Electronic Control Units and Power Electronics for Aerospace Applications

LIEBHERR

Electronic Control Units and Power Electronics for Aerospace Applications

Liebherr-Elektronik GmbH has been a competent partner in the development and production of control units and power electronics for the aerospace industry for more than 10 years. The range of applications covers long-, medium- and short-haul transport aircraft, regional and business jets, military aircraft and both civil and military rotorcraft – electronic products from Liebherr can be found in all major aviation programs. The range also includes safety-critical applications (DAL A functions).

To guarantee customers a reliable product launch phase, all developments are managed using a proven maturity assessment model and are fully compliant with the RTCA-DO-254 standard. Beside the development, qualification and series production – including series production acceptance tests – Liebherr also provides repairs of equipment in accordance with EASA Part 145 and FAR 145.

Many electronic assemblies from Liebherr are also used in unpressurized areas and under harsh environmental conditions.

Power Electronics

A major development focus in aerospace is the ”More Electric Aircraft (MEA)“ for which Liebherr’s broad product range in power electronics offers mature and field proven solutions. Motor-control electronics for electrical 4-quadrant drive systems in different power ranges support a wide range of different applications. Besides electrical actuation in the field of ”high-lift systems“ and ”primary flight controls“, these also include electrically powered compressors for air conditioning. Many different drive and power electronics applications from Liebherr have accumulated in-service experience in recent aircraft programs.

Control and Monitoring Electronics

Liebherr control and monitoring electronics are based on powerful micro-controllers. For safety-relevant applications, these units are designed in a Control / Monitor architecture. Form factors are configured to the customer’s requirements, e.g. according to ARINC 600, ARINC 404, in a flanged box design or as a cabinet solution.

Today, Liebherr control and monitoring electronics can be found both in the field of flight control systems and landing gear actuation as well as in air-conditioning, cabin pressure control and de-icing. The high degree of hardware standardization allows a broad range of use in new applications.

Product Examples




Brief description	Airconditioning System Control Unit	Slat PCU Motor Control Electronic Unit	Supplemental Cooling Electronic Unit	Actuator Control Computer
Customer / program	Airbus A320	Airbus A350 XWB	Airbus A380	Airbus Helicopters NH-90
Product classification	Control and monitoring electronics	Power electronics	Power electronics	Control and monitoring electronics
Application	Air-conditioning controls	Motor control power electronics	Motor control power electronics	Main rotor actuation & tail rotor actuation controls
Architecture	Dual lane	Simplex channel	Simplex channel	Control / Monitor
Housing	ARINC 600 Standard 4MCU	Customized, sealed housing	Customized, sealed housing, liquid cooled	ARINC 600 Standard 5MCU

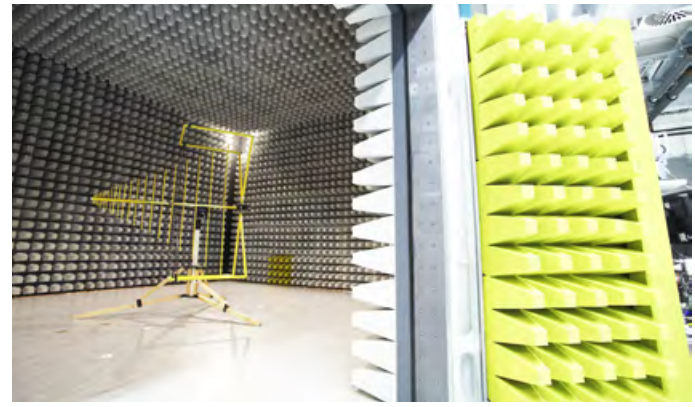
Integrated Air Management Controller	Landing Gear Actuation and Steering Control Unit	Integrated Air Management Controller	Integrated Air Management Controller	Flight Control Electronic Modules
Boeing 747-8	Bombardier CS100	Comac C919	Embraer E-Jets G2	Sukhoi Superjet 100
Control and monitoring electronics	Control and monitoring electronics	Control and monitoring electronics	Control and monitoring electronics	Control and monitoring electronics
Air-conditioning controls	Actuation and steering controls	Air-conditioning, cabin pressurization, bleed air controls	Air-conditioning, cabin pressurization, bleed air controls	Fly-by-wire flight controls
Dual lane	Control / Monitor	Dual lane	Dual lane	Control / Monitor
ARINC 600 Standard 4MCU	ARINC 600 Standard 4MCU	ARINC 600 Standard 4MCU	ARINC 600 Standard 6MCU	Customized cabinet

Development and Production

Electronic units and assemblies are developed and manufactured entirely in-house.
As the center of excellence for electronics with many years of experience, Liebherr-Elektronik GmbH offers maximum flexibility in designing, developing and producing electronic components (SRUs) and units (LRUs).

Qualification

The existing laboratory facilities such as EMC chamber, HALT chamber or vibration generators allow comprehensive function and environmental testing of the units for the aviation sector and ensure very high quality standards.



Product Support

Liebherr offers an optimum overall concept ranging from a life-long repair service to guaranteed spare parts supplies to the management of discontinued components.

Certificates

Comprehensive certificates such as FAA, EASA and ISO guarantee high standards of quality and performance for electronic products from Liebherr.

Liebherr-Component Technologies

Liebherr-Component Technologies AG, based in Bulle, Switzerland, is responsible for all activities of the components division of the Liebherr group. The companies and business areas belonging to this division are specialised in the development, design, manufacture and reconditioning of high-performance components in the field of mechanical, hydraulic and electrical drives and control technology. The sale of components to customers outside the Liebherr group of companies is managed centrally by Liebherr-Components AG in Nussbaumen, Switzerland.

Many Years of Experience

Liebherr has decades of experience in the manufacture of high-quality components used in cranes and construction machines, in the mining industry, maritime applications, wind turbines, in vehicle technology or in aerospace and transportation technology.

The Right Solution for Every Need

A high degree of vertical integration and the use of flexible, state-of-the-art production systems allow Liebherr to offer its customers tailor-made solutions. Liebherr is your partner for joint success – from the product idea to development, manufacture and first installation right through to series production. For the various components of the drivetrain, Liebherr also offers remanufacturing in various degrees in a dedicated factory.

System Solutions from a Single Source

Components from Liebherr are perfectly matched to each other with regard to operation. Depending on the requirement, individual components from the wide product range can be expanded through to the complete drivetrain. This results in impressive system solutions which can be integrated into a variety of applications.

Highest Quality Standards and Long Service Life

All components meet the very highest demands for functional reliability and durability, even under extreme loads and harsh conditions. Elaborate quality management and extensive analysis and test procedures are practised throughout the entire development and production process, guaranteeing reliability and long component service life.

www.liebherr.com

Biberach / Riss (Germany): large diameter bearings, gearboxes, rope winches, switchgear, electronics, electrical machines

Bulle (Switzerland): diesel engines, gas engines, splitter boxes, axial piston units, injection systems

Kirchdorf (Germany): hydraulic cylinders

Lindau (Germany): electronics, power electronics

Ettlingen (Germany): remanufactured components

Monterrey (Mexico): large diameter bearings

Dalian (China): gearboxes

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