



INDUSTRIAL CONNECTIVITY FOR FACTORY AUTOMATION

JEFF BARNES

DISTRIBUTION CORPORATE ACCOUNT MANAGER –
INDUSTRIAL EUROPE

creating connections for life

molex

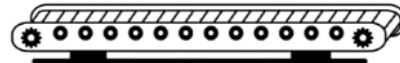
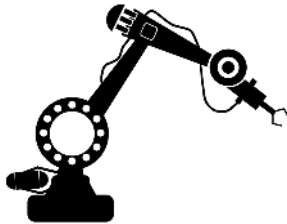
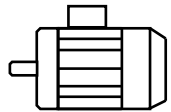
LET'S SIMPLIFY A MACHINE INTO A HUMAN BODY...

What items make up a Human Body?

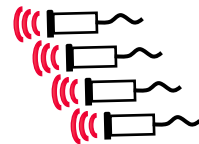
- Brain - PLC



- Muscles - Motors/ Robots/ Conveyors

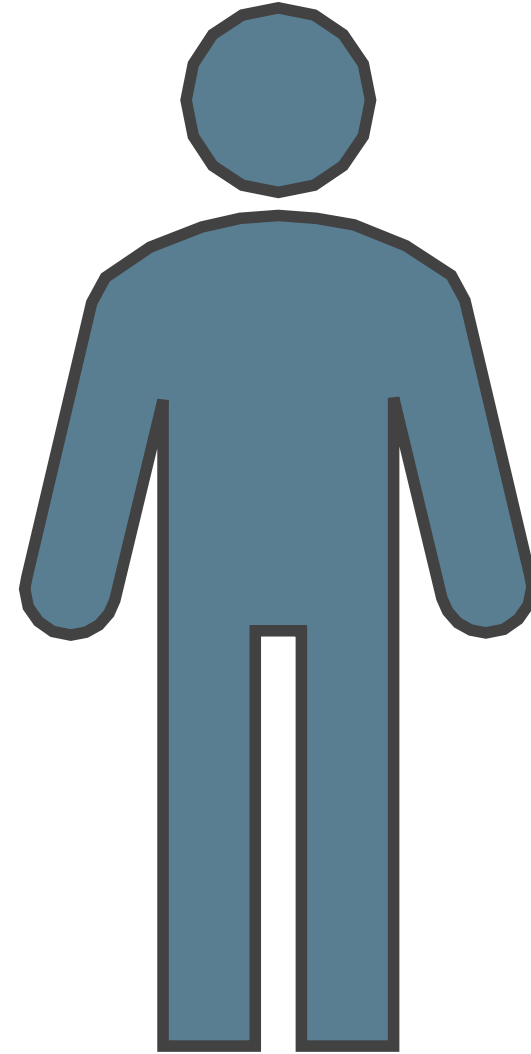


- Finger tips – Sensors



- Circulation – Hydraulics/ Pneumatics

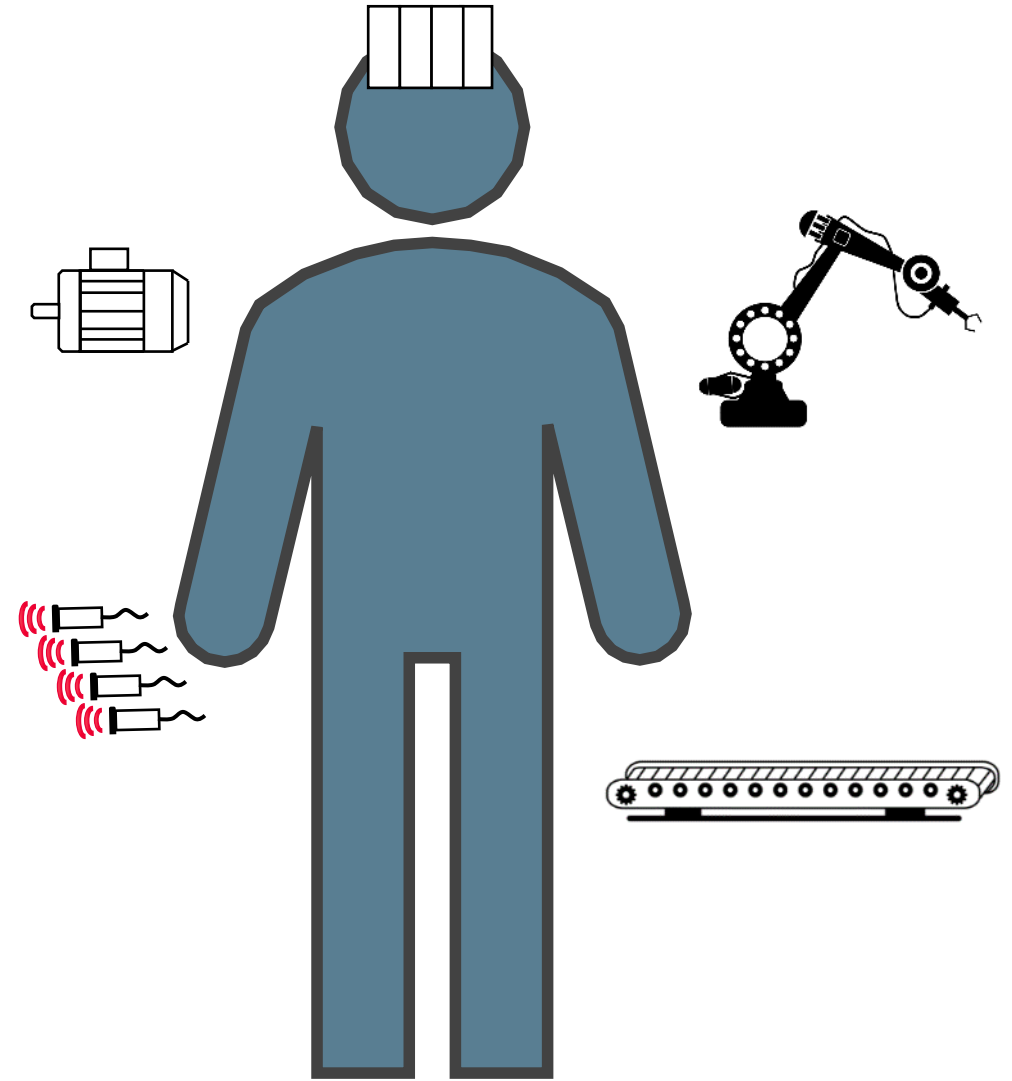
- Skeleton – Framework of the machine



LET'S SIMPLIFY A MACHINE INTO A HUMAN BODY...

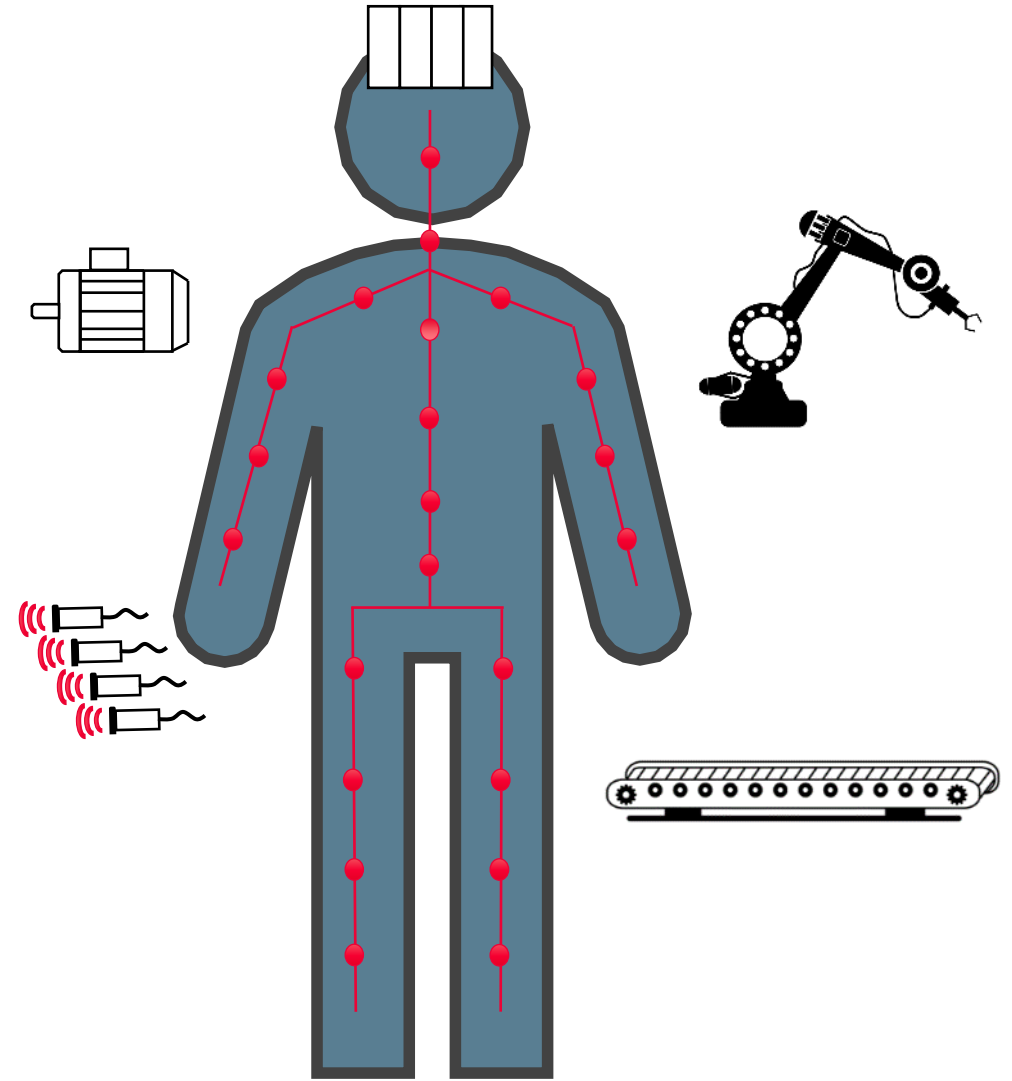
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- Brain - PLC
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LET'S SIMPLIFY A MACHINE INTO A HUMAN BODY...

Molex Industrial is the
'Central Nervous System'
of the machine



TARGET MARKETS

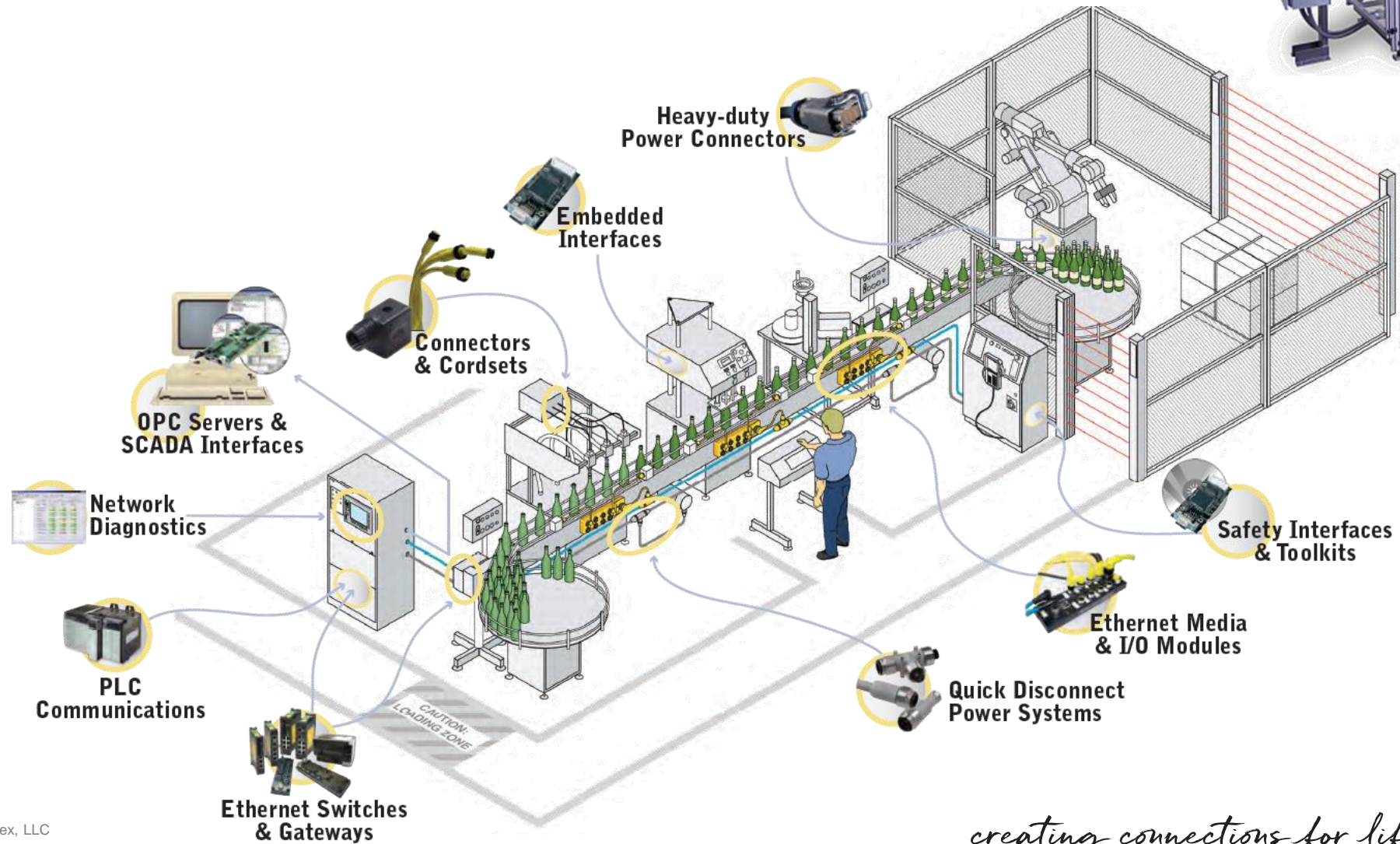
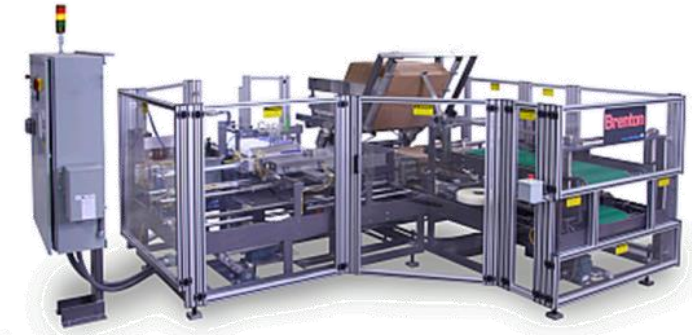
- 1 Automotive production line
- 2 Conveying and sorting application
- 3 Material handling
- 4 Food and beverage processing
- 5 Robotics
- 6 Device OEMs
- 7 Machine builders

CONNECTIVITY PRODUCT LINES

- BradPower
- Mini-Change
- M23
- Micro-Change (M12)
- Nano-Change (M8)
- MPIS
- Network Connectivity
- DIN Valve Connectors
- GWconnect HDC Connectors
- Industrial Network Solutions
- Flamar cables
- Inductive & Photoelectric sensors



COMPLETE SOLUTION FOR AUTOMATION INFRASTRUCTURE



MOLEX PRODUCT OFFERING FOR MACHINES

Molex has a complete product offering from Network card to I-O to cord-sets to Sensors

PLC

Connectivity Solutions

Sensors

Valves

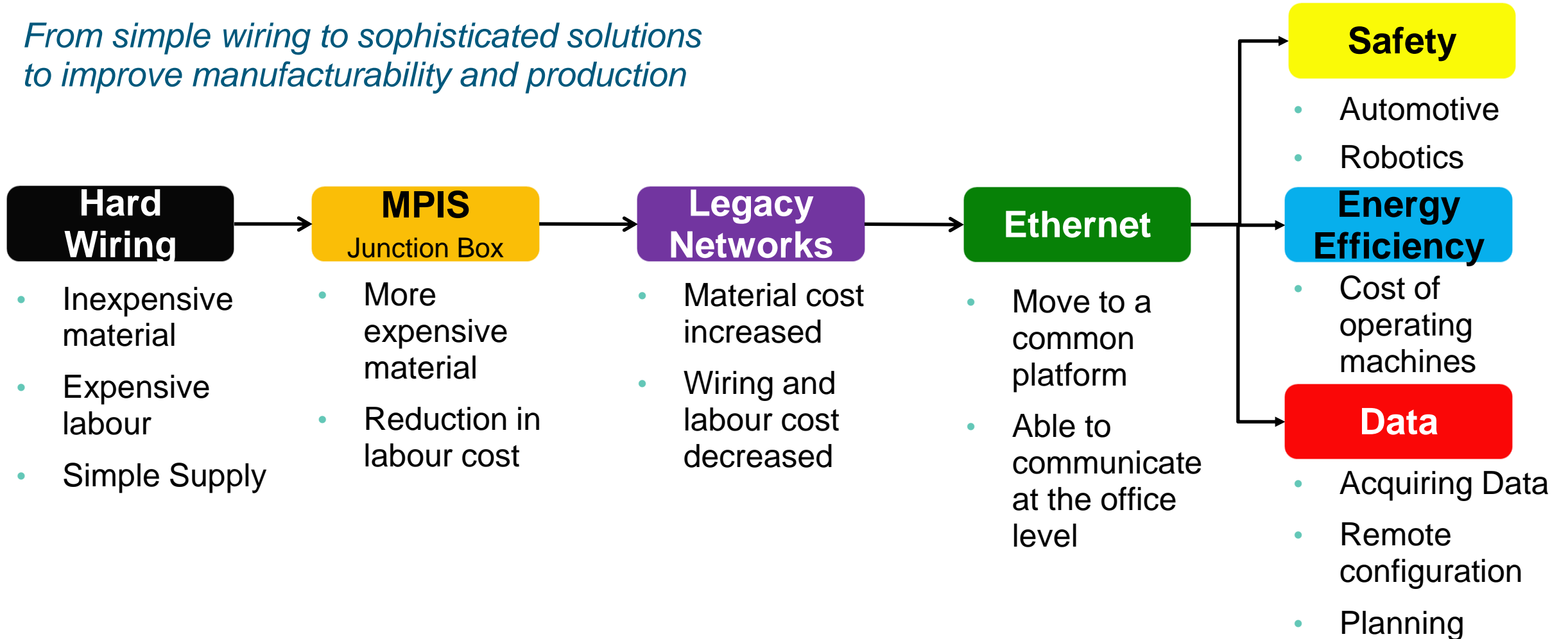
Motion



Connectivity Solutions

MARKET CHANGES - TRENDS

From simple wiring to sophisticated solutions to improve manufacturability and production

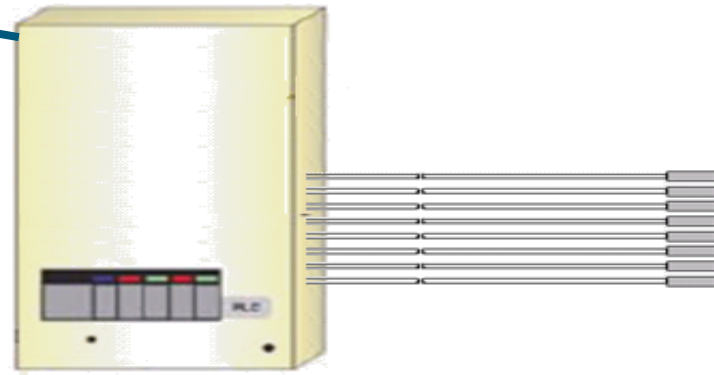


FROM HARD WIRING TO SOFT WIRING (MPIS)

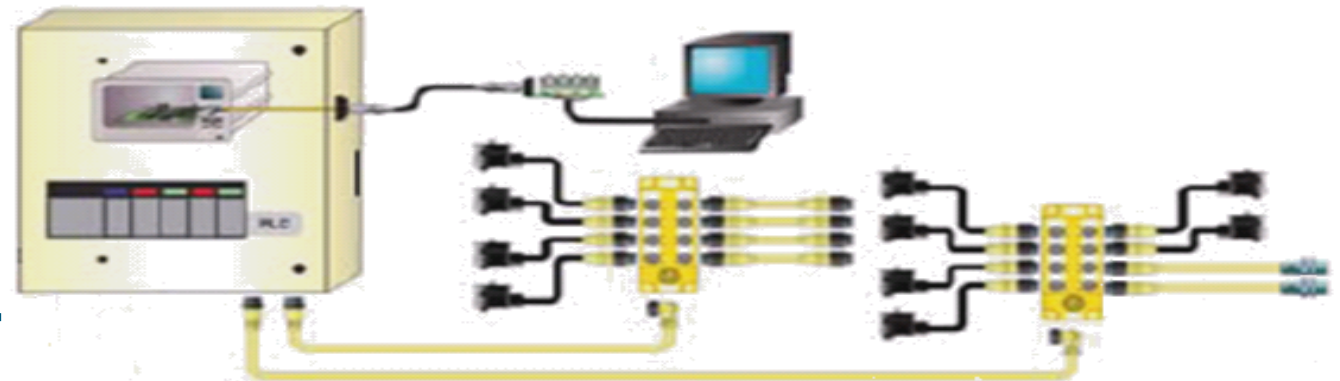


- Possible Reduction in I-O cards
- Reduction in terminal blocks

COST



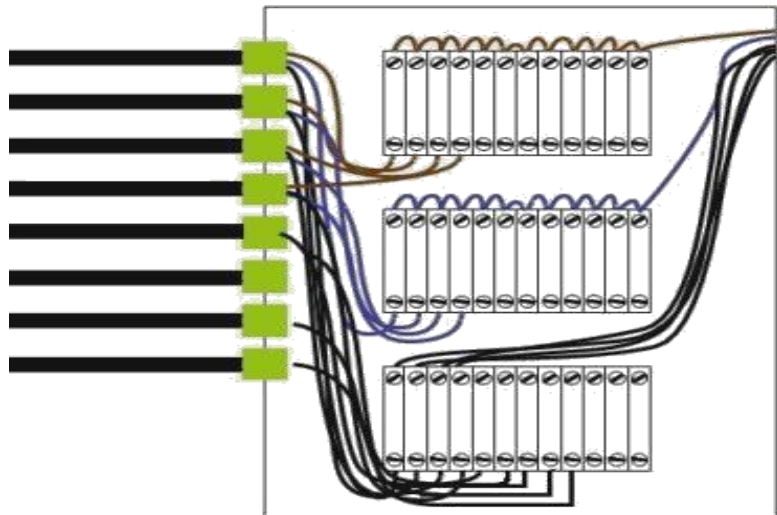
- Reduction in terminal block I-O cards and wire termination
- Possible reduction Cabinet dimension



ADVANTAGES FOR MACHINE BUILDERS COMPARISON WITH 8 SENSORS

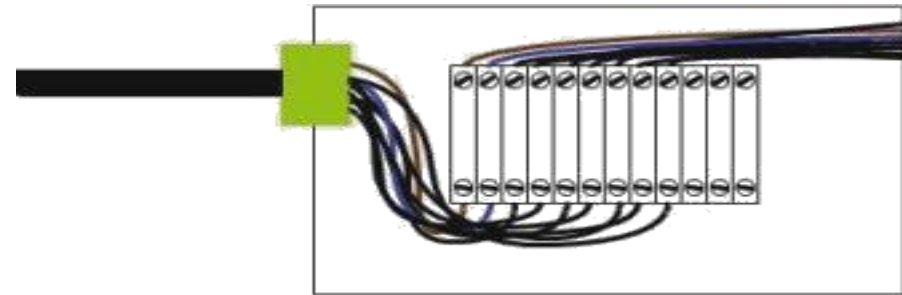
Traditional wiring

- 8 sensors
- 24 wires
- 24 terminal blocks
- 8 cable gland

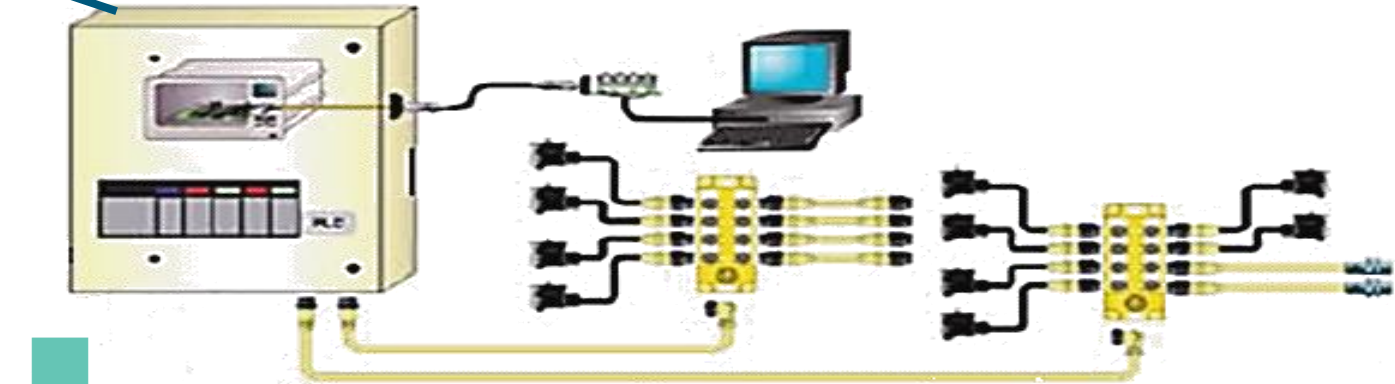
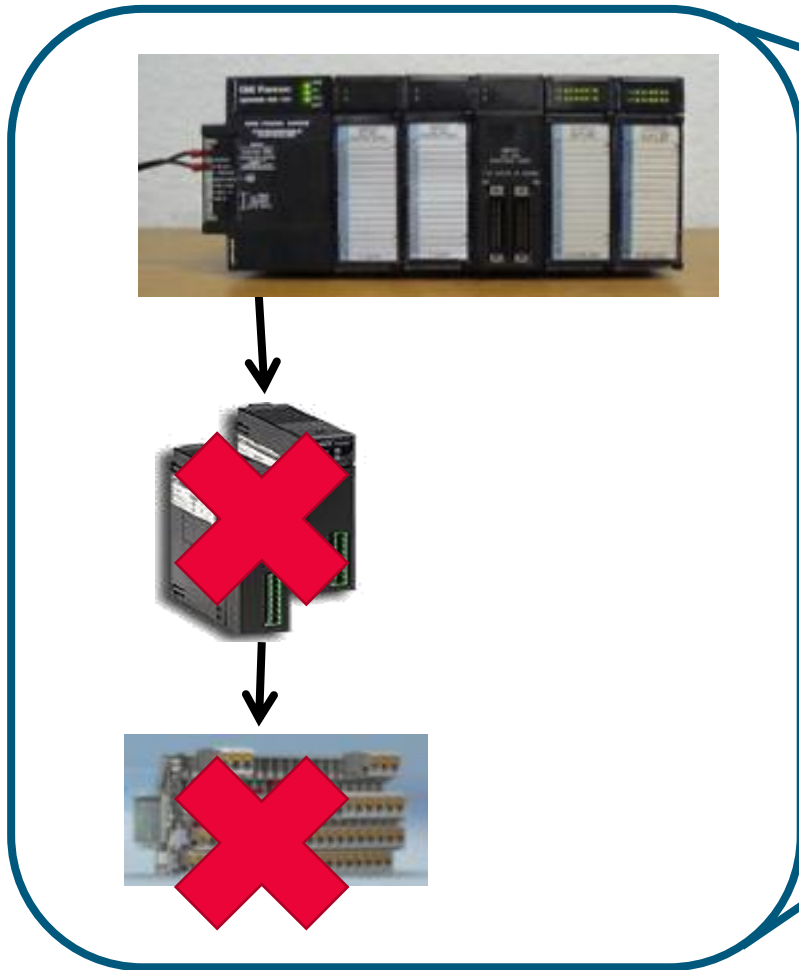


MPIS

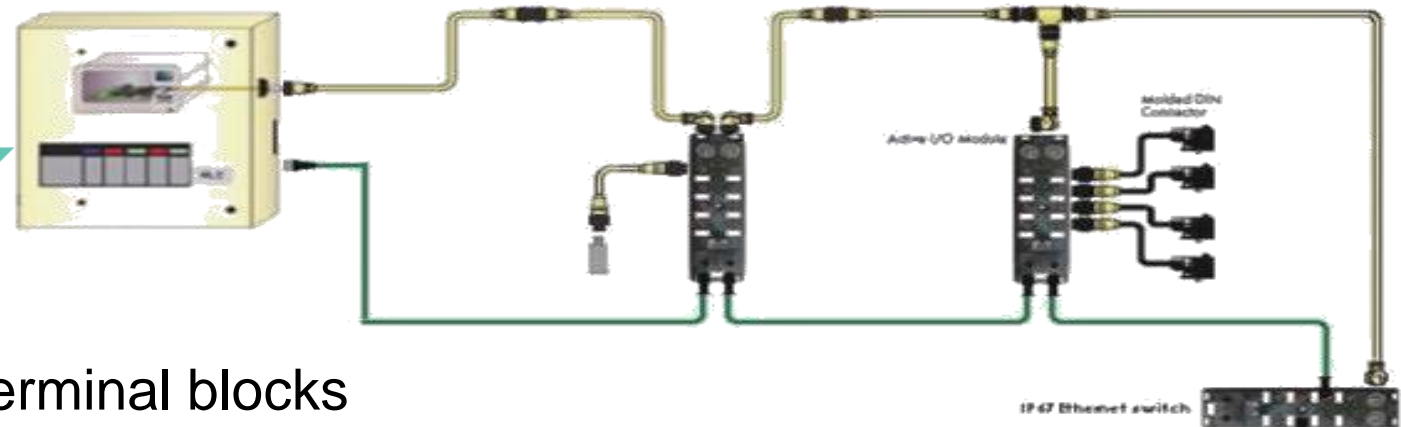
- 8 sensors
- 1 main cable
- 11 wires
- 11 terminal block
- 1 cable gland



FROM MPIS TO ETHERNET SOLUTION



COST

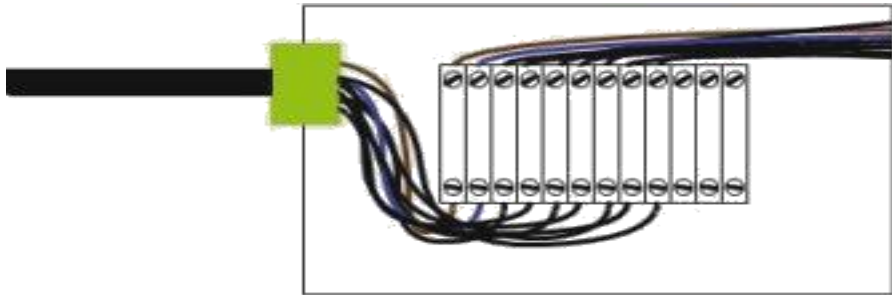


- Elimination of I-O cards and terminal blocks
- Adding Ethernet card

ADVANTAGES FOR MACHINE BUILDERS COMPARISON WITH 8 SENSORS

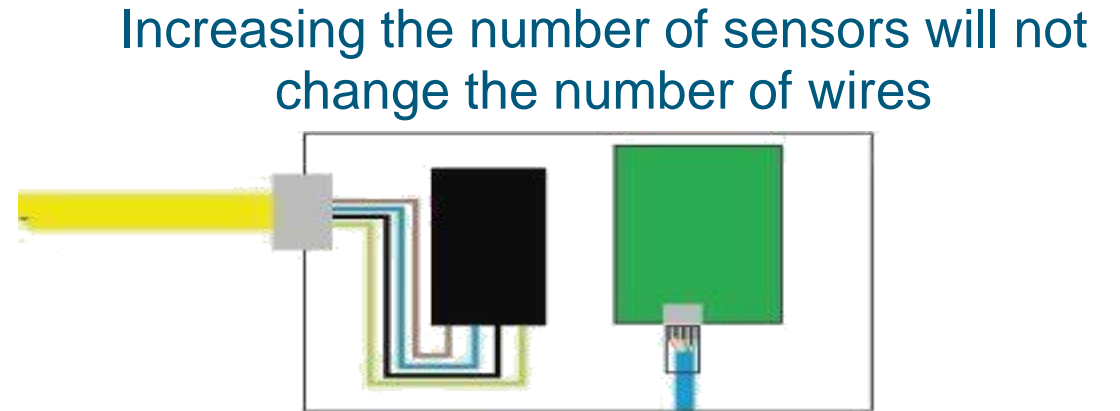
MPIS

- 8 sensors
- 1 main cable
- 11 wires
- 11 terminal blocks
- 1 cable gland



Ethernet

- 8 sensors
- 1 main cable
- 5 wires
- 1 Ethernet cable
- 0 terminal block
- 0 cable gland



TYPICAL SAVINGS THAT CAN BE MADE

	TRADITIONAL WIRING				MPIS 11 WIRES				MPIS 19 WIRES				ETHERNET-PROFINET			
	Number of I-O that can be used =====>				48 I-O				48 I-O				48 I-O			
	N pcs.	Time/ Min.	Price	Total	N pcs.	Time/ Min.	Price	Total	N pcs.	Time/ Min.	Price	Total	N pcs.	Time/ Min.	Price	Total
Components																
MPIS / I-O Block	0		30	€ -	6		30	€ 183	3		37	€ 110	3		216	€ 648
Sensor cordset	48		5.2	€ 250	48		5.4	€ 259	48		5.4	€ 259	48		5.4	€ 259
M 12 Y Splitter									24		8	€ 187	24		8	€ 187
Cable Gland	48		1.0	€ 48	6		1	€ 6	3		1	€ 3	0		1	€ -
Terminal Block	144		2.0	€ 288	66		2	€ 132	57		2	€ 114	0		2	€ -
Ethernet Cable				€ -				€ -				€ -	3		21	€ 62
Ethernet Rec + RJ45													1		13	€ 13
Power Cable				€ -				€ -				€ -	3		55	€ 164
Power Receptacle													1		18	€ 18
I/O Card	4.8		150	€ 720	4.8		150	€ 720	4.8		150	€ 720				
Ethernet NIC				€ -				€ -				€ -	0		0	€ -
Labor to Wire up																
Wire termination	144	4	2	€ 1,344	66	4	2.333	€ 616	57	4	2.333	€ 532	5	1	1	€ 5
Drill Hole	48	1	0.583	€ 28	6	1	0.583	€ 4	3	1	0.583	€ 2	2	1	0.583	€ 1
Total Labor				€ 1,372				€ 620				€ 534				€ 6
Total Customer cost in EURO				€ 4,050				€ 2,539				€ 2,461				€ 1,364
Saving from Previous solution								-37%				-3%				-45%
Saving from Traditional solution								-37%				-39%				-66%
Saving from MPIS 11 Wires																-46%

BRAD INDUSTRY CONNECTORS

Brad Nano-Change M8
 Brad Micro-Change M12
 Brad Ultra-Lock M12
 Brad M12 Power
 Brad Mini-Change
 Brad M23
 Brad Power

Circuit Size	3 to 5	3 to 12	3 to 12	4 to 5	2 to 19	6 to 19	3 to 4
Available Configurations	Cordsets s/e,d/e Receptacles FM/BM Field Attachables	Cordsets s/e,d/e Receptacles FM/BM Field Attachables	Cordsets s/e,d/e Receptacles FM/BM Field Attachables	Cordsets s/e,d/e Receptacles FM/BM Field Attachables	Cordsets s/e,d/e Receptacles FM/BM Field Attachables	Cordsets s/e,d/e Receptacles FM/BM Field Attachables	Cordsets s/e,d/e Receptacles FM/BM Field Attachables
IP-Rating	IP65/IP67	IP67	IP69K	IP67	IP67	IP67	IP67/IP68/IP69K
Current	3-4 A	1,5-4 A	1,5-4 A	12-16 A	2-13 A	8-28 A	10-30 A
Wire Gauge	0,25 mm ² -0,34 mm ²	0,14 mm ² -0,34 mm ²	1,5 mm ² -2,5 mm ²	0,14 mm ² -2,5 mm ²	16-22 AWG	0,14 mm ² -1,5 mm ²	10 AWG
Mounting thread Ø	8mm	12mm	12mm	12mm	12mm	23mm	34,925mm

Size

INDUSTRIAL CONNECTIVITY

Typical Applications

Variable Speed
Drives

Robot Controllers

Vision Systems

Pneumatic Valve
Controllers

Servo Drives

Functional Safety
Systems

INDUSTRIAL CONNECTIVITY

Brad Micro-Change (M12) Connectors



IP67-Rated HarshIO Modules



Brad Nano-Change (M8) Connectors



FCT D-Sub Connectors



Brad M8/M12 Cordsets



Brad Passive-Signal and Safety MPIS Boxes



Brad Ultra-Lock Connection system



mPm Din Valve Connectors



MICRO CONNECTIVITY 'IN THE BOX'

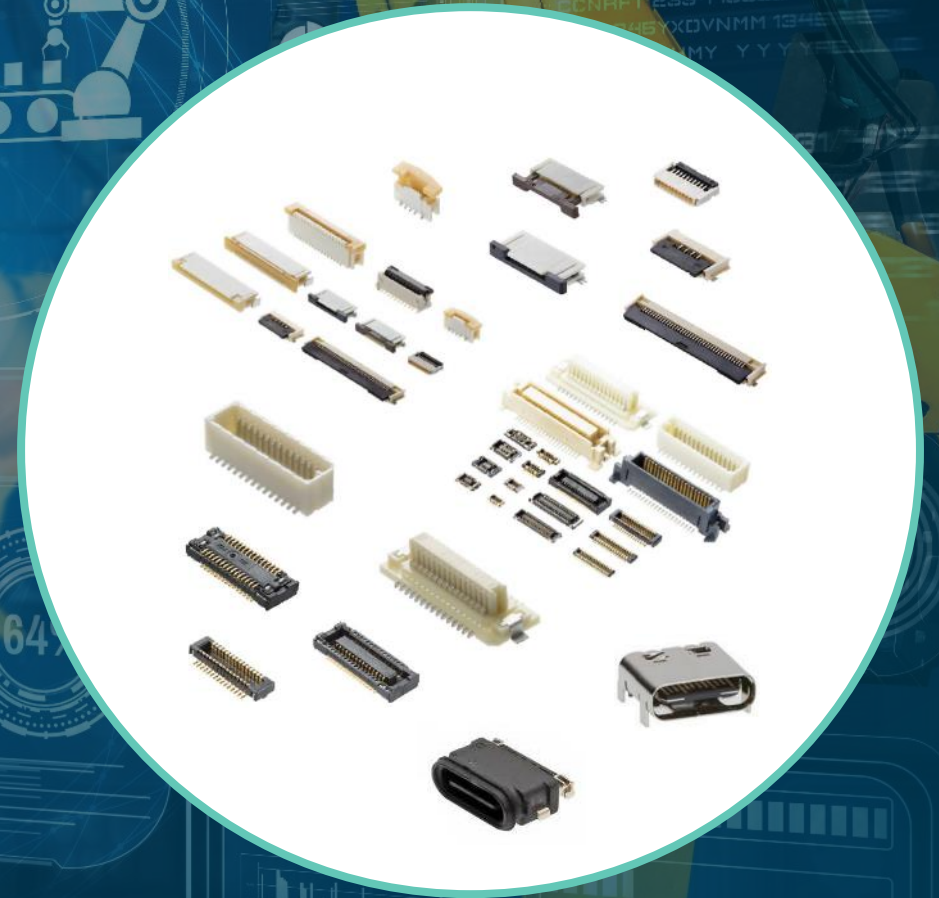
Core products provide robust connectivity

SlimStack Board-to-Board Connectors
High speed or floating

Easy-On FFC/FPC Connectors
High speed and double contact

USB Connectors
Sealed Type-C

Learn more about these products at www.molex.com



RESOURCES

ARTICLES & BLOGS

- [Smart Solutions for Complex Machines](#)
- [The Future of Industrial Automation](#)
- [The Industrial Internet of Things: The Opportunities Connected Components Can Create](#)
- [What's Trending: Building and Industrial Automation Trends Require Connectivity](#)

INTERACTIVE GUIDES

- [Interactive Guide: Food and Beverage](#)
- [Interactive Guide: Oil and Gas](#)

BROCHURES

- [Smaller and Lighter IoT Solutions](#)
- [Brad Automation: Industrial Designer Guide](#)

A man and a woman are sitting at a table in a kitchen, looking at a laptop together. The man is on the left, wearing a denim jacket, and the woman is on the right, wearing a light-colored t-shirt. They appear to be engaged in a collaborative activity. The background shows a kitchen with shelves and a window. The overall tone is warm and professional.

creating connections for life

THANK YOU

molex