

Amphenol

COMMUNICATIONS SOLUTIONS



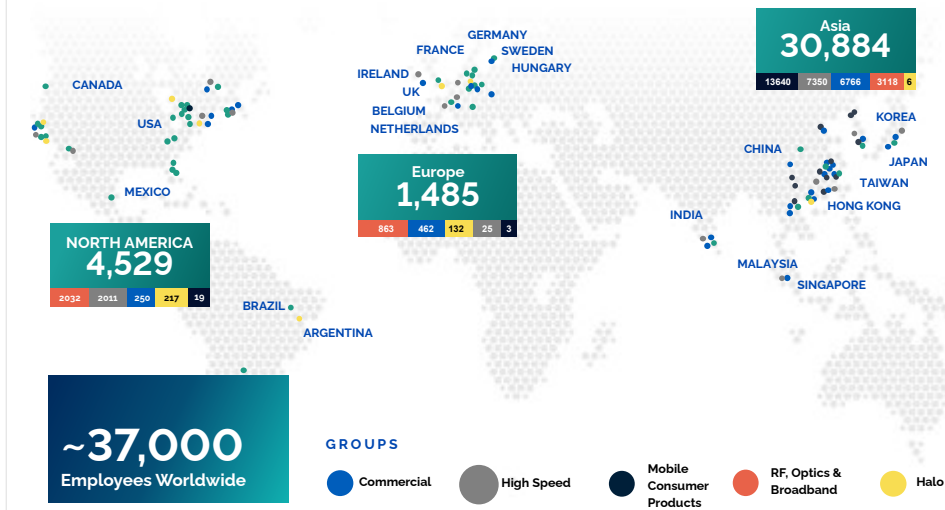
Amphenol

Amphenol Communications Solutions (ACS), a division of Amphenol Corporation, is a world leader in interconnect solutions for Communications, Mobile, RF, Optics, and Commercial electronics markets.

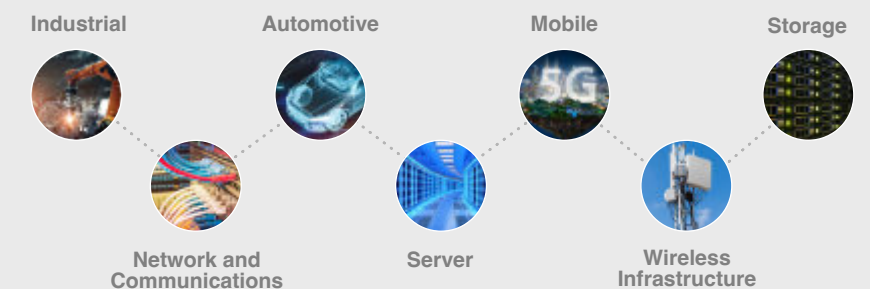
Amphenol Corporation is one of the world's largest designers and manufacturers of electrical, electronic and fiber optic connectors and interconnect systems, antennas, sensors and sensor-based products and coaxial and high-speed specialty cable.

ACS has an expansive global presence in research and development, manufacturing, and sales. We design and manufacture a wide range of innovative connectors as well as cable assemblies for diverse applications including server, storage, data center, mobile, RF, networking, industrial, business equipment and automotive.

Strong Global Presence



Application and Market Solutions



Custom Capabilities

Our engineering teams collaborate with our customers on thousands of projects every year, so no matter what technical, operational and even commercial challenges you face, Amphenol Communications Solutions can develop a solution for you!

Product Overview



www.amphenol-icc.com/high-speed-backplane



Paladin HD®

- Density optimized performance beyond 112G PAM4
- Achieves 144 diff pairs within 1U Orthogonal slot
- Consistent signal integrity performance over the entire mating range
- Flexible architecture supports right angle female, direct orthogonal, and cables



Paladin®

- Supports data rates beyond 112G PAM4; industry leading signal to noise performance
- Consistent signal integrity performance over the entire mating range
- Flexible architecture supports direct orthogonal, traditional backplane, mezzanine, coplanar and cable requirements



ExaMAX®

- Cost optimized with scalable performance to 112G PAM4
- Innovative design supports low insertion/extraction forces along with reduced crosstalk and low insertion loss
- Flexible architecture supports direct orthogonal, traditional backplane, coplanar and cable requirements



ExaMEZZ®

- Cost optimized with scalable performance up to 112G PAM4
- Innovative design supports low insertion/extraction forces along with reduced crosstalk and low insertion loss
- Stacked height range from 15 to 45mm in 2- and 4-Pair configurations



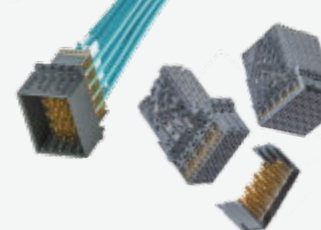
XCede® HD

- Supports designs from 8G to 56G PAM4
- The de facto standard for high performance backplane designs with industry leading density
- Supports Embedded Capacitors



AirMax®

- Cost optimized with scalable performance up to 56G PAM4
- Traditional backplane offering including standard and inverse gender
- Standard is 3-, 4- and 5-Pair



XCede®

- Supports designs from 8G to 56G PAM4
- Scalable and flexible design supports all your system requirements
- Supports Embedded Capacitors; mechanically robust

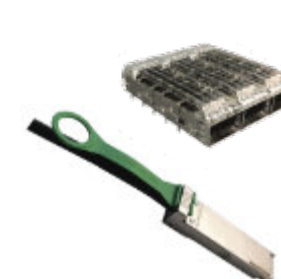


www.amphenol-icc.com/high-speed-io



UltraPort®/ ExtremePort® SFP

- Supports designs from 28G, 56G PAM4
- 112G PAM4 solutions in development
- Passive & active cables; 26AWG to 32AWG cable
- Stacked, ganged and belly-to-belly board connector and cage configurations with heat sinks and light pipes



UltraPort®/ ExtremePort® QSFP

- Supports per port designs from 100G, 200G and 400G PAM4
- 4 lanes per cable – 28G, 56G and 112G per lane capability
- Passive & active cables; 26AWG to 32AWG cable
- Stacked, ganged and belly-to-belly connector and cage configurations



ExtremePort® QSFP DD

- Supports per port designs from 200G, 400G and 800G PAM4
- 8 lanes per cable – 28G, 56G & 112G per lane capability
- Double the bandwidth per port vs. QSFP
- Backwards plug compatibility with QSFP



ExtremePort® OSFP

- Supports per port designs from 200G, 400G and 800G PAM4
- 8 lanes per cable – 28G, 56G & 112G per lane capability
- Thermal management engineered into cabled solution
- PAM4 modulation providing solutions up to 800G aggregate bandwidth



mSAS HD External Connectors

- Capable of speeds up to 24Gb/s per channel (4 lanes, 8 lanes, 16 lanes available)
- Supports SAS 4.0 and PCIe Gen 4.0 applications
- 32Gb/s for PCIe Gen 5.0 solution in development



mSAS HD Active Optical Cables

- Capable of speeds up to 16Gb/s per channel (4 lanes)
- Supports SAS 2.0/3.0 and PCIe Gen 3.0/4.0
- Transmission distance up to 100m (MMF)



100G QSFP Active Optical Cables

- Capable of speeds up to 25.78125Gb/s or 28.056Gb/s per channel (4 lanes)
- Supports 100G Ethernet and Infiniband 4xEDR and 4x32 FC protocols
- Transmission distance up to 100m (MMF)



300G CXP2 Active Optical Cables

- Capable of speeds up to 25.78125Gb/s per channel and 25Gb/s per channel (12 lanes)
- Supports Ethernet (25.78125Gb/s per channel) and Cpri (25Gb/s per channel) protocols
- Up to 300Gb/s aggregate bandwidth per channel



200G QSFP DD Active Optical Cables

- Capable of speeds up to 25.78125Gb/s or 28.056Gb/s per channel (8 lanes)
- Supports 200G Ethernet NRZ
- Maximization of linear port density



400G QSFP DD Active Optical Cables

- Capable of speeds up to 56Gb/s per channel (8 lanes)
- Supports Ethernet PAM4
- Maximization of linear port density



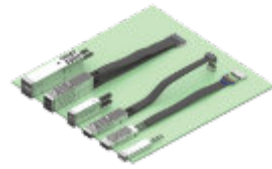
Leap® On-Board Transceiver

- 300Gb/s aggregate 12TRx at distances up to 70m
- Capable of speeds up to 28Gb/s per channel
- Low power consumption: 5.4W
- Small form factor: 1sq inch



SCFF On-Board Transceiver

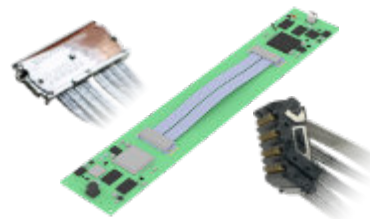
- 1TRx at up to 28Gb/s at distances up to 70m
- Duplex LC optical port
- SMT solder and 2-screw PCB fixation



External High Speed IO

On package or near ASIC to external IO receptacles

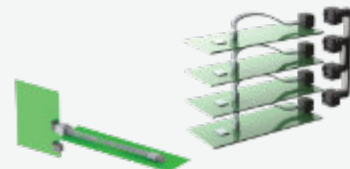
- Fully compliant to established industry standard interfaces: SFP, QSFP, QSFP DD, OSFP and others
- Supports transmission speeds of 28G, 56G and 112G per lane
- Press fit or cabled sideband signal management; engineered wire management
- Stacked, ganged, and belly-to-belly configurations coupled to high density (DP/mm²) near chip and on chip solutions



Internal High Speed IO

Near ASIC to card's or board's location in system

- Delivering a simple, low-loss, direct link to pluggable modules or anywhere in the system
- Optimization of low loss twinax cable with connectors including Mini-SAS HD, OCulink, SlimSAS™, Mini Cool Edge IO, ExtremePort™ Z-Link, Flash & Swift
- High speed, low profile and high density (bandwidth / mm²) near chip and on package solutions including micro-LinkOVER™ and DensLink™
- Solutions available at 28G, 56G, 112G and 224G signaling speeds
- Multiple cable exit options including straight, right angle, and coplanar
- Construction options including double ended, Y, and breakout cables



Cabled Backplane

Near ASIC to system backplane or coplanar cards

- Cable Backplane System portfolio products extend the reach of passive copper for next generation system designs
- 56G and 112G PAM4 performance
- Optimization with our high speed, low loss twinax cable with Paladin® and ExaMAX® backplane connector families
- Flexible connector architecture supports cable blind mating with a backplane cable, press fit headers, right angle and orthogonal configurations



High Speed Bulk Cables

High frequency SkewClear EXD cable technology

- Offerings include multi-pair cables: 2, 4 and 8 pair constructions in wire gages from 32 AWG to 26 AWG (34 AWG in development)
- Supports transmission speeds of 10G, 28G, 56G, and 112G PAM4 per lane bandwidths
- Impedance tuned designs support: Paladin®, ExaMAX®, ExaMAX+®, micro-LinkOVER™, Swift, Flash, GenZ, OverPass™ HSIO
- FEP insulated wiring for higher temperature environments



1G-10G Transceivers

- LR, ER, BIDI, CWDM, LWDM, DWM, etc
- SFP, SFP+, CFP, XFP
- C-TEMP, I-TEMP
- Tunable



100G Transceivers

- QSFP28, CFP, CFP2, CFP4
- AOC, SR4, LR4, ER4 LITE, CWDM4
- C-TEMP, I-TEMP



200G Transceivers

- QSFP DD
- ER4
- Ask about availability



25G Transceivers

- AOC, BIDI, SR, LR, ER
- DWDM, BIDI LR, BIDI ER, CWDM
- C-TEMP, I-TEMP



400G Transceivers

- QSFP DD
- FR4, DR4, SR8
- Ask about availability



40G Transceivers

- SR,LR,ER, CWDM, AOC
- QSFP+
- C-TEMP, I-TEMP



16G / 32G / 64G Fibre Channel Transceivers

- EWRAP and OWRAP loopback designs
- C Temp and I Temp on some models
- Ask about availability



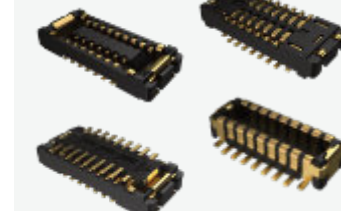
0.50mm FFC/FPC

- Easy to operate and vibration-proof
- Wide height range from 1.25mm to 5.80mm with 4 to 80 contact positions in both vertical and right angle orientations
- Front/back/vertical flip and slider mechanisms with ZIF or Non-ZIF cable terminations



1.00mm FFC/FPC

- Easy to operate and prevents against solder and flux wicking
- Wide height range from 2.00mm to 5.04mm with 3 to 34 contact positions in both vertical and right angle orientations
- Front flip and slider mechanisms with ZIF or Non-ZIF cable terminations



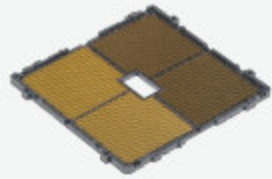
Micro Board-to-Board

- Low profile and fine pitch for high density applications
- High current rating (Up to 5A)
- Chamfer connector design prevents mismatching



Floating Board-to-Board

- Floating range of ±0.50mm in the X, Y and Z directions
- High speed performance (Up to 10Gb/s)
- Double contact points for enhanced contact reliability
- 1.0mm, 0.8mm and 0.5mm pitch with power pin option.
- FLTStack is USCAR-2 compliant



cLGA® High Speed Sockets

- Mechanically robust compression technology supporting designs with pin counts up to 10,000+ and 56 Gb/s+ data rates
- High performance configurations available in both LGA/LGA and LGA/BGA form factors



Lynx™

- Low-profile flexible open pin field design available in 4-15mm heights at .6mm contact pitch
- Optimized for density and cost. Supports data rates up to 28 Gb/s



cStack™

- Configurable low profile compression solution available on .6mm to 1.27mm pitch in LGA/LGA and LGA/BGA form factors
- Ideal for board to board and module to board applications



Lynx™ QD

- Designed in multiple form factors: right angle, coplanar and vertical stacker
- Optimized for differential pair signaling to support PCIe Gen5 and 56G performance



cStack™ & Custom Flex

- Designed for applications where flexibility, space, weight and performance are critical
- Available with BGA, LGA, SMT, press-fit or thru-hole connector terminations



M-Series™ 56

- Designed to support high technology products in board-to-board or flex assembly architectures from 4-15mm
- Next-generation differential pair contact design for 56G NRZ, 112G PAM4 performance



Double Density Cool Edge for Ultra Compact Design

- Designed to accommodate both high speed signal and power in a space-saving format using two rows of contacts



M.2 & PCIe GEN 4 and 5

- Meets industry standard PCIe 4.0 and 5.0 with high speed up to 32GT/s per differential signal pair



Slim Cool Edge for High Speed Hybrid Design

- Designed for high speed up to 32GT/s (or 56GT/s PAM4) capability



SAS PCIe (U.2 & U.3) 4.0 and 5.0

- Designed to meet SFF8639 and SFF8680 spec with high speed up to SAS 4.0 24Gb/s and PCIe 5.0 32GT/s



Mini Cool Edge for GEN Z/EDSFF/OCF

- Designed to meet SFF TA1002, Gen Z, EDSFF, OCF



DDR4 and DDR5

- Designed to meet JEDEC SO-016, SO-017, SO-019 and SO-023 spec
- Vertical, right-angle orientations and SO-DIMM version available



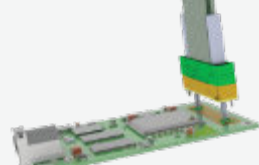
QSFP DD / OSFP Host Compliance Test Fixtures (HCTF)

- Full 16 differential pair access
- 1.85 mm test points meet both IEEE 802.3 and CEI 112G/lane requirements
- Each lane carefully matched through coax and PCB structures to ensure that the insertion loss and skew are constant for the entire unit



SK Series Family of Sockets

- Socket can be easily mounted and de-mounted with a few screws encouraging re-use across board revisions
- Durable 40 GHz+ socket solutions offer low loss connection for high performing devices



TR Multicoax Series

- Superior signal integrity up to 70 GHz
- Solderless system eliminates signal distortion for clean signal integrity
- Multiple form factors and channel counts available



CA Series Connectors and Interposers

- Bandwidth and performance beyond 32 Gb/s
- Pure vertical interface, no offset required



EnergyEdge™ X-treme

- Available in straddle mount, right angle, right angle coplanar, and vertical configurations
- 3000W at 12V
- 25% increase in current linear density
- 23% size reduction compared to traditional card edge connectors



CoolPower® SDM

- Up to 35A per pin, high current Coolband contact technology
- Backplane, coplanar, and orthogonal configurations available
- 2 position or 4 position available



BarKlip® BK500 IO

- OCP ORv3 48V BarKlip® distributes up to 500A per contact (45° C/300LFM airflow)
- New secondary chassis grounding contacts, providing additional grounding functionality for safety
- Simple configurable plug-and-play cable solutions
- Fully compliant with ORv3 Power Output specifications (PSU, BBU, Server/Storage Sleds)



PwrMAX® G2

- Next generation PwrMAX® - highest density blind-mate Power and Signal connector series
- 130A per contact and 18% size reduction
- Orthogonal, mezzanine, coplanar and right angle configurations available for both PCB and busbar applications



PwrBlade® ULTRA HD

- Up to 85A per contact
- 2.0mm high density signal pitch
- Ultra-low contact resistance (0.4mΩ at end-of-life conditions)
- Ultra-low profile height of 9.6mm above board for optimized airflow



PwrBlade+® IO

- Up to 60A per contact (high power) & 25A per contact (low power)
- Power & signal contacts are highly configurable
- Wide range of wire sizes available



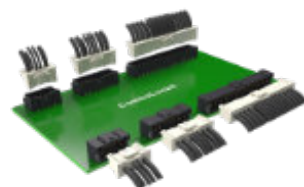
PwrBlade® MiniMezz Connector

- Up to 50A per contact (high power) and 25A per contact (low power)
- Available stack heights range from 8mm to 20mm (tooled in 1mm increments)
- +/- 0.80mm gatherability for blind-mate applications
- 2.0mm pitch for both power & signal contacts



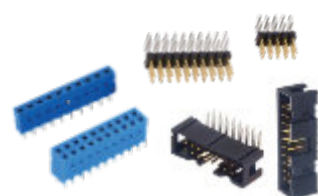
Minitek MicroSpace™ 1.27mm

- Compact, robust and versatile
- LV214 severity-2 compatible
- 4A per contact, TPA, CPA features



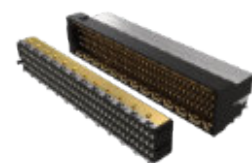
ComboLock® 1.00mm / 3.00mm

- Compact, hybrid wire-to-board connector.
- Active Positive Latching
- 1.5A signal, 10A power



Modular Systems 2.54mm/2.00mm

- Dubox®, Quickie®, BergStik®, PV® 2.54mm, Minitek® 2.00mm
- Industry proven connector system
- Board to Board, Wire/Cable to Board



BergStak® Secure 1.00mm

- High security, high density
- EMI Shielding
- Speed up to 32Gb/s.



Minitek MicroSpaceXS™ 1.27mm

- Compact, robust and versatile
- LV214 Severity-3, USCAR-T2V2 compatible
- 4A per contact, TPA, CPA features



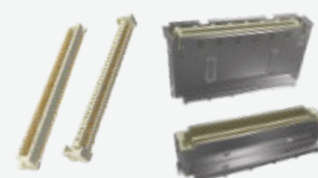
FlexLock® 2.54mm

- FPC system for easy assembly
- USCAR-T2V2 compatible.
- 3A per contact, TPA, CPA features



MicroSpeed® 1.00mm

- Industrial grade reliability.
- Superior EMI, EMC performance
- Speed up to 25Gb/s.



BergStak® 0.80mm

- Ideal for use in high density applications
- Wide range of positions and stack heights
- Speed up to 16 Gb/s.



Minitek MicroSpaceXS™ Waterproof 1.27mm

- LV214 Severity-3, USCAR-T2V2 compatible
- IP68
- 3A per contact, TPA, CPA features



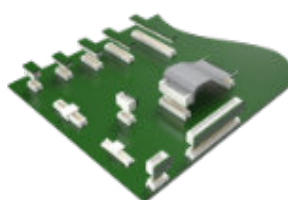
WireLock® 1.80mm

- Robust, low mating force
- USCAR-2 V2 compatible.
- 3A per contact, TPA, CPA features



ComboStak® 0.80mm / 2.0mm

- Hybrid and medium power solution
- 0.8A signal, 20A power
- Signal speed up to 12Gb/s.



Conan® Lite 1.00mm

- Secure, reliable connector
- Audible "click" to ensure perfect mating
- Speed up to 8 Gb/s.



OCTIS™ Outdoor IO

- Robust I/O for high reliability and performance



Custom Industrial and Automotive Connectors

Wide range of customized connector solutions from ECU connectors and sensor housings in automotive applications to circlip assemblies, board-to-board headers, interface modules and plug-in splitters in Industrial applications.



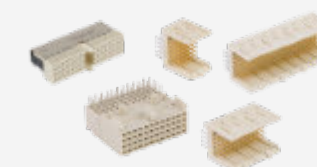
D-Sub Slimline

- Ultra slim body with contact alignment in a single row for significant saving in board space and with mating compatibility



Minitek® Pwr Family

- Complete unsealed connector range from 2.5mm to 5.7mm pitch
- Current rating ranging from 5A to 23A



Industrial Backplane Connectors

- 2.00 mm Millipacs® series hard metric connector, 2mm Metral® series future bus connector & 2.54mm DIN 41612 connector for robust applications in the Industrial segment
- Features 2-beam twisted tulip contact which provides an equalized signal path



Custom Battery Connectors

- Robust customized battery/charger connectors and terminal solutions for E-bikes, power tools, lawn mowers, robotic vacuum cleaner and personal care devices.
- Available in various pin configurations and connector sizes with current ratings up to 100A. IP67 sealed when mated



High Temperature Backplane Connectors

- Feature-packed connectors designed for use in higher operating temperature applications. Compliant to EN45545



USB

- USB4 Gen 3 Type C connectors newly launched. Multi-protocol, high-speed USB solutions for next generation designs
- Waterproof USB Type C with IPX4 to IPX8 rating



High Speed Interconnect

- Proven, high speed, low profile 0.60mm pitch connectors in 4X, 8X, 12X, 16X, 20X, 24X configurations. Meets PAM4 56G and PCIe 5.0 standards
- SlimSAS™, SlimSAS™ Low Profile, Z-Link, Mini Cool Edge IO, Swift, Flash



RJMG

- Modular Jacks with integrated magnetics in stacked, ganged, multi-port, single port and RJ45-USB combinations
- Up to 10Gb/s and PoE 130W



Power Connectors

- Wire to Board connectors in 3.0 mm and 4.2mm pitch with current ratings from 6.5A to 20A per pin
- Designed for IT and Datacom applications



High Speed Automotive

- Connectors for Automotive Electronics: HSD, HSC, HSBridge+, Netbridge+



Fan Connectors

- Unique modular fan interconnect solutions for Servers, Storage and Data Center applications



Lighting Connectors

Zhaga Book 18 and 20 and NEMA/ANSI C136.41 compliant lighting connectors and cable assemblies for LED indoor, outdoor and street lighting applications



Rugged Connectors and Cables

Ruggedized, IP67 sealed standard interfaces including RJ, USB, USBC, D-Subs, HDMI, and new interfaces including MRD and FLH connectors and cable assemblies



ix Industrial Ethernet Connectors and Cables

ix Industrial IP20 and IP67 connectors and cable assemblies for next gen high speed, ruggedized Industrial Ethernet applications per IEC 61076-3-124



RJ / Modular Jacks

- Modular Jacks in stacked, ganged, multi-port and single port combinations.
- Meets Cat5e, Cat6, Cat6A specification performance levels



Single Pair Ethernet Connectors and Cables

Single Pair Ethernet (SPE) IP20 and IP67 interfaces for next gen high speed, ruggedized Industrial Ethernet applications per IEC 63171-6



Industrial RJ Plugs and Cable Assemblies

- Ruggedized Industrial RJ plugs with IDC termination, metal latching and cable entry options
- Meets Cat6A performance specifications for use in factory and other applications

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