# **Amphenol**



ENABLING THE ELECTRONICS REVOLUTION

## PRODUCT OVERVIEW



For over 80 years, Amphenol has been a premier provider of advanced technology interconnect products to the world's leading electronics companies. From our very first product in 1932 — tube sockets for radios — to our current broad array of interconnect products, antennas, and sensors, we have consistently strived to create leading-edge, innovative products for a diverse range of customers across a multitude of industries and end markets. Through our close collaboration with these customers, Amphenol has become the interconnect partner of choice in enabling the electronics revolution.

Our organization is spread across more than 30 countries with more than 45,000 employees in greater than 100 facilities. Our long term track record of success reflects in particular the agile, entrepreneurial culture of our management team, who consistently demonstrate an unwavering commitment to creating value for our customers.

This catalog highlights our broad portfolio of high technology products across the primary end markets we serve. It is designed to help you understand Amphenol's capabilities in developing performance-enhancing solutions that will enable your company to fulfill your high-technology needs.

Thank you for partnering with the Amphenol team. We are at your service.

R. ADAM NORWITT PRESIDENT & CEO, AMPHENOL CORPORATION



Amphenol enables customers around the globe to deliver innovative high technology equipment by closely collaborating through all phases of product development.





CONCEPT

DESIGN

VALIDATION

PRODUCTION

MIDDLE EAST & AFRICA TUNISIA MOROCCO SOUTH AFRICA UNITED ARAB EMIRATES ISRAEL

#### **ASIA & PACIFIC**

CHINA HONG KONG INDIA 🎥 JAPAN KOREA MALAYSIA INDONESIA TAIWAN AUSTRALIA SINGAPORE VIETNAM

# PRODUCTS Broadband Communications

Amphenol is a world leader in broadband communication products with industry-leading engineering, design, and manufacturing expertise. Amphenol offers a broad range of coaxial cable products to service the rapidly expanding broadband market, from customer premises cables and interconnect devices to distribution cable and fiber optic components. Amphenol also has diverse interconnect products deployed on a wide range of broadband equipment from sophisticated head-end equipment to digital set-top boxes, high-speed cable modems, and DBS interface devices. Amphenol leads the way in broadband communications.



Amphenol TCS Global Amphenol Global Intercnnect Systems Global

Amphenol Holland Electronics USA

Amphenol Fiber Optic Products USA, China, Mexico

Amphenol RF USA, China

Amphenol Backplane Assembly USA, Ireland, China, Mexico

Amphenol Times Fiber Communications USA, China

Amphenol Tuchel Electronic Industrial Germany, China

Amphenol ConneXus Sweden, Estonia, India

Amphenol AssembleTech China

Amphenol East Asia Elect. Tech. Shenzhen Co., Ltd. China, Taiwan

Ujin Korea

Amphenol TFC do Brazil Brazil

Amphenol Tel-Ad Israel



From the central office through to the set-top box, Amphenol's high performance cable, interconnect and passive products are a key enabler of high-definition video, high-speed internet and cable-based telephony. Our products enable our customers to deliver sharp video, clear voice, and the highest bandwidth internet connections to homes around the world.





**CATV Drop and Specialty Cables** Amphenol's drop and specialty cables for the CATV market range from 59, 6, and 11 series cables used daily in the field to the unique specialty cables used in head-end equipment and other devices that require the unique features and touch that only Amphenol can deliver. Our mini coaxial product line offers many space-saving and performance-enhancing options needed in today's evergrowing markets.



Semiflex Trunk & Distribution Cable Amphenol's low-D.C. loop resistance of T10 and TX10 cable results in lower installation and annual power costs. These cables are ideal for urban and coastal environments, feeder or underground applications, and are resistant to extensive mechanical abuse and rodent attack. These cables have a specified 1 Ghz bandwidth for all rebuilds, upgrades, or new plants, and allows a system to handle future demands.



**ThinLine** Amphenol's ThinLine Semiflex is our newest development in hardline coaxial cables. Available in the 0.396", 0.540", 0.715" and 0.860" sizes at impedances of 50  $\Omega$  and 75  $\Omega$ , the seamless outer conductor provides superior flexibility and bending characteristics. Our unique process of triple bonding amongst all the components of the hardline coaxial cable provides for the cleanest coreability and preparation for connectorization.



TX15 MegaDrop Cable Amphenol's TX15 Flexible Feeder Cable has the low signal loss of a hardline cable with the high mechanical flexibility of a drop cable. TX15 cables are perfect for multiple dwelling units and any other settings requiring tight bends and severe turns.



**Coaxial and Multi-coaxial Cables for Telecommunications Applications** Amphenol is one of the premier manufacturers in Latin America for coaxial cables for the telecommunications industries. Our product profile provides designs for specialized applications needing single coaxial and multi-coaxial cables in various sizes, combinations, and specifications for telecommunications as well as the radio, video, TV, and information industries.



**Control and Instrumentation Cables** Amphenol's factories in South Korea and Brazil specialize in numerous types of wire and cables used for applications beyond CATV. Our high-quality control and instrumentation control cables are used worldwide for numerous applications and device interconnects.



Telephony Cables Amphenol's superior telephony cables come in indoor, outdoor, burial, and interconnect varieties in use by telecom operators throughout Brazil and around the world. Requirements for assemblies using our telephony cables can be handled in house with Amphenol connectors from various divisions around the world.



Fiber Optic Feed-Thru Assemblies Amphenol's fiber optic feed-thru assemblies were developed to provide a means of connecting optical transport cables to optical processing equipment. Dielectric and armored optical cable styles are available for connecting 1 to 24 terminated fibers through either a stainless steel or polymer 5/8"-24 threaded housing. The unique sealing design protects without the need of an external sealing heat shrink.



Fiber Optic Interconnect Products Amphenol is a premier manufacturer of optical interconnect products. Amphenol offers a complete line of products, including fiber management systems, attenuators, jumpers, couplers, and outdoor cable assemblies, which are designed to meet the most rigorous industry standards.



Ingress/Egress Reduction Connectors BarrIER<sup>™</sup> is a patent-pending connector interface technology that provides a significant reduction in RF ingress and egress. BarrIER<sup>™</sup> enabled products protect and improve your system from the effects of LTE, impulse noise, etc. passing through open connectors and ports, (a major source for ingress / egress).



QC II Compression Connector Amphenol's universal compression connector is ideally suited for Professional and consumer use with its one-piece all metal design providing a secure 360 degree compression seal. This results in maximum RF shielding performance. The QC II is also available with QuickShield if a continuous ground feature is needed. Consumers and technicians can easily hand tighten to optimal torque values without using a wrench.



Window Jumper Amphenol's Flat Window Jumper is a rail-protected coaxial cable jumper assembly for use in doors and window jams when drilling through walls is not permitted. The patent pending rail system protects the precision Teflon coaxial cable from deformation due to bending or repetitive impact within a window or door frame.



QuickConnect Jumpers Amphenol's QuickConnect connector system is a permanently fixed overmolded coaxial cable assembly for broadband applications. This unique assembly is ideal for broadband self-install kits due to its ergonomic hexagonal shape which is easily gripped and properly tightened without using tools. Since the hexagonal overmolded plastic is permanently fixed to the connector it does not pose a potential choking hazard.



**CATV Hardline / Semi-flex Connectors** Amphenol offers a full line of CATV Hardline / Semiflex connectors to meet the demanding requirements of HFC broadband infrastructures of CATV multiple system operators and telephone companies worldwide. Our 3-piece connector design ensures high-quality performance, easy maintenance, and durability in the global marketplace.



CATV Splitters, Amplifiers, Couplers, Enclosures, and Premise Hardware Amphenol offers a full line of CATV splitters, amplifiers, couplers, enclosures, and premise hardware to meet all cable installers needs. These products are designed for indoor and outdoor applications. Splitters and couplers are available for mounting in both vertical or horizontal positions and vary in size from 2 to 16 ports.



Ground Blocks These blocks protect coaxial cable from lighting strikes with in-line coaxial ground blocks available in single and dual line configurations. They feature a high-performance zinc body splice with machined threads, multiple ground screw configurations as well as nickel plating and stainless steel ground screws for maximum outdoor survivability.



Satellite Distribution Systems Amphenol offers a variety of satellite distribution systems specifically designed for single home and MDU applications. Available with multiple input/output configurations, auto gain control amplifiers, HDTV capabilities, and integrated sub-band returns for data applications.



**Coaxial Filters** Amphenol makes a wide variety of in-line coaxial filtering products that aid in protecting, isolating, blocking and passing video and data signals at various frequencies in installations where specific instances are required.



Headend Cables and Connectors Modern head-ends require compact, high-performance cables and components to maximize performance and bandwidth demands. Amphenol has developed several varieties of single and bundled Mini and RG59 cables in dozens of color combinations and number counts. Complete, ready-to-install, 100% tested assemblies reduce the installation costs by 50-60% for these critical areas of a broadband communications system. Amphenol's mini cables are combined with Amphenol connectors and easy-to-use installation tools to complete the package.



HD BNC HD BNC delivers true 75 ohm performance in a footprint 51% smaller than traditional BNC connectors, allowing four times the density. Engineered to enhance electrical and mechanical performance, the HD BNC connector features the trusted, push and turn interface of traditional BNC, providing tactile feedback and a positive lock for quick and guaranteed mating.



MCX The MCX series is a great option where weight and physical space are limited. The MCX provides broadband capability though 6 GHz in a snap-on connector design. A range of connectors are available, including printed circuit board and cable connectors. Typical applications include automotive, wireless LAN, broadband, and wireless infrastructure markets. MCX connectors conform to the European CECC 22000 spec.



Gangmate Interconnects Amphenol offers two configurations of Gangmate Interconnect: Board-to-board and Input/Output. Board-to-board allows multiple RF connections to be made between two fixed PC boards. Input/Output allows the connection between external cable connectors and Internal PCB connectors. Applications include CMTS, Internet, and telecommunications.



**SMB** Amphenol's SMB connectors conform to the requirements of Mil-C-39012, and the interface is in compliance with MIL-STD-348. Available in  $50\Omega$  and  $75\Omega$ , the SMB provides broadband capability through 10 GHz with a snap-on connector design and utilizes die cast components in non-critical areas to provide a low-cost solution.



**Type F** Amphenol knows that low-performance F receptacles could not be used in high-speed cable modems and customer interface units (CIUs). The industry has challenged connector manufacturers to develop high-performance connectors featuring -30 dB return loss at 1 Ghz – Amphenol has met this challenge. Our high-performance F-connectors comply with a 3/8-32 thread specification. Primary applications are for cable television (CATV), set-top boxes, and cable modems.



**Type G** Our Type G connector is a slide-on alternative to the Type F with 15A continuous current rating. The Type G complies with the MIL-STD 202 specification for vibration, shock, thermal shock, moisture resistance, and salt spray. The Type G has an impedance of 75  $\Omega$  — ideal for CATV applications. The Type G line consists of Bulkhead Mount Jack Receptacles and PCB Mount Jack Receptacles.



AMC Connectors, Jumpers and Adapters Amphenol Micro Coaxial (AMC) connectors, jumpers and adapters are ultra-low profile (2.5mm mating height) RF connectors with a small footprint (3mm x 3mm). The AMC series offers easy snap-on/off mating,  $50\Omega$  impedance, and DC - 6 GHz frequency range. The series is also 100% compatible with the U.FL interface.



Mini-SMB Amphenol's Mini 75Ω SMB provies broadband capability through 2 GHz. Its snap-on design utilizes die cast components on non-critical areas to provide a low cost solution. The Mini 75Ω SMB offers snap-fit mating for quick connect/disconnect. The reduced housing allows circuit miniaturization and efficient space utilization. Built in accordance with requirements of Mil-C-39012, the interface is in compliance with Mil-STD 348 and is interchangeable with Industry Standards for Miniture 75Ω SMBs.



Mini Head-End Connectors High quality, compact, 1-piece, fixed pin connectors ideal for CATV head-end applications. These connectors are available in multiple configurations including BNC, F, MCX, MPM, RG59, RG-6, 23 AWG, standard and quad shield.



Twinax Twinax connectors are used with 78  $\Omega$  and 95  $\Omega$  conductor cables and operates from 0-200 MHz. Due to the improved shielding characteristic (>30dB), these connectors are used in balanced low level and high sensitivity circuits. Twinax connectors feature keyway polarization to ensure system integrity and prevent signals from being mixed. The connectors are ideal for computer network applications and process equipment.



**AFI** The AFI connector interface is a solution for board-toboard RF applications. It utilizes a proprietary configuration that allows for industry leading "float" to compensate for the axial and radial misalignment due to packaging tolerances. This industry-leading float results in a maximum misalignment allowed by the system of .030" (0,8 mm) radial and .040" (1,0 mm) axial.



Amphe-10G The Amphe-10G was designed as an alternative to fiber for high speed data transfers. Using an oval contact system housed in a 38999 shell, end users can achieve the highest data speeds of up to 10Gbps.



**CMTS Interconnects** Amphenol's CMTS cable harnesses cover either internal or external assemblies for Cable Modem Terminations Systems. The external harnesses typically use bundled 75 Ohm cable. Internal cable assemblies typically run no longer than 18", but due to the dense nature of the chassis, special consideration has to be given to the size and flexibility of the cable.



HDMI Connectors Amphenol's HDMI connectors provide an interface between any compatible digital audio/video source and a compatible digital audio and/or video monitor. These connectors support standard, enhanced, or high-definition video, plus multi-channel digital audio on a single cable.



Smart Card Connector Smart Card Connectors are integral components of a smart card reader or terminal, and provide electrical contact to the smart card's pads. The connector is not a standalone peripheral device. An additional interface circuit is necessary to be able to read and write to the smart card whether a smart card is a memory only or a microprocessor card.



Rack Mounted Head-End Systems Amphenol can help design, build, burn-in, balance and ship a head-end system to the jobsite. We make head-ends to simplify your next commercial installation that include all adaptors, color coded cables, interconnects and components necessary for plug and play operation. Both mini-mods and full-sized modulators available.



HDMI, Mini HDMI, and Micro HDMI Amphenol creates high-quality HDMI, Mini HDMI, and Micro HDMI cables for today's high definition media. Our HDMI 2.0 cable family is built to support 3D formats and 4K resolutions up to 60 frames per second. Our HDMI family product offering is customizable to fit customer specific configurations such as coloring, connector configuration (types A, C, & D) as well as customized angles.

## products Defense

Amphenol is the world leader in the design, manufacture, and supply of high-performance interconnect systems for harsh environment military applications. Amphenol provides an unparalleled product breadth, from military specification connectors to customized highspeed board level interconnects and fiber optics; from flexible to rigid printed circuit boards; from backplane systems to completely integrated assemblies. Key markets supported are avionics, radar, communications, ordnance, missiles, engines, ground vehicles and tanks, space, and all levels of aviation. Amphenol is a technology innovator that designs to meet customers' needs during all phases of the life cycle of military hardware.

### Defense

Amphenol Aerospace Operations USA Amphenol Fiber Systems International USA Amphenol Griffith Enterprises USA USA Amphenol Nexus Technology USA Amphenol PCD USA Amphenol Printed Circuit Board Technology USA Amphenol RF USA SV Microwave, Inc. USA Amphenol Times Microwave Systems USA Amphenol Borisch

Amphenol Canada Corporation Canada Amphenol Sefee France Amphenol Socapex S.A.S France Amphenol Air LB France, Germany Amphenol Ionix UK Amphenol Limited UK Amphenol Interconnect India India Amphenol Japan Japan

Amphenol DaeShin

Korea



Amphenol knows the meaning of the term "battle tested." With decades of expertise in harsh environment interconnects for air, land, sea, and space, Amphenol was a natural partner to support a broad range of high performance products through the development of the F-35 Lightning II program. Whether facilitating high speed data transfer for sophisticated flight controls or enabling the next generation of beyond visual range air-to-air combat, Amphenol's team rose to the challenge. Our technologies are playing a significant role in enabling the F-35 to meet the many challenges of this ground-breaking next generation fighter jet.



**1760 Weapons Release** The 1760 Weapons Release connector is a low-profile version MIL-STD-1760 connector and overmolded cable system for aircraft interconnection applications such as munitions and weapon rack stores. With a lower, flatter design, this is an ideal connector for tight-fitting aircraft and ordinance applications.



83538 Weapons Release The 83538 Weapons Release Connector was designed for use on aircraft that carry rail launch missiles such as AMRAAM. With buffer plug and missile receptacles, the connector is designed for blindmating of stores on rail launch applications. Used on F-18, B- 52, B-2, and SRAM II programs. The 83538 meets the applicable specifications of MIL-STD-1760 Stores Management.



MIL-DTL-38999 Series I LJT, Series II JT The LJT Series I has a longer shell to provide 100% scoop-proof protection for recessed pins. The JT Series II connector has a low-profile shell for maximum weight and space savings. Both series incorporate three point bayonet mating/unmating and five-key/ keyway polarization. The LJT and the JT series feature crimp termination and rear-release contacts.



MIL-DTL-38999 Series III TV Tri-Start Amphenol MIL-DTL-38999 Series III connectors offer the highest performance capabilities for general duty and severe environment applications. Completely mates and self-locks in a 360-degree turn of the coupling nut (no lockwire needed). Five key/keyway polarization eliminates mismating and universal mounting holes for front or rear mounting aid in blindmating. Available options include PC Tail, Hermetic, Filter, Fail Safe Lanyard Release, Clutch-Lok (vibration resistant), Flex, Fiber Optics, and High-Speed Contacts.



MIL-DTL-38999 with MT (Multi-terminal) Ferrule Termini Amphenol's CF38999 series provides an ideal connector solution for MIL-PRF-29504 termini for the military and aerospace markets. Perfect for single or multi-mode applications, CF38999 connectors are designed to meet or exceed 38999 requirements, with features such as precisionaligned inserts, ideal for increased optical performance. Amphenol is also qualified to meet JSF/F35 specifications for both optical termini and connectors.



**38999 High-Density** Amphenol has developed a full range of high-density inserts to fit in MIL-DTL-38999 shells or derived products. These inserts allow a contact density increase of 45% versus a standard MIL-DTL-38999 connector equipped with size 22D contacts. These high-density inserts can accept MIL-Spec crimp contacts, as well as contacts with PC tails. These inserts are compatible with all the derived product ranges.



HF38999 High-Frequency Contacts Amphenol provides the latest technology in high speed contacts - differential twinax and quadrax contacts, size 8-16, for use in MIL-DTL-38999 special circular connectors. These contacts can be terminated to many cable types depending on the application and by using standard interfaces they can be installed in any D38999 size 8, 12, or 16 insert.



**38999 PowerSafe** Amphenol's PowerSafe connector is directly derived from the MIL-DTL-38999 Series III. The connector series can accommodate power platforms from 13 to 100A per contact and is equipped with "First Mate Last Break" contacts connected to the shell. The grounded FMLB contact will stay in the right position even if the insulator of the connector is destroyed by fire.



MIL-Spec Circulars Amphenol offers many other MIL-Spec connectors to fit your needs both in military and commercial applications including: MIL-DTL-27599 Series I, II Solder, Pyle MIL-DTL-26500, Matrix MIL-DTL-5015, Matrix MIL-DTL-26482 Series II, Matrix MIL-DTL-83723, Series III, and Pyle MIL-DTL-83723 Series III.



Hermetic/Sealed Connectors Amphenol's Hermetic connectors are designed for environmental moisture sealing with fused compression glass sealed inserts. Available in all the basic cylindrical connector families: MIL-DTL-38999, MIL-C-26482, MIL-C-83723, MIL-C-5015. Hermetic connectors are also available in rectangular rack and panel connectors. Connector mating is accomplished in the normal fashion of the connector series.



Durmalon Plating Durmalon plating finish meets 500 hours of salt spray and maintains excellent conductivity making it a perfect replacement to OD CAD finishes. This finish is qualified to the MIL-DTL-38999 Class T finish and is RoHS compliant.



Amphenol Press Fit Connectors Amphenol manufactures a complete series of MIL-DTL-38999 Series I, II, and III connectors with Press Fit compliant pin contacts for solderless mounting on printed circuit boards. Both pin and socket contacts are available in any MIL-DTL-38999 series I, II, or III insert pattern having contact size 16, 20, or 22D. Press Fit connectors allow for simplified board assembly while eliminating problems inherent in soldering connectors to boards.



EMI/EMP Filter Products Amphenol's EMI/EMP protection connectors offer the versatility of standard connectors, but with EMI/EMP protection that filters unwanted frequencies for sensitive circuits. By housing EMI/EMP devices internally, you can eliminate costly and bulky exterior discrete protection devices. Available in many sizes, styles, and arrangements, Amphenol filter connectors are inter-mountable and intermateable with standard MIL-spec connectors.



Specialty EMI Filter Connectors Amphenol specializes in EMI filter connectors in standard and custom configurations. Tube or planar capacitor technologies are used with a patented solderless design to offer capacitor stress-isolated features. This enables these connectors to give superior performance, even in high-thermal and physical shock environments, custom rectangular filter connectors are available. In addition to standard interfaces such as ARINC, D-Sub, and Micro-D.



D38999 Series III Composite Tri-Start Connectors MIL-Qualified to MIL-DTL-38999, Rev. L, the Composite Tri-Start Connector offers a lightweight, corrosion resistant connector with the same high performance features as its metal counterpart. The Composite Tri-Start Connector is up to 40% lighter than Aluminum equivalents and up to 70% lighter than Stainless Steel equivalents. These connectors can withstand 2000 hours of salt spray exposure with standard platings. These connectors are also qualified to BACC63CT and BACC63CU connector specifications.



**RNJ Low-Profile** RNJ Low-Profile rack and panel connectors are designed to connect electrical devices between a moving unit (rack) and a fixed unit (panel). The locking of the mating pair is ensured by a mechanical device on the rack. The RNJLP design allows a short distance between the two panels. This is a big benefit for systems where space is an issue.



Zero-G Astronaut Handle-Operated Connectors The Zero-G Astronaut connector is a high-performance environmental MIL-DTL-38999 Series III type connector designed for use in a manned spacecraft environment. The connector meets qualifications of MIL-DTL-38999 and is listed on NASA specification SSQ-21635. The unique lever-operated engaging system was developed to allow the EVA-suited astronaut to mate and unmate the connector in zero gravity.



High Speed 10G Base-T Contacts and Connectors Amphenol offers a high performance interconnect solution for CAT6A type cable. The new Quadrax contact features a higher bandwidth than standard CAT5E contacts with enhanced crosstalk performance due to compatibility with shielded twisted pair of cables. Quadrax can be used for a variety of system protocols including 1000/10G Base-T Ethernet, PCI Express, HDMI 1.3, and DVI.



**62BG/62IN** 62GB/62IN series connectors are generalpurpose, environment-resistant, miniature circular connectors with three-point bayonet coupling and five-key polarization. Designed to meet the requirements of MIL-C-26482 Series I solder type, these connectors are widely used in military and industrial applications.



HTC Amphenol's HTC connector range has been engineered to exceed the MIL-DTL-87323 performance requirements for the latest generation of airplane engines. The connectors feature a new, robust anti-decoupling mechanism and new insert designs and materials. These connectors are specially designed to meet Rolls-Royce's latest ESC15 & ESC16 KV Class high-frequency vibration specification as well as European EN2997 & SBAC ESC10 specifications.



Bulldog This IP68 sealed RoHS compliant connector range has been specifically developed for harsh environment vehicle applications. The Bulldog series is designed to utilize standard MIL-C specification insert arrangements within a rugged and non-reflective shell design. The utilization of standard insert arrangements ensures the connector's suitability for power, signal, and data applications.



Terrapin Intended for harsh environment applications and used extensively in soldier communications, Amphenol's Terrapin is a miniature series of circular push-pull connectors. Within a rugged shell design, Terrapin offers superior EMC performance and high environmental sealing to IP68. Resilient in severe battlefield situations, the RoHS compliant black-silver plating is both low-luster and corrosion resistant.



MIL-DTL-55116 Audio Connectors These waterproof, polarized, 5 and 6 contact electrical connectors are designed for use in audio frequency circuits at 60 volts maximum potential and 0.5 amperes maximum current. The plugs and receptacles come in both crimp and solder versions. Shielding and filter options are available. A miniaturized version of the M55116 connectors – 50% the size of the standard connector – is also available.



Luminus Luminus is a compact, configurable interconnect with an easy, secure coupling mechanism and tough polyamide housing. The product is ideal for today's sophisticated commercial, military, and industrial vehicle interior environments in which full-spectrum, adjustable, and LED lighting creates a more comfortable and productive atmosphere. Its small footprint and aircraft-grade cablemount accessories allow for fast and efficient assembly.



2M Connector Series Designed for interconnect applications requiring high performance and reduced size and weight. This smaller, high density, lightweight connector far exceeds the competition in quality and performance levels. The 2M Series is a superior and versatile connector designed and tested to mil-spec standards, comparable to MIL-DTL-38999.



**1767 PA Modules** The 1767 PA module is an innovative junction module based on the classic 1750 module. The PA's "Positive Locking" wiring technology offers a 100% guarantee of properly locked contacts in the cavity. 1767 PA modules are available from 8 contacts size 12 up to 36 contacts size 22, and are produced in hybrid and grounding versions.



Relay Socket Amphenol offers the industry's broadest range of pluggable bases for electro-mechanical relays in MIL-PRF-12883, European, and custom configurations. Environmentally sealed for harsh environment applications, these rugged relay sockets will accept standard crimp contacts to MIL-C-39029. High-temperature and aircraft fluid-resistant, these sockets come in many varieties including track-mount, panel-mount, and quick-mount snap-in styles.



Junction Module MIL-T-81714 Series I and II and 1765 modules are available in a broad range of standard and custom electronic packages. Diodes, resistors, and other components can be securely packaged within the sealed housings to provide improved system efficiency and density. Track-mounted terminal junction modules are available in a variety of standard sizes from AWG12 through AWG26 with a broad selection of bussing variations.



SIM Module High-Density The #23 High-Density SIM module is an exclusive Amphenol innovation. Based on standard EN4165 SIM modules, the HD modules have thirty size 23 contacts (BACC47) - an increase of more than 50% over #22 modules. HD SIM Modules are available with or without peripheral sealing and are fully compatible with all SIM connector series.



**Mil-T-8174 Junction Modules** Amphenol Series I and II Junction Modules are a proven and reliable electrical wiring and integration system (EWIS). Widely used throughout the commercial air and military markets, the M81714 series offers a complete solution for low power distribution and control systems. Series I Terminal Junction Modules are offered in Feedback, Feed-through Electronic, In-Line Splice, and Ground configurations. Series II Socket Junction Modules are offered in Feedback, Board Mount, In-Line Splice, and Ground configurations. Mounting rail and installation/termination accessories are available for both Series.



**1750 Modules** Quick junction modules for signal and low current distribution, where sealing (IP66 / IP68 and IP69K), space and weight-saving are prime requirements. Specifically suited for wiring optimization, then offering weight and cost savings, these track-mounted modules (on metallic or composite track) are available from 8 contacts size 12 up to 36 contacts size 22 in different contact configurations. They also come in hybrid or ground versions, as well as PCB or component carrier versions. Fully REACH / RoHS compliant and conform to ABD0031 and FAR 25853 (Fire, Smoke and Toxicity).



SIM Monomodule Push Pull These rectangular connectors are modular, mulit-contact, multi-functional mono-module connectors, for in-flight entertainment and cabin system applications. These light-weight composite products are available in shielded or non-shielded versions. They present a very compact design with a push-pull locking system for blindmating and 7 keying positions.



Military Fiber Optic Amphenol's fiber optic termini and connectors provide reliable transfer of data signals for communication systems in many applications: military aircraft, ground vehicles, commercial aircraft, radar, missiles, battlefield equipment, medical equipment, and test equipment.



28876 M28876 multi-channel fiber optic connectors and backshells are the U.S. Navy standard for mission-critical shipboard applications. These connectors are designed to provide superior optical performance in severe environmental and mechanical operating conditions. Our industry-leading backshells feature the robust, yet simple to use Quickloc cable captivation system. Angled physical contact (APC), custom materials, and custom-plated connectors are also available.



NGConn The MIL-PRF-64266-compliant fiber optic connectors (Next-Generation Connector-"NGConn") combine the best features of industry-standard D38999 (Series III) and M28876 connectors. Designed specifically for both avionics and shipboard fiber optic applications, these innovative connectors include genderless contacts and high-density packaging and are available in a wide variety of materials, shell sizes, insert patterns, and plating finishes.



TACBeam The TACBeam® connector series is a hermaphroditic fiber optic lens connector that is ideal for military tactical applications where cleanliness and high mating cycles are a concern. Lens technology is less vulnerable to contaminants than traditional physical contact technology. The connector is available in 1 to 4-way configurations or both single mode and multimode fiber. The TACBeam® complies with M83526/20 and /21 (QPL pending) and is the choice of the US Marine Corps for their tactical communication needs.



**TFOCA-II® Fiber Optic Modem** TFOCA-II® Fiber Optic Modem (FOM) provides optical-electrical (0-E) and electricaloptical (E-O) conversion for harsh environments. This standalone unit features ruggedized optical transceivers integrated into a compact housing with 10/100/1000 Ethernet electrical interfaces (additional electrical interfaces available-consult factory) and AFSI's TFOCA-II® connector. The "plug and play" unit allows systems engineers to effortlessly convert their systems to take advantage of the benefits of fiber optics without the need to design and develop harsh environment fiber optic transceivers and associated electronics.



**1900SIM Modular Connector** Amphenol's 1900SIM Modular Connectors are made with light weight composite materials in shielded and non-shielded sealed (IP 66/68/69K) versions. They are designed with clip in backshells and optional locking systems for quick installation. They offer 36 keying options and conform to ABD0031 and FAR 25853 regulations.



**SIM Splice** This modular composite splice provides a reliable and simple connection between two SIM modules. Available with or without cable clamp and/or flange, the SIM splice can be fixed on/under a structure or feed-through. It can be fitted with the complete range of SIM modules.



Harsh Environment Harnesses Amphenol has the capability to design and manufacture complex harsh environment cable assemblies and harnesses to the exacting demands of the military and commercial aerospace market for all types of communication and power distribution needs.



PhaseTrack Based on the unique, thermally stable proprietary TF5 dielectric material, PhaseTrack cable represents the most significant breakthrough in coaxial cable technology in decades. TF5, the most stable dielectric material available, almost completely eliminates the rapid and wildly varying changes of phase with temperature characteristic of other high performance expanded PTFE dielectric flexible RF and microwave coaxial cable assemblies.



SFT SFT high performance microwave cables are rugged and flexible making them ideal for interconnect applications from inside LRUs to system interconnects and antenna feeders in military and commercial systems. The wide range of available connectors cover many interface types and frequency ranges.



Complex Wiring Harnesses Amphenol is a highly experienced Manufacturer of Cable Harness Systems for all Military & Aerospace applications. Existing proven applications include commercial airliners, fighter aircraft, military helicopters, military & civil aero engines, torpedoes and military vehicles. Our capabilities include Closed Bundle Harnesses Assembly, Open Bundle Harnesses Assembly, Encapsulated harnesses, Overbraiding (Nomex, PEEK, PTFE, Nylon, Bekinox), Conduit Assembly, Potting, Flat Woven Cables. We bring together know how, proven performance, process & product excellence with the back-up of skilled engineers to deliver cost effective OEM solutions without compromising our superior quality. Our fast and agile processes enable us to support very demanding and urgent requirements.



Woven Harnesses Amphenol manufactures a variety of Woven harnesses, where low finished goods weight, alongside small / flat-form harness routing areas are required. This is a unique product / process that is ideal for areas where there is a small / tight space envelope – a variety of different cable types and sizes can be brought together to create a "customized ribbon type" cable solution. It is also possible to incorporate bends and cable drop outs into this product. Woven harnesses are in use in a wide range of applications, including military aircraft & torpedoes where packaging constraints are a major factor.



High Speed Cable Assemblies The high speed cable assemblies feature high frequency capabilities with small diameter push-on interfaces. These cables are primarily used for "inside the box" applications to attach I/O connectors to PCB mount connectors in MIL-AERO, Test and Instrument, and Datacom/Telecom markets.



Skewclear Cable Amphenol's SkewClear® cable is optimized for high temperature avionics grade applications in 1, 2, 4, and 8 pair versions and Amphenol Aerospace's high speed twinaxial OCS contact system. This 200 °C rated cable is built with silver plated stranded conductor, FEP dielectric and jacket, and incorporates low skew 100 ohm twinaxial parallel pairs for 10 Gb ++ data transfer.



Military Communications Cable Assemblies Amphenol tactical communications product offering includes standard and custom accessory cables designed to interface with all military radio platforms. These cables are used to connect ruggedized laptops, intercom systems, and display tracking systems as well as audio applications.



Custom Micro-D Cable Harnesses Increasingly Amphenol's customers are looking to drive size, weight, and cost out of their electronic assemblies. Amphenol Custom Micro-D harness solutions allow customers to integrate Micro-D connectors that meet or exceed MIL-DTL-83513 requirements into complex harness assemblies which include EMI shield braid, custom backshells, multiple connector and signal technologies into a single, turn-key harness. These custom solutions are perfect for Missile, Electro-Optical (E/O), or any other application requiring tight packaging.



Rhino 38999 This High Power connector series combines the benefits of field proven MIL-DTL-38999 circular connectors with low resistance hyperbolic RADSOK® power contacts. Designed to meet the latest military and industrial specifications, Rhino 38999 connectors also comply with stringent safety requirements. Rhino 38999 connectors are intended to satisfy market requirements for up to 1000A power & high voltage in harsh environment conditions. With IP68 sealing, anti-decoupling ratchet mechanism, superior EMC and RoHS Black Zinc Nickel plating, Rhino 38999 connectors ensure a reliable connection.



Dualok Interconnect System Dualok is an enhanced anti-decoupling mechanism that can be used on virtually any cylindrical plug connector and backshell. The Dualok Interconnect System greatly improves electrical performance in harsh environments while providing a size and weight savings when compared to standard connectors in the same class. Dualok technology is applied to the plug connector and backshell only and will mate with standard receptacles.



A Series Connectors are available in a variety of standard positions (2-18 pos.). The AT, ATM, ATP and AHD Series connectors were designed as a high-performance, costeffective solution within the Heavy Equipment, Agricultural, Automotive, Military, Alternative Energy and other demanding interconnect architectures. All of these connectors are compatible with other existing standard products industrywide, and feature rugged thermoplastic housing with superior environmental sealing and hand insertable/removable contacts for simplified service.



VITA 66.1 Fiber Optic Interconnects Amphenol's VITA 66.1 MT connector provides a reliable high speed connection for the most extreme commercial and military environments. This ruggedized interconnect is among the highest density of connector products on the market. MT ferrules can be accommodated up to 24 fiber optic channels per MT ferrule or up to 48 channels per connector.



**Oval Contact System (OCS):** For use with CAT6A-type cable. Four strategically spaced inner contacts form two 100 Ohm matched impedance differential pairs, size 8. System benefits from enhanced crosstalk performance due to compatibility with shielded twisted pair of cables. These contacts can be used for a variety of high-speed applications beyond current quadrax design.



**Contacts** Amphenol has a very wide range of contacts for both MIL-Spec and many specialty military/commercial connector applications which include the International Space Station, fighter aircraft, battlefield communication networks, and military ground vehicles. Contacts include signal, power, thermocouple, PCB, wire-wrap, coax, triax, twinax, fiber optic, differential pair, and other quadrax.



Brush Contacts The brush contact is made up of multiple strands of high-tensile wire that are bundled together. A reduction in mating/un-mating force of 70% to 90% is achieved over conventional contacts. The brush contact has proven low-resistance, durability, and long contact life. Hybrid low-mating force connectors can be designed with combinations of brush and coax, twinax, power contacts, and fiber optic termini.



Backshells for Circular Connectors Amphenol provides a complete range of backshells for all circular connectors. These backshells are QPL certified to the AS85049 standard and any variants of the same could be supported in short lead-time. We will work with you to create exactly the variety of backshell you need.



ABS2216 Composite Backshells for MIL-DTL-38999 series II, EN3645 connectors & TV/CTV connectors offer performance meeting or exceeding all Airbus specifications. These backshells are light, quick, and easy to install. They handle temperatures from -65° C to 200° C with an anti-decoupling system to withstand shocks and vibrations in a variety of configurations.



UHD Interconnect Amphenol's UHD interconnect is a highreliability packaging solution for airborne, space, shipboard, and ground-based applications. The UHD connector is presently used in all of these environments and meets the requirements of EIA spec IS-753, DESC spec #89065, and IEEE spec 1101.1 to 1101.9.



VIPER Interconnect Viper from Amphenol is a high-density interconnect platform. Featuring: 70 single-ended signals per linear inch, 56 differential pairs per linear inch, and signal integrity to 10 Gbps. Viper is available in standard 3U and 6U configurations and is ruggedized for Avionic Ground and Naval Applications.



NAFI Interconnect Amphenol's NAFI daughter card and backplane connectors are another board level interconnect solution. They provide a wide range of medium contact density patterns and meet MIL-C-28754 standards. Daughter card termination is through-hole, using nickel/gold solder-plated contacts. The mating interface is a blade contact that can be either parallel or perpendicular to the daughter card.



SJS In-Line Junctions Amphenol's SJS family of environmentally-sealed in-line junction splices are developed to bring higher reliability, improved installation ease, and greater flexibility to wiring applications. These in-line junctions consist of compact, cylindrical plug and receptacle housings which lock firmly together with a straight push, and unlock with either a simple "twist and pull" (single contact) or "squeeze and pull" (triple contact) motion.



HDAS With its robust and simple design, high density, and high performance to extreme conditions, Featuring 6-tines starclip contact technology and a high-density staggered grid, HDAS is the right connector when installation cost and reliability must be considered.



Low Mating Force, Rectangular Green Brush Connectors Amphenol's Low Mating Force Connectors are well known in the connector arena – with proven performance on the ground, in the air, and at sea. In service for over 25 years, with over 50 million brush contacts fielded; and qualified for use on many military applications. Military versions meet MIL-DTL-55302/166 through /172.



**CTF Media Converter Family** For use with CAT6A-type cable. Four strategically spaced inner contacts form two 100 0hm matched impedance differential pairs, size 8. System benefits from enhanced crosstalk performance due to compatibility with shielded twisted pair of cables. These contacts can be used for a variety of high-speed applications beyond current quadrax design.



Sealed Receptacles with UTS Crimp Contacts for Bulkhead Applications A lightweight D38999 Series III interconnect solution for sealed bulkhead applications. These jam-nut or wall-mount connectors offer lighter weights than glass fused steel hermetics. They feature 1x10-5 minimum leak rates when properly installed. This, combined with crimp insert able contacts, allows quick and reliable termination using standard M39029/57 socket contacts – perfect for pressure vessel or thru-bulkhead applications.



Universal Header Assembly for Flex Print/PC Board Mounting The universal header assembly will provide for easy separation of EMI/EMP filter connectors from a flex assembly or PC board. Headers can be installed to standard connectors, allowing for electrical testing that would adversely affect the sensitive diodes, MOV's, or capacitors in the EMI/EMP connectors. Connector assemblies can be easily removed from and reattached to the header assemblies as the manufacturing process dictates.



**DDR4** Amphenol's DDR4 DIMM connector was developed to replace the DDR3 standard in the high-end server memory market. The DDR4 connector complies with the interface standard JEDEC POD12 allowing for data transfer rates of 1.6 Gbps– 3.2 Gbps.



Fairlead Leveraging its 30 + years experience in Clamp Block Technology, Amphenol produces high-quality, low-cost fairlead blocks and prides itself on timely and accurate delivery. Designed for use in airframe, fuel tank, and engine applications, our blocks are offered in multiple materials and can also be customized to help meet specific customer requirements.



P-Clamp The P-Clamp has been engineered for lean manufacturing and is available in numerous material and configurable options. These clamps have been proven in the field to outperform traditional P-clamps and saddle clamps. They feature different cushioning options and are completely non-conductive/non-corrosive, lightweight, and very durable.



**PEEK Stand-Off** Designed with PEEK polymer, a durable, lightweight, chemical-resistant material, our high-performance standoffs are designed to replace traditional aluminum standoffs that are heavier and less cost-effective. They come in two standard configurations – straight and right angle.



CC516 Monoblock Cable Clamps The new monoblock CC5516 composite cable clamps are a lightweight version of standard metallic NSA5516 clamps, offering a 60% weight savings. They are mounted and locked in place on the structure in one step by a screw. The CC5516 clamps are available in 37 sizes, for bundles or pipes from 3 - 60 mm in diameter. The over molded silicone provides perfect protection from shock and vibration.



ABS 1339 Monoblock Cable Clamps The monoblock ABS 1339 cable clamp allows the perfect fixing of electrical cable harnesses on structure. These cable clamps are fully designed in composite with silicon overmolding, providing a perfect bundle protection from shocks and vibrations. They are available in 8 sizes, for bundles from 3 to 48 mm, and are available for general (brown silicon) or fuel zone use (blue silicon). They are fixed on structure by a screw and are closed by a simple cable tie.



Triax Amphenol Triax connectors are used in applications where maximum RF shielding and minimum noise radiation is required. Triax are engineered for superior performance and are built to the highest quality standards. They are the perfect solution for high temperatures, harsh environments and can be tested and approved for use in nuclear reactor chambers.



**HN-Type** The HN connector series features a medium size weatherproof interface, designed for high voltage applications. HN connectors offer captivated contact design which prevents contact recession under temperature extremes and mechanical stresses. The coupling mechanism features a 3/4-20 threaded interface. The rugged construction makes HN connectors ideal for military and industrial applications.



C Type Type C connectors feature a medium sized, weatherproof interface with a constant 50  $\Omega$  impedance. They may be used with 75  $\Omega$  cables, at lower frequencies (below fg300 MHz) where no serious mismatch is introduced. These connectors also feature a two-stud bayonet lock allows for quick coupling and easy installation.



**AFI** The AFI connector interface is a solution for board-toboard RF applications. It utilizes a proprietary configuration that allows for industry leading "float" to compensate for the axial and radial misalignment due to packaging tolerances. This industry-leading float results in a maximum misalignment allowed by the system of .030" (0,8 mm) radial and .040" (1,0 mm) axial.



SC-Type Amphenol SC coaxial connectors are medium sized and offer constant 50  $\Omega$  impedance. They operate from 0-11 GHz and are manufactured to meet MIL-C-39012 specification. The connector mating is a .687-24 UNEF screw thread and the plug coupling nut has safety wire holes. Such qualifications make the SC interface ideal for military, instrumentations and testing applications.



**SSMA** The SSMA connector is designed to be a space-saving alternative to the standard SMA originally designed for use with .085 semi-rigid cable. The male contact was designed to be the same size as the cable conductor so that it could be used as the mating pin for optimized VSWR. This interface is available with 50 0hm options and gold plating is standard.



**TNC** The TNC connector series features a miniature, threaded weatherproof interface with a constant 50  $\Omega$  impedance and operates from 0 - 11 GHz. The TNC is available in standard and reverse polarity configurations. Reverse polarity is a keying system accomplished with a reverse interface, and ensures that reverse polarity interface connectors do not mate with standard interface connectors.



**SMP** Amphenol offers a solution for high frequency, high data rate applications in the SMP line of RF connectors. The SMP connector features a subminiature with a frequency range of DC to 40 GHz. It is commonly used in miniaturized high frequency coaxial modules and is offered in both push-on and snap-on mating styles for quick installation.



Quarterback The Quarterback® product line utilizes a high frequency miniature RF interface (up to 65 GHz) with a rugged bayonet coupling mechanism. The reduced withdrawal forces are well-suited for reliably mating cable assemblies to delicately soldered board mount connectors, minimizing potential PCB damage. Ideal for bench-top testing, high vibration environments, and high mating cycle applications.



RFfortless RF Connectors and Components The blind mate RFfortless® series offer a wide variety of push-on and blindmate RF connector solutions with series including BMA (OSP), BMMA (OSSP), BZ, BMZ, ZMA, SMP, SMPM, and SMPS. In addition to cable and board mount connectors, a line of ganged multiport solutions and resistive components is also available with a full range of terminations and spread of attenuation values. Full cable assemblies are also available.



MILTECH Amphenol produces sealed, flexible RF and microwave transmission line assemblies optimized for military environments. These cables exhibit an extremely long life in the rigorous environments found in airborne, shipboard, and ground based applications. MILTECH cables are hermetically sealed and incorporate intermediate sections compatible with an assortment of connector systems.



Vita 67 is the first RF standard for VPX platforms that solves an important problem in the area of interoperability between backplane and daughtercard and allows RF signals to be routed underneath the backplane reducing mean time to repair and replace. This rugged solution can be applied side-by-side with VITA 46 hardware and is available in 3U or 6U formats. Some applications include embedded solutions, SIGINT, avionics, and radar systems.



Push Button Switches Amphenol manufactures switches that exceed MIL-S-8805/3, or MS25089 and is capable of manufacturing custom switches to meet a wide variety of design needs. Standard switch range from one to five contacts rated between 3-10Amps at 115VAC/28VDC.



**TFOCA-II 4-Channel** Amphenol's TFOCA-II<sup>®</sup> fiber optic connector series is ideal for military tactical applications as well as other environmentally harsh conditions. The hermaphroditic design allows for simple concatenation and the removable insert cap facilitates easy connector maintenance. Designed and patented by Amphenol, the TFOCA-II<sup>®</sup> is the required connector for the U.S. Army WIN-T (Warfighter Information Network Tactical) program.



**CTOS SM Fiber Optic** Amphenol's CTOS SM and CTOL SM is a unique expanded beam single-mode fiber optic connector. These connectors are used in diverse applications such as battlefield, UAV, oil & gas, railway, and broadcast. To make deployment easier, we developed a Compact Carrier Deployable System. This is the lightest and most compact solution available on the market.



ARINC 801 Termini Insert for 38999 Series III Connector Amphenol now offers multi-channel cylindrical connectors that comply with the ARINC specification. This connector is available in straight-plug and wall-mount receptacle, using the ARINC 801 ceramic termini. ARINC 801 connector features include precision ARINC 801 fiber optic termini (typical multi-mode insertion loss is less than 0.15 dB), removable alignment sleeve insert for easy cleaning of fiber optic termini, and three stages of alignment: shell-to-shell keys, guide pins, and ceramic alignment sleeves.



**MFM Series** The simplex MFM fiber optic range has been specifically designed to operate in harsh environments. The rugged, anti-vibration, corrosion resistant design ensures high environmental and optical performance in a variety of applications in the air, on land, or above / below sea.



Lux-Beam is Amphenol's solution to upgrade from a physical contact to a contactless technology in optical communications. LUX-BEAM is not subject to degradation of performance resulting from friction of optical surfaces as is usual on traditional butt joint termini. With its patented pin to socket realignment feature, LUX-BEAM is compatible with connectors from different suppliers and provides an efficient adjustment to tolerances during mating.



Pegasus the latest innovation in light weight aerospace connection systems. These twist & lock connectors provide the same convenience and weight savings of the Luminus Series, with the added benefit of EMI shielding and protection from ambient noise transients. The Pegasus Series is the ideal choice for AC wash lighting, fluorescent lighting, switching power supply systems, and inter-system connectivity signal paths, where protection against ambient noise transients is required.



ATC Series Connectors Amphenol's ATC Series of connectors and cable assemblies are designed to interface with the AN/PRC-117G and AN/PRC-152 military radio 32 pin data connectors. These connectors are available as field installable connector kits and as factory assembled molded cable assemblies. The ATC Series of connectors are engineered for use in harsh environment applications and feature a rugged, watertight two piece metal shell design.



TAC Connectors Miniature M55116-Type TAC Connectors for soldier-worn applications, radio systems, and ruggedized communications systems. TAC Connectors are designed and manufactured to the exacting specifications of MIL-DTL-55116 requirements at half the size of the standard connectors. Can be utilized in audio frequency circuits at 60 volts maximum potential and 0.5 amperes maximum current. Currently six, seven, and ten pin versions are available.



Waterproof Breakaway Connectors Our connectors, which are watertight in up to 6 feet of water, have molded-on wiping-action contacts that provide a self-cleaning feature and eliminate issues with pin/socket open contacts. Both a seven and ten pin version is available. The connectors are designed for multiple cable diameters, are available in shielded versions, and can include either solder-type contacts or insulation-piercing contacts, which are field-replaceable. A miniature version is available in the seven pin version. and urgent requirements.



Military Telephone Plugs and Jacks Amphenol is a qualified military supplier of airborne audio connectors, MIL-DTL-9177. Ruggedized design that offers a number of connector options for different mounting styles, switch functions, and soldier attachments. Ranges from four to eight conductors. Features of these connectors include: environment resisting, RFI/EMI protection, low-level circuit capabilities, high cross-talk resistance.



Magnus MJP Amphenol's Magnus MJP plug is a strong, rugged, durable connector made to meet the growing demand for high quality audio on board today's modern aircraft. Using a smart "break-away" system, whereby the plug and jack are connected by a magnetic force, the Magnus MJP saves users the aggravation of having their favorite headphone ruined by eliminating the occurrence of having the plug torn away from the headphone cable by a single, careless motion.



Rectangular Amphenol has long been the leader in providing high-performance rectangular connectors and systems. Our rectangular connectors feature many contact varieties including low-mating force brush contacts. The brush contact has proven durability and long contact life with up to 100,000 mating cycles. Hybrid low-mating force connectors can be designed with combinations of brush and coax, twinax, power contacts, and fiber optic termini.



HiLinx With our newly QPL certified HiLinx family, we offer engineers a modular solution allowing the mixing of all types of signals: low-level, power, fiber optics, coaxial lines, and differential pairs, while retaining compatibility with the well-known M55302 standard. This system of stainless steel skirts, fittings, and stackable modules, brings flexibility where compromises are not allowed.



**R39 and R393 Connector Series** The R39 and R393 rectangular connectors provide high performance in the severe environmental demands of military specifications while delivering the same reliable and familiar benefits found in the MIL-DTL-38999 Series. This low profile translates into a smaller space-saving footprint, and the new rectangular orientation provides a variety of installation options.



HDB3 High-Density Rectangular This new connector series incorporates a higher-density contact pattern and lower mated height. HDB3 utilizes the high-performance brush contact system for reliability in harsh environments. The mounting hardware, keys, and guide pins have been combined to occupy less board space.



Filter D-sub and Specialty D-sub Connectors Amphenol's Filter D-sub connectors contain integrated EMI filtering, using Amphenol's stress-isolated filter designs. Our connectors are available in all D-sub arrangements including customized insert and shell configurations. These connectors are also offered with IP67 moisture sealing performance and meet or exceed requirements of MIL-DTL-24308.



Ruggedized, Non-Floating Brush Rack and Panel Connector Series This connector series utilizes Amphenol's durable and reliable B3 contact system in a rugged, non-floating rack and panel connector. Included in this series are digital and power/digital "hybrid" insert arrangements. The hybrid series utilizes Amphenol's high-performance RADSOK® power contacts along with Amphenol's proven B3 contact.



83733 Connectors, Filter and non-Filter Amphenol's R58 Series is a harsh environment rectangular connector designed to exceed the requirements of MIL-DTL-83733. This connector is well suited for hostile military and commercial avionics environments where shielding effectiveness and corrosion resistance is mandatory. This series is available both filtered and non-filtered. Filtering is achieved using stress isolated capacitor technology. Applications include blindmate, cable to cable, and cable to box connections in military avionics, targeting PODS and wing pylons.



Micro-D Connectors Filtered and non-filtered Micro-D connectors are designed to meet MIL-DTL-83513 requirements and are excellent for applications where space and weight are at a premium. Integrated EMI Filtering offers further system space savings with superior EMI performance. Customized shell configurations are available including those with integrated, one-piece backshells.



ARINC & Filter ARINC Style Rack & Panel Connectors Amphenol's ARINC products are rack & panel, blindmate, rugged connectors designed for commercial and military avionics systems. These connectors are available in standard and custom configurations with a mix of contact types including: power, signal, RF, and fiber optics. Customized ARINC products can fit into any size or shape of electronics box while integrated EMI and/or EMP filtering offers weight and space savings.



SIM Modular Series 2 Amphenol's SIM connectors are modular, multi-contact, and multi-functional rectangular connectors. Qualified according to the EN4165 spec., they come in metallic or composite versions, shielded or not, and feature clicker nuts or rack & panel plugs. SIM connectors can be a standard or flange-mount receptacle that can be assembled side by side on a panel providing unparalleled contact density.



ASR Connectors Amphenol's ASR connector is a new concept and design for a compact and easy to use interconnect where space and weight-saving is a prime requirement. The ASR series features a snap-locking mechanism, making connecting and disconnecting easy. The ASR series is perfectly suited for in-seat systems, cabin service systems, and in-flight entertainment systems.



**GIGASTAK** The GIGASTAK is designed with the same modular format as the standard LRM product. This design flexibility allows for the use of standard off the shelf components in a custom configuration to meet specific application needs. The GIGASTAK 6.25 Gbps high-speed inserts can be combined with low-speed digital, power, coax, and/or fiber optic termini. Features include vibration resistance, ESD protection, robust structural support, and design flexibility.



Durmalon Plating Amphenol has two plating options, Durmalon and Black Zinc Nickel, that are, not only RoHS compliant, but also Cadmium Free and Lead Free. Both platings are D38999 Mil-Spec qualified (Class T and Class Z), they can withstand 500 mating cycles, 500 hours of dynamic salt spray, and are non-reflective.



MIL-Power Heavy-Duty Connectors Originally designed for use by the military, Amphenol's heavy-duty connectors have become widely used in aerospace, ground support, and shipboard applications. Some features include quick positive coupling, waterproof-IP67 rated, no lockwiring required, high shock and vibration capabilities, and are available in both crimp and solder terminations.



Monoblock Assemblies Designed for power distribution purposes, these monoblock assemblies are made of terminal junction blocks for copper and/or aluminum cable connections. Monoblock assemblies are available with individual or shunted terminals (from 1 to 12) of different diameters. The protective cover fixing, as well as the terminal assembly's fixing on the structure, is secured by pillar bolts.



**Bus Bar - Power Distribution** Amphenol's bus bars provide a means of power distribution between power generator boxes, terminal blocks, and smaller terminal block interconnects. Bus bars are available in various standard sizes and shapes as well as in custom designs. Bus bars present high mechanical resistance and are resistant to high temperatures.



**Daughter Cards** Daughter Cards are at the heart of many state of the art electronics systems. Amphenol's Daughter Cards are precisely crafted solutions for the most demanding applications. Pictured above is an 18 layer Daughter Card. It features three sequential laminations for blind and buried via's and via-fill with a dozen  $100\Omega$  differential pairs meeting stringent electrical test requirements.



Backplanes Amphenol Backplanes are required to perform in the most demanding environments, such as commercial airliners, Army helicopters, Navy and Air Force fighters, C4I electronics, missiles, ground vehicles, and Navy warships. Our Backplanes are used on programs such as the F-35 Joint Strike Fighter, F-22 Raptor, F-18 Super Hornet, Theater High-Altitude Air Defense Radar, AH-64 Apache, RAH-66 Comanche, and AEGIS radars used on U.S. Navy warships.



 $\mu\text{-Com 10Gb}\text{+}$  Ethernet Micro Connectors - Designed to meet the need for miniaturized connectors with rapid transmission speeds and high resistance to environmental extremes. Environmentally tested to MIL-DTL-38999 Series III military specifications, the  $\mu\text{-Com 10Gbits}$  + features a 15 mm (.59") max. external diameter and can exceed 10Gb/s per IEEE 802.3an-2006 even in the harshest environments. The rugged IP68 design features four completely insulated twisted wire pairs throughout the connector to minimize cross-talk and special patent-pending interfacial shapes to minimize perturbation.



**RES-GMC Military Ethernet Media Converter** Amphenol's RES-GMC is a MIL-STD rugged, unmanaged-military-grade media converter. It provides 1 gigabit copper port to 1 gigabit fiber optic port. Developed for military and harsh environment applications, the RES-GMC is compliant with MIL-STD461, MIL-STD-810, MIL-STD-704 and MIL-STD-1275. The RES-GMC series serves as a robust solution to extend your Tactical Gigabit Ethernet network connectivity of up to 120Km over fiber.



Multimedia Ruggedized Connectors (MRC) Amphenol's MRC connectors can be used for all of your multi-media needs. From running Gigabit Ethernet to standard USB/HDMI media specifications, our MRC connectors can be configured to meet your needs in all types of communication. These attributes combined with an IP67 rating, make Amphenol's MRC connector an ideal solution in commercial aircraft.



**R-SATA, Ruggedized SATA Connectors** The new, rugged R-SATA style connector is perfectly suited as the primary internal storage interconnect for flight computers, connecting the system to peripherals such as hard drives, solid state drives, and removable magnetic media drives. The R-SATA supports SATA 3.0 protocol, delivering 6.25 Gb/s data rates & beyond. Amphenol's R-SATA connector utilizes a Micro-Hyperboloid contact with proven performance. The Micro-Hyperboloid contact system offers low insertion and extraction forces, high durability counts, and is resistant to shock, vibration and fretting corrosion.



VME64X Interconnects VME64X connectors have a more rugged interface than standard connectors for improved vibration durability. They meet the needs for a harsh environment connector requiring Level 2 maintenance. Military and commercial aviation, military vehicles and GPS systems are examples of markets that need the ruggedized VME64X connector solution. The ruggedized VME64X connector mounts to standard VME64X cards and backplanes, but it does not mate to other types of VME commercial connectors.



Relay Sockets Amphenol's Relay Sockets are supplied in a broad range of standard and special configurations for 2 - 25 amp operations. Amphenol supports the broadest range of QPL and non-QP requirements. Our Relay Sockets feature state-of-the-art ultrasonically bonded interfaces, eliminating air paths and providing improved protection against moisture and degradations. They are available in Low Profile, Extended-Height, Micro Miniature, Board Mount, Track Mount, and Solder termination styles.



Resistive Devices Amphenol manufactures a complete line of standard and custom-designed terminations and attenuators, including QPL and high-relability versions. Terminations are designed to absorb all incident power with minimal reflection, while effectively terminating the line or port impedance. Flangemount designs are available along with high-power versions to 50 watts. We offer a variety of connector configurations including SMA, blindmate, and ZMA.



Modul R Dedicated to future avionics needs for the LRM IMA (Line Replaceable Module Integrated Modular Architecture) market, the MODUL R combines modularity and high performance in harsh environments. The MODUL R was created in response to the electronic packaging revolution requiring advanced features in terms of resistance, size and weight reduction along with easy maintenance and modularity.



Rugged IP Switch Amphenol Ethernet switches are designed to provide a robust interconnect solution in extreme conditions. They are built using high-performance electronic components, rugged Ethernet and power supply connectors such as RJField TV, and heavy duty packaging. Amphenol's switches resist vibrations, temperature, oil, and water.



**RJ Field & USB Field Range** Using Amphenol's field bus connector range for harsh environment Ethernet applications, you can transform all standard existing RJ45 or USB cord sets into an environmental connector without the use of tools or the need for a cable operation. Reinforced USB memory keys are also available in different capacities.



Flexible Circuits For over 30 years, Amphenol's capabilities are among the world's broadest and most advanced, delivering consistent quality and high-bandwidth systems for mission critical applications. Proven engineering and manufacturing expertise eliminates printed circuit (flexible or rigid) design obstacles.



**Rigid Flex Assembly** Amphenol's Rigid Flex capabilities are among the best in the world. Mission-critical applications such as this example are among our standard offerings. The part pictured above is in service in many different fixed-wing fighter aircraft. This part has 16-layers with blind and buried via's assembled with six unique filter connectors on which we perform thermal cycling and level-two testing.



Engine & System Control Electronic assemblies used to control and monitor the operations of Auxiliary Power Units (APUs), turbine engines and other systems. Products include turbine engine controls, data memory modules and missile actuator controllers.



**Display Ruggedization** Amphenol designs and manufactures a large range of displays that are rugged enough to operate in the extreme environments found in military and aerospace applications. Touch screen input, sunlight readability, and boot kick resistance are a few of the available options.



Line Replaceable Units Amphenol is vertically integrated to produce complex electro-mechanical assemblies which include displays, wiring harnesses, CCAs and mechanicals. In-house testing and environmental screening capabilities provide flexibility and help to ensure product quality. Amphenol also adds value by providing engineered solutions to improve functionality, manufacturability, and to remove obsolescence.



Electronic Packaging Amphenol provides system-level electronic packaging solutions for the design, fabrication, and assembly of connectors, pwb's, flex/rigid flex, cable harnesses, and chassis. Amphenol provides a systematic and professional approach to build-to-print or in-house design of board-to-box and box-to-box interconnection solutions for military and commercial applications.



Value Added Solutions This equipment, located on the cockpit ceiling, allows the crew to manage and to watch many critical helicopter functions. Due to the functional purpose of this equipment, several OHCP configurations are defined to fit different helicopter configurations. Currently there are more than 20 standard configurations.



Value Added Solutions Amphenol tackles problems such as PWB routing, signal integrity, mechanical robustness, and thermal reliability concurrently rather than independently. Solving complex packaging challenges depends on making sure that environmental, mechanical, and electrical factors are all addressed at the system-level. By taking this system-level perspective and focusing on these factors, we are able to meet your program's most challenging packaging requirements.



Ground Support & Test Equipment Electronic and electro-mechanical systems used to control and/or test APU, turbine engines and other systems. Products include APU test systems/facilities, suitcase testers, Line Replaceable Units (LRUs) test systems, assembly tooling, mobile test systems, avionics integration facilities and ground support systems for missile launch vehicles.



Precision Ultra stable Temperature Standards Temperature Standards are rugged, precision sensors suitable for use as secondary or working temperature standards for all laboratory metrology applications. They generally are not affected by shock and vibration and, consequently, are also suitable for field use. They fill the need for low cost temperature standards for general laboratory and hospital use, clinical applications and process temperature measurements. Special versions are available for military and space use.



Flight Control Measurement Racks Amphenol will work with you to design and build custom flight control measurement racks with integrated complex cable assemblies. These systems conform to all unique and regulatory driven requirements of the aviation industry.

# PRODUCTS Commercial Air

Amphenol is a technology leader in the design, manufacture, and supply of high-performance interconnect systems for a broad range of commercial aerospace applications. Leveraging our many decades of experience in the military aviation market, Amphenol provides unparalleled application specific designs for the unique requirements of a commercial aircraft manufacturer. Our innovative solutions facilitate the increasing demands of light weight and enhanced performance in applications such as avionics, radar, communications, cable management, harnessing, and engines. In addition we are investing in long-term new technologies, including fiber optics, flexible printed circuits, radio frequency interconnect, printed circuit boards and next generation high speed interconnect, in order to enable the next generation of planes.

#### **Commercial Aerospace**

Amphenol Commercial Aerospace USA Amphenol Aerospace Operations USA Amphenol Borisch USA Amphenol Griffith Enterprises USA Amphenol PCD USA, China Amphenol Printed Circuit Board Technology USA SV Microwave Inc. USA

Amphenol Canada Corporation Canada

Amphenol Sefee France

Amphenol Socapex S.A.S France

Amphenol Air LB France, Germany

Konfektion E Elektronik Germany

Amphenol lonix UK

Amphenol Limited

Amphenol Sincere Flex Circuits China Amphenol Japan Japan



Amphenol has been a leader in enabling weight reduction in next generation commercial aircraft. Through our unique material innovations, combined with advanced manufacturing capabilities, we have created a broad range of light-weight interconnect and system attachment components, all of which meet the exacting environmental and safety standards required of modern aircraft. Whether saving weight or designing the next generation of cabin lighting connectors, Amphenol's focused team is enabling the next generation of aircraft to take flight.





Apex Galley Connector Based on Amphenol EN4644 implementation, the APeX Rectangular Galley Connector is a robust, reliable rectangular galley connector for use in new galley designs. Intermateable and interchangeable with existing ARINC 810 galley connectors, Amphenol Rectangular Galley connectors provide designers with a low cost alternative compared to existing solutions. Amphenol Rectangular Galley inserts use an overmold that improves environmental sealing and component longevity. The housing features a guide pin for quick and simple blind mating.



ARINC & Filter ARINC Style Rack & Panel Connectors Amphenol's ARINC products are rack & panel, blindmate, rugged connectors designed for commercial and military avionics systems. These connectors are available in standard and custom configurations with a mix of contact types including: power, signal, RF, and fiber optics. Customized ARINC products can fit into any size or shape of electronics box while integrated EMI and/or EMP filtering offers weight and space savings.



**1900SIM Modular Connector** Amphenol's 1900SIM Modular Connectors are made with light weight composite materials in shielded and non-shielded sealed (IP 66/68/69K) versions. They are designed with clip in backshells and optional locking systems for quick installation. They offer 36 keying options and conform to ABD0031 and FAR 25853 regulations.



SIM Monomodule Push Pull These rectangular connectors are modular, multi-contact, and multi-functional mono-module connectors for in-flight entertainment and cabin system applications. These light-weight composite products are available in shielded and non-shielded versions. They are compact, have a push-pull blind mate latching system and offer 7 keying positions.



EN3545/1900 Connectors Amphenol's EN3545/1900 connector series is available sealed or unsealed with copper or aluminum contacts in hybrid signal and optical versions. In addition, there are multiple locking mechanisms and keying options offered to tailor the EN3545/1900 to your most demanding applications.



Luminus Series The Luminus Series are lightweight, cost-effective connectors for low power distribution and control applications that are highly reliable and simple to use. Available in multiple configurations and arrangements, a solution can be tailored to suite your application's exact requirements. Proven solutions can be found in single engine general aviation, multiple-engine business and commercial passenger jets, and high performance rotary aircraft. Ideal where space is limited, these innovative, "scoop-proof" connectors feature a locking mechanism that ensures stability, are blindmatable, and RoHS compliant.



Magnus MJP Amphenol's Magnus MJP plug is a strong, rugged, durable connector made to meet the growing demand for high quality audio on board today's modern aircraft. Using a smart "break-away" system, whereby the plug and jack are connected by a magnetic force, the Magnus MJP saves users the aggravation of having their favorite headphone ruined by eliminating the occurrence of having the plug torn away from the headphone cable by a single, careless motion.



Mil-T-8174 Junction Modules Amphenol Series I and II Junction Modules are a proven and reliable electrical wiring and integration system (EWIS). Widely used throughout the commercial air and military markets, the M81714 series offers a complete solution for low power distribution and control systems. Series I Terminal Junction Modules are offered in Feedback, Feed-through Electronic, In-Line Splice, and Ground configurations. Series II Socket Junction Modules are offered in Feedback, Board Mount, In-Line Splice, and Ground configurations. Mounting rail and installation/termination accessories are available for both Series.



Relay Sockets Amphenol's Relay Sockets are supplied in a broad range of standard and special configurations for 2 - 25 amp operations. Amphenol supports the broadest range of QPL and non-QP requirements. Our Relay Sockets feature state-of-the-art ultrasonically bonded interfaces, eliminating air paths and providing improved protection against moisture and degradations. They are available in Low Profile, Extended-Height, Micro Miniature, Board Mount, Track Mount, and Solder termination styles.



**1750 Modules** Amphenol's quick junction 1750 Modules provide signal and low current distribution in situations where sealing, space, and mass reduction are prime requirements. Designed specifically for wiring, weight, and cost savings in configurations up to 36 contacts in pin sizes 8-12. They fully conform to ABD0031 an FAR 25853 and are available in hybrid, ground, and PCB versions.



SIM Modular Series 2 Amphenol's SIM connectors are modular, multi-contact, and multi-functional rectangular connectors. Qualified according to the EN4165 spec., they come in metallic or composite versions, shielded or not, and feature clicker nuts or rack & panel plugs. SIM connectors can be a standard or flange-mount receptacle that can be assembled side by side on a panel providing unparalleled contact density.



Monoblock assemblies Designed for power distribution purposes, these monoblock assemblies are made of terminal junction blocks for copper and/or aluminum cable connections. Monoblock assemblies are available with individual or shunted terminals (from 1 to 12) of different diameters. The protective cover fixing, as well as the terminal assembly's fixing on the structure, is secured by pillar bolts.



Commercial Aircraft Power Products Amphenol has developed a number of interconnects focused on primary and secondary power distribution and high voltage, in support of the trend towards More Electric Aircraft, using Amphenol technologies, such as our RADSOK socket contacts. Products include: High Voltage Power Panel Connectors for wide body commercial aircraft; Secondary Power Distribution Connectors for narrow body commercial aircraft; and High Voltage Cylindrical Connectors.



D38999 Series III Composite Tri-Start Connectors MIL-Qualified to MIL-DTL-38999, Rev. L, the Composite Tri-Start Connector offers a lightweight, corrosion resistant connector with the same high performance features as its metal counterpart. The Composite Tri-Start Connector is up to 40% lighter than Aluminum equivalents and up to 70% lighter than Stainless Steel equivalents. These connectors can withstand 2000 hours of salt spray exposure with standard platings. These connectors are also qualified to BACC63CT and BACC63CU connector specifications.



Sealed Receptacles with UTS Crimp Contacts for Bulkhead Applications Amphenol has designed a lightweight D38999 Series III interconnect solution for sealed bulkhead applications. These jam-nut or wall-mount connectors offer lighter mass than glass fused steel hermetic options. They feature 1x10-5 minimum leak rates when properly installed. This, combined with crimp insertable contacts, allows quick and reliable termination using standard M39029/57 socket contacts - perfect for pressure vessel or thru-bulkhead applications.



BACC Connectors Amphenol can supply a wide variety of connectors qualified to Boeing Commercial Airplanes specifications. These include D38999 Series III Stainless Steel connectors (BACC63DB and DC); D38999 Series III Composite connectors (BACC63CT and CU); M83723 Stainless Steel Firewall connectors (BACC63CM and CN); and MIL-5015 connectors (BACC63CD and CE).



Universal Header Assembly for Flex Print/PC Board Mounting The universal header assembly will provide for easy separation of EMI/EMP filter connectors from a flex assembly or PC board. Headers can be installed to standard connectors, allowing for electrical testing that would adversely affect the sensitive diodes, MOV's, or capacitors in the EMI/EMP connectors. Connector assemblies can be easily removed from and reattached to the header assemblies as the manufacturing process dictates.



Dualok Interconnect system Dualok is an enhanced anti-decoupling mechanism that can be used on virtually any cylindrical plug connector and backshell. The Dualok Interconnect System greatly improves electrical performance in harsh environments while providing a size and weight savings when compared to standard connectors in the same class. Dualok technology is applied to the plug connector and backshell only and will mate with standard receptacles.



Aircraft Wire Harness and Cable Management Products Designed to secure and guide wire bundles throughout an aircraft, Amphenol Wire Harness and Cable Support products were designed for lean manufacturing and durability. They are offered in multiple materials, and are designed for use in airframe, fuel tank, and engine applications. Available in various standard configurations and sizes, Amphenol also offers customized products to help meet specific customer requirements.



**C-Clamps** Amphenol C-Clamps (Cable Clamps) provide routing, support and fixing for cable harnesses of various diameters. They are used in the wing sections, in the fuselage for power and electrical cables, as well as inside the cabin for in-flight entertainment or cabin service systems. Different materials and configurations are available depending on the temperature and routing of the conduits (including versions for use inside the fuel tank).



CC516 Monoblock Cable Clamps The new monoblock CC5516 composite cable clamps are a lightweight version of standard metallic NSA5516 clamps, offering a 60% weight savings. They are mounted and locked in place on the structure in one step by a screw. The CC5516 clamps are available in 37 sizes, for bundles or pipes from 3 - 60 mm in diameter. The over molded silicone provides perfect protection from shock and vibration.



ABS 14XX Pipe Clamps The ABS 14XX monoblock pipe clamps allow for the perfect fixing of hydraulic pipes on aircraft structures. Designed in composite with silicon over molding the clamps provide perfect protection to pipes from shock and vibration. Multiple versions are available for general (brown silicon) or fuel zone use (blue silicon), with 1 to 5 holes in various and mixed diameters.



P-Clamp TheP-Clamp has been engineered for lean manufacturing and is available in numerous material and configurable options. These clamps have been proven in the field to outperform traditional P-clamps and saddle clamps. They feature different cushioning options and are completely non-conductive/non-corrosive, lightweight, and very durable.



Woven Harnesses Amphenol manufactures a variety of Woven harnesses, where low finished goods weight, alongside small / flat-form harness routing areas are required. This is a unique product / process that is ideal for areas where there is a small / tight space envelope – a variety of different cable types and sizes can be brought together to create a "customized ribbon type" cable solution. It is also possible to incorporate bends and cable drop outs into this product. Woven harnesses are in use in a wide range of applications, including military aircraft & torpedoes where packaging constraints are a major factor.



Complex Wiring Harnesses Amphenol is a highly experienced Manufacturer of Cable Harness Systems for all Military & Aerospace applications. Existing proven applications include commercial airliners, fighter aircraft, military helicopters, military & civil aero engines, torpedoes and military vehicles. Our capabilities include Closed Bundle Harnesses Assembly, Open Bundle Harnesses Assembly, Encapsulated harnesses, Overbraiding (Nomex, PEEK, PTFE, Nylon, Bekinox), Conduit Assembly, Potting, and Flat Woven Cables. We bring together know how, proven performance, process & product excellence with the back-up of skilled engineers to deliver cost effective OEM solutions without compromising our superior quality. Our fast and agile processes enable us to support very demanding and urgent requirements.



Flight Control Measurement Racks Amphenol will work with you to design and build custom flight control measurement racks with integrated complex cable assemblies. These systems conform to all unique and regulatory driven requirements of the aviation industry.



**Control Units** Amphenol will work with you to design and build custom control units with integrated wiring harnesses and switches. Whether to control lighting or locking the flight deck door, our control units conform to all unique and regulatory driven requirements of the aviation industry.



Modul R Dedicated to future avionics needs for the LRM IMA (Line Replaceable Module Integrated Modular Architecture) market, the MODUL R combines modularity and high performance in harsh environments. The MODUL R was created in response to the electronic packaging revolution requiring advanced features in terms of resistance, size and weight reduction along with easy maintenance and modularity.



ABS2216 Composite Backshells for MIL-DTL-38999 series II, EN3645 connectors & TV/CTV connectors offer performance meeting or exceeding all Airbus specifications. These backshells are light, quick, and easy to install. They handle temperatures from -65° C to 200° C with an anti-decoupling system to withstand shocks and vibrations in a variety of configurations.



Lux-Beam is Amphenol's solution to upgrade from a physical contact to a contactless technology in optical communications. LUX-BEAM is not subject to degradation of performance resulting from friction of optical surfaces as is usual on traditional butt joint termini. With its patented pin to socket realignment feature, LUX-BEAM is compatible with connectors from different suppliers and provides an efficient adjustment to tolerances during mating.



 $\label{eq:product} \begin{array}{l} \label{eq:product} \mu\mbox{-} \mbox{Connectors} \mbox{ Designed} \\ to meet the need for miniaturized connectors with rapid \\ transmission speeds and high resistance to environmental \\ extremes. Environmentally tested to MIL-DTL-38999 Series \\ III military specifications, the <math display="inline">\mu\mbox{-} \mbox{Conn}\mbox{10Gbits}$  + features a 15 mm (.59") max. external diameter and can exceed 10Gb/s per IEEE 802.3an-2006 even in the harshest environments. The rugged IP68 design features four completely insulated twisted wire pairs throughout the connector to minimize cross-talk and special patent-pending interfacial shapes to minimize perturbation. \end{array}



2M Connector Series Amphenol's 2M connector series is designed for interconnect applications that require high performance with reduced mass and size. This smaller, high density, lightweight connector far exceeds the competition in quality and performance levels. The 2M series is a superior and versatile connector in all aspects when compared to other standard MIL-DTL-38999 options.



Multimedia Ruggedized Connectors (MRC) Amphenol's MRC connectors can be used for all of your multi-media needs. From running Gigabit Ethernet to standard USB/HDMI media specifications, our MRC connectors can be configured to meet your needs in all types of communication. These attributes combined with an IP67 rating, make Amphenol's MRC connector an ideal solution in commercial aircraft.



**R-SATA, Ruggedized SATA Connectors** The new, rugged R-SATA style connector is perfectly suited as the primary internal storage interconnect for flight computers, connecting the system to peripherals such as hard drives, solid state drives, and removable magnetic media drives. The R-SATA supports SATA 3.0 protocol, delivering 6.25 Gb/s data rates & beyond. Amphenol's R-SATA connector utilizes a Micro-Hyperboloid contact with proven performance. The Micro-Hyperboloid contact system offers low insertion and extraction forces, high durability counts, and is resistant to shock, vibration and fretting corrosion.



**Oval Contact System (OCS):** For use with CAT6A-type cable. Four strategically spaced inner contacts form two 100 0hm matched impedance differential pairs, size 8. System benefits from enhanced crosstalk performance due to compatibility with shielded twisted pair of cables. These contacts can be used for a variety of high-speed applications beyond current quadrax design.



**CTF Media Converter Family** For use with CAT6A-type cable. Four strategically spaced inner contacts form two 100 0hm matched impedance differential pairs, size 8. System benefits from enhanced crosstalk performance due to compatibility with shielded twisted pair of cables. These contacts can be used for a variety of high-speed applications beyond current quadrax design.

# products Industrial

Amphenol is a technology leader in the design, manufacture, and supply of high-performance interconnect systems, sensors and antennas for a broad range of industrial applications, including medical equipment, factory automation, heavy equipment, instrumentation, motion control, rail mass transportation, alternative energy, and oil & gas exploration and extraction. Amphenol's core competencies include application specific industrial interconnect solutions utilizing integrated assemblies with flexible printed circuits as well as high-power interconnects requiring a high degree of engineering and system integration. Our innovative solutions also facilitate the increasing demands of embedded computing and power distribution. Industrial

Amphenol Advanced Sensors Global Amphenol Industrial Operations USA. China Amphenol Alden Products USA Amphenol DC Electronics USA Amphenol Fiber Optic Products USA, China, Mexico Amphenol Fiber Systems International USA Amphenol InterCon Systems USA Amphenol Interconnect Products Corporation LISA Amphenol Nelson Dunn USA Amphenol Oil & Gas Technologies USA Amphenol PCD USA, China USA, China Amphenol TCS USA, Japan Amphenol Global Imterconnect Systems Global Amphenol Times Microwave Systems USA Amphenol Sine Systems USA Amphenol Canada Canada Amphenol Technical Products International Canada Amphenol ConneXus Sweden, Estonia, India Amphenol Socapex S.A.S. France Amphenol Air LB France, Germany Amphenol Tuchel Electronic Industrial Germany, China **Amphenol Limited** IIK **Amphenol Sincere Flex Circuits** China Amphenol Solar Technologies China Guangzhou Amphenol Electronics Communications China Amphenol Interconnect India India Amphenol Japan Japan Amphenol DaeShin Korea Amphenol LTW Taiwan, China Amphenol Australia Pty Ltd. Australia Amphenol Tel-Ad

Israel



Today's diesel engines are becoming more complex as new environmental and regulatory standards are introduced around the globe. Amphenol has partnered with engine manufactures to develop new ruggedized sensors that can monitor particulate output to optimize engine operation and maintenance. Our team understands the many challenges that are created by the extremely harsh environment in which such equipment must operate. Our engineers are designing not only sensors, but also the connectors, flexible circuits, and wiring harnesses to withstand the world's harshest and highest vibration environments.



Radsok® RADSOK'S twisted grid configuration allows for 50% more current to pass through the same size pin, while providing increased reliability, ampacity and cycle durability as well as lower insertion force, T-rise and voltage drop.



**Groundimate** With the new Groundimate series, Amphenol is able to replace the now used PE connections, made up of ring terminals in electrical cabinets, with pluggable contacts. By using the well-known and field-proven RADSOK® technology in combination with the clicklfit locking device, a high-current carrying capacity is achieved. Owing to different locking parameters, it is possible to connect GroundImate contacts with pins or threads.



Power Bus - Sur-Lok & Hi-Lok Amphenol now features the Sur-Lok compression lug and Hi-Lok semi-permanent high-amperage connector. Sur-Lok is a field-crimpable contact assembly featuring RADSOK® technology. Hi-Lok was invented in response to customer demand for a tool-less but semi-permanent high-amperage connector. Often used as a replacement to the traditional threaded post and ring terminal.



**RIG-Lok** RIG-Lok is a reverse bayonet connector which incorporates our patented RADSOK technology. The plug contains an 18mm RADSOK socket and the receptacle contains an 18mm pin with the option of crimp, 2 hole busbar, or threaded busbar termination. When unmated, personal safety is maintained through touchproof, dead-front contact design.



**Neptune** NEPTUNE<sup>®</sup> incorporates our RADSOK<sup>®</sup> contact technology and is typically used in oil exploration equipment and portable power distribution equipment.



Rhino 38999 This High Power connector series combines the benefits of field proven MIL-DTL-38999 circular connectors with low resistance hyperbolic RADSOK® power contacts. Designed to meet the latest military and industrial specifications, Rhino 38999 connectors also comply with stringent safety requirements. Rhino 38999 connectors are intended to satisfy market requirements for up to 1000A power & high voltage in harsh environment conditions. With IP68 sealing, anti-decoupling ratchet mechanism, superior EMC and RoHS Black Zinc Nickel plating, Rhino 38999 connectors ensure a reliable connection.



**5015** Amphenol's 5015 Series is a rugged, versatile, and environmental resistant connector with proven electrical capability. 5015 series connectors are medium to heavy-weight cylindrical connectors with 5 shell styles, 19 shell sizes, and 5 service classes. The 5015 offers 286 contact arrangements from 1 to 104 circuits. It is available in solder or crimp contacts, threaded coupling, coaxial and thermocouple contacts, and RoHS compliant versions.



**97** Amphenol's 97 Series is the lowest-cost cylindrical interconnect solution in the proven 5015 family connector style. An extremely versatile connector family, the 97 Series offers six shell options, 128 different contact arrangements, 1 to 52 circuits, one of the largest selections of insert patterns on the connector market, and crimp, solder, thermocouple, and PCB (100 suffix) contacts.



ACA-B The ACA-B is designed for commercial and industrial environments requiring a rugged bayonet style connector for heavy duty power and signal applications. A comprehensive selection of insert arrangements and accessory hardware configurations is featured to accommodate heavy-duty commercial wire and cable. ACA-B is manufactured in accordance with MIL-C-5015 and VG95234. The insulators are made of high-quality polychloroprene material and withstand temperatures of -55° C to +125° C.



PT These miniature cylindrical connectors offer twice the number of contacts in half the size of a standard connector. These miniature bayonet connectors are available in several series, each with varying design characteristics and customer options to meet cost considerations and provide maximum design flexibility. There are two styles within the family that are MS approved and qualified to MIL-C-26482 Series 1, as well as several proprietary styles.



Amphe-Power The Amphe-Power® series consists of three of the time-tested and reliable families of Amphenol Industrial Connectors, all of which are MIL-5015 style, medium to heavy-duty cylindricals. This series, enhanced with RADSOK® sockets, can now handle up to 50% higher amperages. Current Amphe-Power® product lines support from 50A to 1000A continuous-duty.



P-Lok The P-Lok connector is a rapid mate multi-pin pushpull connector engineered to provide reliable yet convenient electrical connections for a wide variety of industrial and commercial applications. P-Lok features the same electrical characteristics as MIL-C-5015 connectors.



GT The GT Interconnect Family is a high-performance, high-power, rugged, and sealed connector with reverse bayonet coupling. Originally designed for use by the military, the GT has become the preferred connector for mass transit. The heavy duty GT connector is also widely used in commercial, geophysical, aerospace, ground support, and shipboard applications.



Vortex GT The Vortex GT is a GT shell type connector with reverse bayonet coupling RADSOK® technology, designed specifically for delivering high-power from source to load. The plug contact is an 18mm crimp type RADSOK® socket combined with an 8mm RADSOK® pin. The receptacle contact is an 8mm screw type RADSOK® pin combined with an 8mm RADSOK® socket. Uses include electrical generators, fuel cells, load banks, and charging systems.



Amphe-Lite<sup>™</sup> The Amphe-Lite<sup>™</sup> connector series is designed for signal, power, RF, or fiber optic interconnect requirements in harsh environments. The Amphe-Lite<sup>™</sup> series offers the highest performance capabilities for severe environment applications, yet is cost-effective enough for general-duty and non-environmental applications.



Star-Line<sup>™</sup>/Star-Line<sup>™</sup> EX The Amphenol Star-Line<sup>™</sup> series connectors are heavy duty environmentally sealed plugs and receptacles used in all types of industrial and aerospace applications. These compact environmental connectors provide outstanding performance in complex ground support cable networks, process control systems, and instrumentation systems. The Star-Line EX<sup>®</sup> Series is a hybrid form of the parent Starline<sup>®</sup> product line. Typical uses include: petrochemical refineries, land, and offshore drilling systems.



Amphe-EX<sup>™</sup> Amphenol, the worldwide leader in explosion-proof and hazardous-environment interconnects, has introduced a new, miniature, explosion-proof threaded connector specifically designed to allow a signal to pass through Zone rated areas using coaxial, fiber optic, or standard copper cables. The new Amphe-EX is complimentary to Amphenol's industry-proved Star-Line EX. In addition, the rugged Amphe-EX connectors are ATEX and IECex approved for Zone 1 rated applications.



Service Loops and Cable Assemblies Amphenol Industrial Products Group is THE leading provider of Service Loops and Cable Assemblies to the drilling industry. As drilling equipment and, specifically, Top Drive Systems travel up and down in the drilling mast, a robust and reliable umbilical is necessary to provide the electrical and hydraulic power from the rig to the equipment. As a sort of ultra-heavy-duty "extension cord", this flexible cable and hose bundle (AKA:Service Loop) is a critical component of the overall drilling system. Amphenol Industrial Products Group is recognized for producing the highest quality, highest performance, and most reliable Service Loops and related Cable Assemblies in the industry.



DeepSight In response to the growing need for fiber optic monitoring systems in oil wells, Amphenol has developed the DeepSight fiber optic connector for use in down-hole applications. DeepSight has the ability to withstand the high pressure, temperatures, and corrosive fluids found in downhole environments. These connectors are precision-machined and designed to provide superior optical performance in extreme conditions.



PRLC The PRLC series uses MIL-C-38999 Series III construction with a Tri-Start mating mechanism, an excellent anti-vibration coupling. The connector has a generic construction throughout, all housed within a shell size 13. Typical applications for PRLC include: oil and gas exploration, and mass transit. The shell material is nickel, aluminum, bronze for marine and mass transit applications and stainless steel for oil field and mining applications.



Cable Glands Amphenol, the worldwide leader in explosionproof and hazardous environment interconnects, introduces our broad range of explosion-proof and industrial cable glands. The new Cable Gland product line is designed to perform in the most demanding environments. Amphenol's complete line of EX Zone 1 and 2 rated cable glands offers our customers great flexibility.



Amphe-PRB Amphe-PRB is a Plastic Reverse Bayonet connector series which offers a single-phase, two-phase, and three-phase multi-core waterproof solution for emerging markets.



Amphe-Mine EX The Amphe-Mine EX series is a hybrid form, of the parent Star-Line product line. The series holds many certifications such as ATEX, IECEx, AEx, Canadian EX and GoST-R. In addition to these hazardous area classifications, Amphenol has added Australian Group I Mining approval. This new certification is through TUV Rheinland, and meets the IECEx listing for Group I applications in Australia.



**KTK** Our KTK is molded and machined glass-filled epoxy with gold contacts and a Viton 0-ring. Kintec compatible and can be fully integrated with the GE Tensor configuration. These connectors offer high pressure and high temperature sealed connections standard in the downhole industry.



Amphe-Armor A rugged connector originally designed for the geophysical industry and the exploration of natural resources, where connectors are needed to withstand the harsh environments of oil, gas, mud and water. Houses either PT series with solder termination, bayonet coupling or Amphe-Power GT with crimp termination, reverse bayonet coupling.



Aqua Power Aqua Power connectors are designed for extremely heavy-duty use—and are trusted in some of the most rigorous underwater applications on the planet.



Barracuda The Barracuda range of environmental IP68 sealed connectors is specifically designed for harsh applications where water, dust, oil, or spray is present. These molded connectors are interchangeable with the equivalent industry standard connectors, which feature enhanced ergonomics and ruggedized moldings. The Barracuda bodies are molded from glass filled nylon and all have the same outside diameter of 38 mm at the largest point.



**Optron Hybrid Connectors** Amphenol's Optron connectors are a complete line of circular hybrid connectors designed and qualified to MIL-PRF-28876, Rev. E. They are precision machined and designed to provide superior optical performance in extreme environmental conditions. The Quickloc backshell also allows easy access to maintain or reconfigure termini without altering the captivated aramid fiber.



**CUDA** Amphenol's CUDA line of geophysical connectors are designed to meet tough industry standards for harsh environment operation by using innovative interconnect technology. They are available in single connector and gun arrays from stock or on short lead-time to suit the variable demand cycle of the marine exploration industry.



**Cord Grips** Amphenol Cord Grips provide a complete array of sealing and hardware types. Whether the application calls for a small straight sealing body design, or a larger angled style, Amphenol Cord Grips provide rugged aluminum components to withstand years of service.



**DHR** Amphenol's Downhole Rotatable Connector series (DHR) have been designed to reduce failure points leading to increased system reliability. The DHR series is fully compatible with existing housings and standard mounts used throughout the downhole industry and they are able to withstand temperature up to 200° C.



**Poseidon** Amphenol's Poseidon line of connectors are the most advanced marine exploratory connectors of their type in the industry. They were created for rigorous use in extreme depth applications enabling them to deliver maximum data and power in the toughest conditions.



**RPT** Amphenol's RPT connectors are based on the 26482 connector series, but designed with a stronger shell and reinforced keyway. These improvement allow the RPT series to perform in the harsh environments of the geophysical market in a miniature bayonet cylindrical connector form factor. With numerous configurations available, the RPT series offers flexibility in a small rugged design.



Submariner Series The Submariner series of connectors is designed to be used in many diverse applications including diving equipment, ROV's, submersible pumps, and underwater cameras.



HelioLug HelioLug is a grounding component for solar modules and solar racking systems allowing easy termination to the ground wire.



**MVC Series** Engineered to Amphenol's high standards for ruggedness and reliability, there is no field condition in the world that can impede the MVC. Our Rapid-Couple interlock method makes for a coupler with a quick and easy mating/ unmating system. This provides for positive mating and secure fitting covers that repel water and soil while keeping the contacts uncontaminated. The MVC coupler has been remarkably designed with a wide range of features and benefits that makes this the coupler of choice for the mining industry.


Amphe-CM Amphenol's Amphe-CM connector line has been designed to deliver power and signal in the challenging environment presented by underground mining. The Amphe-CM is available in stainless steel with a reverse bayonet coupling design, making it ideal for mining operations where ease of connection in difficult installation environments is crucial.



**GEN-LOK** GEN-LOK is a power connector that offers a quick and convenient interconnection, supplying power to modular electric drilling rigs in remote, rugged and demanding land and sea locations.



ArmorLite<sup>™</sup> Cables Amphenol's ArmorLite<sup>™</sup> protected cables are a cost-effective solution to expensive conventional armored cables. For many years, seismic exploration companies have looked for a solution to keep seismic crews working in conditions where small animal bites have shut them down. Seismic crews using cables protected with ArmorLite<sup>™</sup> have seen production in these areas improve tremendously.



Geophone Strings & Products Amphenol provides a wide range of vibration measurement devices called Geophones. Geophones are sophisticated measuring devices and are based on a coil suspended by springs in a magnetic field, within a steel case. The seismic industry today demands tight tolerances to meet the exacting standards of a modern seismic survey. Amphenol's geophones are a cost-effective solution backed by a 3-year warranty.



Geophysical Connectors Amphenol's geophysical connectors are used in land seismic, transition zone, marine, and down-hole markets. Our capabilities include: land, marsh, and marine geophone, hydrophone, and array connectors; gender and polarity pocket adapters; battery and specialty overmolded connectors; and cable overmolding.



Telemetry Seismic Cables Amphenol is an independent designer and manufacturer of telemetry seismic cables used with a wide range of seismic data acquisition systems such as I/O, Sercel, Aram, and Fairfield. We specialize in engineering products that perform globally in all climates and conditions such as land (arctic & desert), transition, and marine environments.



HeavyMate Series Amphenol's HeavyMate series offers a large range of heavy duty rectangular connectors designed for applications in harsh industrial environments. Inserts for power or signal transmissions are available as well as a modular connector system to combine both in one connector. The robust metal housing offers excellent EMC ratings and can withstand salt spray common in offshore applications.



ADG & ADGC Amphenol's ADG Series connectors are used principally in rail mass transit and heavy industry applications. Their main characteristic is the fast and precise coupling of the receptacle and plug connectors. Three bayonet ramps on the receptacle allow for the fast and perfect mating with only a one quarter turn of the coupling nut. They withstand exposure to moisture, oil, and vibration.



**RMT Inter-Car Jumpers** Inter-car Jumpers from Amphenol provide electrical connections between all types of rail vehicles and can be supplied for low-voltage and signals, high-voltage, 3-phase, and fiber optic systems. These jumpers are designed to suit a variety of insert arrangements, different currents and voltages, and many different cable sizes and types.



RMT Junction Boxes Amphenol has designed a wide range of termination boxes allowing customers to terminate different types and sizes of cables on the underside and within rail vehicles. These termination boxes are designed to meet very harsh environmental conditions encountered in the rail mass transit market including: high-voltage bus line boxes, traction motor connection boxes, shore supply connection boxes, DC supply connection boxes.



AMHTC Amphenol's AMHTC Series (Amphenol High-Tension Connectors) is primarily used for railway vehicle-installable power distribution systems. They offer the ultimate in safety and reliability under the most severe operating conditions. AMHTC is available in two standard varieties, which allow complete hook up through the standard daisy chain principle.



Bus Bar - Power Distribution Amphenol's bus bars provide a means of power distribution between power generator boxes, terminal blocks, and smaller terminal block interconnects. Bus bars are available in various standard sizes and shapes as well as in custom designs. Bus bars present high mechanical resistance and are resistant to high temperatures.



FlexiPlug® Hybrid Pluggable Block Amphenol's FlexiPlug® combines U.S.-style standard screwdriver barrier-block wire terminations with a European-style pluggable block nose, and will mate with most standard headers. Screw/pressure-plate terminations enclosed in a tri-barrier configuration accept either a #2 Philips-head or a 1/4" flat screwdriver and will accommodate up to two 12 AWG wires or ring-/fork-tongue terminals.



Neptune NEPTUNE® incorporates our RADSOK® contact technology and is typically used in oil exploration equipment and portable power distribution equipment.



**Power Mount** Amphenol's Power Mount series combines RADSOK® contact technology with our industry tested TMPC contact design to form a new range of power connectors. Designed to meet the rugged requirements of the oil and gas exploration market, the Power Mount provides increased amperages in a single pin connector. The molded flange is available in AC/DC color codes to protect the user from cross mating in the field.



**Powerlok** Utilizing RADSOK<sup>®</sup> technology, the PowerLok was designed with compactness and robustness in mind. Suitable for applications up to 1000V ranging from 90A-500A, the PowerLok is a reliable, easy to use, and cost effective solution.



ePower The ePower series of connectors feature RADSOK® technology and are designed for the demanding requirements of hybrid, electric vehicles, and utility truck electrical systems, operating at 800 VDC to 1000 VDC with a 200A to 500A rating.



**POWERLUG** Amphenol's POWERLUG cable termination is formed from contiguous copper stranding, eliminating the crimp joint of standard ring terminals. This significantly increases cable termination reliability while reducing the MV drop inherent within a crimp joint. Closer spacing is allowed as the joint diameter does not exceed the diameter of the terminated cable. Available in standard or custom POWERLUG configurations.

Ecolmate Ecolmate is a circular connector featuring easy operation, reduced dimensions, and a more robust design to withstand harsh conditions. The connector's primary applications are factory automation, machining, and medical. The series comprises a large selection of housings and shapes, as well as models with screw, solder, and crimp termination.



**C16-3** The C16-3 circular connector series is designed to meet the high-performance requirements of harshenvironment industrial applications. The range includes versions with screw and crimp terminations. A selection of crimp contacts for hand crimp tools and for crimp machines enables a reliable termination resulting in qualitative, technical, and economic advantages. A broad selection of housing styles are available.



Luminus Luminus is a compact, configurable interconnect with an easy, secure coupling mechanism and tough polyamide housing. The product is ideal for today's sophisticated commercial, military and industrial vehicle interior environments in which full-spectrum, adjustable, and LED lighting creates a more comfortable or productive atmosphere. Its small footprint allows for quick and efficient assembly.



UV Amphenol is highly focused on developing standard products and customer specific solutions for the UV disinfection market. These products cover a broad range of UV applications from water purification, waste treatment, surface purification, to air purification. Our products are suitable for commercial, industrial, marine, and municipal requirements. Some examples of our UV products are lamp connector systems, ballast installation systems, power distribution systems, instrumentation connectors, waterproof connectors, and industrial control cable assemblies.



X-Lok Amphenol's X-Lok connector provides a cost-effective assembly solution with superior safety and reliability in data and power transmission. X-Lok has a high level of durability with proven long life due to it's superior weather resistance with it's IP67 rating and UV rating of F1.



**M-Series** Amphenol's waterproof sensor connectors and cable assemblies are designed for use in a variety of environments. With numerous options, the M-series is your perfect solution for all of your multi and single mode connections. These connectors along with our M8 & M12 distribution boxes offer efficient installation to reduce overall labor costs.



**Cable Joiner** Amphenol's Cable Joiner was designed and developed for simple, quick and reliable cable interconnections. It is available in several options to meet various cable OD and wire sizes. Amphenol's cable joiner also meets the latest requirements for locking protection. Installation is quick and simple with standard crimping butt terminals or screw terminal blocks for different application needs.



**RBL Connector** Within the renewable energy market, Amphenol's RBL connector serves as an interface between control units on heliostats & trackers, hydraulics and motors making motion possible. With our innovative latch locking system, Amphenol's RBL connector greatly reduces installation time while providing a high performance interconnection.



H4 PV Connector The premiere solar connector in the market today, carries more amps, has a higher IP rating, and is fully intermateable with the industry standard connector.



Hercules PV Junction Box The Hercules line of junction box assemblies are produced exclusively for crystalline silicon solar modules. With many models and endless pole/diode configurations paired with our PowerLink cable and H4 PV connectors, we can meet any module need.



**PV AC Connectors and T-Junction** Amphenol offers a comprehensive selection of interconnects for Micro Inverters and AC Solar Panels in the solar industry. Our VTC Trunk & Drop cables, BMC connector, and other accessories are designed for high performance, reliability, durability and longevity improved power performance, ease of installation all while reducing up front installation costs.



PowerBOSS / PowerBOSSlite / ControlBOSS The Advantage Line<sup>™</sup> PowerBOSS,<sup>™</sup> PowerBOSSlite,<sup>™</sup> and ControlBOSS<sup>™</sup> hybrid interconnect systems provide power, control, and communication connectivity on a plug and play basis. The development of modular, crush-resistant, factory-molded connectors has eliminated the need for hardwired or traditional conduit installations.



**Wall Bushing Connector** This new patented power feedthrough solution is designed for easy assembly even in difficult to access areas. Based on RADSOK<sup>®</sup> technology, the wall bushing connector enjoys high current capacity, low mating forces, and a high number of mating cycles. Designed for cabin applications on commercial vehicles, this connector shows its reliability at high vibrations in rough environments.



Factory Automation Mini 7/8", M8, M12, and RJ45 are robust, streamlined and scalable Factory Automation patch cords and cord sets for use in robotics, conveyors, sorting, automated storage/retrieval, packaging, overhead transport, palletizing, material handling system, etc. Our patch cords are available as a standard product or they can be configured with custom cables to meet your specific design requirements.



**C091** The C091 connector series is used in automation, test and measurement, medical, sensors, and telecommunications. Their proven design and performance make these connectors a recognized industry standard. They are available with a screw or bayonet locking system. Receptacles are available for front or back-panel mounting and offer a variety of connection possibilities.



AX Series The revolutionary AX series of XLR connectors introduce an exciting contemporary look and feel to the professional audio interconnect market. They are designed to complement modern audio architecture and truly "fit" within their environment. An impressive list of features guarantees pure sound performance in the most demanding applications providing unrivalled value.



Industrial Relay Sockets Amphenol Industrial Audio Relay Sockets provide a low cost, high quality solution for customers looking to maximize the life cycle of their existing product architectures. Made with black phenol plastic and stamped alloy contacts, Amphenol Industrial/Audio Relay Sockets meet existing dimensional and performance specifications. Typical applications are home security, door & gate openers, industrial automation, thermostats and lighting using "unsealed" relays. Audio applications are high-end audio amplifiers, guitar amplifiers, electronic organs and speakers and using vacuum tube amplifiers, pre-amplifiers and rectifiers.



A Type The A-type XLR chassis receptacles have been designed and manufactured with the Original Equipment Manufacturer's needs in mind. The compact shell design offers significant space savings over the traditional "D" type shell providing a higher connector density.



ECTA 133 / ECTA 544 The ECTA 133 is ideally suited to industrial applications due to its rugged design, convenient push-pull operation, wide range of contact sizes, and high contact density. ECTA 544 series plastic circular connectors are used for industrial applications such as: robotics, laboratory test equipment, transportation, and tool interconnection. The ECTA 133 & ECTA 544 are designed, produced, and certified according to EN 61984.



Amphe-RC Based on the Matrix MIL-DTL-5015 the Amphe-RC is a threaded coupling, crimp contact connector.



Amphe-SP3 Amphe-SP3 are Single Pole Plastic Connectors with RADSOK® Contacts, Amphenol's high current contact technology.



**RADLOK** Based on our Surlok<sup>™</sup> Compression Lug with RADSOK<sup>®</sup> technology, but features a quick release button making for easy and rapid connections/disconnections.



Custom Terminal Blocks From complete wiring management enclosures to slight variations on existing designs, Amphenol has all of your custom terminal block needs covered. We are happy to tailor any I/O block to your specific application whether it be performance criteria or just a distinctive appearance. Since we offer a broad range of both standard products and standard options, we are often able to customize even smaller projects without delay or expense.



PCB Terminal Blocks Amphenol's PCB terminal blocks offer a broad range of standard and application-specific fixed and pluggable I/O for wire-to-board. Available in screw clamp, cage clamp, and spring clamp wire attachment in numerous pitches and are UL, CSA, and TUV approved.



DIN Terminal Blocks & Interface Modules Modular DIN rail-mount "inside the box" wire-to-wire terminal blocks come in screw clamp, spring clamp, and bolt wire attachment configurations. Standard and application-specific DIN railmount "inside the box" wiring transition and signal conditioning interface modules for systems integration, supplement DIN terminal blocks to reduce installed cost and enclosure size, while increasing wiring reliability.



Amphe-10G The Amphe-10G was designed as an alternative to fiber for high speed data transfers. Using an oval contact system housed in a 38999 shell, end users can achieve the highest data speeds of up to 10Gbps.



A Series Connectors are available in a variety of standard positions (2-18 pos.). The AT, ATM, ATP and AHD Series connectors were designed as a high-performance, costeffective solution within the Heavy Equipment, Agricultural, Automotive, Military, Alternative Energy and other demanding interconnect architectures. All of these connectors are compatible with other existing standard products industrywide, and feature rugged thermoplastic housing with superior environmental sealing and hand insertable/removable contacts for simplified service.



Tru-Loc The Tru-Loc series includes 2-way, 4-way, and 6-way inline plugs and receptacles. Our engineering team can also design this series to mate to a device, sensor, fuel injector, splitter, pass through connector, and more. Special backshells can be designed for the 6-way series, and we can meet 150°C temperatures upon request. These connection systems are RoHS compliant and seal to IP67 when mated. They are rated for high vibrations at 32 Grms.



AT Circular Series The AT Circular Series is a molded thermoplastic receptacle with a positive retention system and sealed by redundant grommet wire sealing. The square flange design ensures a drop in replacement to existing panel design and the jam nut design makes for easy installation. Available in 3-, 5- and 9-way, the 9-way receptacles also meet the J1939 standard.



Max-M12 The Max-M12 is a ruggedized M12 high speed data connector based on the IEC 61076-2-101 and SAE J 2839 standards.



SMA fiber Optic Connectors and Assemblies The Amphenol designed SMA connector is the first industry standardized fiber optic connector. This connector is ideal for medical applications requiring custom fiber sizes and higher optical power levels. Available with ceramic or stainless steel ferrule, in 905 or 906 configuration, with traditional epoxy and polish or with a FlberGrip® epoxyless termination.



Dsub Connectors Amphenol offer a full range of Dsub connectors from stamped and formed pins to screw machine pins with more than 6000+ standard items available. Amphenol's Dsub TW Hybrid series permits a mix of contacts including signal, high voltage power, and coaxial in the same housing with up to 18 different contact arrangements.



**1777 Modules** Quick Junction modules support signal and low current distribution purposes, where sealing, space, and weight-saving are prime requirements. These track-mounted modules (on metallic or composite track) are available from 8 to 18 contacts with contact sizes from 12 to 20 in various configurations. Amphenol's 1777 series also offers hybrid PCB solder modules.



**1977 Connectors** The composite sealed 1977 connectors are available in 5 contact configurations, from 50 contacts gage 20 to 5 contacts gage 8. Locking as well as keying and fixing on structure is allowed by the pin & socket polarizers. This product range is derived from the classic EN3545 / 1900 product range for industrial applications.



**RJ 45 (ODVA)** Amphenol's new ODVA-Compliant RJ45 series connectors meet the Ethernet/IP RJ45 requirements and standards. With an IP67 rating these connectors are suitable for Industrial Automation, BWA, and Smart Grid markets.



**RJ Field & USB Field Range** Using Amphenol's field bus connector range for harsh environment Ethernet applications, you can transform all standard existing RJ45 or USB cord sets into an environmental connector without the use of tools or the need for a cable operation. Reinforced USB memory keys are also available in different capacities.



Pulse-Net<sup>®</sup> Industrial Ethernet Pulse-Net<sup>®</sup> is a ruggedized Ethernet connector that offers the convenience and functionality of a standard RJ45 connector plus push & click, Pulse-Lok<sup>®</sup> mating action for positive confirmation of engagement, industry standard components and termination tools, and multiple termination options.



Millimeter Wave Connectors and Components The high frequency millimeter wave product line has the precision, quality and performance needed for the millimeter wave spectrum through 67 GHz. Products include 2.92 mm, 2.4 mm and 1.85 mm and are available as connectors, terminations, attenuators, cable assemblies and customized solutions. These parts are ideal for applications requiring high frequency transmission in the high speed digital, test and measurement, instrumentation, and SATCOM markets.



**SSMA** The SSMA connector is designed to be a space-saving alternative to the standard SMA originally designed for use with .085 semi-rigid cable. The male contact was designed to be the same size as the cable conductor so that it could be used as the mating pin for optimized VSWR. This interface is available with 50 0hm options and gold plating is standard.



**Precision RF** APC stands for Amphenol Precision Connector and was developed by Amphenol and Hewlett-Packard engineers. The APC is the first instrument-grade coaxial connector series to achieve repeatable TE11 mode resonance-free signal transmission from DC - 50 GHz with a minimum return loss of 26 dB. These 50  $\Omega$  connectors are designed for test and measurement equipment where reliable performance is critical for repeated connect/disconnect cycles.



**TNC** Developed in the late 1950's, the TNC connector series features a miniature, threaded weatherproof interface with a constant 50  $\Omega$  impedance and operates from 0 - 11 GHz. The TNC is available in standard and reverse polarity configurations. Reverse polarity is a keying system accomplished with a reverse interface, and ensures that reverse polarity interface connectors do not mate with standard interface connectors.



AC Series C The AC Series C type chassis receptacles feature two connectors in one space saving housing. A combined XLR female receptacle together with a 6.35mm (1/4") phone jack give the designer more flexibility ensuring premium board space is saved. Various configurations are available in either stereo or mono layouts with vertical/horizontal printed circuit board or solder contacts.



ARC Connectors and Cable Assemblies Amphenol's ARC line of ruggedized connectors and cable assemblies are engineered for superior performance and are designed to operate in extreme conditions. These products are made to withstand rigorous vibration, chemical elements and drastic temperatures. Typical applications include mining, transportation and industrial control systems. The connectors are offered in TNC, Type N, and SMA series, are fully tested to IP67 specifications and are available with complete cable solutions.



High-Voltage Cable Assemblies Amphenol is a leader in high voltage connectors and cable assemblies with products ranging from 1KV to 75KVDC. Our experienced high voltage design engineers collaborate with customers to develop custom solutions and engineered cable assemblies that solve the most demanding high voltage challenges. Throughout our 70 years of high voltage leadership we have served a diverse range of customers in the complex and competitive medical, industrial and military markets and have developed industry standard connectors for X-Ray, ESD, HeNe lasers and more.



Medical Cabled Products The demanding operating room environment can test the quality and toughness of a connector/ cable assembly like none other. From precision power tools to catheters and probes, these instruments must be able to endure repeated use, mechanical stress, and sterilization. Amphenol's Pulse-Lok<sup>®</sup> line of auto-coupling connectors and integrated overmolded cable assemblies is engineered to withstand the unique challenges of this demanding environment.



**Fine Wire Terminations for Medical** Expertise in wire management and fine wire termination to connectors, flex circuits, and circuit boards allows us to meet shifting medical marketplace demands. We terminate coax and micro-miniature ribbon cables using wires as small as 46 AWG (.0015) on .0045 centerlines, and offer welded termination of 44 AWG and larger type t, k, or e thermocouple cables. Amphenol's process and design capabilities allow for micro-termination (35 – 44 aWg) with superior reliability. By standardizing equipment, we have successfully developed redundant capability in China, to offer customers a lower cost solution where required.



RFID Connectors Amphenol has capabilities to integrate RFID technology alongside our connectors and cable assemblies. The RFID integrated system allows the OEM to protect their product by securely programming individual serialization and critical data through the read/write capability of the transponder tag.



Non-Magnetic Connectors A range of connectors including RF, Coax, Amphelite,<sup>®</sup> and Pulse-Lok<sup>®</sup> are now offered in non-magnetic versions to meet the unique needs of MRI and other applications in which magnetic interference poses a challenge. Manufactured using durable, corrosion-resistant non-magnetic composite materials, these connectors will not produce image artifacts in MRI scans and are made for years of use in medical environments.



Medical Push On Connectors An alternative to conventional threads or bayonet style connectors, Amphenol's Pulse-Lok® connectors provide an automatic latch with audible, visual, and tactile feedback when the connector is fully mated. Simply push the connector into its mating socket and the self latching coupler springs into position. To disconnect, a simple quarter turn of the coupler cams the plug out of its mate making Pulse-Lok® one of the most intuitive and easy to use medical connectors on the market.



Pulse-one The PulseOne overmolded plug cable assembly and receptacle is designed to meet the growing need for human worn and disposable high-performance connection systems. Its ergonomic shape, environmental sealing features capable of IP-X7, and low cost option make PulseOne ideal for both physiological monitoring and instrumentation.



Integrated Medical Assemblies Amphenol can do much more than just the connector and cable assembly. Whenever a unique I/O is required such as a patch panel or an adaptor to another system, Amphenol can provide the turnkey solution. This can include the box, printed circuit boards, seals, labels and instructions for use, packaged into a single SKU for the OEM.



Amphe-Lite Non-Magnetic The non-magnetic Amphe-Lite is another variation of the highly reliable industrial multi-pin interconnect that is ideal for a variety of applications.



Industrial Strength Skewclear® Cable Amphenol's® cable is optimized for rugged high data rate applications such as factory floor automation, outdoor geophysical data acquisition, or railroad car high speed video. It is constructed with high flex stranded conductors, very low skew twinaxial parallel pairs, and either halogen free or rugged polyurethane outer jackets. It is compatible with Amphenol's high speed twinaxial OCS crimp contact system



Industrial Wire Harnesses Amphenol has the capability to manufacture a wide variety of rugged and dependable wire harnesses for incorporation into a variety of industrial applications. Utilizing Amphenol and non-Amphenol connectors, we are able to work directly with the customer from conceptual design through to product launch to ensure smooth production. With factories in several countries, Amphenol offers unique flexibly to meet your global supply chain needs.



High Speed Cable Assemblies The high speed cable assemblies feature high frequency capabilities with small diameter push-on interfaces. These cables are primarily used for "inside the box" applications to attach I/O connectors to PCB mount connectors in MIL-AERO, Test and Instrument, and Datacom/Telecom markets.



Marine Amphenol is a leader in the marine electronics market offering waterproof housing integration and standard NMEA 2000 cable assemblies. Our products are commonly found in a variety of marine applications as embedded communication links between radios, GPS systems, antennas, boat motors, and fish and depth finders.



MRC Connector The MRC connector is a modular rectangular connector, and consists of a rugged aluminum frame, plastic modules with many insert arrangements, and crimping contacts for high current (power) and low current (signal). MRC has a self-lockable system specially designed for RMT applications with high vibration.



Smart Card Connectors Smart card connectors are integral components of a smart card reader or terminal, and provide electrical contact to the smart card's pads. Amphenol provides smart card connectors for use in a variety of applications such as set top boxes, payment terminals, vending machines, and automotive applications.



Infotainment Interconnect Solutions Amphenol's comprehensive infotainment solutions encompass customized media interface hubs & ports, integrated wireless charging, and automotive grade cabling solutions to connect everything together. These solutions are the culmination of Amphenol's innovative engineering, planning, and production efforts that provides our customers with a comprehensive automotive infotainment system.



**PowerBox** Amphenol provides comprehensive Electro-Mechanical design and testing for electrical cabinets including power supply, controllers, circuit breakers, insulated transformers, and cable management. Our design services include full electrical, mechanical, and thermal analysis to ensure we meet your most demanding applications.



Monoblock Cable Clamps The monoblock cable clamps for industrial applications allow the perfect fixing of electrical cable harnesses on a structure. These cable clamps are fully designed in composite with silicon overmolding, providing a perfect protection to the wires from shocks and vibrations. They are available in 8 sizes, to cover the whole diameters from 3 to 48 mm. They are fixed on structure by a screw and are closed by a simple cable tie.



Discharge Air Temperature Sensor The Discharge Air Temperature is used to measure the temperature of the air that is emitted from the air ducts. Fast response time and "Fir-Tree" or "Twist-Lock" designs for fast installation & easy service. Alternate resistance versus temperature thermistors is available.



Water & Oil Temperature Sensor Amphenol's temperature sensors for either oil or water applications provide a crucial link in preventing damage to engines in heavy duty engine applications. The sensors offer both integral and flying lead designs with numerous resistance values to choose from with temperature ranges of -40° C to 185° C and higher.



**High Temperature Sensor** This sensor operates over a temperature range from -40 °C to 850°C. It monitors the temperature before and after SCR system in diesel engines as part of the engine control strategy. It is designed for fast response, optimized for thermal dissipation and suitable for high vibration and corrosive environments.



Active in vehicle Temperature Sensor An integrated, low-noise fan draws a greater volume of cabin air across the temperature sensor providing a faster response as compared to a traditional passive sensors. This can result in a more accurate climate control, leading to better cabin comfort. This sensor can also help improve the efficiency of the temperature control system by reducing the on / off cycles of the heating and cooling system. It is quiet in operation, a coreless type motor and low in current consumption. Amphenol can also supply with a humidity sensor in the package along with temperature sensor.



**Outside Air Temperature Sensor** This sensor measures the temperature outside the passenger compartment and is usually mounted inside or near the front bumper or in the side mirror. The sensor relays the outside air temperature to the controller of the automatic HVAC systems. The sensor has high sensitivity, a compact design, an integral sealed connector and ensures single hand installation with no tooling.



Intake Air Temperature Sensor The intake air temperature sensor measures the temperature of the air into the engine and reports to the engine control unit (ECU). The ECU uses this information to optimize fuel delivery and the air-to-fuel ratio to produce efficient combustion. The sensor has fast response times as well as a snap-fit housing that eliminates wiring insulation damage.



Transmission Fluid Temperature The transmission fluid temperature sensor measures the temperature of the transmission fluid. The sensor provides input to the control module to modify shift patterns for smoother shifting in automatic transmissions and also provides over-temperature protection by locking the torque convertor. The twist and lock design ensures easy installation.



Diesel Particulate Filter Sensor The Accusolve Diesel Particulate Filter (DPF) Soot Sensor utilizes radio frequency technology to enable accurate measurement of accumulated soot in the DPF, providing real-time soot loading data and real time closed loop control of the DPF regeneration process. Accurate measurement of the soot load allows for the optimization and reduction of regeneration cycles of the DPF. This in turn allows for improved fuel economy and improved filter life for active and passive regeneration systems.



Exhaust Gas Recirculation (EGR) This sensor is made in both a 150° C and a 300° C temperature version. It is used to monitor the temperature at several locations in diesel engines as part of the engine control strategy. The high temperature sensor is used in the exhaust gas and the low temperature sensor is used in the intake air stream. Both are designed for fast response, are optimized for thermal dissipation and are suitable for high vibration and corrosive environments.



**Fin Sensor** This sensor measures the Evaporator Core temperature so that it doesn't freeze over preventing a costly repair. The Evaporator cools the refrigerant that is pumped around the vehicles HVAC system. The ultra-fast response time aides in the HVAC system efficiency by enabling the evaporator core to operate closer to 0°C without the risk of a freeze over condition. Small size & flexible packaging facilitates installation and service. Probe construction protects the probe from moisture.



Tire Pressure Sensor The NPX1 sensor represents the next generation of Remote Tire Pressure Monitoring (RTPM). NPX1 integrates a silicon pressure sensor, an 8-bit RISC processor, and a LF-input stage to meet market demands for flexible, customer specific behavior/solutions and overall system cost reduction for RTPF applications. The programmable version of this sensor is available for development purposes, allowing the customer to download the application code into an electrically programmable EPROM version.



Surface Mount Pressure Sensor Amphenol's silicon pressure sensors in surface mount packages offer an ultra-small Silicon Fusion Bonded (SFB), ultra-high stability SenStable<sup>®</sup> piezoresistive chip placed in a plastic package that exploits high volume, leadframe package technology to bring forth a low-cost sensor alternative to the OEM user.



Thermopile IR Temperature Sensor Amphenol's thermopile IR temperature sensors are used for non-contact surface temperature measurement in various applications like microwave ovens, cooktops, air conditioners and thermometers.



Pipe Clip Temperature Sensor The sensors are designed for industrial HVAC applications. The sensor consist of a NTC thermistor on a ceramic/metal shoe assembly seated in a polymer housing with flexible twin cable connections. The housing is fitted with a spring metal clip for pipe attachment. Typical applications include gas boiler control, domestic water systems, air conditioners, radiator inlet-outlet, electric showers, vending machines, chiller and refrigeration units.



Self-Adhering Surface Temperature Sensors Self-Adhering Surface Temperature Sensors are designed for industrial HVACR applications, typically for placement on the external wall of a water tank or boiler reservoirs. They are also suitable for reservoir tanks working in conjunction with solar panel water heating systems. This range of adhesive pad sensors detect over-temperature resulting from a malfunction or a dry-fire.



Turbidity Sensor The turbidity (amount of suspended particles) sensor utilizes an optical sensor for measuring turbid water density or an extraneous matter concentration using the refraction of wavelength between photo transistor and diode. By using an optical transistor and optical diodes measures the amount of light coming from the source of the light to the light receiver, in order to calculate water turbidity. Applications include water conservation and energy management of washing appliances.



Appliance Temperature Sensor Amphenol offers a full suite of custom temperature sensor assemblies used for a variety of commercial and residential refrigeration and cooking appliances. The encapsulated cable leaded NTC thermistors and the related meat probe sensor are used to measure the temperature of chilled or cooking foods and are suitable for home appliances and microwave ovens.



**Commercial and residential HVAC Temperature Sensors** Amphenol has a breadth of high volume core temperature sensing products for HVACR applications. Customized Cable Probe Temperature Sensors consist of NTC thermistors encapsulated within metal housings, extension cables and connector systems for optimizing energy efficiency performance.



Precision Ultra stable Temperature Standards Temperature Standards are rugged, precision sensors suitable for use as secondary or working temperature standards for all laboratory metrology applications. They generally are not affected by shock and vibration and, consequently, are also suitable for field use. They fill the need for low cost temperature standards for general laboratory and hospital use, clinical applications and process temperature measurements. Special versions are available for military and space use.



Temperature Thermistors Amphenol offers one of the most comprehensive ranges of thermistor products in the world today; driven by temperature technologies. These include high temperature thermistors, gauge drivers, sensors, and elements. Amphenol provides solutions to temperature sensing challenges faced in a variety of applications.



NDIR CO2 Module Amphenol's NDIR CO2 Module is ideal for applications where CO2 levels need to be measured and controlled for indoor air quality and energy saving applications such as demand control ventilation. This affordable gas sensing solution for OEMs eliminates the need for calibration with Amphenol's patented ABC Logic<sup>™</sup> software and lifetime calibration warranty.



Building Environmental Control Sensor and Transmitter Amphenol's building control transmitters and sensors work seamlessly with building automation systems allowing you to simply and effectively control fresh air into a ventilated space to regulated standards, providing immediate energy savings. These can sense and report CO2, temperature, and humidity levels.



Humidity & Temperature Sensor Chip Amphenol offers the most advanced and cost effective humidity and temperature sensing solution for virtually any type of application. A capacitive polymer sensor chip and a CMOS integrated circuit with EEPROM are integrated into one embedded system in a reflow solderable SMD package. Individually calibrated and tested and is simple and ready to use without further calibration or temperature compensation.



Dust Sensor Transmitter This sensor measures the dust particle concentration in air by using optical sensing method. An infrared light emitting diode (IR LED) and a photo-sensor are optically arranged. The photo-sensor detects the reflected IR LED light by dust particles in air. The sensor can detect the small particle like cigarette smoke and can distinguish it from large house dust by pulse pattern of signal output.



Medical Pressure Sensor Amphenol's medical pressure sensors are specifically designed for use in disposable medical applications. The device is compensated and calibrated per the Association for the Advancement of Medical Instrumentation (AAMI) guidelines for industry acceptability. The sensor integrates a high-performance, pressure sensor die with temperature compensation circuitry and gel protection in a small, low-cost package.



Catheter tip Pressure Sensing die Amphenol utilizes its advanced silicon micromachining technologies to offer some of the smallest pressure sensor elements for use in medical catheters. These sensors enable point-of-use pressure sensing for superior frequency response and accurate localization. Our capabilities enable customization of these sensors to meet customer and application needs.



Battery Temperature Sensor Amphenol's hybrid battery temperate sensors can withstand the harsh environment required for hybrid battery systems. These sensors give the customer high accuracy at a wide range of operating temperatures.



**Moisture Measurement System** Amphenol's Protimeter line of moisture meters makes measuring moisture and related metrics such as humidity and surface temperature easier than ever. These meters are widely used in the construction and building inspection industry and feature an ergonomic design able to handle the rigors of the field.



Advanced Validation Systems Amphenol's Kaye validation system products are designed to meet the most demanding industrial requirements for process improvement, thermal validation and reporting. Specializing in providing turnkey system solutions and supporting them with unmatched technical service, we offer a complete range of temperature standards, baths, thermocouples, and fittings all designed to provide the most accurate process measurement available.

### PRODUCTS Automotive

Amphenol is a leading supplier of advanced interconnect systems, antennas, and sensors for the automotive industry. Applications include infotainment, telematics, communication and navigation modules, as well as engine control, safety, lighting, climate control, vehicle dynamics, and hybrid drives. Amphenol's ability to collaborate with leading global customers on application-specific automotive interconnect, antenna, and sensor technologies is enabling the next generation of connected automobiles with conventional, hybrid-electric, or all electric drive systems.



**Automotive** 



Working closely with key automotive customers, Amphenol engineers developed a new, award-winning transmission interface for hybrid and electric vehicles to distribute power from the battery to the electric motor. Our technical team used the latest processing technologies in conjunction with our more than 80 years of connector design experience to embed uniquely power-efficient performance into an interconnect sized for the automotive industry. Amphenol is committed to being a leader in the burgeoning hybrid-electric vehicle market with both custom and standard solutions, while continuing to drive innovation across our fast growing automotive market portfolio.





Single Position PCB FAKRA The German and American automotive industries have standardized a high-performing, cost-effective RF connector based on the FAKRA and USCAR standards for automotive telematics. Amphenol's single position PCB FAKRA is an edge mount pin in place connector featuring all-metal construction. This connector's all-metal construction makes for a far more robust connector which passes all USCAR and FAKRA standards.



High-Density Dual-Position FAKRA The German and American automotive industries have standardized a high-performing, cost-effective RF connector based on the FAKRA and USCAR standards for automotive telematics. This connector utilizes a standard metal SMB connector embedded within a plastic housing that features multiple color codes for easy identification. FAKRA connectors are designed to perform up to 4GHz and meet the particular mechanical and environmental requirements of the automobile industry.



Hybrid Dual-Position FAKRA Amphenol's Hybrid Dual-Position FAKRA connectors contain one RF port and one DC power port. This connector is used for applications where both RF and power is needed such as amplified antennas for telematics systems. This version differs from the high-density hybrid dual-position FAKRA connector due to its larger case size.



Hybrid High-Density Dual-Position FAKRA Amphenol's Hybrid High-Density Dual-Position FAKRA connectors contain one RF port and one DC power port. This connector is used for applications where both RF and power is needed such as amplified antennas for telematics systems. This high-density hybrid connector is perfect for applications requiring a small connector package.



Single Position Cable FAKRA Utilizing a modified metal SMB coaxial connector, the Amphenol single position cable FAKRA features a closed-entry interface with a protected outer contact making the connector more robust than traditional SMB's. Embedded within a plastic housing which features multiple color codes for easy identification and unique keying to prevent mis-mating, FAKRA connectors are designed to perform up to 4 GHz and meet the particular mechanical and environmental requirements of the automotive industry.



**FME** FME connectors are used for mobile antenna applications and can be adapted for either UHF, Mini-UHF, TNC, BNC and N connector interfaces using between-series adapters. The FME interface features a constant 50  $\Omega$  nominal impedance and its crimp assembly provides easy installation. FME connecters are ideal for wireless and telecom applications.



Mini-UHF Mini-UHF is a miniature version of the UHF connectors that were developed for use in the radio industry. Mini-UHF connectors are used as coaxial interconnects in cell phones, automotive systems, and similar applications where size, weight, and cost are critical. Mini-UHF connectors terminate to RG-58, RG-58A, RG-58B, RG-58C, and Belden 9258 cables. Crimp-type cable plugs and jacks as well as panel and PCB receptacles are available.



MCX The MCX series is a great option where weight and physical space are limited. The MCX provides broadband capability though 6 GHz in a snap-on connector design. A range of connectors are available, including printed circuit board and cable connectors. Typical applications include automotive, wireless LAN, broadband, and wireless infrastructure markets. MCX connectors conform to the European CECC 22000 spec.



MHV MHV connectors are miniature, bayonet locking connections used for high voltage applications up to 5000 volts. This interface conforms to MIL-STD-348 and offers quick-connect functionality. The design of the MHV interface is such that the insulator protrudes beyond the outer contact to provide a degree of protection from shock in the unmated condition. In the mated condition, this interface is considered weatherproof and free from dust ingress.



**SSMA** The SSMA connector is designed to be a space-saving alternative to the standard SMA originally designed for use with .085 semi-rigid cable. The male contact was designed to be the same size as the cable conductor so that it could be used as the mating pin for optimized VSWR. This interface is available with 50 0hm options and gold plating is standard.



Coaxial and Multi-Coaxial Cable for Automotive Application Amphenol is one of the premier manufacturers

of automotive grade coaxial cable for automakers around the world. For over 35 years we have been committed to providing single coaxial and multi-coaxial cable in various sizes, combinations, and specifications in standard and custom configurations. These cables are ideally suited for use in radio, cellular communications, GPS, telematics and infotainment applications in today's modern automobiles.



Automotive Cable Assemblies for Data Communication Amphenol has the cable assembly solutions you need to transfer data within a vehicle. Whether it is high-speed data systems, LVDS (low-voltage differential signaling) systems, navigation systems or parking distance control systems we will partner with you to develop the solution you need.



HSD Automotive Connectors Amphenol's automotive HSD (High Speed Data) Connector's focus on various applications from displays to rear seat infotainment modules in a variety of configurations. These connectors support harsh environment conditions for camera applications in areas like bumper zones or side mirrors. Amphenol's HSD automotive connectors can be used in combination with a variety of protocols such as LVDS (Low Voltage Differential Signaling), GVIF (Gigabit Video Interface), USB, IEEE 1394 as well as Ethernet Protocols.



Infotainment Interconnect Solutions Amphenol's comprehensive infotainment solutions encompass customized media interface hubs, ports, and integrated wireless charging pads. These solutions are the culmination of Amphenol's innovative engineering, planning, and production efforts that provides our customers with a comprehensive automotive infotainment system.



Automotive Data Cable Assemblies Amphenol has integrated the latest technology allowing all in vehicle infotainment modules to be connected through automotive grade assemblies. With our Automotive Data Cable Assemblies, vehicle OEM's can integrate the latest high speed USB and HDMI functionality with automotive grade supplier quality, product specifications, and support.



Automotive Antenna Solutions Amphenol's automotive antennas and RF cable assemblies are integrated into car doors, window glass, and infotainment systems; and assembled onto vehicle roofs. From shark fin antennas to coaxial assemblies, Amphenol can provide solutions for GPS, SDARS, WiFi, Bluetooth, 3G, 4G LTE, and AM/FM.



Automotive Touch Panels Amphenol has developed the capabilities to create Touch Panels that meet the exacting demands of today's automobiles. Whether used as a control interface or for a backseat infotainment system, Amphenol will work with you to ensure the perfect driver or passenger experience.



Smart Card Systems Amphenol has a long history of creating smart card systems for a multitude of applications. Amphenol's smart card systems are tailor-made for integration into EV charge stations for customer identification and payment. We also have unique expertise in RF solutions needed for contactless payment systems.



Safety Restraint Systems - Connectors, Retainers, and Cable Assemblies Amphenol's safety restraint systems product family consists of the well established 10 mm interface and the 11 mm solutions AK1, AK2, and AK2+. Different connector versions are available with latch, pushbutton, and reversed locking legs. The filter elements are coil, mono-block, and multi-material ferrite, straight and right angle versions. Our complete line of retainers are available with or without a shorting bridge and are 100% camera checked and printed for the highest class of traceability.



Automotive Interior Lighting Modules Amphenol has developed interior lighting modules using LED technology which are used for functional and ambient lighting in vehicle interiors. Modules are equipped with single or RGB color LED electronics working as direct lighting or as light guides creating a safe and comfortable driving environment.



Bulb Sockets and Connectors for Automotive exterior lighting Amphenol has developed standardized bulbsockets and connectors reflecting the latest trends in the automotive industry. These products, along with custom developed solutions, represent a wide portfolio of components – bulbsockets, connectors, grommets, modules – allowing lampmakers and 0EMs to choose the right connection. Amphenol lighting components are designed in line with common automotive standards.



Lighting Wiring Harnesses Amphenol works with customers to produce specialized electrical harnesses for vehicle lighting. We develop and source the necessary parts such as connectors, terminals, housings, clips, tubes, and tape to build the right solution for the customer at the right price. These harnesses are used for complete vehicle lighting applications – headlamps, rear lamps, interior lighting.



Defrosting Glass Electrical Harness Amphenol will work with customers to determine the perfect solution for their defrosting glass harness needs. Based on customer's specifications, we will design and overmold connectors. Our defrosting glass harnesses are produced for major automobile manufacturers throughout the world.



**TNB (Buckle Connector) Electrical Harness** Amphenol has a long history of products designed specifically for automotive safety systems. Amphenol developed a connector for Seat Belt Detection approved by RENAULT and used by many other Tier-1 automobile manufacturers.



Power Steering System Harnesses Amphenol has worked with customers to create solutions for today's increasingly complex steering wheels and power steering systems. Based on customer specifications, we design the harness and over mold the connectors to create a complete solution. We have the capabilities to create harnesses with airbag and speed limit functions built-in.



Airbag Electrical Harness Amphenol has worked with customers to design and build airbag electrical harnesses based on specific design requirenments. Based on these custom specifications we design, source, and assemble airbag connectors with other components such as terminals, housings, clips, tubes, cable ducts and tape to assure a high quality end-product.



Engine Control, Cooling, Shock Absorber, and Exhaust Cable Asssemblies Engine cooling, suspension, and exhaust systems are becoming more intelligent each year. To help customers cope with new components Amphenol creates robust and intelligent cable assemblies for all aspects of cooling, suspension, and exhaust systems.



Wiring Harness for Gearbox Transmissions and Diesel Engines These harsh environment wire harness and cable assemblies are able to withstand high-temperatures while undergoing high-vibration, high-abrasion, and high-humidity. Solutions are available for sealing requirements, chemical resistance, and custom harness securing through innovative overmolding processes and proven designs.



**Door Switch Harness** Amphenol's assemblies meet the demands of new car door switch and handle designs. These specialized & customizable harnesses can range from traditional entry systems to advanced keyless entry.



Custom Box Builds Amphenol has vast experience in valueadd box builds for our customers worldwide. We will work with your engineers to create the complete assemblies that your business requires. We can source and integrate your specific circuits into a complete solution along with our connectors and cables.



IP The Industrial Plastic (IP) range of miniature bayonet locking connectors has both 62IP non-removable solder contacts and 162IP removable crimp contacts. These are fully interchangeable with Amphenol's 62 Series connectors and accessories. The shells, panel nuts, coupling nuts, and accessories are molded from Thermoplastic. This gives a smooth, low-luster black finish that, once molded, does not require any plating or further processes.



Flat Contact Housings Flat contact housings are available for contact sizes 0.64 mm, 1.2 mm, 1.5 mm, 2.8 mm, 4.8 mm and 9.5 mm. They are used for contacting electrical / electronic components in the vehicle and can be used as a floating coupling (inline). Depending on the size and design these contact housings are available with up to 14 pins as sealed version or up to 52 pins as non-sealed version. The reliability of the connector is significantly enhanced by the integration of a secondary lock (TPA) and – optionally – a control positioning assurance (CPA).



**Electronic Housings** Inside our electronic housings we can integrate electronic components and sensors protecting them and allowing vehicle connections and mounting. Contacts inside the housing are encapsulated or pressed in - if required the components are pre-assembled according to the customer's needs. The connection to the onboard network is realized via standard connectors. Depending on the area of installation, the housings are available as sealed or non-sealed versions. In order to enable ventilation for sealed electronic housings, we can integrate a pressure release device.



**Cable Channels** Cable channels ensure accurate and robust routing of cable harnesses. They are mounted in the interior, the engine compartment and the underbody of vehicles. Cable channels are designed for operating temperatures from  $-40^{\circ}$  C up to  $80^{\circ}$  C in the interior and up to  $140^{\circ}$  C in the engine compartment. Depending on the material, two-piece (base and lid) or one-piece versions are manufactured (body with cover) ranging in length from 10 to 630 mm. Various standard mounting systems (clip/sockets) allow for easy installation in the vehicle)



Module-to-Module Interconnects Our long standing leadership in designing high-current interconnects for harsh environments makes us the logical choice for interconnecting the high power modules that form battery packs. Using modular designs and our proven-superior RADSOK<sup>®</sup> insert, we can design the space-saving interconnect solution you are looking for.



Automotive Radsok® Connectors and Cable Assemblies The RADSOK product family includes multiple contact sizes and standard housings for wire to wire as well as wire to board/lead frame connections. Many features such as TPA, CPA, water protection, and coding are implemented in the housings which can be adapted for customized solutions. RADSOK is approved by vehicle manufacturers and is already in use in mass production for high-power, high-current, and other applications.



activePinLock RADSOK® Housings Amphenol's activePinLock connector interface has a high power RADSOK® contact with a unique locking mechanism in a functional and attractive plastic housing. This interface allows for quick and easy mating and unmating. Reliability is greatly enhanced due to audible and tactile locking action which assures the operator the connector is properly mated.



Overmolded RADSOK® Cable Assemblies Amphenol has developed a unique overmolded RADSOK® cable assembly system for high-power automotive applications. Our cable assemblies feature an environmentally sealed connection system. This new design creates a more robust system and can broaden the scope of applications for RADSOK® technology in harsh environment applications.



A Series Connectors are available in a variety of standard positions (2-18 pos.). The AT, ATM, ATP and AHD Series connectors were designed as a high-performance, costeffective solution within the Heavy Equipment, Agricultural, Automotive, Military, Alternative Energy and other demanding interconnect architectures. All of these connectors are compatible with other existing standard products industrywide, and feature rugged thermoplastic housing with superior environmental sealing and hand insertable/removable contacts for simplified service.



**SAE J1772 Level II Plug and Receptacle** The SAE J1772 Level II is the standard interface for single phase AC charging in North America and Japan. Level I (16A) and Level II (30-70A) versions are available. Amphenol has led the way in development of this standard and supports OEMs on their latest plug-in vehicles.



**SAE J1772 Level III Plug and Receptacle** The Level III plug and receptacle is a DC fast charging, high current charge interface capable of 550A. Amphenol is at the forefront of design and development of the SAE J1772 Level III/DC standard and has been central in SAE's efforts to standardize this product.



**Micro-Vehicle Charge Connector** Designed specifically for use on small urban electric vehicles, this connector provides users with a very quick and easy mating interface for high current quick charging. This connector is designed for high mating cycles and has a very user-friendly low level of insertion force. This connector features a variety of pin layouts to accommodate between 60 and 400 A.



Relay and Fuse Boxes Amphenol's relay and fuse boxes are support systems for standardized relays and fuses and connect them to the vehicle-mounted on-board power supply system. They are customized according to customers' needs and designed and manufactured for different numbers and formats of fuses / relays. These solutions can be adapted across conventional, hybrid, and electric vehicles.



HV Connectors and Harnesses Amphenol has leveraged its extensive background in power connectors and harnesses to create a line of high voltage interconnects for the automotive market for use in next generation hybrid and electric vehicles. These solutions use Amphenol's proven RADSOK<sup>®</sup> contact and can be integrated into application specific harnesses.



Transmission Interconnect Amphenol's rugged crash test worthy transmission housing connector is designed to bring power to electric motors within transmission housings. It uses Amphenol's proven RADSOK® contacts which allow for far more power in a smaller package. This interconnect is specifically designed for the harsh environment found beneath the car.



High Voltage Cable Assemblies Amphenol has the capabilities to create custom solutions for all your high voltage and high current needs common in many hybrid and electrical car applications.



ECTA Automotive High-Voltage Connectors Amphenol's ECTA connectors, receptacles, and harnesses are designed for use in battery systems, generators, electric motors, power distribution, electronic air conditioning, oil pumps, service plugs, and diagnostic plugs. Featuring a quick connecting push-pull mechanism, the ECTA is an ideal solution for numerous automotive applications.



High Voltage interface for E-Motors Amphenol has developed an award winning high voltage interface for connecting electrical motors to power units. This interface provides high electrical performance in situations where space is at a premium.



350A / 1000V Rated GT Style Utilizing our unique high power RADSOK® contact, Amphenol has leveraged our long history as the leader in high power industrial interconnects to design a GT style circular connector for high power vehicle applications. Suitable for harsh environments, our high power circular connectors come in a variety of sizes to suit your needs. The connectors can be designed with a variety of insert arrangements and either threaded or reverse bayonet coupling.



**Bi-Metallic Busbars** Amphenol has developed extensive expertise in solving a central issue experienced by all manufacturers of high energy storage systems - a cost effective production process for bonding dissimilar metals together. This Bi-Metallic welding expertise can provide you the turn-key parts you need for interconnecting battery cells.



Manual Service Disconnect with/without Fuse Amphenol's standard fused and non-fused manual service disconnects can be configured to meet your packaging requirements. Our manual service disconnect with fuse packages a specially designed high power fuse in a very compact package. Safety systems include last-mate, firstbreak, touch-proof contacts, as well as a convenient nylon handle for removing the unit. Our manual service disconnect without fuse includes a safety circuit to ensure that power is never going through the unit when disconnecting. For added safety, touch-proof contacts are included.



**Oil Pressure Switch** Amphenol's oil pressure switches are used to monitor oil circuits in internal combustion engines and machines. Media pressures ranging from 0.05 bar up to 4.6 bar can be monitored in the temperature range from  $-40^{\circ}$  C to  $+160^{\circ}$  C. The switches are available as single-pole NO ("normally open") and NC ("normally closed") variants. The electrical connection is customized according to customers' needs. The mechanical connection can be equipped with or without seal/sealant and with metric or imperial threads. For particularly heave loads, there are system pressure-free and hydraulically damped versions.



Sun Sensor Amphenol's dual or single solar sensors use photo diode cells to measure the intensity of the light that enters into the cabin of the vehicle. It takes this information and feeds it back to the automatic temperature control (ATC) unit of the air conditioning system.



Infrared Sensors The ZTP series of IR thermopile sensors are used for non-contact surface temperature measurement. The product consist of thermo-elements, flat IR filter, a thermistor for temperature compensation in a hermeticallysealed TO package. AAS offers both single zone and dual zone sensors for automotive applications. The sensors measure the temperature of the occupants of the vehicle and feeds that information back to the controller where it compares the temperature reading to the set temperature on the HVAC system and then uses the temperature delta to compensate up or down automatically.



Auto Defogging Sensor mounted on the windshield behind the rear view mirror. The Auto Defog Sensor consists of a thermistor for windshield temperature sensing and Humidity Sensor combined with ambient temperature compensation. These three elements allow the sensor to predict Dew Point or Fogging Condition in vehicles before fogging starts. This information then feeds back to the automatic temperature control (ATC) unit of the vehicle's air conditioning system. The HVAC can then be activated to ensure safe driving conditions and increase energy efficiency by minimizing HVAC on time.



**CO2 Automotive Sensor** Small automotive ready package for simple OEM in-cabin integration. Zero maintenance with automated re calibration for the detection of CO2 concentrations up to 10000 ppm. Applications include in-cabin air quality control for driver awareness; energy efficiency regulating fresh air ventilation and in-cabin refrigerant leak detection.



Water & Oil Temperature Sensor Amphenol's temperature sensors for either oil or water applications provide a crucial link in preventing damage to engines in automotive applications. The sensors offer both integral and flying lead designs with numerous resistance values to choose from with temperature ranges of -40° C to 185° C and higher.



High Temperature Sensor This sensor operates over a temperature range from -40 °C to 850°C. It monitors the temperature before and after SCR system in diesel engines as part of the engine control strategy. It is designed for fast response, optimized for thermal dissipation and suitable for high vibration and corrosive environments.



Active in vehicle Temperature Sensor An integrated, low-noise fan draws a greater volume of cabin air across the temperature sensor providing a faster response as compared to traditional passive sensors. This can result in a more accurate climate control, leading to better cabin comfort. This sensor can also help improve the efficiency of the temperature control system by reducing the on / off cycles of the heating and cooling system. It is quiet in operation, a coreless type motor and low in current consumption. Amphenol can also supply with a humidity sensor in the package along with temperature sensor.



**Outside Air Temperature Sensor** This sensor measures the temperature outside the passenger compartment and is usually mounted inside or near the front bumper or in the side mirror. The sensor relays the outside air temperature to the controller of the automatic HVAC systems. The sensor has high sensitivity, a compact design, an integral sealed connector and ensures single hand installation with no tooling.



Discharge Air Temperature The Discharge Air Temperature is used to measure the temperature of the air that is emitted from the air ducts. Fast response time and "Fir-Tree" or "Twist-Lock" designs for fast installation & easy service. Alternate resistance versus temperature thermistors are available.



Intake Air Temperature Sensor The intake air temperature sensor measures the temperature of the air into the engine and reports to the engine control unit (ECU). The ECU uses this information to optimize fuel delivery and the air-to-fuel ratio to produce efficient combustion. The sensor has fast response times as well as a snap-fit housing that eliminates wiring insulation damage.



Multifunction Air Cleaner Sensor This sensor utilizes two pressure sensors for measuring both intake air pressure and barometric pressure as well as a humidity sensor and a temperature sensor to alert the operator as to when the air cleaner needs to be changed and ensure optimum engine performance for better fuel economy.



Transmission Fluid Temperature The transmission fluid temperature sensor measures the temperature of the transmission fluid. The sensor provides input to the control module to modify shift patterns for smoother shifting in automatic transmissions and also provides over-temperature protection by locking the torque convertor. The twist and lock design ensures easy installation.



Battery Temperature Sensor Amphenol's hybrid battery temperate sensors can withstand the harsh environment required for hybrid battery systems. These sensors give the customer high accuracy at a wide range of operating temperatures.



Exhaust Gas Recirculation (EGR) This sensor is made in both a 150° C and a 300° C temperature version. It is used to monitor the temperature at several locations in diesel engines as part of the engine control strategy. The high temperature sensor is used in the exhaust gas and the low temperature sensor is used in the intake air stream. Both are designed for fast response, are optimized for thermal dissipation and are suitable for high vibration and corrosive environments.



Transmission Pressure Sensor Amphenol leverages its core silicon micromachining technology and utilizes advanced packaging technologies to offer pressure sensors that are industry leading in size and weight in automotive-proven applications. Sensors based on this technology are qualified for use in transmission control systems and fuel delivery systems, among others. We offer an unusually small and robust sensor for use in automatic transmission control. These sensors are among the lightest in the industry, weighing only 3.55 grams, and are low-profile for integration into today's limited design space.



Fuel Pressure Sensor Amphenol has developed an integrated quick-connect and pressure sensor combination. This sensor greatly simplifies the incorporation of the pressure sensing function into fuel delivery lines, reduces weight, and eliminates several additional parts and operations that were traditionally required.



Tire Pressure Sensor The NPX1 sensor represents the next generation of Remote Tire Pressure Monitoring (RTPM). NPX1 integrates a silicon pressure sensor, an 8-bit RISC processor, and a LF-input stage to meet market demands for flexible, customer specific behavior/solutions and overall system cost reduction for RTPF applications. The programmable version of this sensor is available for development purposes, allowing the customer to download the application code into an electrically programmable EPROM version.



Surface Mount Pressure Sensor Amphenol's silicon pressure sensors in surface mount packages offer an ultra-small Silicon Fusion Bonded (SFB), ultra-high stability SenStable® piezoresistive chip placed in a plastic package that exploits high volume, lead frame package technology to bring forth a low-cost sensor alternative to the OEM user.



**Fin Sensor** This sensor measures the evaporator core temperature so that it doesn't freeze over, preventing a costly repair. The evaporator cools the refrigerant that is pumped around the vehicles HVAC system. The ultra-fast response time aides in the HVAC system efficiency by enabling the evaporator core to operate closer to 0° C without the risk of a freeze over condition. Small size & flexible packaging facilitates installation and service. Probe construction protects the internal components from moisture.



Diesel Particulate Filter Sensor The Accusolve Diesel Particulate Filter (DPF) Soot Sensor utilizes radio frequency technology to enable accurate measurement of accumulated soot in the DPF, providing real-time soot loading data and real time closed loop control of the DPF regeneration process. Accurate measurement of the soot load allows for the optimization and reduction of regeneration cycles of the DPF. This in turn allows for improved fuel economy and improved filter life for active and passive regeneration systems.

# products Mobile Devices

Amphenol provides a broad range of components with content on the majority of the world's mobile devices produced each year. Amphenol designs and manufactures a full range of electro-mechanical interconnect products and antennas found in mobile phones, tablets, laptops, wearables and other mobile devices. Our broad product offering includes antennas, RF cables, RF switches, internal and external connectors, LCD connectors, board-to-board connectors, card sockets, battery connectors, input-output connectors, charger connectors, metal and ceramic injection molded components, touch panels, and electromechanical hinges. Our capability for high-volume production of these technically demanding, miniaturized products, combined with our industry-leading ability to react quickly to frequently changing customer requirements together with our speed of new product introduction are the critical factors for our success in this market.

### **Mobile Devices**

Amphenol Mobile Consumer Products Group Hong Kong Amphenol Commercial Interconnect Korea Hangzhou Amphenol Phoenix China Shanghai Amphenol Airwave China, Finland, USA Amphenol Mobile Connector Solutions China, Germany Amphenol Mobile Connector Products Korea Amphenol Taiwan Taiwan Amphenol RF USA, China



Although you may not see them when you pick up your smart phone, touch screen tablet or wearable device, it is a safe bet that an Amphenol product is inside your device. Our wide range of antennas, miniaturized interconnects, cables, flex circuits and mechanical components has enabled the proliferation of wireless devices, helping give people access to information virtually everywhere in the world.





LDS Antennas Laser Direct Structuring (LDS) has lead to vast opportunities in innovative design. The laser activation technology produces thinner lines and smaller features than previously made possible by other molded interconnect device processes without compromising consistency and repeatability. Surface mounting components on LDS antennas is also possible.



Tablet Antennas Amphenol's high performance tablet antennas are integrated into laptops, tablets, ebook readers and other mobile computing devices. Generally mounted along the edges of the device, these antennas enable connectivity of up to 10 frequency bands in one unit. They can be configured as multiple antenna modules with several coaxial feeder cables or as a single feed unit with one cable.



Entertainment Antennas Amphenol's high performance WIFI antenna solutions for entertainment systems such as PlayStation, TV, and wireless sound systems enable excellent connectivity and high speeds. Multi-antennas for the MIMO system allow better reception and data rates.



**Distribution Network Antennas** Amphenol's series of miniature data cards and USB dongle antennas for 3G, 3.5G, and 4G LTE applications provide the performance to power high-speed mobile internet connectivity. With volumes less than 1.5cc and a customizable geometry, these multiband antennas are easily integrated into miniature data cards. The data card antennas are often combined with diversity antennas in the card to further improve the reception and data rates.



Mobile Device Antennas Amphenol offers market leading expertise in the design and production of antennas for wireless devices. Our single and multi-band solutions cover all wireless bands: USGSM, GSM, PCS, DCS, UMTS, GPS, CDMA, DVB-H, Bluetooth, WLAN, WiMAX, and 802.11a, and 802.11b/g.



**FPC Antennas** Amphenol designs and manufactures custom FPC antennas. The FPC antenna can come with adhesive backing, on plastic carrier, or with wire termination. FPC antennas are commonly used in smartphones, smartwatches, tablets, laptops, set top boxes, and other devices requiring 4G, 3G, diversity, NFC, Bluetooth, and GPS frequency bands.



Mid Frame Antennas Amphenol designs and manufactures plastic mid-frames for smart devices utilizing custom insert molding for metal battery compartments, acoustic chambers, and other mechanical components. Two-shot LDS can be utilized for increasing mechanical strength of the frame yet create a unique LDS antenna geometry.



**Over-Molded Whip and Stubby Antennas** Amphenol manufactures various whip and stubby antennas utilizing in-house single/dual shot injection molding and insert molding processes for single and multiband frequencies. Various connector interfaces can be selected for custom applications.



Wireless Power Charging Amphenol is a member of the Qi Wireless Power Consortium. Amphenol offers Qi standard transmitter coil solutions as well as custom receiver coil and FPCB solutions. Wireless charging can now be found in many applications such as smartphones, smartwatches, digital cameras, MP3 players, and wearable patient monitoring devices.



AMC Connectors, Jumpers and Adapters Amphenol Micro Coaxial (AMC) connectors, jumpers and adapters are ultra-low profile (2.5mm mating height) RF connectors with a small footprint (3mm x 3mm). The AMC series offers easy snap-on/off mating,  $50\Omega$  impedance, and DC - 6 GHz frequency range. The series is also 100% compatible with the U.FL interface.



Micro Coax Harness Amphenol is one of the leading providers of MCX cable solutions on the market. The current market demands a more integrated connectivity solution, including integrated hinge/MCX cable assemblies. Our Micro Coax Cable assembly is designed for high-speed transmission, high EMI shielding, and a very small bundle diameter for optimal spacing in tight applications.



Mobile Cable Assemblies Amphenol's cable assemblies are widespread in the market for wearable products. These cable assemblies are used for data transfer and power charging.



Mini-UHF Mini-UHF is a miniature version of the UHF connectors that were developed for use in the radio industry. Mini-UHF connectors are used as coaxial interconnects in cell phones, automotive systems, and similar applications where size, weight, and cost are critical. Mini-UHF connectors terminate to RG-58, RG-58A, RG-58B, RG-58C, and Belden 9258 cables. Crimptype cable plugs and jacks are available, as well as panel and PCB receptacles.



**RF Products** Amphenol's jumper and antenna cables cover a wide range of RF applications for mobile devices. These products are widespread in mobile applications for receiving, transferring, or switching RF signals.



**RF Switches** Amphenol's full range of RF switches come in straight and right angle mountings as well as miniature, low-profile, and lightweight versions for different phone design requirements. Our full mechanical switches provide high reliability for wireless terminal testing and connection to external car antennas of up to 5Ghz.



Sapphire Glass Sapphire glass has excellent mechanical properties including its hardness and anti-abrasive characteristics. Sizes range from a small camera lens aperture to a smart device cover window.



Touch Panel Lenses, IMD Covers & Sheet Lenses Amphenol has developed the capabilities to create applicationspecific mobile phone touch panel lenses, IMD covers and sheet lenses to fit your precise needs. We will work with you to create the attractive design your new mobile phone needs in order to be successful in the marketplace.



Moving Mechanisms Amphenol's moving mechanisms are designed for your customized applications and match your required dimensions. Various types are as follows: Slide, Folding, Automatic, Friction, and more.



Battery Connectors Amphenol's comprehensive offering of battery connectors for mobile phones come in single and multicontact versions with straight and right angle mountings. They are available in a variety of pitches and heights to meet different phone and battery pad requirements. They feature stamp and form beryllium contacts with additional solder tags for high reliability and conductivity.



SIM Card Connectors Amphenol's extensive range of SIM card connectors is available in five types: wing connectors, bridge block connectors, SIM block connectors, ultra flat SIM card connectors, and bioplast SIM card connectors. Furthermore, they come in 2FF, 3FF, and 4FF styles. They are available in 6 or 8 contact versions, with or without locating pegs for board stability, and are suitable for automatic assembly processes. Many are available with detection switches that allow your device to know if a SIM card is present.



SIMLOCK® Amphenol's SIMLOCK® was designed for SIM/SAM card applications. The SIMLOCK features dimensions only slightly larger than the SIM card. The closed system with integrated card guidance assures reliable contacting of the SIM card, meeting critical card tolerances as per GSM 11.11. The polarization notch does not allow incorrect card positioning. Suitable for automatic assembly processes: pick & place, tape & reel packaging, and SMT solderable.



Mini UICC (Micro SIM) Connectors Amphenol's series of mini UICC connectors is designed to accept micro SIM cards for optimized printed wiring board area consumption. The mini UICC connector series features prevention of improper micro SIM card insertion or SIM card slide out. Different card handling possibilities include push-pull types, push lift / cover hinged types, bridge block or drawer versions.



Waterproof Micro USB Amphenol's breakthrough innovation in waterproof micro USB receptacles allows high speed data transmission for your wearable device. With an IPx8 rating, this light waterproof connector is a great fit for all of your mobile computing applications.



Camera Sockets Amphenol provides 20 & 24 contacts camera module sockets for mounting on PCBs allowing mobile camera installation without any additional devices or processes.



Mini HDMI Connectors Amphenol's HDMI and Mini HDMI connectors provide an interface between any compatible digital audio and/or video devices. These connectors are available in different sizes and configurations and support HD-video plus multi-channel digital audio on a single cable.



Micro USB Connectors Amphenol creates high quality Micro USB connectors for today's high definition media. These connectors can be customized to meet your specific needs. Special modifications may include customized configurations and customized mounting options.



Micro-SD Connector Amphenol produces a wide variety of micro-SD and mini-SD memory card connectors. These connectors are available in hinged and non-hinged varieties as well as in a push-push version. They are typically used in a wide range of portable electronic devices including mobile phones, smart phones, PDAs, MP3 players, GPS devices and video game systems.



**Contact Pads (Press-on Contacts)** Amphenol's contact pads are used in contact areas and as spacers on PCBs. Durable plating includes a diffusion barrier. The contact pads connect with low resistance over the product's lifetime for use in sensitive connections of antennas, microphones, and carbon PCBs. They are available in a wide variety of shapes and sizes. Thickness: scalable  $\geq$  0.1 mm. Contact Pads are suitable for automatic assembly processes: pick & place, tape & reel and SMT solderable.



Spring Clips Amphenol's spring clips are very versatile and can be used in many applications including: antennas, metal housing connections, grounding connections, shielding connections, ESD & EMC connections, and LSD connectors. They can incorporate a deflection stop to avoid permanent deformation of the clip. Scalable height for platform use. Spring Clips are suitable for automatic assembly processes: pick & place, tape & reel packaging and SMT solderable.



Audio Jacks and Plugs Amphenol's range of Audio Jacks and Plugs are widely used in mobile phone applications. These connectors are available in different configurations, e.g. compressed type or for SMT soldering versions.



Metal Injection Molding (MIM) Amphenol produces high quality parts with over 90% metal density through our metal injection molding (MIM) process. The MIM process provides greater flexibility in design complexity, prevents corrosion, and provides a resistant polish. It allows us to produce large runs with a very low material waste. The MIM process is used on components of various applications including mobile phones, laptops, and industrial and automotive platforms.



Wire to Board Connectors Amphenol's wire to board connectors are widely used in mobile applications. These connectors guarantee a robust connection and a stable withdrawal force with protection against wrong insertion.



**Board to Board Connectors** Amphenol's board to board connectors are an integral components of mobile devices. They combine low profile with stable contact/mating force and with secured transmission reliability.



Spring Loaded Connectors Amphenol offers a wide product range of spring loaded connectors. These connectors have a large working range and high contact force allowing safe data transmission. They can be used on mobile applications in the automotive industry.



Double Push Connector Amphenol's double push connectors prevent unintended card extraction by a safe locking mechanism. The tray is released without using any tool.



**Embedded Flexprint Connector** Amphenol's flexprint connector is the result of innovative engineering. This flexible, space saving solution has a high reliability and opens up new opportunities for mobile application design.

## PRODUCTS Information Technology and Data Communication

Amphenol is a global provider of interconnect solutions to designers and manufactures of Internet-enabling systems. Amphenol's range of offerings in backplane interconnect systems, cable assembly, connector products, and fiber optic and high performance cable span applications in servers, storage systems, optical and copper networking equipment, modems, hubs, routers, switches, and a wide array of other IT equipment. With our design creativity, simulation and testing capability, and cost effectiveness, Amphenol leads the way in interconnect development for the equipment powering the internet. Whether industry standard or application-specific designs are required, Amphenol provides customers with products that enable performance at the leading edge of next-generation, high-speed technology.



The mobile Internet revolution and explosion of IP-based video are creating challenges once unimaginable for equipment makers and service providers operating the world's data and telecommunications networks. As the number of connected devices grows into the billions, Amphenol's engineers are developing new solutions every day to enable the ongoing data revolution. With industry-leading high-speed/high-bandwidth interconnect products, such as our industry leading XCede connector family, Amphenol is pushing the boundaries to allow new levels of data speed.

#### Information Technology and Data Communication

Amphenol TCS Global

Amphenol Global Interconnect Systems Global Amphenol Cables on Demand USA Amphenol High Speed Cables USA Amphenol High Speed I/O Connectors USA Amphenol InterCon Systems USA Amphenol Interconnect Products Corporation USA Amphenol Printed Circuit Board Technology USA Spectra Strip USA Amphenol Commercial Products USA. China Amphenol Fiber Optic Products USA, China Amphenol RF USA. China Amphenol Backplane Assembly USA, Ireland, China, Mexico Amphenol Canada Corporation Canada Amphenol Tuchel Electronic Industrial Germany, China Amphenol ConneXus Sweden, Estonia, India Amphenol Infocom Europe Netherlands Amphenol AssembleTech China Amphenol Jet Interconnect China Amphenol Sincere Flex Circuits China Amphenol East Asia Limited - Taiwan Taiwan





XCede® Designed for 20+ Gbps performance, Amphenol's XCede® connector platform enables the future data rate requirements of datacom, telecom, storage, and wireless equipment. Offering a linear density of 82 differential pairs per inch, the XCede product family meets the true high-density needs of architectures with multiple front or rear fabric slots and blade systems with cooling straight through the backplane. XCede meets the IEEE 802.3ap v3.2 10GBASE-KR standard with margin.



XCede<sup>®</sup> Stacker The XCede<sup>®</sup> Stacker enables parallel board-to-board designs with the same high levels of performance and reliability as the Xcede backplane system. The XCede Stacker is available in a 4-Pair configuration with stacking heights from 15 mm to 44 mm. Modular construction and guidance options allow optimized connector lengths for each application.



XCede® Right Angle Male The XCede® right angle male connector is a derivative of the XCede® family which enables co-planar board-to-board or board-to-cable high-speed interconnection. With 25+ Gbps performance, the XCede® right angle male mates with standard right angle female daughter card connectors, and is available in 85 and 100 ohm impedance.



XCede® HD Amphenol's XCede HD is compliant with the Hard Metric Form Factor Requirements detailed in EN 61076-4-101:2001, and features a 36% increase in density as well as enhanced electrical performance design features. This allows the product to be more suitable for tighter card pitches and upgrades to existing chassis designs. The XCede HD supports designs up to 28 Gbps.



**Chameleon** is a new industry leading High Speed/High Density Array for Telecom & DataCom, Medical Imaging, Industrial Control, Test and other applications requiring single ended, differential and/or power connections. Chameleon is a highly adaptable connector. It sets a new standard for array products with industry-leading flexibility, performance, and density in board to board applications. With stack heights from 6mm to 15mm in 1mm increments and Pin counts from 40-500+, and Pair counts 16-160.



XCede® Orthogonal The XCede® connector family provides designers with superior electrical performance up to 25+ Gb/s (Xcede Orthogonal) for orthogonal midplane architectures and 12.5 Gb/s (Xcede) for traditional backplane architectures. The Xcede Orthogonal connector system provides the first differential connector truly optimized for orthogonal midplane configurations.



XCede® SEHI Amphenol's SEHI connector is an innovation in RF technology in a press fit alternative., By leveraging knowledge from Amphenol's Xcede platform, SEHI is able to achieve the standard "screw-machine" RF connector SI performance with higher density and lower costs. SEHI has been designed to meet all CCAP requirements developed by Comcast and Time Warner. Available in 50 0hm and 75 0hm impedance options, SEHI is available currently in a 2 pair configuration.



Backplanes & Daughter Cards Amphenol's capabilities are among the world's broadest and most advanced, delivering consistent quality for high-bandwidth systems and missioncritical applications for more than 30 years. Proven engineering and manufacturing expertise eliminates printed circuit (flexible or rigid) design obstacles.



**Crossbow**<sup>14</sup> The Crossbow<sup>14</sup> connector system is the first differential connector truly optimized for orthogonal midplane applications. Crossbow is designed so the differential pairs on each side of the midplane share vias, allowing designers to take full advantage of the benefits associated with orthogonal midplane architectures. With 25+ Gbps performance, Crossbow meets the IEEE 802.3ap v3.2 10GBASE-KR standard with margin, ensuring compliance with future 10 Gbps specifications.



**GbX**<sup>®</sup> Amphenol's GbX<sup>®</sup> connector is a high-density optimized differential connector offering a choice of density configurations. GbX provides increased density, exceptional impedance matching, and low crosstalk. GbX delivers data rates of 5 Gbps and is ideal for 4 x 3.125 XAUI links. The GbX connector provides up to 69 pairs per linear inch (5-Pair configuration) with a choice of configurations (2-, 3-, 4-, and 5-Pair) for higher application flexibility.



**GbX® Right Angle Male** Amphenol's GbX® Right Angle Male (RAM) enables co-planar board-to-board or board-to-cable high-speed interconnections. Currently available in 2-Pair configurations (27 differential pairs per linear inch), with two different heights (standard RAM and extended RAM). Highspeed differential and L-Series versions are also available.



InfinX<sup>™</sup> Amphenol is developing the next generation of high speed mezzanine surface mount connectors. InfinX<sup>™</sup> is optimized for differential signaling and utilizes patented "dampening resonance" technology. The connector is capable of supporting data rates up to 25+ Gbps, and is offered in 4 and 6 pair versions in stack heights from 10 to 38 mm.



HD-Optyx<sup>™</sup> HD-Optyx<sup>™</sup> is a blindmate, fiber optic connector, designed for applications where flexibility and card edge density are paramount. The innovative modular architecture facilitates efficient layout solutions and provides a wide array of possibilities during design-ins or system upgrades. Common components may be readily configured for custom applications, eliminating the need for costly tooling and lost time-to-market. The platform combines reliable performance with ferrule protection in one compact, robust package.



**NeXLev®** Amphenol's NeXLev® high-density parallel board connector is capable of handling data rates up to 12.5 Gbps, providing a robust solution for your increasing bandwidth demands in mezzanine applications. The connector can be routed to support single-ended or differential architectures and offers 20 stacking heights from 10-33mm. NeXLev uniquely applies BGA attachment technology, widely accepted for its high reliability, making it robust both during manufacturing and in the field.



VDHM The VDHM connector platform revolutionized the high speed backplane connector industry. It has a dedicated ground system for higher performance and is scalable up to 25 Gbps. VHDM is available in 6 & 8 row configurations and provides designers cost-performance flexibility by combining low speed and high speed signals on the same connector.



VHDM® Stacker Amphenol's VHDM® Stacker allows the design of parallel board-to-board connections with the high-speed, high-density performance of standard VHDM. The connector utilizes press-fit compliant pins which can be routed singleended or differentially. Zero and 15 column modules are available with stacking heights from 18mm and up. The VHDM Stacker delivers data rates of 3.125 Gbps with 76-101 real signals per linear inch.



VHDM-HSD<sup>™</sup> The VHDM-HSD<sup>™</sup> connector is a shielded, high-density, high-speed press-fit connector system optimized for differential pair architectures. A modular design allows all the features and functionality required in a system to be integrated in a single robust connector. VHDM-HSD delivers data rates up to 5 Gbps, scalable to 10 Gbps with backwards-compatible eHSD<sup>®</sup> connector. Available in 5-, 6-, and 8-Row versions.



VHDM Cable Assemblies Amphenol's VHDM Cable Assemblies are the cable solution complement to Amphenol's broad VHDM backplane product family. The VHDM backplane system is a 3.125 Gbps capable connector & cable system that holds crosstalk to less than 5% and can be configured to meet various customer design requirements.



Aptera<sup>™</sup> The Aptera<sup>™</sup> connector's low-profile design addresses difficult packaging challenges by balancing high-speed interconnect with the need to conserve board space and maximize airflow. Ideal for the space constraints of high-speed memory and card edge applications, Aptera's low-profile construction reduces minimum slot pitch between daughtercards to 10mm (.39").



Aptera Stacker<sup>™</sup> Amphenol's Aptera<sup>™</sup> Stacker provides a mezzanine solution with the same electrical performance as the standard Aptera connector. Aptera<sup>™</sup> Stacker is available in 40 mm board-to-board stack heights, which mate to the standard Aptera backplane modules.



AirMax VS® The AirMax VS® connector utilizes edge-coupling technology to improve electrical impedance control with optimized stagger to minimize signal crosstalk. This innovative combination delivers a cost-effective interconnect for multi-gigabits/s applications. To leapfrog traditional complex Stripline designs, the AirMax VS solution utilizes "Virtual Shields," which eliminate costly metal interleaves between columns. \*\*AirMax VS is a registered trademark of FCI.



cLGA® Socket Connector Amphenol's cLGA® land grid array socket system brings conventional connector-material construction to a high-performance, low-cost socket design. The cLGA® socket is fully qualified under the EIA-540B0AE and Telcordia GR-1217-CORE specifications. The cLGA product is available in standard .050" and 1 millimeter centerline configurations. A wide array of socket sizes and styles is available.



Backplane Assembly Amphenol has experience in developing leading edge, end-to-end backplane and system solutions is unique in the industry. Through over 20 years of designing, manufacturing and testing of high speed backplanes Amphenol has emerged with a leadership position in the industry delivering optimized cost against critical time to market requirements. Combining engineering expertise with investment in the latest technologies has enabled the delivery of tested nano compliant technology in todays leading edge laminates allowing performance in excess of 25G to meet both todays and tomorrows data transmission requirements.



System Integration Amphenol has over 20 years' experience building complex systems and sub-systems. We combine unparalleled engineering with industry-leading connectors, high-technology printed circuit board and backplane assembly expertise, and systems integration services to deliver total solutions. Technology-focused vertical integration means technology leadership where it matters and focused program management to speed your system to market with the highest possible quality at the lowest possible cost.



CFP2 Amphenols' CFP2 SMT connector is rated for 28 Gbps per channel with resonance dampening for improved signal integrity. The plug connector on the mating interface improves accuracy and aids in achieving high speed performance. The CFP2 interconnect system includes insert molding assemblies for top side contacts and pres-fit cage assemblies complying with IEEE and ITU-T applications.



SFP Connectors and Cages Amphenol's extensive offering of SFP 1xN cages, SMT connectors, and 2xN press-fit stacked combos cover virtually every standard configuration as well as many custom designs, and are compliant with governing MSAs and standards. 1xN and stacked cages are available with light pipes, heat sinks, and a variety of cage footprints in both press-fit and solder tails designs.



ExpressPort/Ultraport SFP + connectors & cages Amphenol's ExpressPort/Ultraport SFP+ series provides the next level of performance from the SFP family, supporting data rates from 10-32 Gbps per channel, in both 1xN and 2xN stacked configurations. SFP+ cages are available with a variety of options including heat sinks, light pipes and EMI grounding/sealing features (spring fingers or elastomeric gaskets).



QSFP/ExpressPort QSFP+ Connectors and Cages QSFP+ cages feature through panel or behind the panel EMI sealing features, as well as light pipes and a variety of heat sink options to satisfy any thermal management requirement. The conectors are available as standard surface mount or stacked QSFP+ versions, which offer data rates from 10-32 Gbps per channel, reduced cross talk and resonance cancellation.



XFP Connectors and Cages Our robust XFP connectors and cages are available in a single port configuration with a variety of standard heat sink options, EMI cage grounding features, and data rate capabilities to 10 Gbps. These press-fit cages and surface mount connectors can be mounted "belly to belly" on a PCB to provide a stacked configuration on the panel.



Mini-SAS I/O Connectors and Cages Amphenol's Mini-SAS I/O connectors and cages provide 4 data channels per port functioning at a data rate of up to 6 Gbps per channel, and are widely used in storage system applications (1.1,2.0, and 2.1 standards). Available in 1, 2, or 4 port configurations, our Mini-SAS cages feature a variety of EMI grounding and sealing features.



Mini-SAS HD I/O Integrated Combo Our Mini-SAS High-Density connector system contains a cage and two row stacked connector in a single press-fit package, providing 4 data channels per port, at 12 Gbps per channel. The combo features integrated heat sinks, and can be used with copper passive, active, or optical cabling systems. Applications include HBA servers, storage devices, switches, and rackmounted computers.



**CX4 and InfiniBand (4x & 12x)** Amphenol's Infiniband (4x & 12x) high-speed assemblies are an ultra-high-performance, cost-effective solution for gigabit-speed applications in data and switched fabric I/O, switches, routers, data storage arrays, and computer clusters. Available in 4 or 12 channels, Amphenol's high-speed assemblies meet and exceed Infiniband standards and requirements and have been tested to work at Double Data Rate (DDR).



SFP+ Cable Assemblies Amphenol's SFP+ cable assemblies are high-performance, cost-effective I/O solutions for 10Gb Ethernet and 10G Fibre Channel applications. SFP+ copper modules allow hardware manufacturers to achieve high port density, configurability, and utilization at a very low cost and reduced power budget. Amphenol's high-speed cable assemblies meet and exceed Gigabit Ethernet and Fibre Channel industry standard requirements for performance and reliability.



SFP with Limiting Amps An Amphenol-developed solution, SFP with Limiting Amps allows systems to transparently accept copper in place of optical modules. This solution offers a significant cost reduction and is available in lengths up to 15m. The design also uses approximately half the power, reducing ongoing energy costs. This copper solution maintains Tx Disable and LOS.



QSFP+ Cable Assemblies Amphenol's QSFP+ copper cable assemblies are a high-performance, cost-effective interconnect solution supporting Ethernet, Fiber Channel, Infiniband, and SAS applications. QSFP copper cables provide a high-density, high-bandwidth solution at very low cost and reduced power budget at 4x5Gb to 4x28Gb. Amphenol's high-speed cable assemblies meet and exceed industry standards for performance and reliability.



QSFP + Active (Linear & Limiting Amplifier) QSFP+ with linear or limiting amps allows systems to transparently accept copper in place of optical modules. This solution offers a cost reduction versus optical transceivers or active optical cables and is available in lengths up to 15m. It is designed with a squelch feature for chatter free operation.



QSFP+ Direct Attached Active Optical Cables Amphenol QSFP+ DAC's are a high-performance, low-power consumption, long-reach interconnect solution supporting InfiniBand, 40 Gigabit Ethernet, and Fiber Channel. QSFP+ QDR/FDR/EDR AOC's provide a high-density, high-bandwidth solution while exceeding industry standards for performance and reliability using Silicon CMPS Photonics Technology.



XCede<sup>®</sup> Cable Assemblies Amphenol has developed XCede<sup>®</sup> high-speed cable assemblies. Amphenol now offers the flexibility of a stackable wafer system, allowing for infinite custom connection options, including power, guidance, and multiple differential pair offerings in both VHDM<sup>®</sup> and XCede<sup>®</sup> product families. XCede<sup>®</sup> cables support a 10Gb serial data rate in multi-aggressor configurations.



RADSOK<sup>®</sup> Power to Board Series The RADSOK<sup>®</sup> Advantage brings more power to the board with three highamperage products: PowerBlok<sup>™</sup>, RADSERT<sup>™</sup>, and PGY<sup>™</sup>. RADSOK<sup>®</sup> solutions offer many options for high-current single-point connections to printed circuit boards. The compact footprint can supply up to 120 amps to the board; preserving surface area and providing more flexibility in board design. RADSOK<sup>®</sup> Power to Board products are designed to eliminate the need for additional wires and/or special crimp tools.



RADSOK<sup>®</sup> RadFin<sup>™</sup> Designed to address the need for amperes greater than 100A while maintaining a small footprint for PCB applications. Another unique feature of the RadFin<sup>™</sup> is its ability to act as a great heat dissipating connector. This dramatically helps reduce T-rise with minimal air-flow required.



RADSOK<sup>®</sup> RadStack<sup>™</sup> Designed to address the need for high current and small foot prints for PCB mezzanine applications, Amphenol's RADSOK RadStack meets the power and space challenges present in the industry today. With its flexible design and multiple configurations, RADSOK RadStack is the choice for high amperage board level mezzanine power applications.



RADSOK<sup>®</sup> PowerBlok<sup>™</sup> WTB Offered in vertical or horizontal mating planes as single-point contact terminals, the WTB product line gives the versatility needed when component placement decisions are crucial. Supplied in easily automated tape-and-reel packaging and designed as pin through hole placement commonly used in the industry. Integration is straightforward whether from design onset or as a component replacement. With the addition of a removable lock housing, mating to the board can remain intact under harsh vibration environments.



RADSOK<sup>®</sup> Super Twist The RADSOK<sup>®</sup> Super Twist contact was developed to enable greater radial misalignment tolerance, or "float," in drawer and blindmate applications. Greater radial gatherablility is achieved in the Super Twist (ST) contact by adding additional "twist" to a larger RADSOK<sup>®</sup> contact. Using a larger 0.D RADSOK<sup>®</sup> creates additional I.D clearance for the mating male pin while maintaining electrical and mechanical performance.



Amphe-GTR Amphenol's Amphe-GTR has become a mainstay of the high end server market for delivering power in critical applications. Featuring RADSOK technology in a circular composite reverse bayonet package, Amphe-GTR can be configured for whatever power or high voltage challenge a customer may face.



Amphe-PD The Amphe-Pd<sup>™</sup> series features RADSOK<sup>®</sup> technology and is ideally suited for data communications applications. Amphe-PD requires no tools to assemble, and can support high amperage in a compact size.



Surlok The SurLok<sup>™</sup> non-environmental compression lug is a field installable, highly reliable, economic alternative to high conductivity, cast copper one or two hole compression lugs. The head of the SurLok<sup>™</sup> pin snaps into a retaining device incorporated into the socket, providing a secure connection that ensures voltage and amperage levels are maintained throughout the duration of the application. Ideally suited for Data center applications where field installation of a lug is required.



DC Jack Whereas most DC jacks are used for power input, Amphenol's unique looking barrel connector was designed for use as a DC output jack. Available in both through-hole or SMT mounting options, Amphenol's family of DC jacks enjoy significant technical advantages over competing products for EMI and RFI resolving.



Battery Harness These cables form an alarm harness in an Uninterruptible Power Supply system. The specially designed D-sub assemblies are tested water-tight at a depth of 3 meters (10 feet). This ensures reliable signal interconnect performance under the severe conditions typically encountered in outside cabinets. Individual assemblies permit substantial variation in length, configuration, and form factor for completed harnesses.



Signal/Power Cable These ruggedized power and signal cable sets have been bolstered with additional metal and nylon braid to significantly increase mechanical strength and add life under extreme usage conditions. Also featured are waterresistant molded inline switches that can be manufactured with any switch form available. The military strain-relieved connectors coupled with environmentally-sealed action buttons and robust cables makes for a very rugged product.



Surge Supressor Cable This 100-pair assembly serves to protect telecom cabinets from electrical surges caused by lightning strikes. The panel is loaded with individual surge protectors for each and every line. The variable length cables can be terminated with every common interconnect known to the telecom industry. Amphenol has developed an advanced development program for this assembly that can improve the form factor and provide cost reduction.



Backplane Power Amphenol's backplane power series is designed to package high-power availability in a small form factor with customized options. This new range has many unique features to meet or exceed existing competitive products in power density.



Bus Bar Amphenol has expansive capabilities in producing customized bus bar solutions. Amphenol bus bars improve system reliability and power system life by replacing unreliable cabling and wiring harnesses. In addition, Amphenol's custom bus bars allow for denser packaging and are individually engineered to fit a customer's application while minimizing space-taking wiring harnesses and cables — allowing increased airflow.



XLRnet XLRnet connectors are suitable for RJ45 1000 Base-T industrial Ethernet applications. They are available in panel mount feed through, IDC punch down block and PCB versions. The cable plug housings are designed to be used with pre-assembled RJ45 cables for quick and simple field installation.



SlimDrawer Connectors Part of the CoolPower® product family, SlimDrawer connectors are blindmateable, and combine robust, high-performance reliability with cost effective features critical in today's applications. Connectors can be easily configured to accommodate a variety of mixed power and signal arrangements. Power contact options include high-current CoolBand or RADSOK® technology for maximum performance.



RADLOK Utilizing the latest RADSOK® technology, Amphenol's RADLOK connector and cable assemblies were designed to be compact and robust. With positive retention features, RADLOK allows data center engineers to design in robust locking features without the need for other costly hardware. The locking mechanism also allows for easy field installation saving on maintenance and installation costs.



**RF Coaxial Cable Assemblies** Amphenol offers a full line of pre-assembled, fixed-length coaxial cable assemblies. Fixed length assemblies are for use in a variety of commercial and industrial applications that require standard configurations or lengths. Cables are available with popular connector series such as BNC, AMC, TNC, SMA and Type N.



cStack<sup>™</sup> Amphenol's cStack<sup>™</sup> flex circuit assemblies combine low-cost termination with high-speed, impedance-controlled interconnection performance. The patented cStack<sup>™</sup> stacking connector used to terminate these assemblies provides high signal integrity interconnection technology, because of the connector's low (.048 inch) profile between flex and board. Flex circuitry for all cStack<sup>™</sup> flex assemblies can be electrically and mechanically customized to exactly fit system specifications.



Harsh Environment D-Sub: MDB Series Amphenol's rugged D-Subs provide a cost-effective option for harsh environments. These environmentally sealed D-subs utilize high-performance thermoplastic inserts and metal die cast shells and are supplied with screw machine contacts. These connectors are available in both standard and high-density versions and a variety of termination styles.



Harsh Environment RJ45: MRJ Series Amphenol's complete range of rugged RJ45 connectors provides an ideal solution for network data transfer in harsh and demanding environments. This family of connectors meets military shock and vibration requirements and are rated for IP67.



Harsh Environment USB: MUSB Series Amphenol's complete range of rugged USB connectors are offered in single and stacked versions with rugged features that provide the ideal solution to data transfer in harsh or demanding environments. This family of connectors meets military shock and vibration requirements and are rated for IP67.



Filtered Connectors Amphenol's FCC57 series of filtered micro-ribbon connectors provides a very cost-effective solution to combat EMI. The family of connectors is the telephone industry's standard for multiple line connections. Available in 36, 50, and 64 sizes with a variety of termination styles, including: male/female, right angle PCB, vertical, press-fit, and solder cuo.



**FPC** Amphenol Flexprint connectors (C007 series) accommodate 0.3 mm thick flexprint cable with different contact configurations and pitch sizes. The double-sided, pre-stressed contact shape guarantees secure contact between the flexprint circuit and the connector, and allows insertion of the flexprint cable in either an upward or downward direction.



Infinity Connectors The Infinity series of receptacles is compliant with SFF-8470 specifications, and is available in both 4x and 12x configurations. Lanyard latching mating styles are available for use with CX4 and InfiniBand applications, as well as Screwlock mating styles for use with SAS, Fibre Channel and 10Gb Ethernet applications.



Standard Modular Jacks Amphenol offers an extensive variety of modular jacks suitable for many applications with varying performance requirements. Optional features include color keying, shielding, and LEDS. RJ11/45 types are available in single, multiport, and stacked configurations. Select series have filtering capabilities for superior EMC performance using a high resistivity ferrite block.



RJ11/45 Amphenol offers high-speed (over 1 Gbps) RJ45 with integrated magnetics. These connectors provide a full spectrum of data speed for RJ45: from 10Mbps to beyond 1 Gbps. Our RJ45 connectors can integrate LEDs into the connector package for easy port identification.



SCA2 (Single Connector Attachment) Amphenol's SCA2 is a type of connector used for internal SCSI cabling systems. "Hot-swapping" allows seamless replacement of failed RAID drives, which greatly simplifies system maintenance procedures. SCA2 features a single plug configuration carrying signal, power, and jumpers together.



**USB with Positive Locking: LUSB Series** Amphenol's USB, Series A with a unique latching mechanism has been developed to address major concerns of unintentional interruption of data transmission. This patented, unique latching mechanism must be intentionally raised in order to remove the plug. An accidental pull on the cable up to 22 lbs force will not separate the connectors.



MDR Amphenol's MDR is a high-density shielded I/O connector with a broad range of board-mount, wire-mount, and cabling components. Ribbon contact is on a grid, which provides a small footprint connector, creating a reliable system for repetitive plugging and unplugging in I/O applications.



Memory Card Sockets Amphenol offers a full range of flash memory connectors (including SD, Mini-SD, Micro-SD, xD, CF1 & 2) with numerous features such as low-profile design, normal or reverse mounting, manual or push-push insert style, and a locking feature to prevent the card from dropping out. Available in SMT, straddle mount, or through-hole termination.



Smart Card Connector Smart Card Connectors are integral components of a smart card reader or terminal, and provide electrical contact to the smart card's pads. The connector is not a standalone peripheral device. An additional interface circuit is necessary to be able to read and write to the smart card whether a smart card is a memory only or a microprocessor card.



**BTB** Board-to-board connectors are available in plug-socket pairs with pin counts ranging from 8 to 50. Spring-type board-to-board connectors are robust and suitable for use in data center applications where there is the potential for external vibration.



C-Byte<sup>™</sup> Compression Connector Amphenol has developed the patented C-Byte<sup>™</sup> flex compression connector system, to substantially increase interconnection speed, reduce cost and eliminate the soldering of mating connectors to circuit boards. The C-Byte<sup>™</sup> flex compression system combines high-signal integrity, solderless connector termination, and low cost in versatile board mating configurations.



M.2 Connector Amphenol's M.2 connector is a cost effective and space efficient design that can support storage SSD and wireless applications. It can replace PCIe, Micro SATA, SAS, USB, display ports, and other critical connections at data speeds up to 8 Gbps.



SATA Connectors & Cables Amphenol offers a complete range of standard and customized Serial ATA (SATA) connectors and cable assemblies. In addition to traditional designs, Amphenol supplies Micros and slim SATA connectors enabling transfer speeds up to 6.0 Gbps depending on how the assembly is configured.



SAS Cables & Connectors Amphenol high speed assemblies are an ultra-high performance, cost effective I/O solution for high speed applications such as data storage, switches, routers and computer clusters. Amphenol's MiniSAS HD assemblies meet and exceed the standard requirements and have been tested to perform at emerging 12G per channel speeds. Our MiniSAS HD 4X & 8X assemblies offer a solution to MiniSAS, Sata, SAS and other high speed I/O interfaces.



**DDR4** Amphenol's DDR4 DIMM connector was developed to replace the DDR3 standard in the high-end server memory market. The DDR4 connector complies with the interface standard JEDEC POD12 allowing for data transfer rates of 1.6 Gbps– 3.2 Gbps.



Dsub Connectors Amphenol offer a full range of Dsub connectors from stamped and formed pins to screw machine pins with more than 6000+ standard items available. Amphenol's Dsub TW Hybrid series permits a mix of contacts including signal, high voltage power, and coaxial in the same housing with up to 18 different contact arrangements.



**RJ 45 (ODVA)** Amphenol's new ODVA-Compliant RJ45 series connectors meet the Ethernet/IP RJ45 requirements and standards. With an IP67 rating these connectors are suitable for Industrial Automation, BWA , and Smart Grid markets.



LC Cable Assemblies Amphenol's fiber optic LC small form factor connector cable assemblies provide high-density connections for a variety of telecommunications applications. Amphenol utilizes TIA 604-10, IEC 614754-20 compliant connectors for assemblies. Connectors are available in 900um, 2mm, or 3mm, short or standard length options, and simplex and duplex configurations.



Fiber Optic Cable Assemblies Amphenol is a premier manufacturer of optical interconnect products. Amphenol cable assemblies are offered in a variety of standard configurations utilizing LC, SC, FC, and ST in both single mode and multimode versions. Multiple cable constructions and custom cable options are available. Amphenol assemblies are designed to meet the most stringent industry standards.



Fiber Management and High Density Fiber Trunking Amphenol has a wide selection of rack mounted patch panels and trunking cassettes which provide easy installation, re-configuration and expansion. Trunking cassettes transition discrete fibers from equipment to small diameter, high density multi-fiber backbone assemblies, providing less congestion and easier access within racks, rooms, and buildings.


**Optical Loopbacks** Amphenol's LC and MPO Optical loopbacks provide a compact and reliable method to facilitate system test and burn in. The compact design allows loopbacks to be used in the most dense applications, connecting the transmit port of an adapter or transceiver to the receive port.



**Optical QSFP Ribbon** Amphenol supports a complete family of optical ribbon cables supporting QSFP and CXP applications. Cables are available in plenum, riser, or halogen free constructions with single or multimode fiber.



Category Patch Cords Amphenol's Category Patch Cords support high bandwidth applications. The snagless boots provide a strain relief and the patch cords are available in multiple colors.



EXD Skewclear® Cable Amphenol's EXD (Extended Distance) cable has been developed to improve basic attenuation in high-data-rate twinaxial copper cables and totally eliminate high-frequency resonances (suckouts) that can severely affect harmonic signal content in these systems. Our EXD cable offers a 10%-20% attenuation improvement, and resonance elimination up to 20GHz.



EXF Skewclear<sup>®</sup> Cable Amphenol's new family of EXF (Extended Frequency) Skewclear<sup>®</sup> cable is designed for high-frequency applications such as InfiniBand, PCI Express, 10 / 40 Gb Ethernet, and SAS. Constructed with flexible low diameter foam PE, EXF Skewclear<sup>®</sup> exhibits improved bandwidth over traditional Skewclear<sup>®</sup> cables.



Internal Flat Multilane SAS Flat Multilane SAS / PCIe is a new product offering designed to offer a planar packaging option inside crowded storage drive bays. Constructed with either 30 or 32 AWG 100 ohm Skewclear® pairs and "side drain" technology, these options are thin, flexible, and are available in custom high-flex life options.



DisplayPort Cables and Dongles Amphenol provides a full range of DisplayPort and Mini DisplayPort configurations to support the growing adoption of digital display technology within the PC and CE industries. DisplayPort is an industry standard which consolidates internal and external connection methods to reduce device complexity while supporting next generation displays that feature higher color depths, refresh rates, and display resolutions. Product configurations include: DP/Mini DP to DP, DP/Mini DP to VGA, DP/Mini DP to HDMI & DP/Mini DP to DVI.



USB Amphenol has developed the Super Speed USB in compliance with the next generation USB Standard, USB 3.0 (Super Speed USB), and is downward compatible to USB 2.0 and USB 1.1 products. Our USB 3.0 product will deliver 10x the data transfer rate of USB 2.0 and has a max transmission speed of 4.8Gbps. Our USB 3.0 product also has improved power efficiency at 900mA as compared to 500mA on USB 2.0. Standard Configurations include: Type A to A, Type A to B & Type A to Micro B.



DVI to LVDS Cable Assembly Amphenol's DVI to LVDS cable assembly is just one example of the customized cable assemblies we can produce for our customers. We have the capabilities to create the custom cable assemblies required by your business. We specialize in creating complex yet cost effective solutions and can easily handle high-mix high-volume product assortments.

## products Mobile Networks

Amphenol is a leading global interconnect solutions provider to the wireless infrastructure market, including applications such as cellular base stations, radio links, mobile switches, wireless routers, cellsite antenna systems, combiners, transceivers, filters, and amplifiers. Amphenol offers a wide product portfolio for every wireless standard and generation of radio technology including 3G, 3.5G, 4G, WiMAX, LTE, as well as future IP-based solutions. The product range includes RF, low-frequency, power, fiber optic, and hybrid connectors and cable assemblies, antennas, backplane interconnect systems, power distribution systems, and installation accessories.



As the only company capable of supporting the entire spectrum of antenna and interconnect requirements in the mobile infrastructure system, Amphenol has helped bring mobile technologies to every corner of the globe. Our broad-based capabilities and relationships with both equipment makers and mobile operators position us strongly to support the widest array of mobile applications. Whether it's an independent network for rail communication or enabling the development of next generation mobile networks around the world, Amphenol has the products and expertise to tailor a solution for your toughest wireless network challenges.

### **Mobile Networks**

Amphenol TCS Global Amphenol Global Interconnect Systems Global Amphenol Antenna Solutions, Inc. USA Amphenol Fiber Optic Products USA, China, Mexico Amphenol High Speed Cables LISA Amphenol High Speed I/O USA Amphenol Industrial Operations USA Amphenol InterCon Systems USA Amphenol Interconnect Products Corporation USA Spectra Strip USA SV Microwave. Inc. USA Amphenol Commercial Products USA. China Amphenol Times Fiber Communications USA. China Amphenol Times Microwave Systems USA. China Amphenol RF USA, China, India Amphenol Backplane Assembly USA, Ireland, China Jaybeam Wireless France, India, Macedonia, UK Amphenol Tuchel Electronic Industrial Germany, China Amphenol Infocom Europe Netherlands Amphenol ConneXus Sweden, Estonia, India Changzhou Amphenol Fuyang Communication Equip Co., Ltd. China Guangzhou Amphenol Electronics Communications China

Amphenol LTW Taiwan, China Amphenol Tel-Ad Israel



Base station Antennas Amphenol designs and manufactures high performance base station antennas from 25 MHz to 5.8 GHz in single-band, dual-band, tri-band, quad-band, pentaband and twin-band configurations. The company offers one of the most comprehensive selections including panels, log periodics, omni-directionals, yagis, planars and more in both fixed and variable electrical tilts, with and without remote azimuth swivel. Also available are cylindrical antennas for low visual impact for both base station and small cell applications.



Small Cell oDAS Amphenol's outdoor distributed antenna systems (oDAS) have been deployed by network operators worldwide to provide improved coverage in outdoor stadiums, public spaces, campuses, tunnels and urban canyons. Aesthetically pleasing, low profile designs are available in both directional and omnidirectional configurations giving network engineers the tools needed to optimize coverage in these difficult environments. Innovative wide band, dual band and tri band configurations are available allowing one distributed antenna system to serve multiple service providers with minimum visual impact.



Amphe-TVS The Amphe-TVS connector is designed for communications equipment manufacturers with power interconnect requirements. Applications for this product would be in harsh environments such as towers, outdoor and rooftop applications. The Amphe-TVS connector offers the highest performance capabilities for severe environment applications. There are 2 insert patterns to choose from: The 2 pole for DC power and the 3 pole for AC power.



Amphe-BTS Amphe-BTS is a circular connector based on the MIL-C-26482 series 2 with clip retention contacts. Features brass shell construction for greater corrosion resistance, provides EMI shielding, is shock & vibration resistant, and uses screw termination contacts making it well suited for field installation.



Small Cell iDAS Amphenol's indoor distributed antenna systems (iDas) have been deployed by network operators worldwide to provide improved coverage in covered stadiums, commercial, multi-use, and residential buildings, multi-use, tunnels. Aesthetically pleasing, low profile designs are available in both directional and omnidirectional configurations giving network engineers the tools needed to optimize coverage no matter the building design & configuration. Innovative wide band, dual band and tri band configurations are available allowing one distributed antenna system to serve multiple service providers with minimum visual impact.



Bus Bar - Power Distribution Amphenol has expansive capabilities in producing customized bus bar solutions. Amphenol bus bars improve system reliability and power system life by replacing unreliable cabling and wiring harnesses. In addition, Amphenol's custom bus bars allow for denser packaging and are individually engineered to fit a customer's application while minimizing space-taking wiring harnesses and cables allowing increased airflow.



**7/16** The 7/16 series is named for the metric dimensions of the connector interface: 7mm OD of inner contact, 16 mm ID of outer contact. 7/16 connectors are designed for use in communications systems with power levels of 100 watts per channel. These connectors are typically used in antennas, satellite communications, and base stations.



RADSOK<sup>®</sup> Power to Board Series The RADSOK<sup>®</sup> Advantage brings more power to the board with three highamperage products: PowerBlok<sup>™</sup>, RADSERT<sup>™</sup>, and PGY<sup>™</sup>. RADSOK<sup>®</sup> solutions offer many options for high-current singlepoint connections to printed circuit boards. The compact footprint can supply up to 120 amps to the board; preserving surface area and providing more flexibility in board design. RADSOK<sup>®</sup> Power to Board products are designed to eliminate the need for additional wires and/or special crimp tools.



Amphe-Lite<sup>™</sup> The Amphe-Lite<sup>™</sup> connector series is designed for signal, power, RF, or fiber optic interconnect requirements in harsh environments. The Amphe-Lite<sup>™</sup> series offers the highest performance capabilities for severe environment applications, yet is cost-effective enough for general-duty and non-environmental applications.



**Card Edge Power Connector** Amphenol provides tailor made Card Edge Power Connectors for various power supply and control applications. It can provide an overall lower cost power solution in smaller spaces when compared to alternative connectors. Amphenol's modularized tool design makes it more economical and versatile for the next generation of power interconnect solutions.



Amphenol Power Solution With the increasing demands of high-current power distribution and control solutions in smaller spaces with best in class performance in mind, Amphenol developed various power products to meet the need. Different types include our AirMax BP, RPS, Board to Board, Fuse Power, and CDMA Power connectors. Amphenol can provide both standard and tailor made power interconnector solution for your most demanding applications.



Lightning Arrestors Amphenol offers a variety of surge and lightning protection products to meet your needs. These unique surge protection devices address applications throughout the entire useful RF frequency range from DC with capability up to 6 GHz. Products available serve the needs of the cellular carrier market as well as land mobile radio, wireless broadband, SCADA and many other markets.



LMR® EZ Style Connectors Amphenol is the leader in providing high quality EZ style connectors. These nonsolder type connectors use silver or gold plated berylliumcopper spring contacts for optimal cable contact and offer considerable time savings, increased performance and more reliability than traditional solder-pin connectors. Many of our EZ connectors are also now available in an "X" version (no braid trim required).



**1.0/2.3** The compact design of the 1.0/2.3 series permits dense connector packing. They are ideally suited to applications where space saving is critical. Versions are available with threaded coupling mechanisms, which provide positive mating, or a unique push-pull coupling system, which allows quick installation. Amphenol 1.0/2.3 coaxial connectors are 50  $\Omega$  units operating from DC-10 GHz. Common applications are amplifiers, base stations, routers, and switching equipment.



AMC Connectors, Jumpers and Adapters Amphenol Micro Coaxial (AMC) connectors, jumpers and adapters are ultra-low profile (2.5mm mating height) RF connectors with a small footprint (3mm x 3mm). The AMC series offers easy snap-on/off mating,  $50\Omega$  impedance, and DC - 6 GHz frequency range. The series is also 100% compatible with the U.FL interface.



**BNC** Developed in the late 1940s as a miniature version of the Type C connector, BNC stands for Bayonet Neill Concelman and is named after Amphenol engineer Carl Concelman. The BNC product line is a miniature quick-connect RF connector. It features two bayonet lugs on the female connector. BNCs are ideally suited for termination on miniature and subminiature coaxial cable, including RG-58, 59, RG-179, and RG-316.



MCX The MCX series is a great option where weight and physical space are limited. The MCX provides broadband capability though 6 GHz in a snap-on connector design. A range of connectors are available, including printed circuit board and cable connectors. Typical applications include automotive, wireless LAN, broadband, and wireless infrastructure markets. MCX connectors conform to the European CECC 22000 spec.



**MMCX** MMCX (also called MicroMate<sup> $\sim$ </sup>) is a micro-miniature connector series with a snap-lock mechanism allowing for 360-degree rotation. MMCX connectors conform to the European CECC 22000 specification. The MicroMate family of products is a 6 GHz 50  $\Omega$  interconnect. A range of connectors are available, including surface mount, edge card, and cable connectors. Common applications include broadband, instrumentation, and telecommunications.



QMA The QMA is a quick-disconnect version of the SMA connector. The electrical performance of the QMA includes low-loss RF performance up to 18 GHz. The QMA connector offers the same high-power handling capability as the SMA connector it is based on. This gives the series significant advantages over other quick-disconnect connectors. Amphenol is a member of the Quick Lock Formula® Alliance.



QN Amphenol's QN connector is a quick-disconnect version of the N connector with similar internal construction, which enables fast and easy mating in tight spaces. The snap-on interface makes the QN connector 10 times faster than a threaded connector. The QN line is perfect for indoor and outdoor applications, including base stations and cable assemblies.



SMA SMA is an acronym for sub-miniature version A and was developed in the 1960s. It uses a threaded interface. 50  $\Omega$  SMA connectors are semi-precision, subminiature units that provide excellent electrical performance from DC to 18 GHz. These high-performance connectors are compact in size and mechanically have outstanding durability. SMA connectors are used in phase array radar, test equipment, ILS landing systems, and other instrumentation.



Type N The Type N connector was developed to satisfy the need for a durable, weatherproof, medium-size RF connector with consistent performance through 18 GHz. There are two families of Type N connectors: Standard N (coaxial cable) and Corrugated N (helical and annular cable). Their primary applications are the termination of medium to miniature size coaxial cable, including RG-8, RG-58, RG-141, and RG-225.



AISG Connector (C091 Outdoor Connectors) Amphenol produces circular connectors conforming to AISG (Antenna Interface Standards Group) requirements. Tightness, temperature resistance, salt mist resistance, and UV-resistance are only a few of the important criteria an AISG connector must fulfill. Our successful realization of the AISG market requirements has made us the worldwide market leader for multipolar circular connectors and assembled wires.



**UHF** Invented for use in the radio industry in the 1930's, UHF stands for Ultra High Frequency. While at the time 300 MHz was considered high frequency, these are now general purpose connectors for low frequency systems from 0.6 - 300 MHz. UHF connectors feature optional reducing adapters which accommodate a wide range of popular coaxial cables.



Valox Amphenol RF BNC Valox Connectors are isolated from the panel via a Valox housing to provide high performance in RF and microwave communications. BNC Valox Connectors feature a proven, easy-to-use interlocking interface that integrates seamlessly into any 50-ohm or 75-ohm RF system. These connectors are well-suited for instrumentation, broadcasting, and network applications.



**SMC** The SMC connecter features a medium-sized 50  $\Omega$  threaded interface designed to meet of MIL-STD-348 standards as generated by the US Air Force. It utilizes die cast components on non-critical areas to provide a low cost solution. The series offers a 10-32 screw-on (threaded) coupling mechanism, allowing performance to 10GHz with low reflection.



**Mini-BNC** The Mini-BNC is designed for wireless applications for higher connector densities while preserving the positive characteristics of the Amphenol full-size BNC's for 75  $\Omega$  systems., allowing 40% more interconnects in the same area. The Mini-BNC connector interface offers a 75  $\Omega$  impedance with acceptable return loss up through 1 GHz and a positive bayonet locking coupling mechanism.



**1.6/5.6** Amphenol 1.6/5.6 coaxial connectors are miniature 75  $\Omega$  units operating from 0-1 GHz. The compact design of the 1.6/5.6 series permits dense connector packing, making these connectors ideally suited to applications where space limitation is a factor. Common applications include base stations, routers, and switching equipment.



**4.1/9.5 Connectors and Adapters** Amphenol offers a full range of 4.1/9.5 connectors and adapters. These products are ideal for applications requiring consistent electrical performance, low return loss, and low intermodulation distortion. This series has been engineered to exceed wireless industry performance standards and to match the physical performance expectations of the 7/16 series.



Advantage Plus No Braid Trim Connectors The Advantage Plus series of connectors exhibit all of the outstanding characteristics of the Advantage series with the added feature of a termination process that does not require trimming of the braid. This new Advantage Plus series of connectors for LMR cable is now available from Times Microwave Systems. Advantage Plus<sup>™</sup> connectors are currently available for LMR® cables ranging from LMR-300 up to and including LMR-600. Advantage Plus<sup>™</sup> connectors are crimp style and include non-solder EZ and solder versions.



SPP-LLPL SPP-250-LLPL jumper cables are used for in-building DAS cellular coverage systems. Low loss and plenum rated, they provide an exceptional combination of low loss, light weight and flexibility. Superior in electrical performance to other copper cable assemblies, SPP-250-LLPL cables are the perfect in-building solution for PIM-sensitive installations. The high quality connectors assure excellent and reliable PIM performance better than -160 dBc allowing multiple carriers to provide coverage using a single distributed antenna system.



AISG Jumper (C091 Outdoor Cable Assemblies) Amphenol provides C091D cable assemblies conforming to the AISG 2.0 specification for wireless infrastructure applications including tower mounted devices such as remote radio heads. Based upon the proven long term reliability of its AISG products, Amphenol now has a major share in the AISG market. The Ecolmate plastic connector program is in use as a power supply system for indoor and outdoor devices such as WCDMA and WiMAX RRH's.



Jumper Cables Amphenol's jumper cables are designed for mobile networks. They typically come in shorter length jumpers and longer versions. The shorter runs are typically used at the tower-top, connecting the antenna to a towermounted device such as an amplifier (TMA). Longer feeders are used to run between that TMA and the base station on the ground. These assemblies handle large amounts of power at high frequency.



D-Sub WCDMA Cable Assembly Amphenol's D-Sub WCDMA cable assembly is just one example of the customized cable assemblies we can produce for our customers. We have the capabilities to create the custom cable assemblies required by your business. We specialize in creating complex yet cost-effective solutions and can easily handle high-mix high-volume product assortments.



**RF Coaxial Cable Assemblies** Amphenol offers a full line of pre-assembled, fixed-length coaxial cable assemblies. Fixed length assemblies are for use in a variety of commercial and industrial applications that require standard configurations or lengths. Cables are available with popular connector series such as BNC, AMC, TNC, SMA and Type N.



TxRx Cable Assemblies Amphenol's TxRx Sealed outdoor connection system allows a direct connection from an outdoor environment to a PCB mounted SFP or SFP+ Cage, eliminating internal optical cabling requirements. The Sealed LC Duplex interface accepts common transceivers, providing a reliable optical connection while allowing an electrical interface to be mated through the enclosure wall and directly to a PCB interface. Also available in RJ-45 configurations allowing migration from copper to fiber without changing the mounting footprint.



J-Connector Amphenol's J-Connector Sealed outdoor connection system allows a direct connection from an outdoor environment to a PCB mounted SFP or SFP+ Cage, eliminating internal optical cabling requirements. The Sealed LC Duplex interface accepts common transceivers, providing a reliable optical connection while allowing an electrical interface to be mated through the enclosure wall and directly to a PCB interface. The J-Connector is available in RJ-45, Power, signal and RF configurations providing a common appearance when multiple media types are needed on the same equipment.



R2CT Sealed Assembly Housing Amphenol's R2CT provides a field installable interface for connecting equipment to outdoor cable assemblies. The housing can be assembled over existing LC, RJ-45 and other cable assemblies to provide water and dust protection, eliminating the need to replace some legacy or previously installed cables.



Silverline Test Cables The SilverLine of test cables are specifically designed for a broad range of test and interconnected applications with options for field and production PIM (Passive Intermodulation) Testing. Fabricated from rugged cable with proved strain relief systems, these cables provide long life and excellent stability in applications where they are repeatedly flexed and mated/unmated.



PT/LC Cable Assemblies The PT/LC leverages the proven mil-spec 264862 metal housing connector design to provide an environmentally sealed and mechanically protected LC duplex interface. PT/LC connectors are designed to perform in the toughest environments, making them exceptionally suited for outdoor applications such as WiMAX, LTE, and backhaul. Multiple receptacle configurations allow standard LC simplex or duplex internal cables to be mated, reducing cost and allowing easy inspection or quick replacement with off the shelf assemblies.



**PT/MPO Cable Assemblies** The PT/MPO leverages the proven MIL-Spec 264862 metal housing connector design to provide an environmentally sealed and mechanically protected multi fiber MPO-style interface. The bayonet style connector system is quick to deploy, requiring only ¼ turn to lock in place. The PT/MPO connectors are exceptionally well suited for WiMAX, LTE and Backhaul applications.



AARC Cable Assemblies The AARC plug and receptacle assemblies combine the reliability of the threaded N-Style connector housing with the ability to connect either 2 or 4 optical fibers in an outdoor environment. Compatible with the ODC® system, the AARC assemblies provide a dust and water sealed interface suitable for connection to outdoor mounted RRH or similar equipment used in WiMAX, LTE and Backhaul technologies.



Telecom Cable Assemblies Amphenol's telecom cable assemblies are widespread in the Brazilian market and recognized for their superior quality. These assemblies are utilized by companies such as Alcatel, NEC, ZTE, and Huawei, and various other original equipment manufacturers in the country of Brazil.



PowerOptx Hybrid Cables PowerOptX High-performance wireless hybrid cable bundled with power and fiber optic together in one low-profile housing which reduces wind-loading and leasing costs. A variety of designs and configurations can be used for towers, and in-building DAS applications – including our RodentRepel jacketed variety, repelling small animal attack.



Telecom Power Cables from Amphenol deliver DC voltages reliably and efficiently to remote and indoor telecom equipment. Special designs simplify installation and reduce space requirements without compromising performance. TFC manufactures a complete line of wireless telecom cables ranging in size and material composition.



LMR® Cable LMR® cables are high performance coaxial communications cables designed for use in virtually all wireless system applications. The cables are more flexible than corrugated cables and exhibit much lower loss than traditional RG cables. Additional LMR® products include high performance connectors in popular interfaces, prep tools, installation tools, and accessories.



AirMax VS® The AirMax VS® connector utilizes edge-coupling technology to improve electrical impedance control with optimized stagger to minimize signal crosstalk. This innovative combination delivers a cost-effective interconnect for multigigabits/s applications. To leap frog traditional complex Stripline designs, the AirMax VS solution utilizes "Virtual Shields" which eliminate costly metal interleaves between columns. \*\*AirMax VS is a registered trademark of FCI.



VDHM The VHDM connector platform revolutionized the high speed backplane connector industry. It has a dedicated ground system for higher performance and is scalable up to 25 Gbps. VHDM is available in 6 & 8 row configurations and provides designers cost-performance flexibility by combining low speed and high speed signals on the same connector.



XCede® Designed for 20+ Gbps performance, Amphenol's XCede® connector platform enables the future data rate requirements of datacom, telecom, storage, and wireless equipment. Offering a linear density of 82 differential pairs per inch, the XCede product family meets the true high-density needs of architectures with multiple front or rear fabric slots and blade systems with cooling straight through the backplane. XCede meets the IEEE 802.3ap v3.2 10GBASE-KR standard with margin.



XCede® HD Amphenol's XCede HD is compliant with the Hard Metric Form Factor Requirements detailed in EN 61076-4-101:2001, and features a 36% increase in density as well as enhanced electrical performance design features. This allows the product to be more suitable for tighter card pitches and upgrades to existing chassis designs, supports designs up to 28 Gbps.



**GbX®** Amphenol's GbX® connector is a high-density optimized differential connector offering a choice of density configurations. GbX provides increased density, exceptional impedance matching, and low crosstalk. GbX delivers data rates of 5 Gbps and is ideal for 4 x 3.125 XAUI links. The GbX connector provides up to 69 pairs per linear inch (5-Pair configuration) with a choice of configurations (2-, 3-, 4-, and 5-Pair) for higher application flexibility.



Backplane Assembly Amphenol has experience in developing leading edge, end-to-end backplane and system solutions is unique in the industry. Through over 20 years of designing, manufacturing and testing of high speed backplanes Amphenol has emerged with a leadership position in the industry delivering optimized cost against critical time to market requirements. Combining engineering expertise with investment in the latest technologies has enabled the delivery of tested nano compliant technology in todays leading edge laminates allowing performance in excess of 25G to meet both todays and tomorrows data transmission requirements.



LMR® Cable Installation Tools Amphenol offers a complete line of rugged, specially designed custom cable prep tools. These tools are designed to eliminate or minimize many of the mechanical and electrical variables that play a part in the connector attachment process. In addition to providing much desired control in the field connector attachmnet process, they offer a considerable time savings and are much safer to use than traditional cable prepping methods.



Aggregation and Demarcation Enclosures Customized solutions for connecting optical fibers and distributing power for signal towers, rooftops, monopoles and customer premise installations. Available with pluggable pre-installed optical and power distribution outlets or can be configured with a mix of compression and pluggable cable ports to facilitate field wiring. Amphenol's enclosures provide a solution for weatherproofing breakout points and allow for easy expansion or re-configuration.

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