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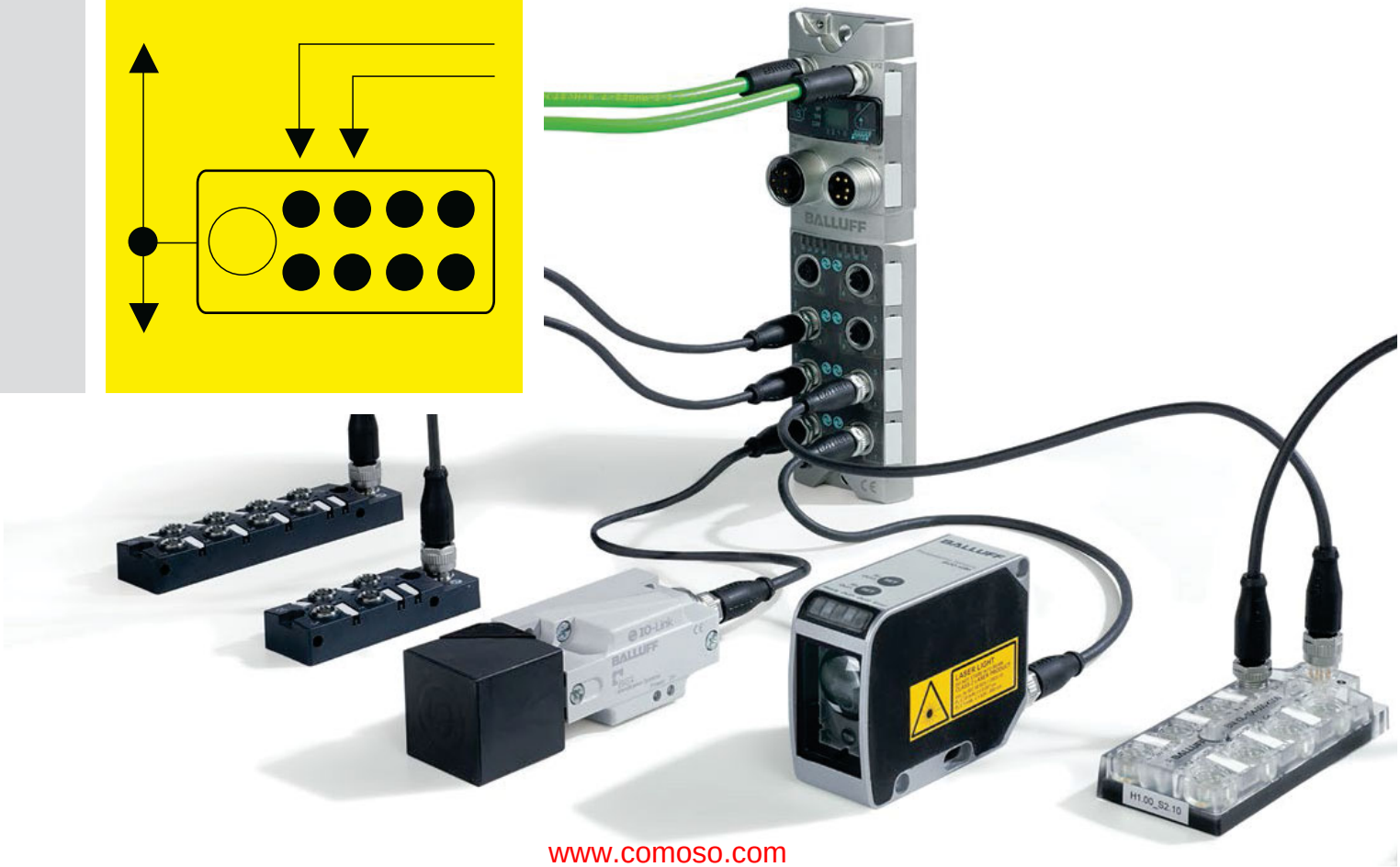
sensors worldwide

Control System Architectures

Bills of materials and common layouts for automation control designers



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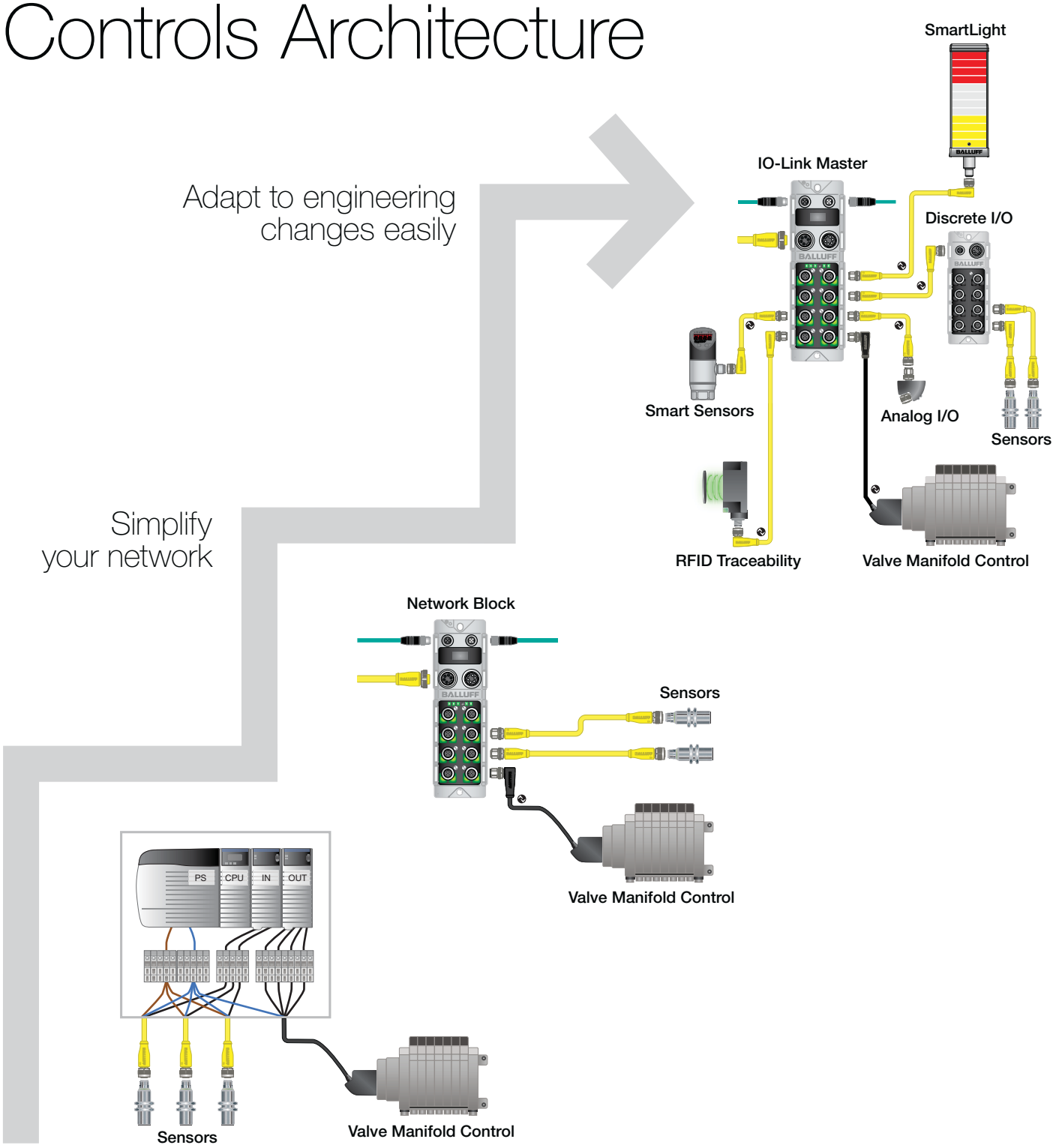
The Balluff Advantage for Your Modular Controls Architecture

Adapt to engineering changes easily

Simplify your network



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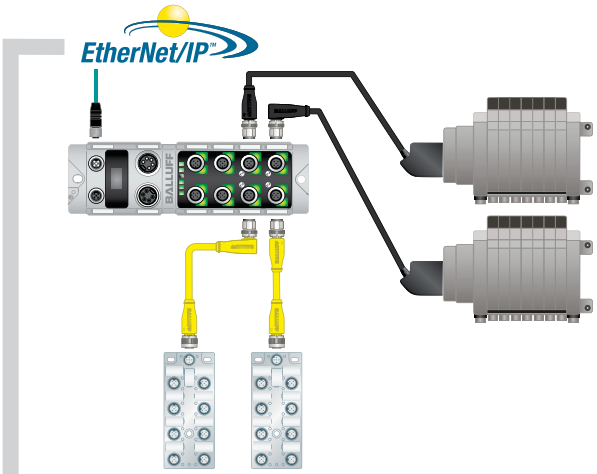
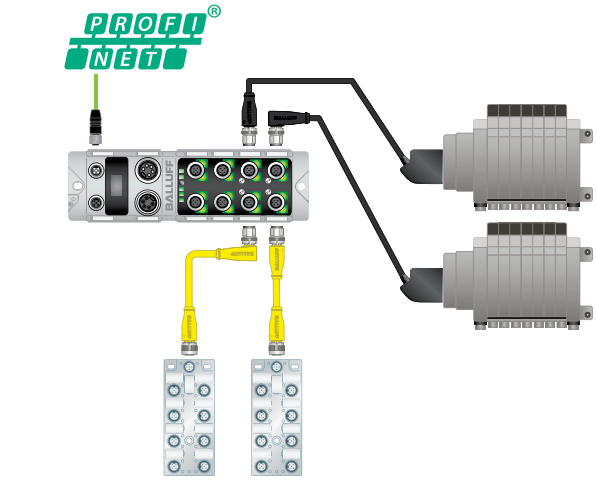
Quickly adapt to customer's choice of network

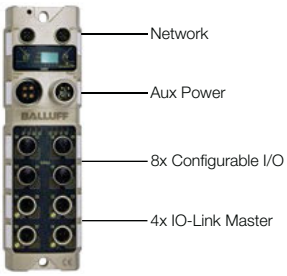


Minimize hardware changes



Minimize change to a BOM

Each Bill of Material (BOM) on the following pages can be adapted to your industrial networks by swapping the master block. Please use caution, while the hardware remains easy to change each network has different requirements for cables and power.



Network Chart – 4 Port Masters

Network	Order code	Part number
EtherNet/IP	**BNI004A**	BNI EIP-502-105-Z015
DeviceNet	**BNI005A**	BNI DNT-502-100-Z001
PROFINET	**BNI004U**	BNI PNT-502-105-Z015
PROFIBUS	**BNI005R**	BNI PBS-502-101-Z001
CC-Link	**BNI0040**	BNI CCL-502-100-Z001
Others	See IO-Link Consortium www.IO-Link.com	

Network Chart – 8 Port Masters

Network	Order code	Part number
EtherNet/IP	**BNI006A**	BNI EIP-508-105-Z015
PROFINET	**BNI005H**	BNI PNT-508-105-Z015
PROFIBUS	**BNI007U**	BNI PBS-508-101-Z001
EtherCAT	**BNI0077**	BNI ECT-508-105-Z015
Others	See IO-Link Consortium www.IO-Link.com	

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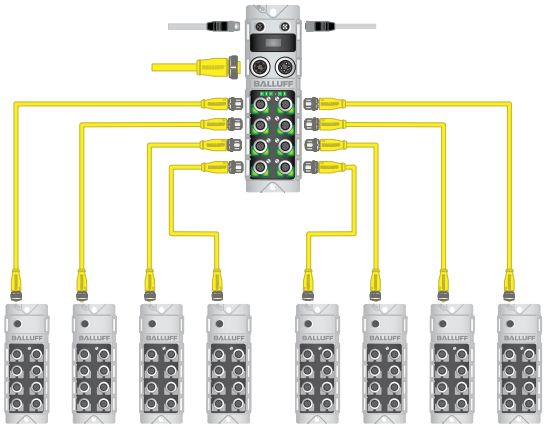
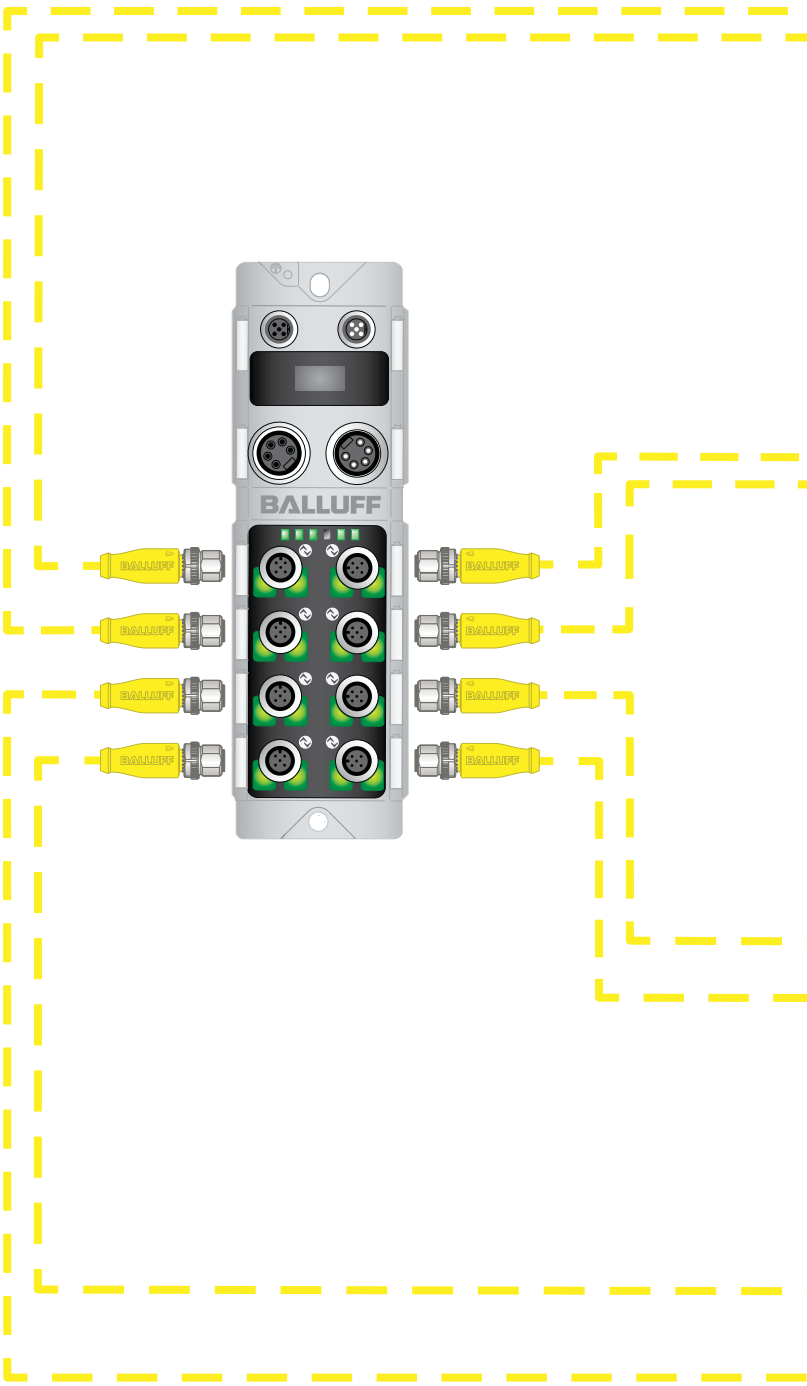
High Density I/O

- Up to 136 I/O points and diagnostics with a single IP address
- Control up to 192 solenoid valve manifold positions per IP address
- Easily setup pick-to-light systems with configurable I/O
- Drive 2 amp outputs with diagnostics and overload protection
- Connect with smart sensors or analog without complexity





IO-Link Advantage

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Order code	Description	Inputs
BNI001W	M8 3wire Inputs - PNP	4
BNI001Y	M8 3wire Inputs - PNP	8
BNI0022	M8 4wire Inputs - PNP	16

Order code	Description	Outputs
BNI006N	25p Dsub - Bosch Rexroth, Festo	24
BNI006M	25p Dsub - MAC	16
BNI006P	25p Dsub - SMC, Parker, Norgen	24
BNI006R	25p Dsub - Numatics	22

Order code	Description	Inputs	Outputs
BNI0006	M12 Inputs Plastic - PNP	16	
BNI0075	M12 Inputs Plastic - NPN	16	
BNI005T	M12 Config Plastic - I/O - 1.1A	≤16	≤16
BNI007Z	M12 Config I/O with expansion	≤16	≤16

Order code	Description	Inputs	Outputs
BNI0039	M12 Inputs - PNP	16	
BNI0062	M12 Inputs - NPN	16	
BNI003C	M12 Config I/O - 1.1A	≤16	≤16
BNI003A	M12 Config I/O - 9A Aux 5pin	≤16	≤16
BNI0051	M12 Config I/O - 9A Aux 4pin	≤16	≤16

Order code	Description	Inputs	Outputs
BNI004K	IP20 Config I/O - Terminals	≤8	≤8
BNI004L	IP20 Config I/O - Terminals	≤16	≤16
BNI005M	IP20 Config I/O - Wires	≤16	≤16
BNI005N	IP20 Config I/O - Wires	≤8	≤8

Order code	Description	Segments
BNI007T	Smart Light	1
BNI0087	Smart Light	1+Buzzer
BNI0088	Smart Light	3
BNI008A	Smart Light	3+Buzzer
BNI0082	Smart Light	5
BNI0085	Smart Light	5+Buzzer

Order code	Description	Inputs
BNI0007	M12 Inputs - Analog & PNP	4(I) / 8
BNI0008	M12 Inputs - Analog & PNP	4(U) / 8

Order code	Description	Inputs	Outputs
BNI0041	M12 Inputs - Analog	1 (I)	
BNI0042	M12 Inputs - Analog	1 (U)	
BNI004T	M12 Inputs - Analog	1 (PT100)	
BNI004C	M12 Outputs - Analog		1 (I)
BNI004E	M12 Outputs - Analog		1 (U)

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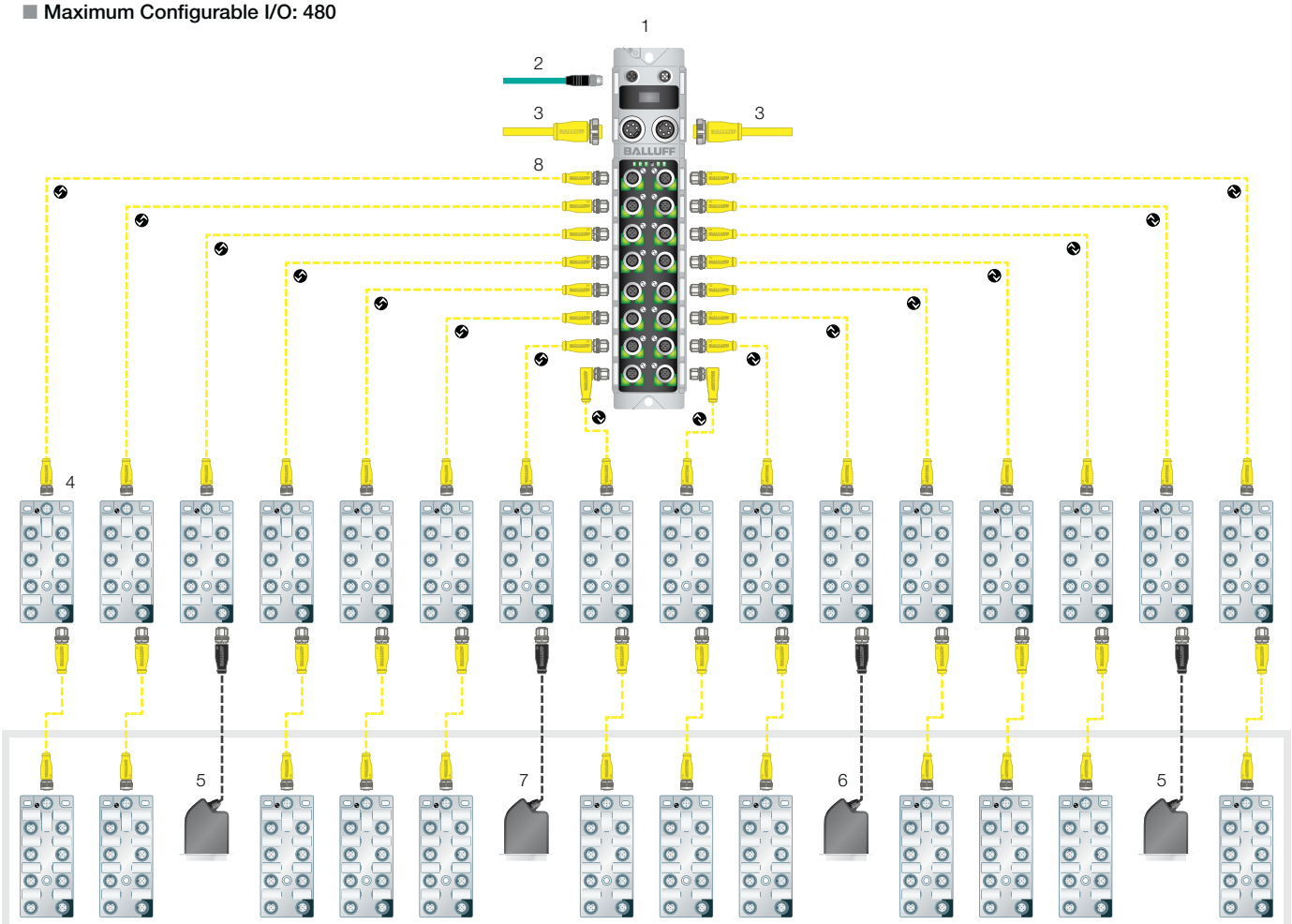
Enhanced High Density I/O

With enhanced expansion port functionality,
a single network node could host a significantly large I/O count.

- **Maximum Outputs: 608**
- **Maximum Inputs: 480**
- **Maximum Configurable I/O: 480**



Balluff Expanded I/O

Key	Order code	Part number	Description	Quantity	Inputs	Outputs
1	**BNI007M**	BNI PNT-509-105-Z033	PROFINET16 Port IO-Link Master	1	≤ 16	≤ 16
2	**BCC04K7**	BCC M414-E834-8G-668-PS54T2-020*	PROFINET Cable M12-RJ45, 2m	1		
3	**BCC09CK**	BCC A315-0000-10-063-VX45W6-020*	AUX Power Cable 7/8" 5-wire, 2m	2		
4	**BNI007Z**	BNI IOL-302-002-K006	M12 - Configurable I/O with expansion port	≤ 32	≤ 16	≤ 16
5	**BNI006N**	BNI IOL-751-V08-K007	Valve Connector: Festo, Bosch Rexroth	≤ 16		24
6	**BNI006P**	BNI IOL-751-V10-K007	Valve Connector: SMC, Parker, Norgen	≤ 16		16
7	**BNI006R**	BNI IOL-751-V13-K007	Valve Connector: Numatics	≤ 16		22
8	**BCC05MC**	BCC M415-M414-3A-304-VX44T2-020*	Sensor Cable M12-M12 4 wire, 2m	≤ 32		

***See connectivity catalog for available lengths.**

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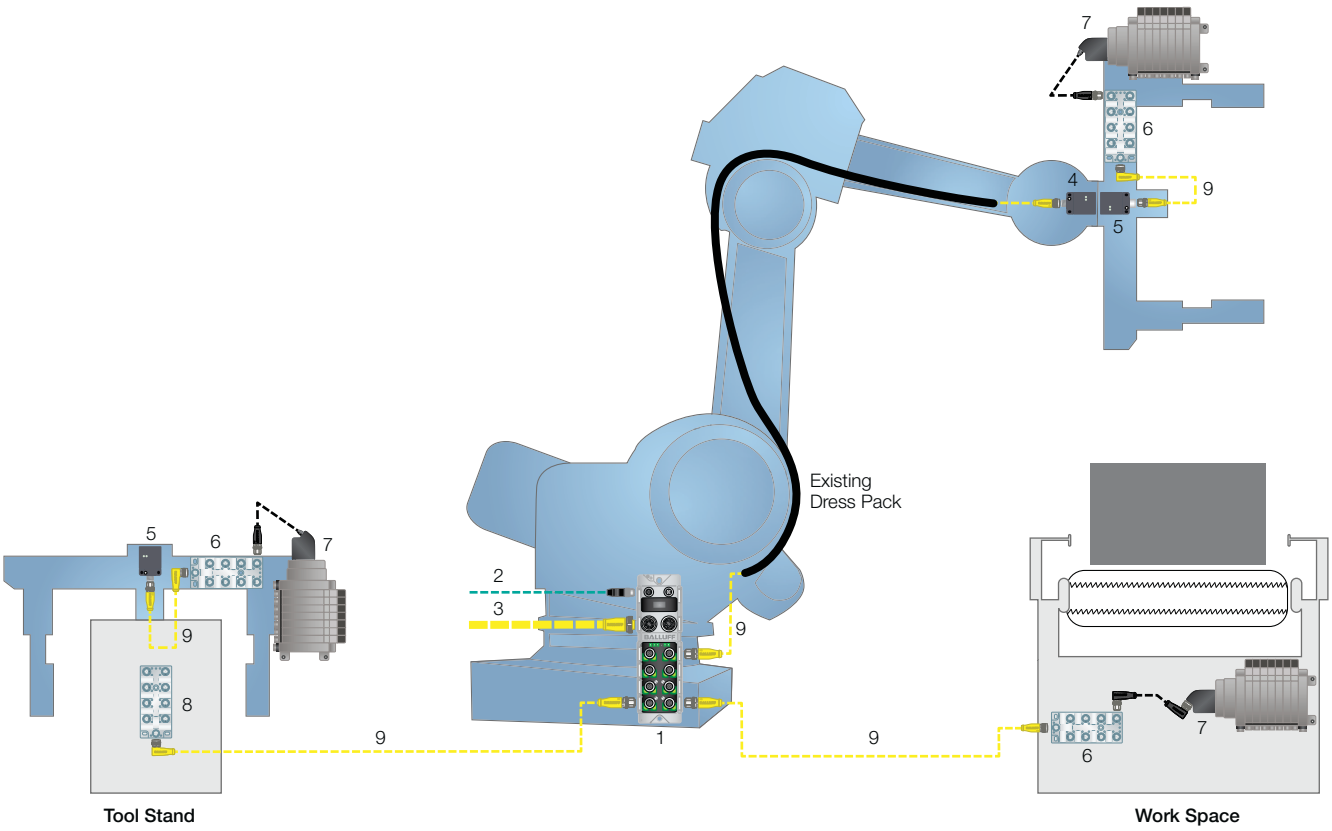
Robotic Automation

- Control end effector I/O requirements with single standard M12 through dress pack
- Daisy chain I/O block and valve manifold to reduce complexity
- Simplify tool change with inductive couplers for powered I/O over an air-gap



Key	Order code	Part number	Description	Quantity
1	**BNI006A**	BNI EIP-508-105-Z015	EtherNet/IP 8x IO-Link Master	1
2	**BCC0E90**	BCC M414-E894-8G-672-ES64N9-020*	Ethernet Cable M12-RJ45 shielded, 2m	1
3	**BCC090W**	BCC A314-0000-10-003-VX44W6-020*	Aux Power Cable 7/8" 4-wire, 2m	1
4	**BIC0070**	BIC 1B0-ITA50-Q40KFU-SM4A4A	Bi-directional IO-Link inductive coupler base for power and data	1
5	**BIC0071**	BIC 2B0-ITA50-Q40KFU-SM4A5A	Bi-directional IO-Link inductive coupler remote for power and data	2
6	**BNI007Z**	BNI IOL-302-002-K006	Configurable 8x I/O hub with expansion port (port 7)	3
7	**BNI006P**	BNI IOL-751-V10-K007	Valve connector 24 outputs SMC, Parker or Norgen Valve manifold	3
8	**BNI0006**	BNI IOL-104-000-K006	M12 16x input PNP hub for tool holder	1
9	**BCC05MC**	BCC M415-M414-3A-304-VX44T2-020*	Sensor cable M12- M12 4 wire, 2m	5

***See connectivity catalog for available lengths.**

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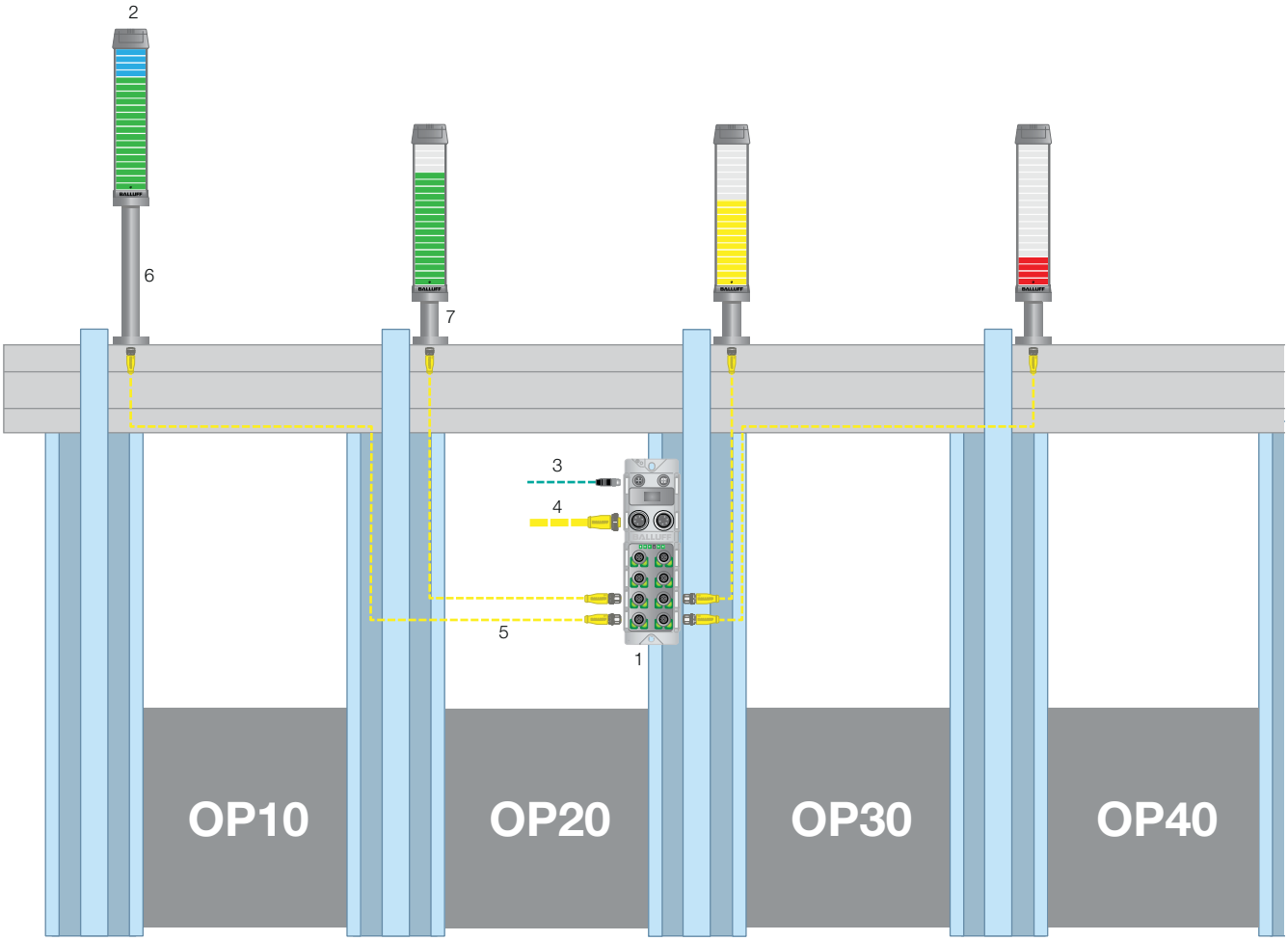
Production Visualization

- Operator performance to quota
- Identify early bottlenecks and maintenance issues
- Communicate with operators, technicians, and management
- Easily retrofit into existing architectures



Key	Order code	Part number	Description	Quantity	Inputs	Outputs
1	**BNI004A**	BNI EIP-502-105-Z015	4x Master - EtherNet/IP	1	8	0
2	**BNI0085**	BNI IOL-802-102-Z037	5 Segment Smart Light – with buzzer	4		
3	**BCC0E90**	BCC M414-E894-8G-672-ES64N9-020*	Ethernet Cable M12-RJ45 Shielded, 2m	1		
4	**BCC090W**	BCC A314-0000-10-003-VX44W6-020*	Aux Power Cable 7/8" 4-wire, 2m	1		
5	**BCC05MC**	BCC M415-M414-3A-304-VX44T2-020*	Sensor Cable M12-M12 4-wire, 2m	4		
6	**BAM026L**	BAM MB-NI-017-400-1	Pedestal mount for SmartLight, H 400 mm	1		
7	**BAM026K**	BAM MB-NI-017-100-1	Pedestal mount for SmartLight, H 100 mm	3		
			Total Inputs/Outputs		8	0

***See connectivity catalog for available lengths.**

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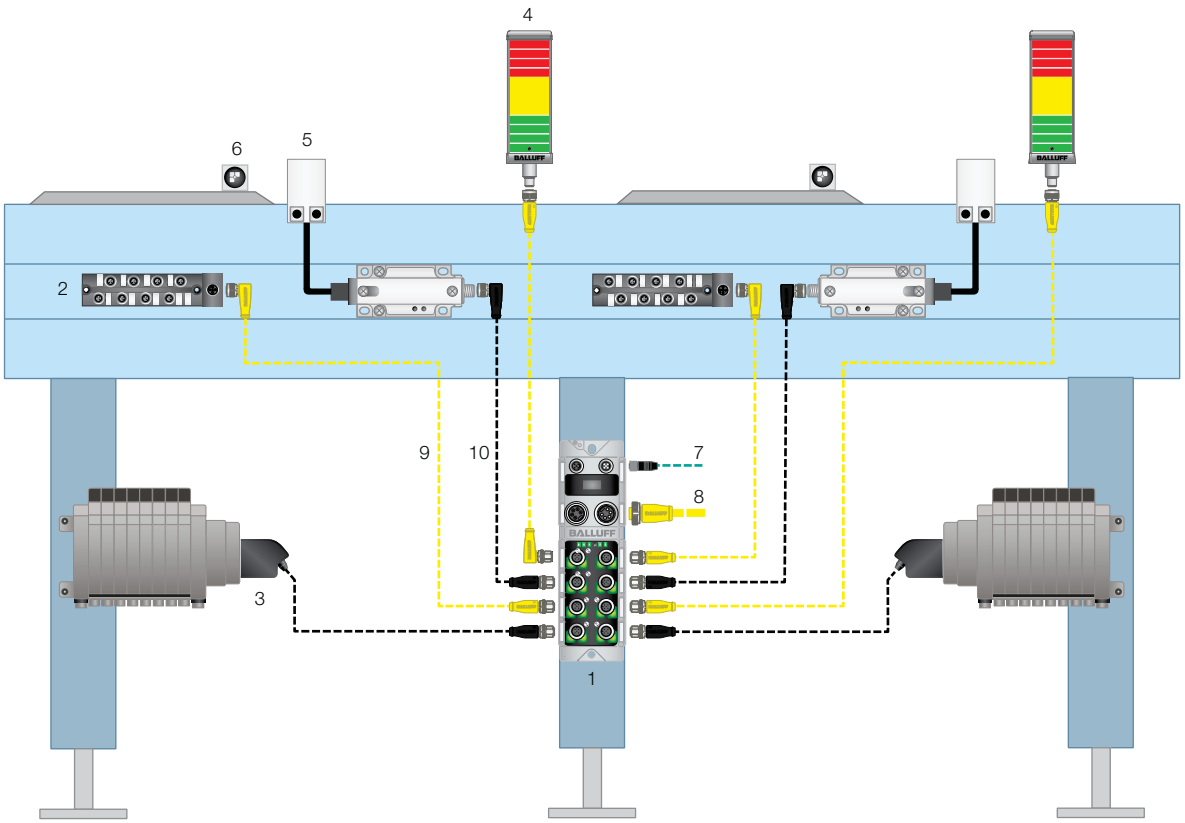
Assembly Automation

- Our most popular configuration of product
- Industrial RFID, Sensor Inputs, Valve Control, and SmartLight
- One master typically runs modular sections
- Easily build modular equipment for transport or flexibility
- Change in network – only change Master block



Key	Order code	Part number	Description	Quantity	Inputs	Outputs
1	**BNI006A**	BNI EIP-508-105-Z015	8x Master - EtherNet/IP	1	0	0
2	**BNI0022**	BNI IOL-104-S01-K021	M8 4-wire Inputs - PNP	2	16	0
3	**BNI006P**	BNI IOL-751-V10-K007	SMC 24 Valve Connector	2	0	32
4	**BNI0088**	BNI IOL-801-102-Z036	3 Segment Smart Light	2		
5	**BIS00M1**	BIS M-402-045-004-07-S4	ISO Read/Write Domino Type Head	2		
6	**BIS0044**	BIS M-110-02/L	RFID Data Tag (based on number of pallets)			
7	**BCC0E90**	BCC M414-E894-8G-672-ES64N9-020*	Ethernet Cable M12-RJ45, 2m	1		
8	**BCC090W**	BCC A314-0000-10-003-VX44W6-020*	Aux Power Cable 7/8" 4-wire, 2m	1		
9	**BCC05MC**	BCC M415-M414-3A-304-VX44T2-020*	Sensor Cable M12-M12 4-wire, 2m	4		
10	**BCC0C00**	BCC M415-M414-3A-305-PS0434-020*	Shielded RFID Cable M12-M12 4-wire, 2m	2		
			Total Inputs/Outputs		16	32

***See connectivity catalog for available lengths.**

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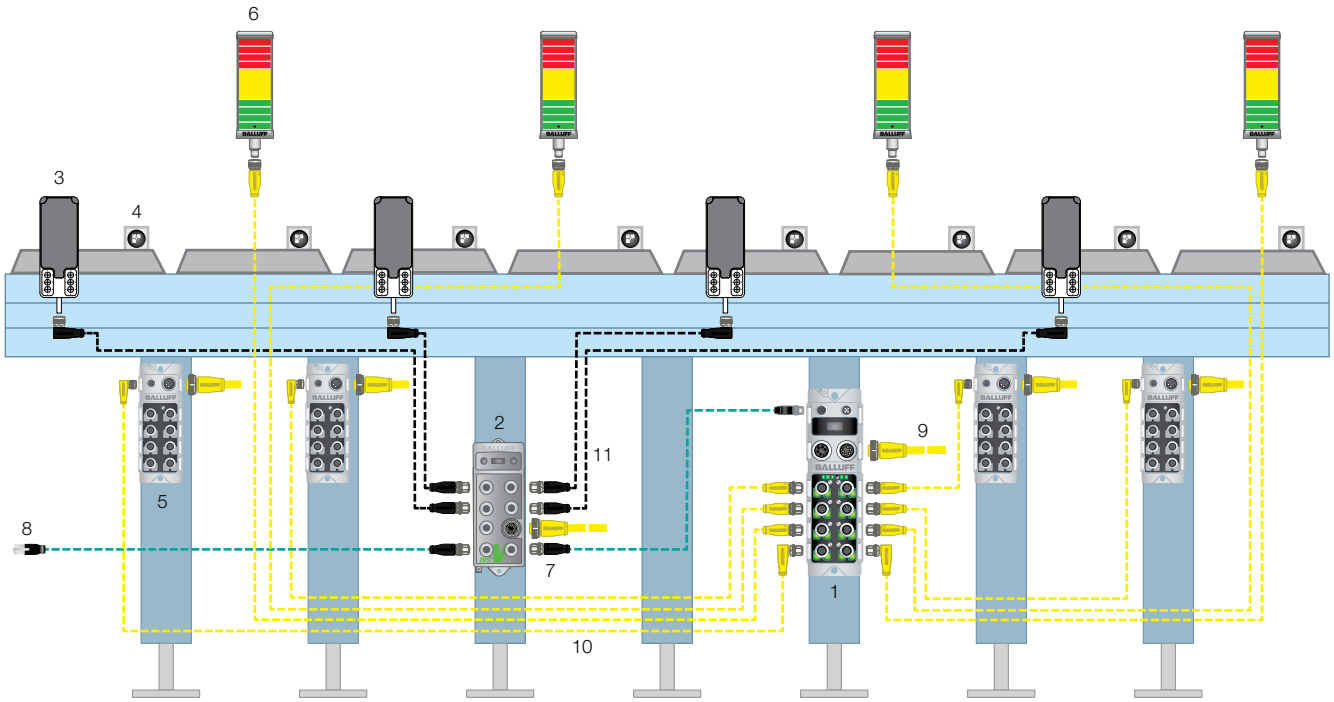
High Volume Data Traceability – Pallet Tracking and I/O

- Process large amounts of read/write data simultaneously
- Collect lineage and build data for each component
- Data stays with the pallet if removed from the line
- Track exact rework requirements



Key	Order code	Part number	Description	Quantity	Inputs	Outputs
1	**BNI006A**	BNI EIP-508-105-Z015	8x Master - EtherNet/IP	1	0	0
2	**BIS0122**	BIS V-6106-034-C004	4x RFID with 1x Master - EtherNet/IP	1		
3	**BIS0131**	BIS VM-355-401-S4	BIS M Read/Write Head Flat	4		
4	**BIS013C**	BIS M-155-15/A	RFID Data Tag (based on number of pallets)	20		
5	**BNI0051**	BNI IOL-302-S01-Z026	M12 Config I/O - 9A Aux 4pin	4	≤64	≤64
6	**BNI0088**	BNI IOL-801-102-Z036	3 Segment Smart Light - Stack Mode	4		
7	**BCC09NN**	BCC M414-M414-6D-338-ES64N9-020*	Ethernet Cable M12-M12 Shielded, 2m	1		
8	**BCC0E90**	BCC M414-E894-8G-672-ES64N9-020*	Ethernet Cable M12-RJ45 Shielded, 2m	1		
9	**BCC090W**	BCC A314-0000-10-003-VX44W6-020*	Aux Power Cable 7/8" 4-wire, 2m	6		
10	**BCC05MC**	BCC M415-M414-3A-304-VX44T2-020*	Sensor Cable M12-M12 4-wire, 2m	8		
11	**BCC0C00**	BCC-M415-M414-3A-305-PS0434-020*	Shielded RFID Cable M12-M12 4-wire, 2m	4		
			Total Inputs/Outputs		≤64	≤64

***See connectivity catalog for available lengths.**

Network Chart

Network	Order code	Part number
EtherNet/IP	**BIS0122**	BIS V-6106-034-C004
Profinet	**BIS013U**	BIS V-6108-048-C002
Profibus	**BIS00T3**	BIS V-6102-019-C001
CC-Link	**BIS010P**	BIS V-6111-073-C003
EtherCAT	**BIS00U9**	BIS V-6110-063-C002

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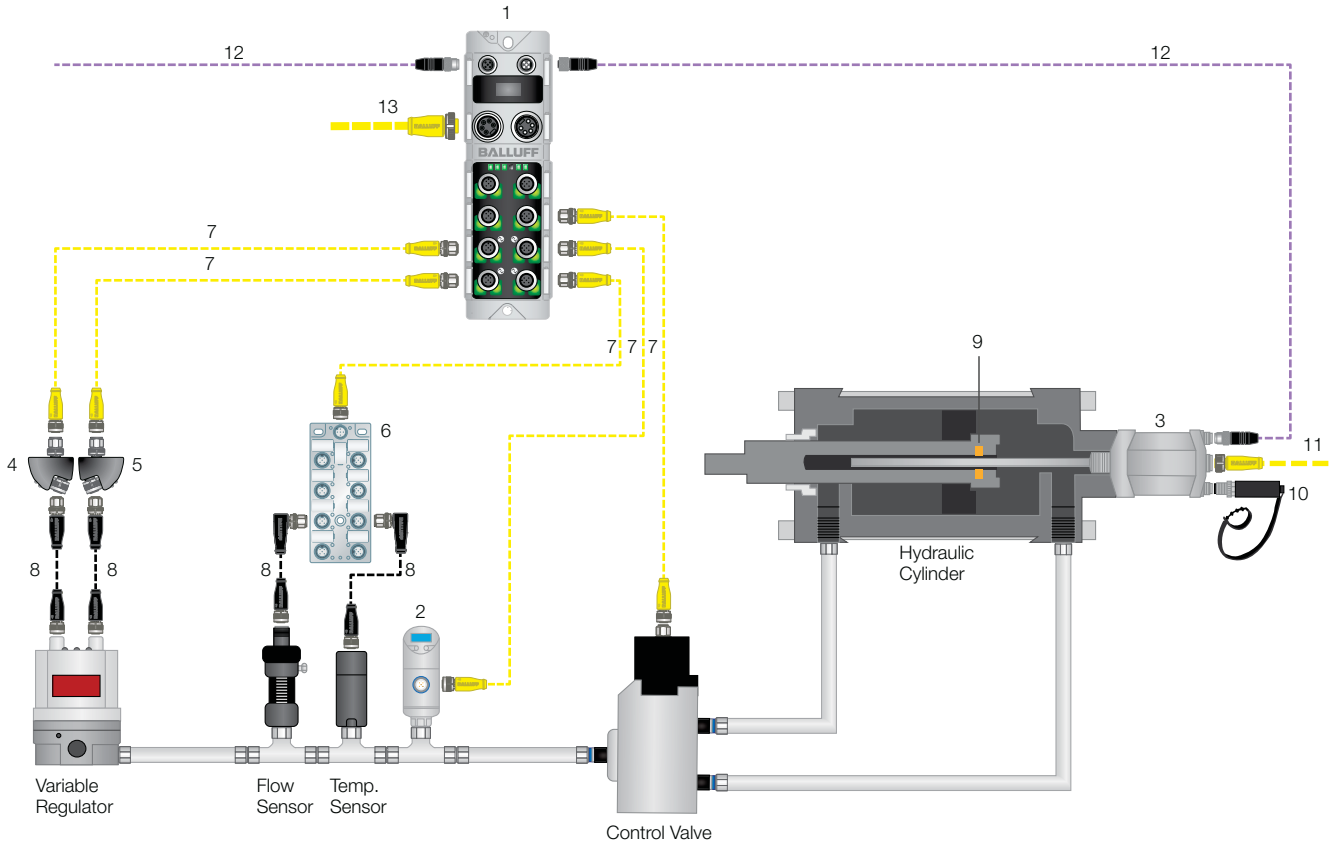
Measurement Devices and Analog I/O

- Eliminate analog headaches
- Remove shielded cable runs
- Add diagnostics to equipment
- Drive high power valves with 2A outputs



Key	Order code	Part number	Description	Quantity
1	**BNI005R**	BNI PBS-502-101-Z001	4 Port Profibus Master	1
2	**BSP008A**	BSP B010-EV002-D00S1B-S4	Pressure Sensor	1
3		BTL5-T110-M_ _ _ _-Z-S103	BTL Z Length 50mm...7m	1
4	**BNI0042**	BNI IOL-714-000-K023	Analog Input Plug	1
5	**BNI004E**	BNI IOL-724-000-K023	Analog Output Plug	1
6	**BNI0008**	BNI IOL-710-000-K006	Analog Hub	1
7	**BCC05MC**	BCC M415-M414-3A-304-VX44T2-020*	M12 to M12 Double Ended, 2m	5
8	**BCC0C00**	BCC M415-M414-3A-305-PS0434-020*	Shielded Cable M12-M12 4-wire, 2m	4
9	**BAM013L**	BTL-P-1013-4R	BTL Z Magnet	1
10	**BCC0718**	BCC M415-0000-2B-R01	BTL Z Terminating Resistor	1
11	**BCC050N**	BCC M313-0000-10-001-EX43T2-020*	BTL Z Power Cable M8, 2m	1
12	**BCC0A16**	BCC M415-M412-3B-329-PS72N1-020*	PBS Cables Double Ended, 2m	2
13	**BCC09CK**	BCC A315-0000-10-063-VX45W6-020*	Power Cable, 2m	1

***See connectivity catalog for available lengths.**

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