

Custom Assembly Solutions



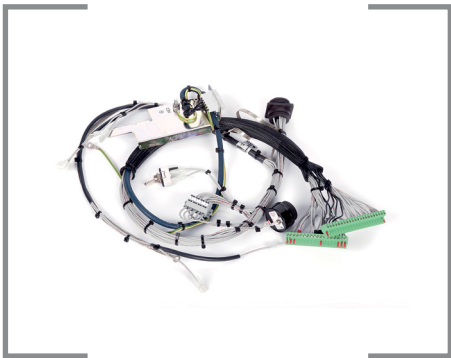
**The IP&E
Specialist**

Amphenol
GLOBAL INTERCONNECT SYSTEMS

TTI, Inc., – A Berkshire Hathaway Company



Amphenol Global Interconnect Systems



Amphenol Global Interconnect Systems designs and manufactures **cable assemblies, busbars, backplane assemblies and power box / PDU Solutions** for the IT, Data Comms, Mobile Networks, Industrial, Transportation (IATF 16949 & IRIS), Heavy Equipment & Medical markets (ISO 13485).

At Amphenol-GIS, we collaborate with our customers and partners to solve their interconnect challenges with competitive innovative **custom and standard** interconnect solutions. We operate on an **open sourcing policy for components**, where we are not restricted to using only Amphenol. So, whether you require an optimised quote on an **existing design**, or help to develop a new **custom solution**, AGIS can help.

AGIS consists of 11 ISO-certified Amphenol Divisions. Our manufacturing locations can be found in Estonia, Macedonia, France, Germany, Poland, Israel, Tunisia, USA, Canada, Mexico, China, India, Japan, Cambodia & Vietnam.



Application Examples

Industrial

- Access Control
- Alternative Energy
- Energy Management
- Factory Automation
- Intelligent Buildings
- Motion and Drives
- Robots and Cobots
- Smart Factory

Medical

- Home Healthcare
- Laboratory Equipment

Transportation

- Automotive
- Agricultural Equipment
- Charging Equipment
- Commercial Vehicles
- Construction and Mining
- Electric and Hybrid Vehicles
- Heavy Equipment
- Marine
- Rail and Mass Transit
- Trucks and Buses



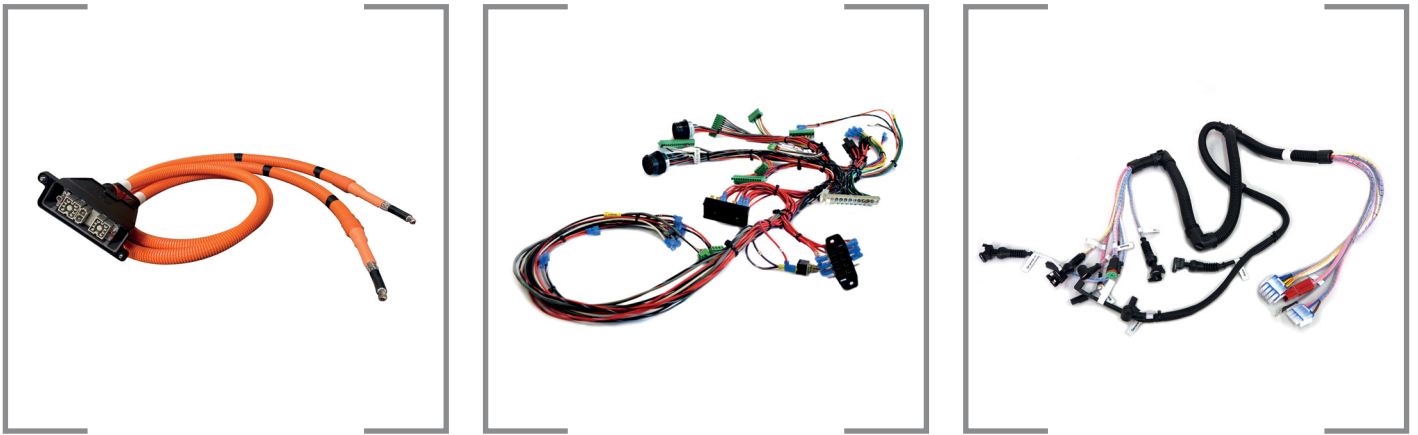
Assembly Capabilities

Cable Harnesses

Amphenol GIS specializes in manufacturing of wire and cable harnesses for various industries such as transportation & heavy equipment (buses, rail vehicles, trucks, agricultural and construction machines, boats & yachts), as well as industrial & medical equipment, telecoms, datacomms and consumer goods.

Amphenol GIS works according to ISO 9001:2015, ISO 14001:2015, ISO/TS 22163:2017 (IRIS rev.03), IATF 16949:2016, UL ZPFW2 1 and UL ZPFW8 1 standards.

Our experienced staff, modern machinery, components from reliable suppliers and quality control system in every stage of production process assures high quality of our products.



High Speed Cables

Amphenol GIS offers a total solution with regards to High Speed Cabling. Almost every device we interact with in our daily lives now has some level of intelligence and connectivity.

It's not just our smart phones and laptops... it's the car you drive, the vending machine you get a cup of coffee from, the digital advertising boards you see, the medical equipment that analyses our health... And due to the amount of data processing and data transmission, all of these devices will require some form of high speed cable assemblies.

We offer products including: MCIO (PCIe Gen6), Extremeport swift, Ultraport SlimSAS™, OCuLink, HD MiniSAS, MiniSAS, SATA, DisplayPort, HDMI, DVI, USB and Ethernet.



Assembly Capabilities

PDU's, Power Boxes & Integration

Whether it's a large-scale industrial printer, a large medical scanner, semiconductor manufacturing equipment, an EV (train, truck, bus, car, tram, boat, agricultural vehicle, earth moving equipment) etc, the requirement for well designed, efficient, and cost effective PDU's is crucial. Amphenol GIS are market leaders in power distribution solutions and services.

Key advantages of our power solutions include:

- Design and implementation of power distribution systems, including high level assemblies combining cables, mechanics and plastics, switches, relays & fuses.
- Vast knowledge and experience in designing and assembling power boxes
- Our experienced engineering teams are capable of supporting the entire product life cycle from R&D through to final design. We can also take existing product designs and assist in re design to lower material costs enhance manufacturability. Strict quality control in every stage of our production processes assures the high quality of our products

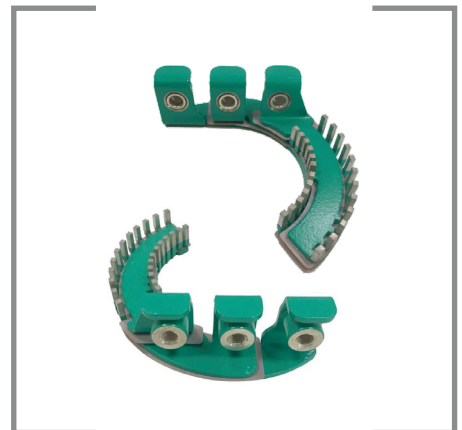
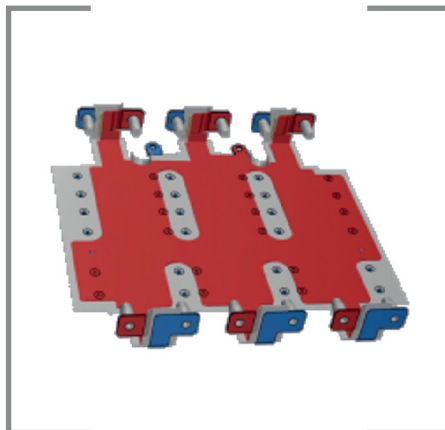


Busbars

Amphenol GIS offers a high-tech product range of power distribution & power conversion bus bars.

Whether it is the use of powder coating or over moulding to ensure optimum insulation on high power distribution busbars or the use of extensive multi-physics simulation and extremely thin insulating material and bonding processes on low inductance laminated busbars for power conversion, we have everything you need to ensure optimised functionality, overall geometry and cost.

- **Drive inverter DC-Link busbars** – IGBTs and SiC MOSFETs require low inductive DC-LINK interconnections to operate efficiently. The current loop inductance level will directly impact component lifetime, so it is imperative to optimize the inductive parameters.
- **Motor busbar** – The main winding system ensures the connection of all stator coils for each motor phase. The system complexity and necessary time for production are directly linked to the number of coils per phase.



Assembly Capabilities

Low Inductance Busbars

IGBTs for HV power conversion systems

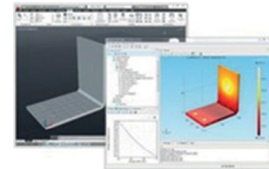
IGBTs require low inductance to allow lower commutation losses and higher switching frequency. Connecting active power modules and passive components (capacitors) inside the high-power converter uses a busbar commonly referred to as a DC link or DC bus. The typical operating power range can be anywhere from 50KW – 2 MW (up to 8-10 MW in modular converters). To ensure optimisation of low inductance busbars, design & simulation tools are critical. At Amphenol GIS we have 'best in class' technology to ensure the optimal busbar solution for your application.

Partnership with laboratories:

- L2EP (Lille)
- LAMIH (Valenciennes)
- LSEE (Béthune)



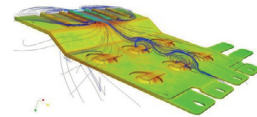
Design Tools



- Internal lab
- Team dedicated to prototyping



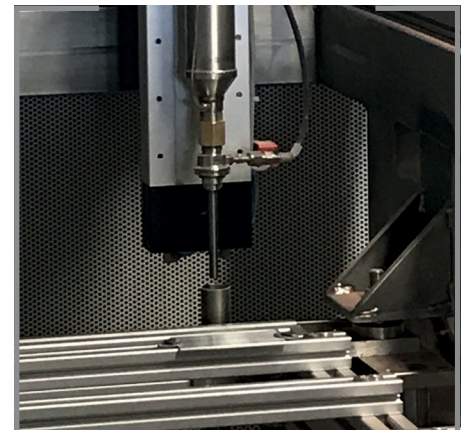
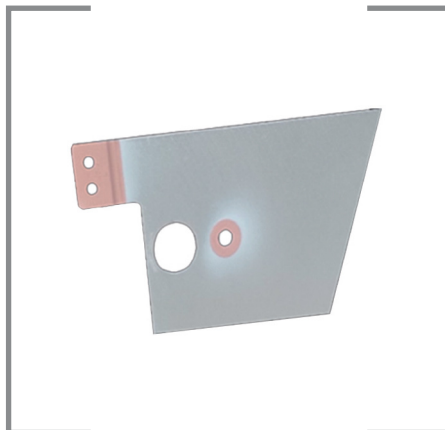
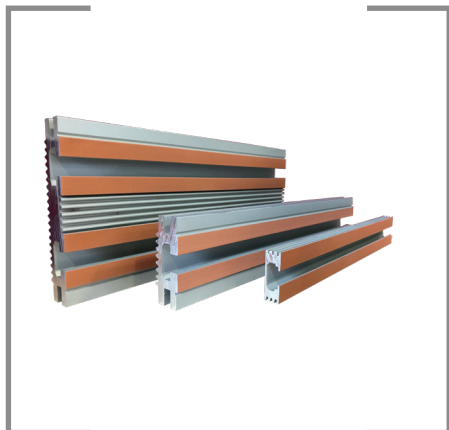
- Multiphysics simulations
- Topology optimisation tool
- Optimised approach on PD (conception rules, specific material.)



Busbars – Optimized Local Surface Treatment

OLST technology (Optimized Local Surface Treatment) is a plating of copper on aluminium. The two metals are inseparably welded together in a special process based on dynamic gas cold spray.

This process combines the advantages of aluminium – low weight, lower cost, easy workability, etc. – with the advantages of copper, such as optimal electrical conductivity, corrosion resistance, easily soldered & special features for electrical purposes.



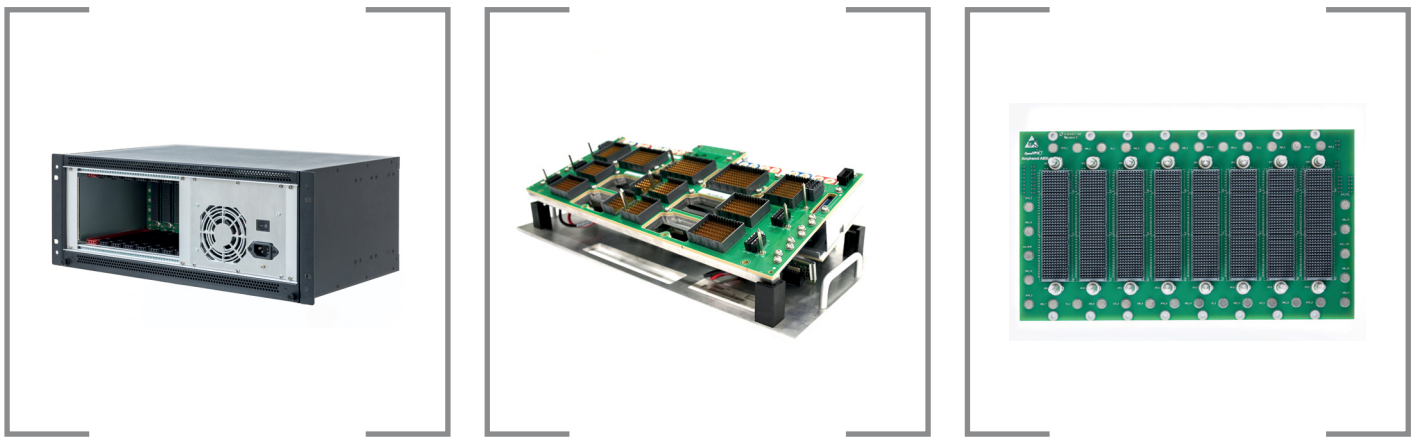
Assembly Capabilities

Backplanes and PCBA's

With the amount of data that is now required to be routed in telecoms, datacomms, broadcasting equipment, medical devices, transport control systems, trackside equipment, autonomous vehicles, air traffic control etc, the requirement for high-speed backplane technology is becoming more and more apparent.

Amphenol GIS combines engineering expertise and investment in the latest technologies to develop leading-edge, end-to-end backplane, PCBA and system integration solutions.

Through over 30 years of designing, manufacturing, and testing high-speed backplanes, our group has evolved into a true global market leader with expertise unique to the industry. We enable the delivery of tested nano-compliant technology that allows performance in excess of 25G to meet the data transmission requirements of today and tomorrow.



Backplanes

As signal speeds increase, connector density increases and pin size decreases Advanced Manufacturing and Test is therefore an absolute requirement to ensure the integrity of the compliant pins and the mating interfaces.

Automated Press Machine

Advanced detection of abnormal press forces.



Automated X-Ray

Captures bent pin escapes from the press machine.



Automated Optical Inspection

Electrical Level II & scanning the mating interface for pins out of alignment



Automated Electrical & SI testing

Ensuring fully functional optimised performance products.



**The IP&E
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Contact TTI today to see
what a true specialist can offer.

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