	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Byte 3/Byte 2	I-31	I-30	I-29	I-28	I-27	I-26	I-25	I-24	I-23	I-22	I-21	I-20	I-19	I-18	I-17	I-16
	Byte 5/Byte 4	S-15	S-14	S-13	S-12	S-11	S-10	S-9	S-8	S-7	S-6	S-5	S-4	S-3	S-2	S-1	S-0
	Byte 7/Byte 6	S-31	S-30	S-29	S-28	S-27	S-26	S-25	S-24	S-23	S-22	S-21	S-20	S-19	S-18	S-17	S-16
	Byte 8																SP
OUT	Byte 1/Byte 0	Display								IPAP							

### 8 inputs/8 outputs

		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Byte 1/Byte 0	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Byte 3/Byte 2	S-15	S-14	S-13	S-12	S-11	S-10	S-9	S-8	S-7	S-6	S-5	S-4	S-3	S-2	S-1	S-0
	Byte 5/Byte 4	HS-15	HS-14	HS-13	HS-12	HS-11	HS-10	HS-9	HS-8	HS-7	HS-6	HS-5	HS-4	HS-3	HS-2	HS-1	HS-0
	Byte 7/Byte 6	OL-15	OL-14	OL-13	OL-12	OL-11	OL-10	OL-9	OL-8	OL-7	OL-6	OL-5	OL-4	OL-3	OL-2	OL-1	OL-0
	Byte 8															SP	AP
OUT	Byte 1/Byte 0	O-15	O-14	O-13	O-12	O-11	O-10	O-9	O-8	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
	Byte 3/Byte 2	R-15	R-14	R-13	R-12	R-11	R-10	R-9	R-8	R-7	R-6	R-5	R-4	R-3	R-2	R-1	R-0
	Byte 5/Byte 4	Display								IPAP							

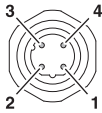
Bitmap legend	
I	Input
O	Output
R	Output reset
S	Input short-circuit
OL	Output overload status
HS	Output handshake
AP	Actuator power status
SP	Sensor/network power status

IPAP output control byte	
Bit 0	Red LED illuminates
Bit 1	Red LED flashes
Bit 2	
Bit 3	
Bit 4	Yellow LED illuminates
Bit 5	Yellow LED flashes
Bit 6	
Bit 7	

Output control byte display (Series 100 only)	
Bit 0	Red LED illuminates
Bit 1	Green LED illuminates
Bit 2	Display disable
Bit 3	
Bit 4	
Bit 5	
Bit 6	
Bit 7	

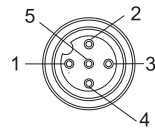
## Pin assignments

### Ethernet



Pin no.	Function
1	TD+
2	RD+
3	TD-
4	RD-

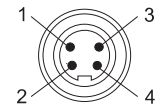
### I/O port



Input port	
Pin no.	Function
1	V+
2	Input
3	0 V
4	Input
5	Ground GND

Output port	
Pin no.	Function
1	Output
2	Output
3	0 V
4	Output
5	Ground GND

### Auxiliary power



Pin no.	Function
1	Actuator (+24 V)
2	Sensor (+24 V)
3	GND sensor
4	GND actuator

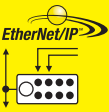
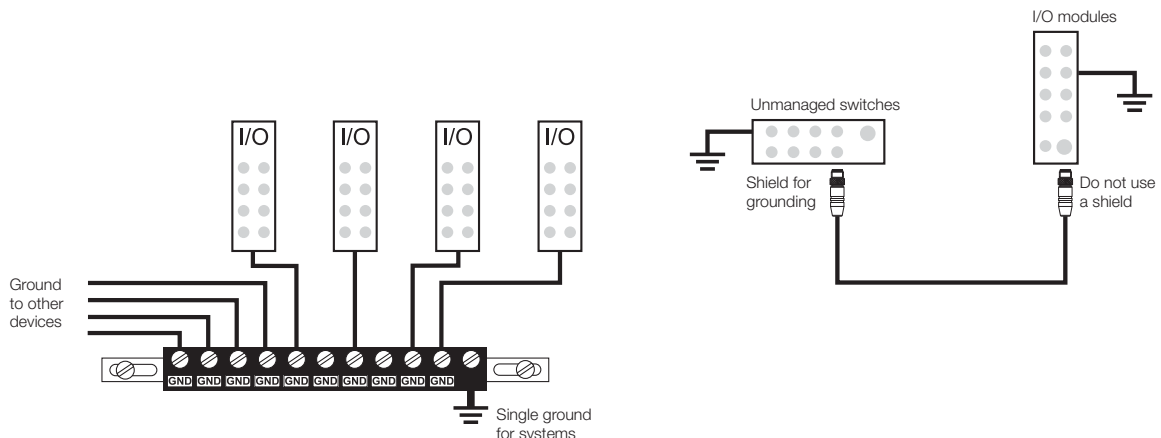
## Information on grounding

With a standard European grounding connection, use a joint ground-point for all blocks (see first illustration). All blocks remain within the same grounding potential. Grounding straps are included for mounting on a painted surface.

If a single-point grounding system is not implemented, it is possible to use a varying grounding potential. However, the shield then generates an equalizing current that has a negative effect on data transmission and can cause interruptions in communication.

With most grounding connections in North America, local machines with completely shielded cables are each connected to a separate ground. This is described in ODVA publication PUB00148RO, "Ethernet/IP Media Planning and Installation Manual."

ODVA recommends that the shield be connected to ground at the switch and not at the network device. Ethernet specification IEEE802.3 also permits the use of unshielded cables.

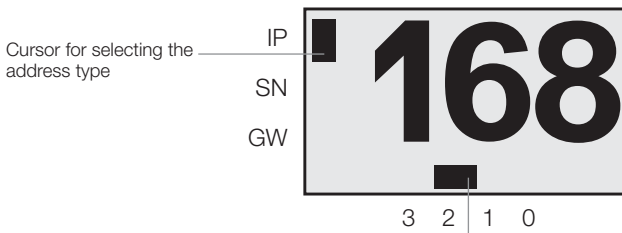


Product topology  
 Modules  
 Unmanaged switches  
 Bus connection cables  
 Bus couplings  
 Bus connectors  
 Bus tee  
 Bus device connectors  
 Power cables  
 Accessories  
**Bitmaps and technical accessories**



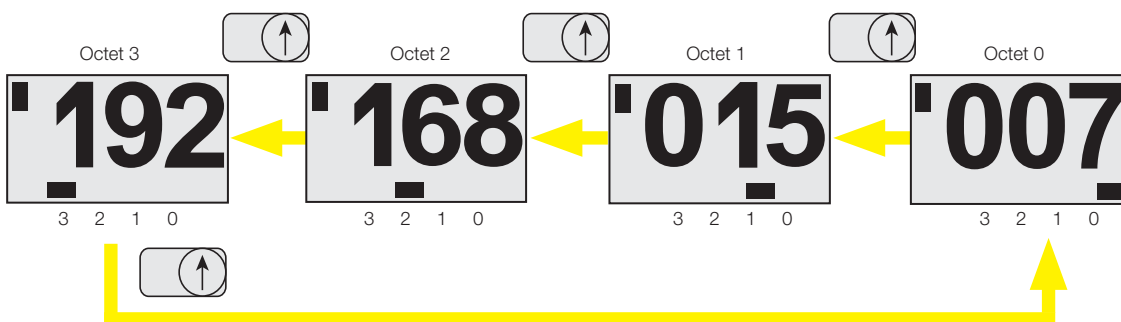
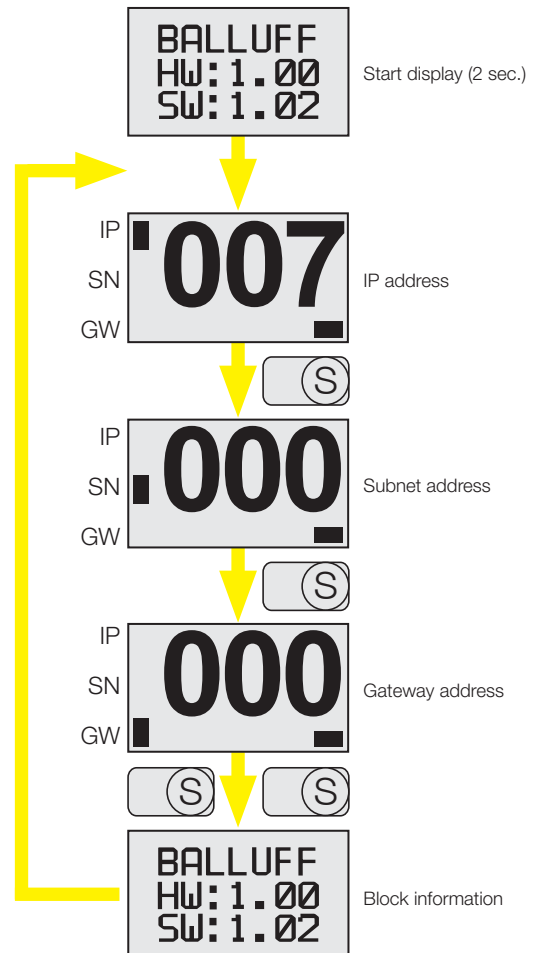
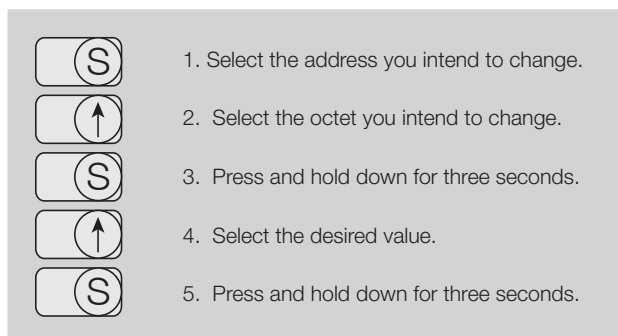
## Ethernet/IP modules Display with operating buttons

The Balluff Series 100 modules feature a digital display with two operating buttons that can be used to program the IP address, subnet and gateway address. You can also view the hardware and software versions from the module. When unused, octet 0 of the IP address is displayed by default.



**Address types**  
IP: IP address  
SN: subnet address  
GW: gateway address

**Octet**  
3: Fourth octet  
2: Third octet  
1: Second octet  
0: First octet



### User-defined functions

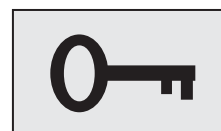
#### User-defined LEDs

The green and red LEDs indicate errors and provide the user with assistance when troubleshooting during maintenance.



#### Button disable

Using the controller as an interface, the operating buttons can be disabled in order to prevent unauthorized access.



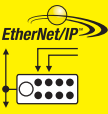
**1. Create a structure diagram of the network.**

**Determine the following:**

- Where are managed and unmanaged switches used?
- What settings apply for managed switches?
- Are shielded cable sets necessary?
- Which route is suitable for physical media, and is the surrounding area noisy?
- How are error reports handled?
- Can graphical representations of unmanaged switches and end devices be secured?

**2. Create a plan for troubleshooting.**

- What is the procedure for rectifying a problem?
- How can Ethernet/IP end devices, managed and unmanaged switches as well as physical media be quickly replaced?



Product topology  
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