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HIGH PERFORMANCE CONTROLLER

POWER TO CONTROL EVERYTHING

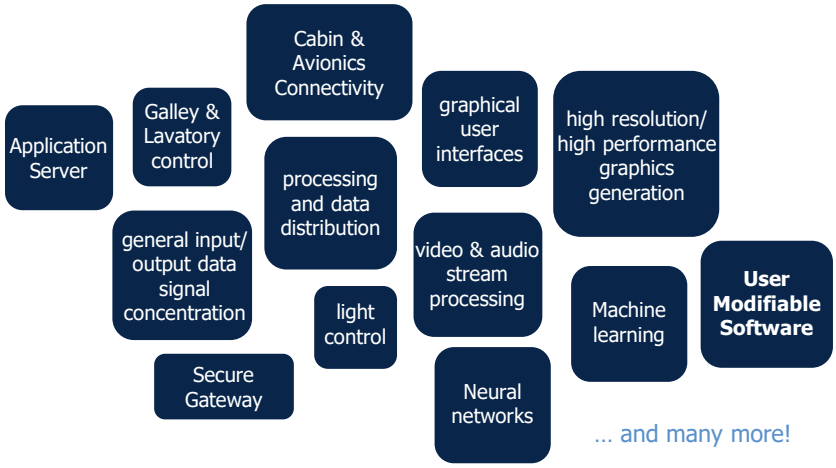
THE IDEA

The CANSAS™ High Performance Controller (HPC) has been developed to specifically address the needs and demands of today's range of applications in the aircraft cabin and as connectivity gateway.

Its design and versatility covers a broad range of cabin use cases, ranging from applications that demand a very high processing power up to safety-critical tasks (up to DAL C).

The CANSAS™ HPC design has been evolved from a long history and experience in Cabin Management Systems and Cabin controllers and has been continuously improved.

Combining the latest state-of-the-art hardware capabilities and airworthiness requirements, the CANSAS™ HPC is very well prepared to master even future applications and challenges in the aircraft cabin as well as aircraft information domain connectivity.



BOOST UP YOUR CABIN

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KEY FEATURES & DESIGN HIGHLIGHTS

- High-performance dual core ARM64 main processor
- Separate, segregated micro processing unit for safety-critical applications (up to DAL C) with dedicated power supply, memory ,and I/O interfaces
- Capability to run software with different criticality levels in parallel (up to DAL C)
- Comprehensive range of standard and aircraft-specific I/O interfaces
- High-performance Graphics Processing Unit
- Digital Signal Processing Units
- Deep Learning/Neural Network accelerators
- 4K/HD video and audio processing capability
- Security-focused Trusted Computing Platform
- Built-in audio amplifier
- Extensibility via multiple internal connectors, e.g., PCIe interface (M.2 2280)
- Available in two variants (both of which are based on a common hardware platform)

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INTERFACE DETAILS

	Type	IODN-HPC
Discrete Input	DSI (versatile, with definable levels)	12
Discrete Output	DSO 50mA (versatile, GND/Open & 28V/Open)	5
Analogue Output	Audio Line Out / HP Out (10W@8Ω)	1 / 1
Bus Interfaces	Ethernet 1000BASE-T	1
	Ethernet 100BASE-TX	4
	Ethernet 100BASE-T1 / 10BASE-T1L (1000Base-T1 optional)	1 / 1
	ARINC 429 (optional)	4 x In, 2x Out
	CAN	5
	RS485	5
	RS232	3
	USB	3x USB2.0, 1x USB3.0
Wireless Interfaces	IEEE 802.1b/g/n, 30 MBit/s (optional)	1
	IEEE 802.22ac, 867 MBit/s (optional)	1
	M.2 sockets for WAN connectivity modules (opt.)	2
Power Input	28V Input	1
Config.- Inputs	Discrete Input GND	5
Option with Display	Display Output	1x FHD, 1x 4K/8K
	Touch Panel	1

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PERFORMANCE FIGURES

MAIN PROCESSOR

- Dual core ARM Cortex-A72 @ 2.0 GHz with hardware virtualization support
- 4 GB Main memory with ECC (RAM)
- 8 GB Program / Mass memory (optionally expandable)
- 3 Floating point DSP Units @ up to 1.3 GHz
- High-performance Graphics Processing Unit
- Heterogeneous Hardware accelerators

FOR SAFETY CRITICAL APPLICATIONS (UP TO DAL C)

- Separate, segregated Dual core ARM Cortex-R5 MCU @ 1.0 GHz (lockstep capable), with dedicated memory and I/O
- 1 MB Main memory (RAM)
- 64 MB Program memory

OPTIONAL WAN EXTENSION

- Two M.2 slots for M.2 2242 or 2280 Key M PCIe NVMe SSD modules
- Two M.2 slots for M.2 3042 Key B WAN/LTE modules
- Integrated LR1120 radio transceiver for S-Band operation in LoRa®
- WLAN interface according IEEE 802.22ac

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SOFTWARE

MAIN PROCESSOR

- Bootloader
- Linux Operating System (Standard)*
- Realtime, partitioning Operating System (Option)
- ARINC 653 API
- Posix API
- Virtualized Linux
- Support for User Modifiable Software (UMS)

SEPARATE SEGREGATED MCU

- Bootloader
- FreeRTOS (Standard)
- SAFERTOS (Option, certifiable up to DAL C and API-compatible with FreeRTOS)

(*) Work in progress on a DAL D certifiable Linux OS

THE OPERATING SYSTEM AND APPLICATIONS ARE FIELD-LOADABLE, UMS IST OVER THE AIR (OTA) UPDATEABLE

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MECHANIC, ENVIRONMENT, QUALIFICATION

IODN VARIANT (WITHOUT EXTENSION)

- Power supply 28VDC
- Typical/Maximum power consumption: 20W/25W
- Size: 177 x 270 x 40 mm
- Weight: 900 g
- Aircraft connectors: two D-SUB connectors (50 pins)

FAP TOUCHSCREEN VARIANT

- Power supply 28VDC
- Typical/Maximum power consumption 50W/60W
- Size: 405 x 255 x 41 mm
- Weight: 4.500 g
- Aircraft connectors: two D-SUB connectors (50 pins)
- Resolution: 1920 x 1080 pixel (FullHD)
- Brightness: 400 Cd/m^2

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DO-160G

DO-160G Section	Qualification Requirement	Preliminary Test Category
4	Temperature and Altitude	A2/B1 with -40 to +70 Deg Std. op. temp.
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	E, AC Types Helicopter and Tubro Prop
8	Vibration	R, curve G and H, curve R
9	Explosion Proofness	n/a
10	Waterproofness	W
11	Fluids Susceptibility	F
12	Sand and Dust	D
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	A
16	Power Input	ZRI with Momentary Power Interruption limited to 200ms
17	Voltage spike	A
18	Audio Frequency Conducted Susceptibility	Z and B
19	Induced Signal Susceptibility	ZW
20	Radio Frequency Susceptibility	TT
21	Emission of Radio Frequency Energy	M
22	Lightning Induced Transient Susceptibility	A2J2L2
23	Lightning Direct Effects	n/a
24	Icing	n/a
25	Electrostatic Discharge	A
26	Flammability	C

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EXAMPLES OF APPLICATIONS

- Cabin Network Server and service hosting (UMS)
- General input/output data signal concentration
- Flight Attendant Displays/Cabin Control Panels
- Processing and distribution of cabin data
- Secure gateway applications, aircraft security domain segregation
- Connectivity unit for external wide area networks (WAN)
- Wireless Access Point
- Monument controllers
- Lavatory & Galley control and management
- Video processing and analytics (machine vision)
- High-resolution/high-performance graphics generation and processing
- Audio processing and analytics
- „Flying Edge“ - Ground System data integration layer for data driven operations
- Local neural network inferences for machine learning and artificial intelligence applications
- Smart Mirrors (visible/invisible displays behind mirrors)
  - Cabin Management Systems, e.g.
  - HMI / GUI / Control Panels
  - Light control
  - Video streaming and display
  - Boarding music
  - Passenger announcement
  - Moving maps display
  - Predictive health monitoring
  - Web browser
  - Web server
  - Database
  - Avionics systems interface

... AND MANY MORE!

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