



CLEANSKY2 PROJECT

Developing breakthrough technologies to significantly increase the environmental performance of aircrafts and contribute to European competitiveness and mobility.

This project has received funding from the Clean Sky 2 Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement No 785425.

YOUR RELIABLE PARTNER FOR INTERCONNECTS & ATTACHMENT SYSTEMS

Amphenol Air LB
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In partnership with Radiall, a major actor of the European aerospace industry, Amphenol Air LB designed a new technology for modular & high density electronic equipment within the HARP consortium (Harmonised Amphenol Radiall Project).

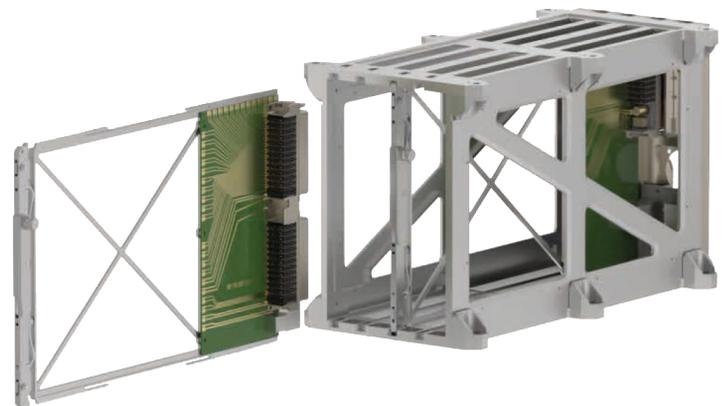
OBJECTIVE OF THE PROJECT

DEFINING NEW TYPE OF CONNECTORS ADDRESSING **MODULAR, LOW COST** AND **HIGH DENSITY CONNECTION** FOR AVIONICS APPLICATION.

Proposing a harnessing approach that addresses the key roadblocks of high connection density systems installation: operator access ergonomics (installation and maintenance of both the system and the A/C wiring), electronic boards insertion and extraction forces, and variable exposure to electro-magnetic effects.

Furthermore:

- **MODULARITY**: being able to host **different types of interfaces** (power, frequency,...)
- **STANDARDIZATION** of the building blocks developed
- **DESIGN TO COST**: target of 60% below current EN4165 based solution
- **ERGONOMY**: **efficient** and **quick install** installation on harness side, as well as of system structure on the aircraft
- **CONNECTION POINTS DENSITY**: host at least **210 connection points** on one electronic board

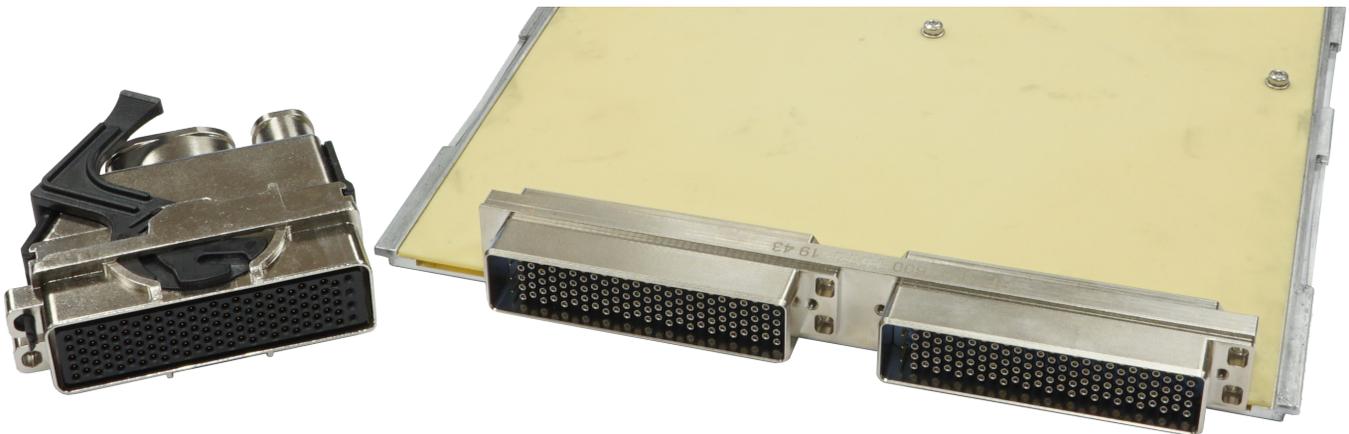


• HIGH PERFORMANCE PRODUCT

Amphenol Air LB brings its long-term experience in molding process applied to interconnect products by successfully developing a **monoblock (one single piece) connector shell**, providing a **limited number of piece parts** and **limited FOD (Foreign Object Damage) risks**.

The shielding is ensured by a thin metallization of the connector shell, offering excellent EMC performances. The use of proven **composite materials** offers a significant **weight saving** while offering **robustness** and **reliability over time**. This **lightweight** connector is particularly suitable for “**greener**” aerospace applications as it contributes to reduce Fuel consumption and CO² emissions, making it **good for environment** and **cost savings**.

Furthermore, this connector has been designed with **space optimization** in mind. In addition to its reduced size on structure (long and thin form factor), the connector also uses modules fitted with **Press Fit contacts** (right angled connection) providing significant **space savings** at the rear of the receptacle (board size). The **cost effective** and **low insertion force** contacts feature a selective treatment and avoid chemical substances usually required for soldering. They also present an overmolded insulation providing good **sealing** performances.



BENEFITS

- Lightweight and shielded
- Space and costs savings
- Environmentally friendly



• MODULARITY & HIGH CONTACT DENSITY

Specializing in **modular** connectors for aerospace applications, Amphenol Air LB has developed a new range of connectors combining removable inserts and connector shells.

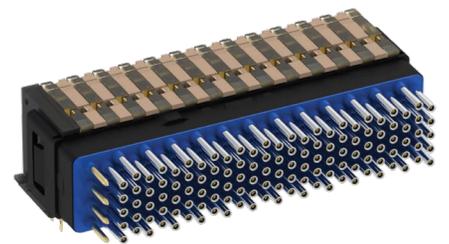
Connector shells consist of a unique plug and two receptacle versions: single shaped or double shaped. The plug shell is fitted with a **module using standard male crimp contacts** (on harness side) and both receptacles are fitted with **modules composed of contact wafers stacked side by side** (on board side). They use the **Overmolded Plated Lead Frame (OPLF) technology** that consists of contact strips each encapsulated in an overmolded composite shell. Each wafer features stamped and formed socket contacts and a **right-angled press fit connection**.

The OPLF technology ensures a perfect contact insulation and allow a drastic **space optimization**, while offering a significant **contact density**. The shortened contacts enable to reduce the PCB - then the whole equipment - size, resulting in additional **weight saving**.

Thanks to their **modular design**, the connector shells can be fitted with a wide range of modules using the same form factor. All connection technologies and needs can be addressed (signal, power, optics, RF...), resulting in **additional tooling costs strictly limited** to the sole contact configurations.



Receptacles: double or single versions



Module: high density and right angled Press Fit PCB connection



Plug: suited for both receptacles

BENEFITS

- OPLF technology & Press Fit contacts
- Compatible with all contact sizes and technologies
- Board & Equipment size optimization

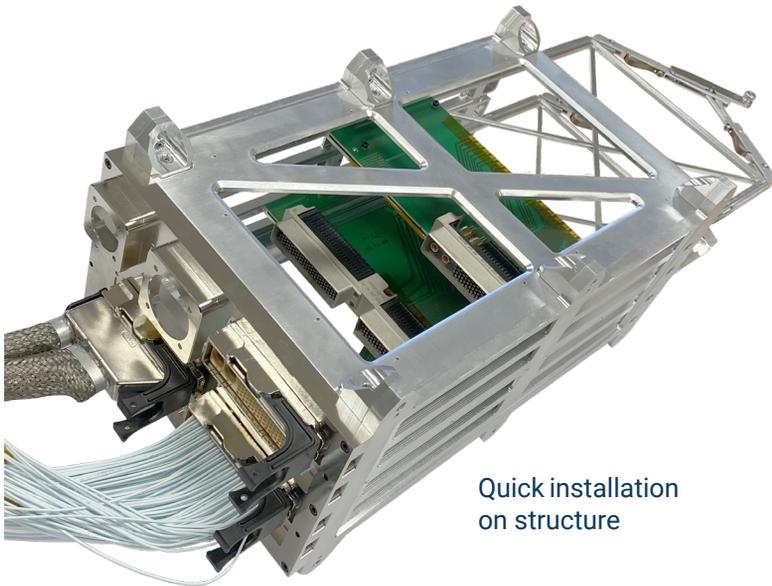


• EASY & QUICK INSTALLATION

Amphenol Air LB strives to develop **easy-to-use** and **quick-install** products aiming to facilitate operator's work, both for the first installation and for future maintenance of the equipment.

This product offers an **innovative connection system**: both the plug and the receptacle are not directly mated together, but are independently mounted on each side of the equipment structure. As a result, the plug (harness side) can be locked to the structure first, then the receptacle second (PCB side). Or the receptacle first and the plug second. Besides, the plug offers a **quick-mate locking** system. **No tools are required** for both mating and installing the connectors, providing **versatility** and significant **time saving**.

On equipment side, the Press Fit contacts can be mounted in one single manufacturing step on the PCB (automated assembly), offering a dramatically **reduced integration time**.



Quick installation on structure



Quick connection plug



Press Fit contacts enabling automatic mount on PCB



BENEFITS

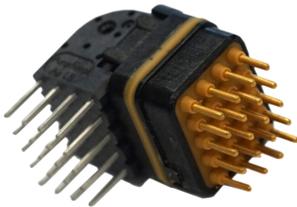
- Tool less system
- Versatile installation or maintenance
- Time saving (80%)



• TOWARDS FUTURE INNOVATIONS

QUICK CONNECT POWER CONNECTOR

Many contacts arrangements can be developed using the Harp plug and receptacle concept, such as 4x gauge 4 (150 amp each) contact + 6x gauge 22 interlock contact, for power application.

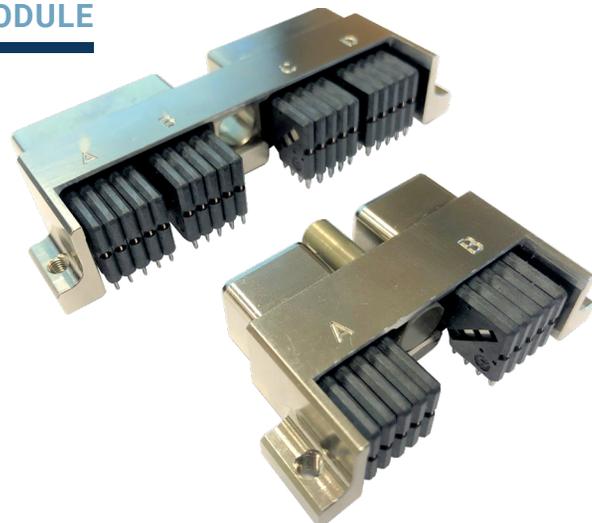


LOW PROFILE OPLF SIM FORM FACTOR MODULE

Alternative to EN4165/SIM modules fitted with standard right angled PCB contacts.

PRESS FIT OPLF SIM FORM FACTOR MODULE

SIM/EN4165 module for automated (quick and easy) mount on PCB.



• OUR COMPANY

Headquartered in Connecticut, USA, **AMPHENOL CORPORATION** is the 2nd largest connector company in the world (1st in Aeronautics & Defence).

Amphenol designs, manufactures and markets electrical, electronic and fiber optic connectors, attachments systems, antennas, sensors and sensor-based products, electronic packaging and optical & high speed specialty cables.

As a worldwide leader, Amphenol has a diversified presence in high demanding interconnect markets including: Aeronautics, Defence, Automotive, Industry, IT Datacom, Mobile devices & networks...

Amphenol global businesses are as diverse as customers they serve. No matter where customers go, they are not far from Amphenol.

GROUP KEY NUMBERS

- Net sales 2021: 10.9 B\$
- 90 000 employees worldwide
- Almost 150 facilities in over 70 countries

AMPHENOL AIR LB is part of the global Amphenol Corporation group, specializing in connectors and attachments systems for Commercial Aerospace, Urban Air Mobility, Defence, Rail and Mass Transit,...

Our company offers a wide range of high performance standard and custom interconnect solutions, connectors and fixing accessories for high demanding applications in harsh environments, where installation weight or space can be significant concerns.

AMPHENOL AIR LB IN 2021

- Net sales: 43.6 M€
- France (49%), Export (51%)
- Comair (63%), Military (24%), Others (13%)

Our products are specifically designed to offer time saving (easy to use and mount), weight saving, space saving (compactness and contact density), sealing, shielding, modularity...



• FOR MORE INFORMATION

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