

# HIGH PERFORMANCE CONTROLLER

POWER TO CONTROL EVERYTHING



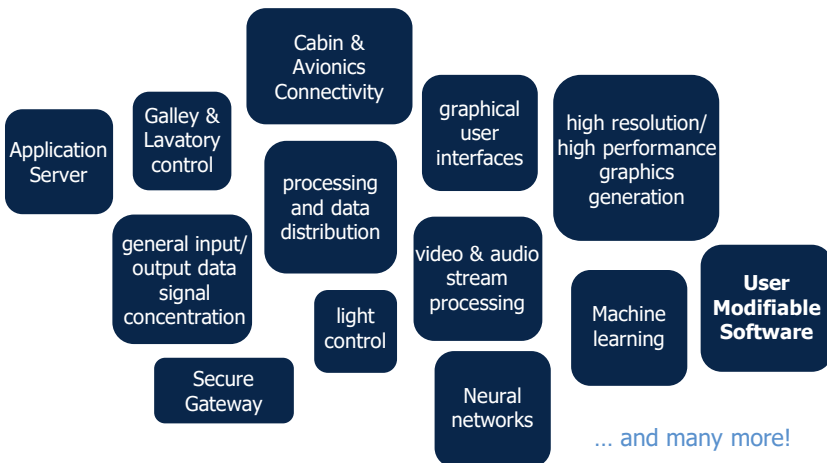
## THE IDEA

The CANSASTM 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 a connectivity gateway.

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

The design of the CANSASTM HPC has evolved from a long history and experience in Cabin Management Systems and Cabin Controllers and is continuously improved.

Combining the latest state-of-the-art hardware capabilities and airworthiness requirements, the CANSASTM HPC is well prepared to master today and future applications and challenges in the aircraft cabin and connectivity.



BOOST UP YOUR CABIN



## 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 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
- Custom extensibility via multiple internal connectors, e.g. PCIe interface (M.2 2280)
- Several equipment variants derived from common HPC platform already available

## INTERFACE DETAILS

	Type	IODN-HPC
Discrete Input	DSI (versatile, configurable levels)	12
Discrete Output	DSO 50mA (versatile, GND/Open & 28V/Open)	5
Analogue Input	Differential Microphone (optional)	4
Analogue Output	Speaker Output 15W@ 8Ω (optional)	2
	Audio Line Out	2
Bus Interfaces	Ethernet 100BASE-T	1
	Ethernet 100BASE-TX	4
	Ethernet 100BASE-T1 / 10BASE-T1L (SPE)	4 1 / 1
	ARINC 429 (optional)	4 x In, 2x Out
	CAN	5
	RS485	5
Wireless Interfaces	USB	3x USB2.0, 1x USB3.0
	IEEE 802.11b/g/n, 12 Mbps secure gateway function	1
	IEEE 802.11ax, 867 Mbps (optional)	1
	M.2 sockets for WAN connectivity modules (opt.)	2
Power Input	28V primary / 28V essential (reduced performance)	1 / 1
Config.- Inputs	Hardware programming pins in connector	5

## HARDWARE PERFORMANCE FIGURES

### MAIN PROCESSOR (DAL D/E)

- 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

### OPTIONAL WAN EXTENSION

- Two M.2 slots for M.2 3042 Key Bfor WAN / LTE modules
- Integrated LR1120 radio transceiver for S-Band operation in LoRa®
- WiFi6 interface according IEEE 802.11ax
- Two M.2 slots for M.2 2242 or 2280 Key M PCIe NVMe SSD or NPU modules

## SOFTWARE

### MAIN PROCESSOR (DAL D/E)

- Linux Operating System
- ARINC 615A Data Loader
- Virtualization & Containerization(e.g. KVM, Docker, Kubernetes)
- Optional:
  - Certification Package for DAL-D Linux
  - Support for User Modifiable Software (UMS)
  - Realtime, partitioning Operating System (Option)
- ARINC 653 API

### 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 INTERCOM (DAL C) EXTENSION

- Class D Speaker Amplifiers Output (separated power supplies for amplification)
- Class H Headphone Outputs
- differential Microphone Inputs

### SEPARATE SEGREGATED MCU (UP TO DAL C)

- SafeRTOS
- Custom Tasks

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

## MECHANICAL KEY PARAMETERS

### IODN HPC

- Typical / Maximum power consumption: 20W / 25W
- Size: 177 x 270 x 40 mm
- Weight: 980g
- Aircraft connectors: two D-SUB connectors (50 pins)



### FAP HPC 15"

- Typical / Maximum power consumption 35W / 50W
- Size: 405 x 255 x 41 mm
- Weight: 4.600g
- Aircraft connectors: two D-SUB connectors (50 pins)
- Resolution: 1920 x 1080 pixel (FullHD)
- Brightness: 400 Cd/m2



### FAP HPC 10"

- Typical / Maximum power consumption 30W/50W
- Size: 270 x 195 x 72 mm
- Weight: 2200 g
- Aircraft connectors: two D-SUB connectors (50 pins)
- Resolution: 1280 x 720 pixel
- Brightness: 1000 Cd/m2



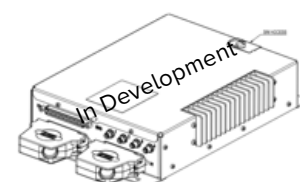
### CCU HPC

- Typical / Maximum power consumption 25W/50W
- Size: 177 x 270 x 55 mm
- Weight: 2.250 g
- Aircraft connectors: two D-SUB connectors (50 pins), 4 Quad-HFM RF connectors



### CIU HPC

- Typical / Maximum power consumption 35W/50W
- Size: 177 x 270 x 55 mm
- Weight: 2.250 g
- Aircraft connectors: two D-SUB (50 pins), D-SUB 25 / SMA connectors for audio and Wi-Fi

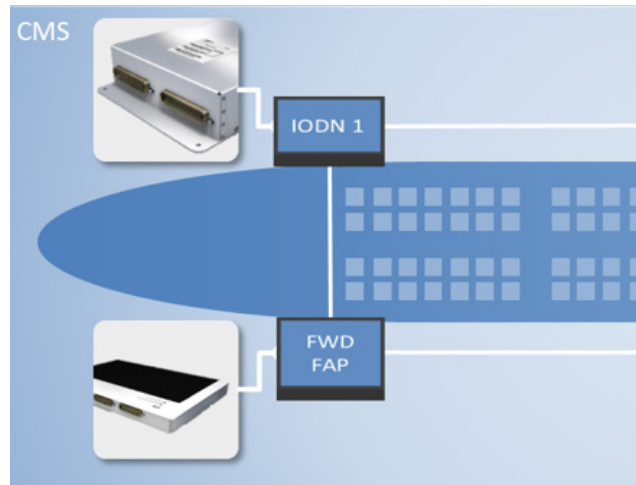


## DO-160G (ALL EQUIPMENT VARIANTS)

DO-160G Section	Qualification Requirement	Preliminary Test Category
4	Temperature and Altitude	B1
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	E, AC Types Helicopter and Turbo Prop
8	Vibration	S, curve C and U2, curve Fa and F1
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

## EXAMPLES OF APPLICATIONS

- Cabin Management Systems
  - HMI / GUI / Cabin 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
- Cabin Network Server and service hosting (UMS)
- General input/output data signal concentration
- 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)



**... AND MANY MORE!**