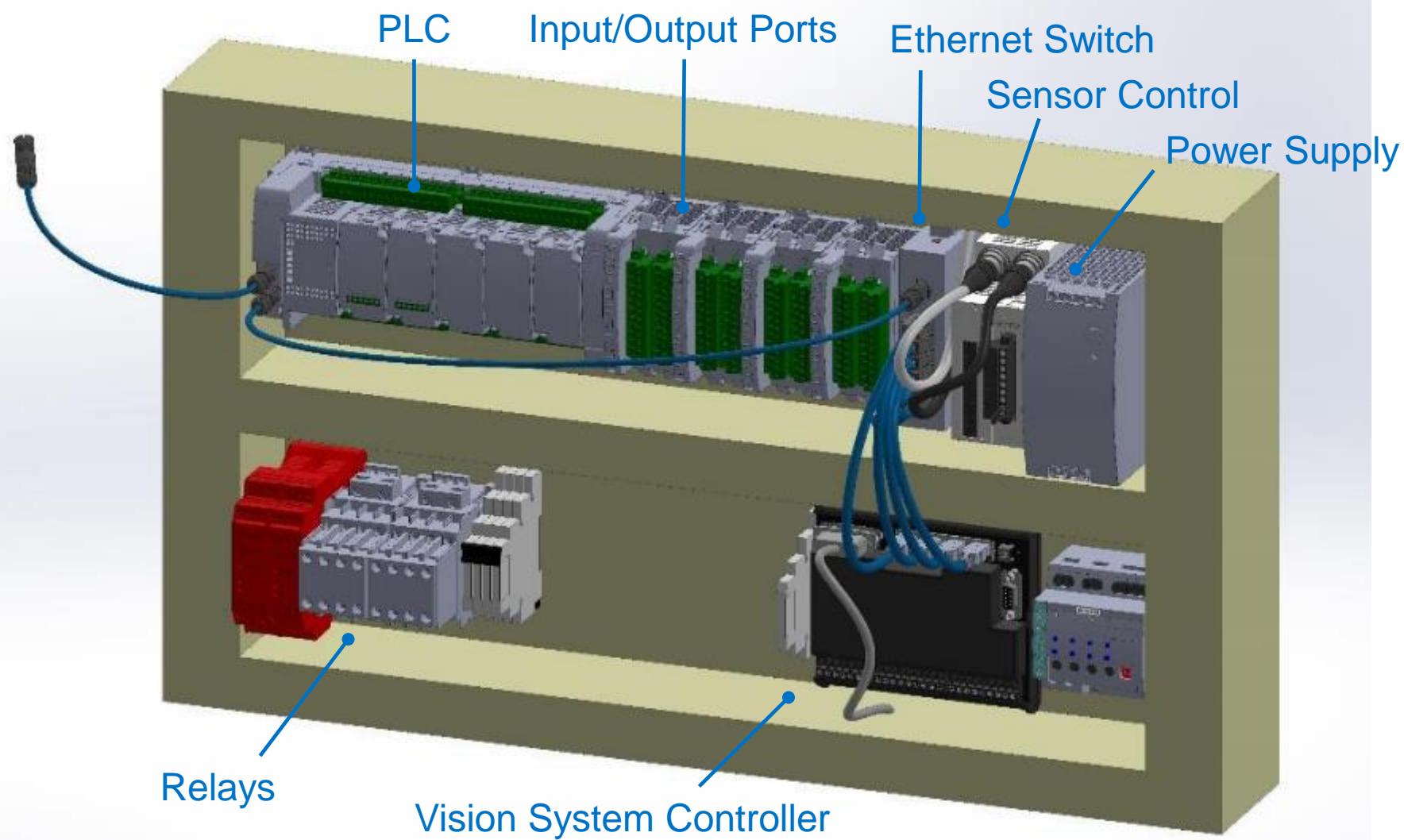


Industrial Ethernet Applications

Typical Industrial PLC Machine Automation Equipment

Industrial IO & Lighting Solutions



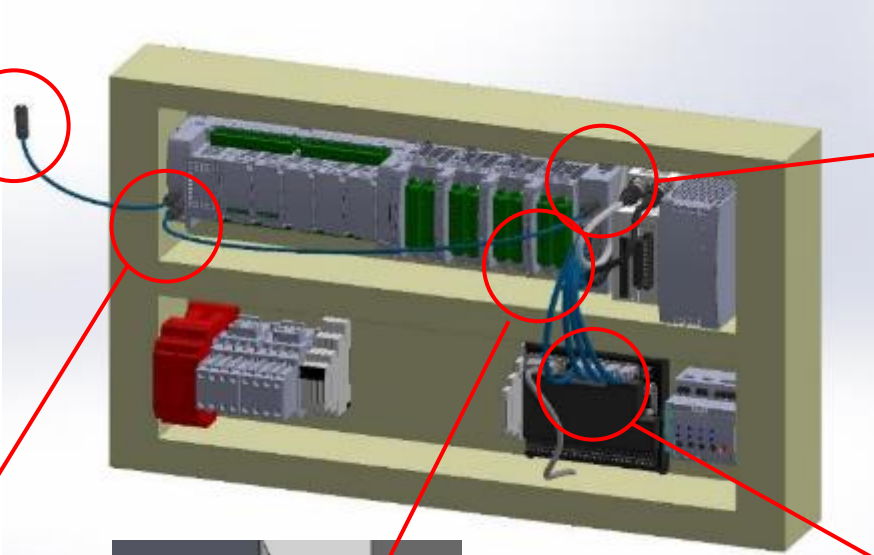
Industrial Ethernet Applications

Ethernet Interconnect - Industrial Automation Equipment

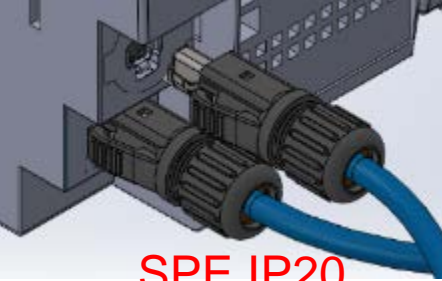
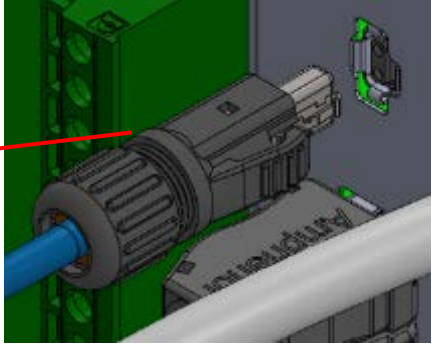
Industrial IO & Lighting Solutions



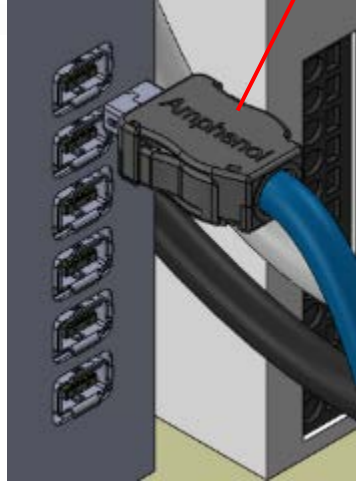
**SPE IP67
MICE2/3
EXTERNAL
PERIPHERALS**



SPE IP20

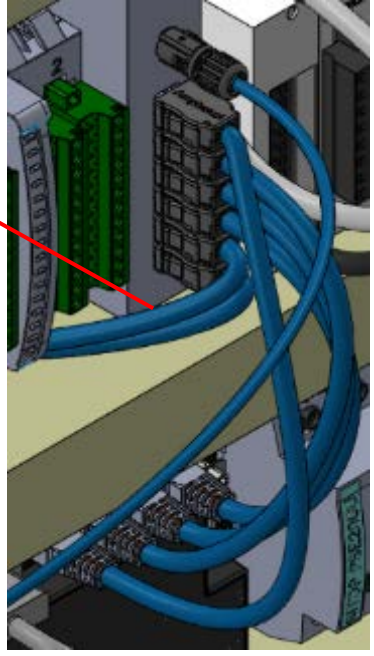


**SPE IP20
MICE1
INTERNAL
CONNECTIONS**



**iX (ND9)
HIGH SPEED
INTERNAL
CONNECTIONS**

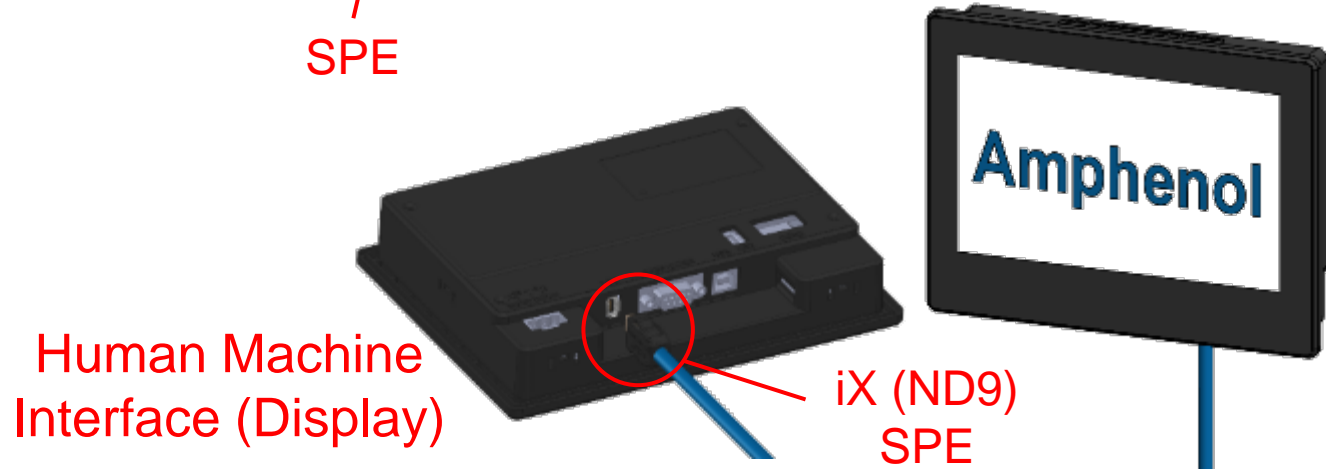
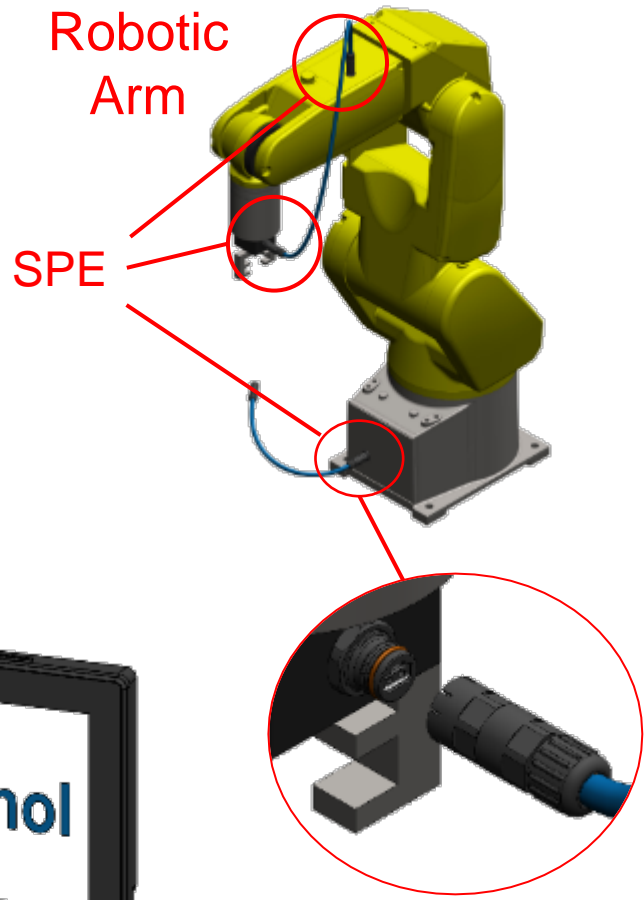
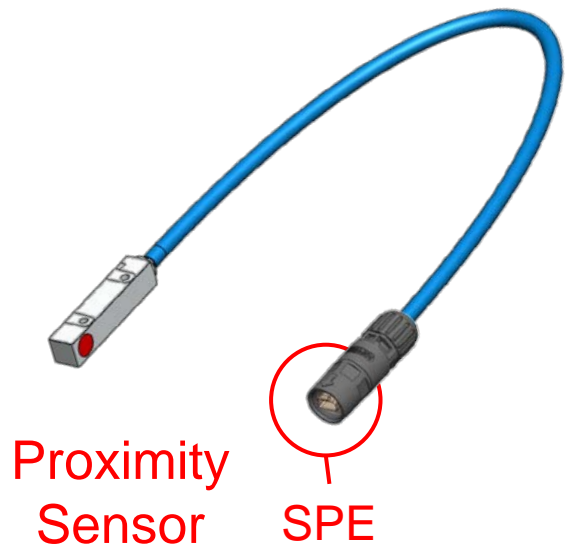
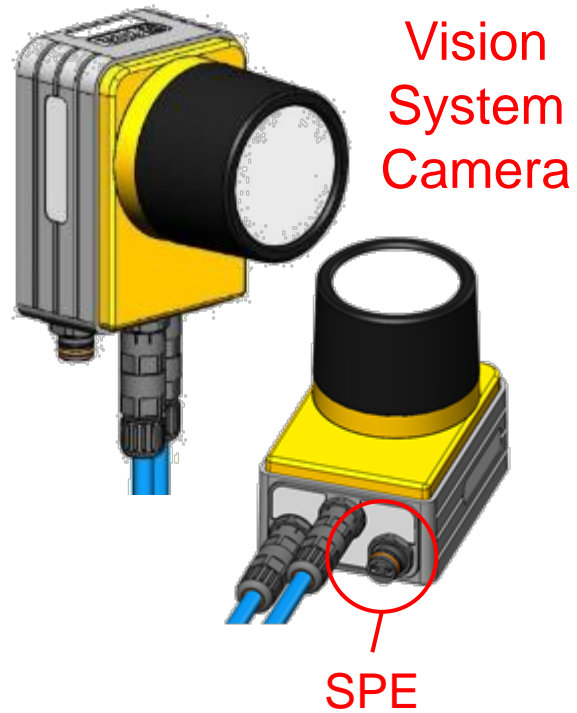
**iX (ND9) TO RJ45
HIGH SPEED INTERNAL
CABLES**



Industrial Ethernet Applications

Industrial Peripheral Equipment Examples

Industrial IO & Lighting Solutions



Industrial Ethernet Solutions

10G Ethernet in a smaller package



Industrial IO &
Lighting Solutions

- ✓ Industry Spec:
 - IEC 61076-3-124 defines a 10-way, shielded, free and fixed connector series for data transmission up to 500Mhz with current capacity of 1.5A per pin.
 - Fully Licensed and intermateable with Hirose & Harting.

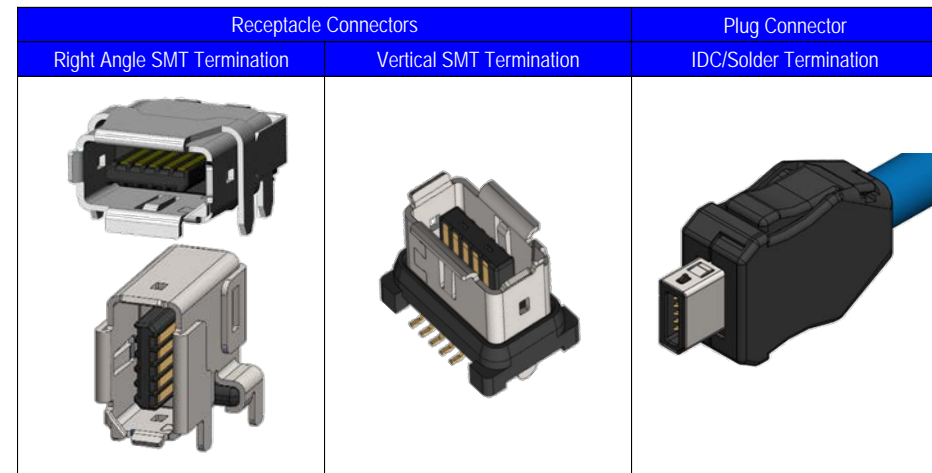
- ✓ Supports 4 pair Ethernet:

- 10/100BASE-T over 100M
- 1000BASE-T over 100M
- 2.5GBASE-T over 100M
- 5GBASE-T over 100M
- 10GBASE-T over 100M

- ✓ Independently tooled products

- ✓ Multiple Configurations:

- Right Angle SMT (Upright Flag, Horizontal), Vertical SMT receptacles
- Field terminable kits for plugs. IDC and Solder termination available
- Cable assemblies: *ix* to *ix*, *ix* to RJ45, *ix* to M12



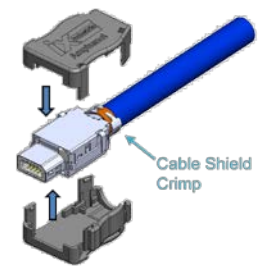
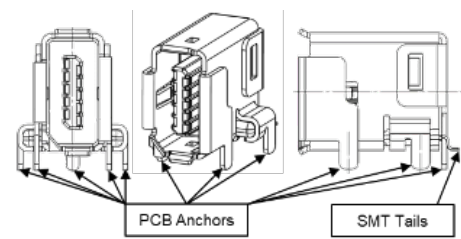
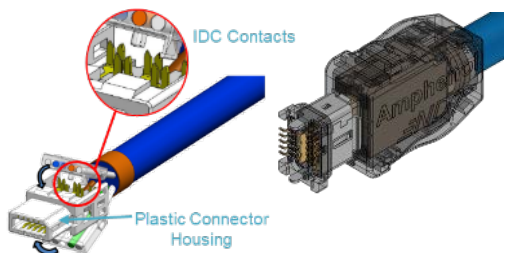
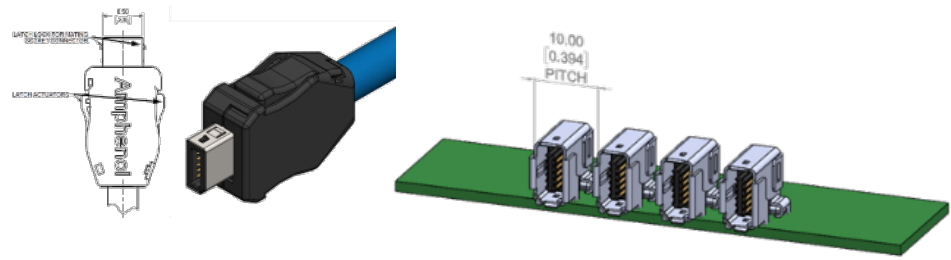
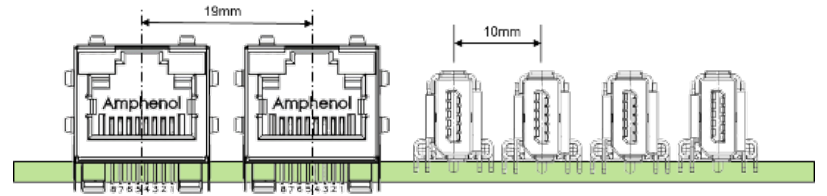
ix Industrial Key Features & Benefits



Industrial IO & Lighting Solutions

ix Industrial™ exhibits key benefits over RJ45, USB, Industrial Mini IO and other Industrial data interconnects.

- ✓ 75% smaller than RJ45
- ✓ 10mm spacing in ganged applications
- ✓ Robust, audible, 2 point metal latching to prevent accidental unplugging and damage
- ✓ Five PTH PCB R/A receptacle anchors endure shock and vibration (EN 50155)
- ✓ Keyed housing to prevent mis-mating
- ✓ 360° shielding for EMI immunity
- ✓ IP20 rated for finger proof (EN 60529)
- ✓ 10G data rate (10GBASE-T, Cat6A)
- ✓ 5000 Mating Cycles (IEC 60512-9-1)
- ✓ Field terminable plugs (IDC, Solder)
- ✓ Easy to use termination hand tool



Receptacle Connectors			Plug Connector	
Vertical Right Angle SMT ("Flag")	Horizontal Right Angle SMT	Vertical SMT		IDC/Solder
Type-A Key Shown	Type-A Key Shown	Type-B Key Shown	Type-C Key Shown	Type-A Key Shown

ix Industrial Planned Versions

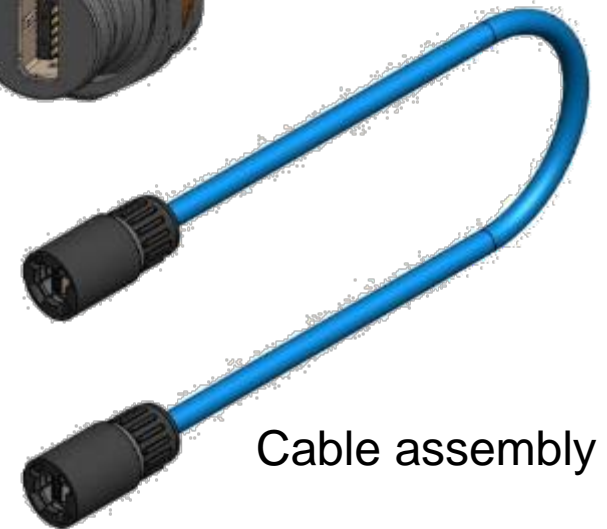
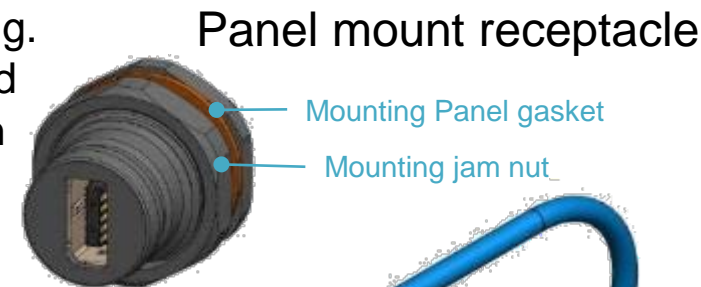
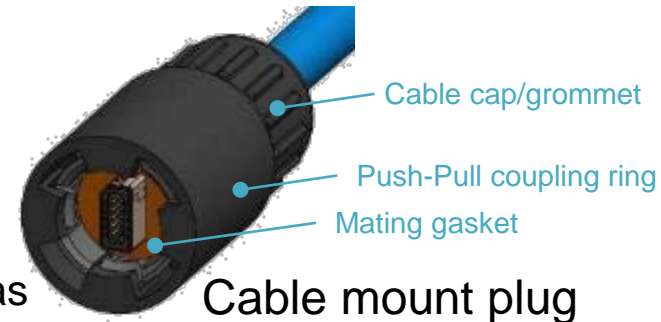
Push-Pull Latching



Industrial IO &
Lighting Solutions

ix (ND9)

- IEC 61076-3-124 specifies the requirements for an IP20 plug and receptacle, but does not currently provide for an IP67 sealed configuration with latching.
- Amphenol is developing an *ix* plug and receptacle that provides IP67 protection from fluid ingress and dust, as well as a positive, push-pull latch.
- The receptacle uses a jam nut to mount to a panel or housing.
- The plug connector is simply pushed onto the panel mounted receptacle connector until it snaps into position and the latch fingers engage.
- The internal face seal compression gasket provides IP67 sealing protection in the mated condition.
- Pulling on the cable itself will not disengage the latch.
- In order to un-mate the plug, the coupling ring is pulled back to disengage the latches, and the plug can then be pulled away from the receptacle.
- In the unmated condition, the panel receptacle is sealed internally, and to the panel with mounting gasket to prevent fluid incursion to the equipment.



Amphenol ICC

Electrical Characteristics

Current Rating:	1.5A @ 40°C (per IEC 60512-5-2, Test 5b)
Voltage Rating:	50 VAC max, 60 VDC max
Initial Contact Resistance:	30mΩ max (per IEC 60512-2-1, Test 2a)
Shielding Resistance:	100mΩ max (per IEC 60512-2-1, Test 2a)
Insulation Resistance:	500 MΩ min @ 500 VDC test voltage (per IEC 60512-3-1, Test 3a)
Dielectric Withstanding Voltage:	500 VDC (per IEC 60512-4-1, Test 4a, Method A)

Mechanical Characteristics

Insertion / Withdrawal Force:	25N (5.6 lbs-force) maximum (per IEC 60512-13-2, Test 13b)
Pull-Out Force:	80N (18 lbs-force) minimum (per IEC 60512-15-6, Test 15f)
Thermal Shock:	10 cycles between -55°C and +85°C (per IEC 60512-11-4, Test 11d)
Humidity:	Low temperature +25°C, high temperature +65°C, cold sub-cycle -10°C, 93% humidity (per IEC 60068-2-38, Test Z/AD)
Mechanical Shock:	300m/s ² , half-sine shock pulses, 11ms (per IEC 60512-6-3, Test 6c)
Vibration, Sinusoidal:	10Hz – 500Hz, 0.35mm, 50m/s ² (per IEC 60512-6-4, Test 6d)
Mating Cycles:	5000 cycles (per IEC 60512-9-1, Test 9a)
Operating Temperature:	-55°C to +85°C

Signal Characteristics

Transmission Rate:	Up to 10 Gb/s
Bandwidth:	Up to 500 MHz

Material Characteristics

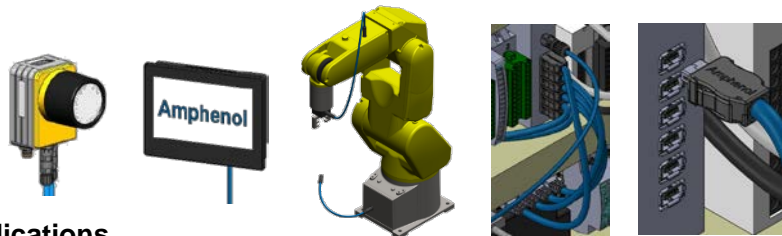
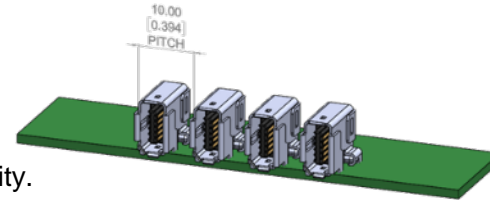
ND9 Series connectors are RoHS compliant per EU directive 2011/65/EU and amendments.

- Unless otherwise specified, the materials for each component shall be:
- Contacts: Copper alloy plated with Gold over 1.27μm (50μ") min Nickel on the mating area
- Housings / Inserts: Thermoplastic, UL94V-0 flammability rating
- EMI Shields: Stainless steel, Nickel plated (Plug) or Tin plated (Receptacle)
- Wire: Copper, metal braid / shield, PVC insulation



Features & Benefits

- Supports implementation of high bandwidth Industrial IoT Ethernet connectivity in Factory and Process Automation applications.
- New standard per IEC 61076-3-124, 10 position connector supporting 4 pair high speed Ethernet.
 - 10/100BASE-T over 100M
 - 1000BASE-T over 100M
 - 2.5GBASE-T over 100M
 - 5GBASE-T over 100M
 - 10GBASE-T over 100M
- 75% smaller than RJ45, 10mm pitch allows greater density.
- Intermateable with Hirose & Harting ix, fully licensed.
- Right angle and vertical SMT receptacles feature robust pcb board locks.
- Robust 2-point latching; solder and field terminable IDC plugs.
- 360° shielding for EMI protection, with keyed housings (A, B, C).
- 5000 mating cycles durability for high reliability.



Applications

- Ethernet connectivity between all levels.
- Machine to Machine, Robotics, Controllers, Switches, I/O Modules.
- Building Automation – Environmental, Lighting control, Sensors.
- Healthcare, Transportation, Security Systems, Traffic Control.

