Department history and professional profile

The Division of Aerospace and Advanced Control (DAAC) was founded in 1997, and it consists of several departments which cover R&D and special small-scale prototype and serial production. The R&D aims at internal in-house development and made-to-order consumer development projects. The department has experienced professionals in software, electronic hardware, mechanic al design, modelling and simulation, and testing development activities with respect to development of state-of-the-art airborne, automotive and industrial, especially for avionics, control systems, power electronics, intelligent & embedded systems. DAAC has a great experience in arranging full-prototype/serial production with respect to ISO 9001 Standards, EASA and FAA Standards. DAAC has been successful as a member of EU Research Development Projects in Aerospace (CESAR, SCARLETT, ACTUATION 2015, ESPOSA, Clean Sky) as well as in the National Research Projects. Lots of our activities have been realized in cooperation with the Czech universities.

Division of Aerospace and Advanced Control

Main activities:

- HW design and development
- SW design and development
- Modelling and simulation
- Testing
- Research & technology development
- Customer technical support

Certification:

- LRQA ISO EN 9001 and ISO / IEC 27 001 and ISO / IEC 20 000-1
- POA certificate issued by EASA
- National „DOA" issued by CAA
- NATO AQAP 2110

References:

- Gold medal for SAM at the 43rd Brno international engineering fair
- Gold medal for NETZ at the 45th Brno international engineering fair
- Grand prix prize for the most complex customer offer at AERO, Prague

Membership:

- Association of the Aviation Manufacturers of the Czech Republic
- Association of Research Organizations (AVO)

Software development and testing in accordance with:

- ANSI C standards Misra C development tools for DSP, MCU, CPU
- RTCA/DO 178 B/C
- IEEE standards software engineering
- Rapid control prototyping (RCP) and code generation
- Cantata C / C++

Hardware development in accordance with:

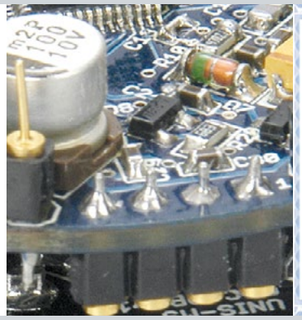
- RTCA/DO-160G
- RTCA/DO-254

Development tools:

- Electronic circuit and PCB design, simulation tools (Altium)
- MatLab, Simulink and power simulation tools
- National Instruments - NI
- dSpace
- Solid Edge

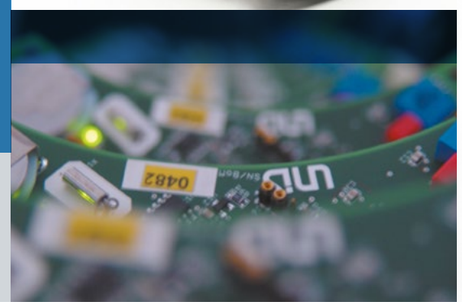
Prototype / serial production / service in accordance with:

- ISO EN 9001 and EASA Part 21, subpart G



Division of Aerospace and Advanced Control

RELIABLE PARTNER IN THE EUROPEAN AVIATION SUPPLY CHAIN



Development

Research and technology development
Model based design, simulation (MATLAB, Simulink)
Automated code generation
Rapid control prototyping
HW development in accordance with DO 254
HW testing in accordance with with DO 160 G
SW development in accordance with DO 178B/C
ANSI C and Misra C standards

Production

Special serial production
Small scale production
Prototypes
Production support (testers, simluators, etc.)
Service and customer support
Full production documentation
ISO EN 9001 and EASA, part 21 subpart G approval

Application

Engine control units
Electric power distribution boxes
Modular control systems
System of aviation modules SAM
Power converters
EHA / EMA actuators
Fuel and hydraulic pump control units
Embedded and mechatronic systems

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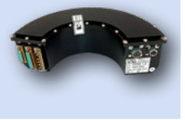
References

Control units and power converters for jet & turbo-prop & turbo-shaft engines

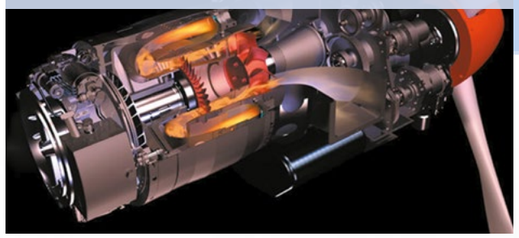


Description:

The control and power system integrates power converter and is designed for the turbine engines - PBS TP100 and PBS TS100 with max. power up to 180 kW and max. thrust up to 1,3 kN for PBS TJ100 engine. HW design versatility allows connection and control of turboprop and turboshaft engines. A part of the control unit system is power electronics for starter generator enabling fully controlled start of the engine.

Application:

PBS Velká Bíteš, a.s. - engine PBS TJ100, PBS TP100, PBS TS100



Electric power distribution box

Description:

Electric power distribution box (EPDB), as a part of electrical power system (EPS), is a set of two distribution boxes inteded for twin engine small aircafts of CS23 category with 28VDC dual-channel electrical system with two batteries and two starter-generators. The main function is the reliable distribution of the electrical energy from airborne systems to airborne loads with respect to the pilot's requests, the equipment of the aircraft and flight phases. EPDB also provides monitoring and protection of the EPS. The EPDB device is controlled by the switches from the cockpit and is implemented in the EV-55 aircraft.

Application:

Evektor, s.r.o. - Aircraft EV55

Control system for aircraft engine (E018)

Description:

E018 is dual-channel engine control unit used to control engine D-18T series 3M/3A. The control unit is used to control the engine in all regimes and monitor its state and function. This unit is part of the automatic engine control system, provides the function of generating electrical control commands, engine protection and ensuring the required engine operating conditions. It is designed for a wide family of cargo and civil aircrafts. The first flight tests will be carried out on the Antonov An-124 aircraft.

Application:

Aircraft AN124-100 Ruslan

Aircraft turboprop engine control system

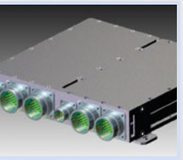
Description:

Control system for aircraft engines utilizes the most modern design and production technologies. The control system was developed in cooperation with GE Aviation Czech company. There were developed prototypes for the purpose of performance of development verification tests, including testing of prototypes directly mounted on the engine at the GE Aviation Czech engine testing facility.

Application:

H80 engine

Control unit for AI-450S-2 and AI-800S engines



Description:

ECU (E452) is a complex aircraft engine control system which consists of:

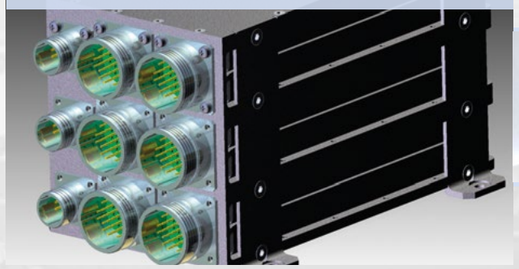
- two ECU modules
- one EMM module
- one VMM module
- one connector module

Two-channel modular control system intened for AI450-S2 and AI-800S and BE2/BE2+ engines is assembled of two ECU0 control units, one EMM engine monitoring unit, one VMM vibromodule unit and connector CON0 unit. Each of these modules represents an independent functional unit – the unit is designed as a distributed system. If one of the modules fails, it is easy to exchange it and the other modules functionality is not affected.

ECU (E452) ensures also communication with onboard systems through I/O, Arinc 429 protocol and communication with service system through ethernet interface.

Application:

Product line AI450 engines



Fuel pump control units

Description:

The main function of the control unit of the transport fuel pump is to regulate the speed of the BLDC engine in order to achieve a constant value of the engine speed and thus the pump, which transports fuel from the tank to the fuel system of the aircraft. The unit was developed for the training aircraft L39-NG, which is manufactured by company AERO Vodochody AEROSPACE a.s.

Application:

Aircraft L39-NG

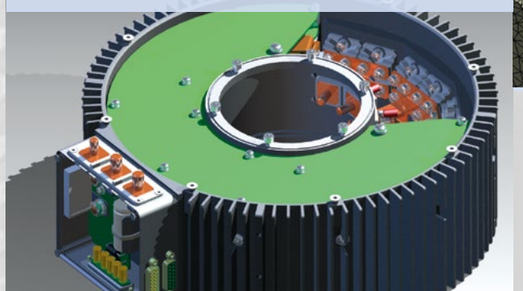
Power converters for aerospace applications

Description:

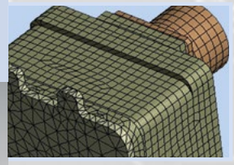
Power converters for aerospace applications are designed to convert AC voltage from engine generators and to provide onboard 28 V DC power supply in accordance with MIL 704/EN 2282 standard. PCTP units are designed in modular concept to supply power from 1 to 9 kW. PCTP units are designed to provide power conversion, overcurrent and undervoltage protection, limitation of the supplied power, monitoring and communication with superior control system via standard communication databus.

Application:

PBS Velká Bíteš, a.s. – TP100 (turbo-prop) and TS100 (turbo-shaft) engines



Mathematical modeling and simulations



Description:

Each product design and its life cycle development is supported by exhaustive mathematical modeling and simulations to reveal weakness in design and to verify the proposed solutions. Mathematical modeling is used in thermal and vibration analyses, verificaiton of electronic circuits and control algorithms. Standard tools such as MATLAB/ Simulink, ANSYS, Comsol, and PSpice are used.

Application:

Power converters for aerospace applications
Fuel pump control units
Control units and power converters for jet & turbo-prop & turbo-shaft engines