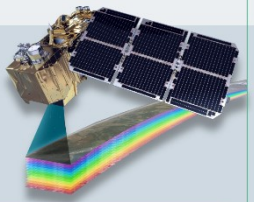
Space Systems & Applications

- ESC AEROSPACE offers services focused on aerospace **satellite payload** chains modeling, as well as a full **design of space qualified payloads**, its **implementation**, **testing** and **preparations** for a rocket launch.
- ESC AEROSPACE offers products: space qualified **on-board data acquisition, monitoring and control systems**, based on **DPU** with subsystems **OBDH**, **MMU**, **PCDU**, **RTU**, **SDR** and **ICU** for **optical** and **hyperspectral cameras**.

esc Aerospace

Products & Services

escICU
Hyperspectral Camera Instrument Control Unit



Powerful universal payload computer for new space satellite platforms and compatible with cubesat platforms.

esc Aerospace

escOBC
Data Handling System
for your mission

Powerful universal On-Board Computer for new space satellite platforms and compatible with cubesats platforms.

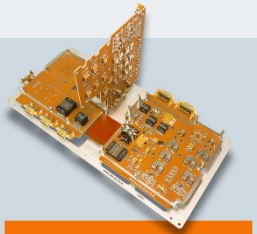
esc Aerospace

escSVF
Software Validation Framework
for OBC and Payloads

Complex testing suite designed to test the Control SW of residing in the on-board computer of microsatellites or its Payloads/instruments.

esc Aerospace

escMDE
Multipurpose Drive Electronic



Designed to drive up to four stepper motors used in the satellites' on board applications.

esc Aerospace

escQTN
Quantum Trusted Node

Key building block of your Quantum Key Distribution (QKD) infrastructure and your getaway to existing or future satellite or terrestrial QKD solutions.

esc Aerospace

esc Aerospace

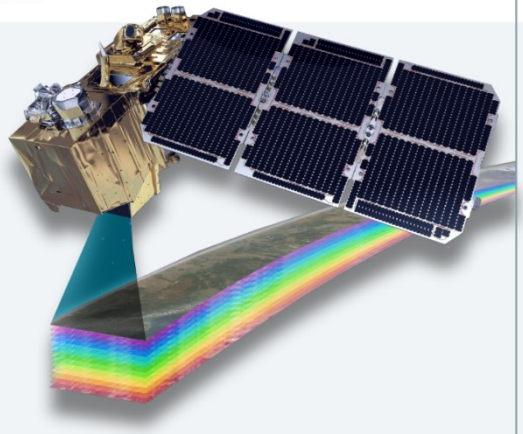
Products & Services

esc Aerospace

escICU

Hyperspectral Camera Instrument Control Unit

Powerful universal payload computer for new space satellite platforms and compatible with cubesat platforms. The dimensions are matched with the PC104 form factor.

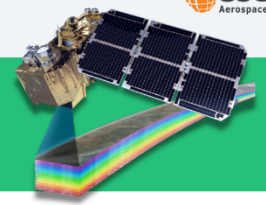


Contact us
+ 420 284 683 784
info@esc-aerospace.com
www.esc-aerospace.com

esc Aerospace as product neutral systems integrator and HW/SW product developer with a focus on Space and Defence offers: Mission Critical Software; Multipurpose Drive Electronics; On-Board Systems; DPU with subsystems MMU, PCDU, RTU, SDR; Space qualified On-board Computer (OBC, OBDH); Secure Communication; SATCOM, QKD; True Random Generator; Payloads: Hyperspectral Cameras, Lidars, Ionizing Radiation Detectors Space Pix; EGSEs/SCOEs; Avionics for Unmanned Systems.

escICU

Hyperspectral Camera Instrument Control Unit



Powerful universal payload computer for new space satellite platforms and compatible with cubesat platforms. The dimensions are matched with the PC104 form factor.

The powerful System on Chip combining multi-core processor and programmable logic array allows efficient and real-time execution of complex algorithms to process raw data on-board, thus reducing space to ground communications bandwidth needs.

Integrated mass memory for storage of acquired data allows to use of the ICU without needs of platform data storage. Data is accessible via Cubesat Space Protocol or ECSS PUS-C via platform communication bus.

Latch-up protection of the ICU and imaging sensor is assured by constant current monitoring and several mitigation techniques.

KEY FEATURES

- Four 64-bit Linux capable user cores + one supervisor core
- Programmable logic array for image sensor readout and functionality extension
- Multiple image sensors readout possible
- Warm/cold redundancy support
- On-board current, voltage and temperature monitoring
- Latch-up monitoring
- On-board data storage
- Users script support for ICU control and data pre-processing (MicroPython)
- Software and programmable logic upgradable

Contact us
+ 420 284 683 784
info@esc-aerospace.com
www.esc-aerospace.com

Making things fly | esc Aerospace © 2026

TECHNICAL SPECIFICATIONS

General	
Processor	5x RISC-V 64-bit
Logical blocks	254 k (461 k optional)
Processor clock	up to 625 MHz
Program. logic clock	up to 343 MHZ
DRAM CPU	1024 MB (ECC)
DRAM FPGA	1024 MB (ECC) (2048 MB optional)
NVM (program)	256 M (redundant)
NVM (configuration)	8 MB (redundant)
Mass storage	32 GB SLC NAND (redundant)
Power supply	5 V (4.5 V - 9.6 V) (28 V optional)
Power supply	up to 10 W
Op. temperature	-40°C to +60°C
Non-op. temperature	-50°C to +85°C

Interfaces	
CAN	2x
RS422/RS-485	2x
UART 3.3 V	1x
PPS (RS-422)	1x
GPIO 3.3 V logic	8x
Debug UART	5x
JTAG for SoC	1x
Ethernet up to 1Gpbs	1x (2x optional)
Image sensor	up to 16x lanes (SerDes 12.7 Gbps) up to 36x pairs (LVDS 1250 Mbps)

Size and Weight	
Length	96 mm
Width	91 mm
Height	35 mm (TBC)
Mass	350 g (TBC)

esc Aerospace

Products & Services

esc Aerospace

escOBC

Data Handling System for your mission

Powerful universal On-Board Computer for new space satellite platforms and compatible with cubesats platforms. The product dimensions are matched with the PC104 form factor.

Contact us
+ 420 284 683 784
info@esc-aerospace.com
www.esc-aerospace.com

esc Aerospace as product neutral systems integrator and HW/SW product developer with a focus on Space and Defence offers: Mission Critical Software; Multipurpose Drive Electronics; On-Board Systems; DPU with subsystems MMU, PCDU, RTU, SDR; Space qualified On-board Computer (OBC, OBDH); Secure Communication; SATCOM, QKD; True Random Generator; Payloads: Hyperspectral Cameras, Lidars, Ionizing Radiation Detectors Space Pix; EGSEs/SCOEs; Avionics for Unmanned Systems.

esc Aerospace

escOBC

On-Board Computer for your mission

Powerful universal On-Board Computer for new space satellite platforms and compatible with cubesats platforms. The product dimensions are matched with the PC104 form factor.

The powerful System on Chip combining multi-core processor and programmable logic array allows efficient, real-time execution of complex algorithms to process raw data on-board, thus reducing space to ground communications bandwidth needs.

Multiple power saving modes may be activated when high computational power is not required to dscrease power consumption.

Independent system monitoring is ensured by integrated supervisor subsystem based on radiation tolerant microprocessor. Latch-up protection is assured by constant current monitoring and several mitigation techniques.

KEY FEATURES

- Four 64-bit Linux capable user cores + one monitoring core
- Programmable logic array for functionality extension
- Independent radiation-tolerant supervisor
- Warm/cold redundancy support
- Expected life-time 3-5 years on LEO
- On-board current, voltage and temperature monitoring

Contact us
+ 420 284 683 784
info@esc-aerospace.com
www.esc-aerospace.com

TECHNICAL SPECIFICATIONS

General

Processor	5x RISC-V 64-bit
Processor clock	up to 625 MHz
Logical blocks	254 k
DRAM	512 MB (ECC)
NVM (program)	128 MB (redundant)
NVM (configuration)	16 MB (redundant)
Mass storage	2 GB SLC NAND
Power supply	5 V ± 5%
Power consumption	up to 10 W
Operating temperature range	-30°C to +60°C
Non-operating temperature range	-40°C to +85°C
Radiation (TID)	30 kRad (Si) for rad-tolerant version

Interfaces

CAN	2x
RS422/RS-485	2x
UART 3.3 V	1x
SPI 3.3 V	1x
PPS (RS-422)	1x
GPIO 3.3 V logic	8x
JTAG for SoC	1x
Ethernet	none/1x/2x (optional)

Size and Weight

Length	96 mm
Width	91 mm
Height	24 mm
Mass	250 g

esc Aerospace

Products & Services

esc Aerospace

escSVF

Software Validation Framework for OBC and Payloads

Complex testing suite designed to test the Control SW (CSW) of residing in the on-board computer of microsatellites or its Payloads/Instruments.

Contact us
+ 420 284 683 784
info@esc-aerospace.com
www.esc-aerospace.com

esc Aerospace as product neutral systems integrator and HW/SW product developer with a focus on Space and Defence offers: Mission Critical Software; Multipurpose Drive Electronics; On-Board Systems; DPU with subsystems MMU, PCDU, RTU, SDR; Space qualified On-board Computer (OBC, OBDH); Secure Communication; SATCOM, QKD; True Random Generator; Payloads: Hyperspectral Cameras, Lidars, Ionizing Radiation Detectors Space Pix; EGSEs/SCOEs; Avionics for Unmanned Systems.

esc Aerospace

escSVF

Software Validation Framework for OBC and Payloads

Complex testing suite designed to test the Control SW (CSW) of residing in the on-board computer of microsatellites or its Payloads/Instruments.

escSVF provides means for both integration and validation testing as it allows to test the CSW directly in its target's HW environment connected to SVF via a set of HW interfaces. It is the ideal part for your HW-in-the-loop (HIL) type of testing. In case of missing HW instruments during the development phase, the SVF can emulate the basic functionality of multiple devices that the CSW shall interface.

The modularity of the SVF allows for simple modifications of the modules required by the user. It is possible to create an ideal mix of modules that fit directly with the customer's needs.

LOGGING AND TEST EXECUTION

- Logs and saves all relevant data to auxiliary Data Storage for deep analysis after every test
- Supports manual test execution with the interaction between the operator and the device under test
- Allows autonomous test execution, either individually or in batches

Contact us
+ 420 284 683 784
info@esc-aerospace.com
www.esc-aerospace.com

Making things fly | esc Aerospace © 2026

KEY FEATURES

Modular: simple to customize and extend the functionality according to the client

Supports manual, semi-manual and autonomous testing

Easy to read generated Test reports or logs

SVF-wide Data storage to archive all critical data for later analysis

HW devices emulation (ADC, RF transceivers, PPS, etc.)

Supported interfaces: CAN/CANopen, SpaceWire, SPI, UART, Ethernet

Running on Windows 10 and Linux without any other required dependencies

esc Aerospace

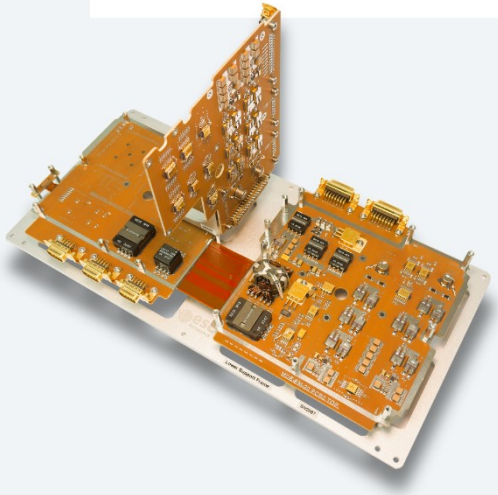
Products & Services

esc Aerospace

escMDE

Multipurpose Drive Electronics

Designed to drive up to four stepper motors used in the satellites on-board applications.



Contact us
+ 420 284 683 784
info@esc-aerospace.com
www.esc-aerospace.com

esc Aerospace as product neutral systems integrator and HW/SW product developer with a focus on Space and Defence offers: Mission Critical Software; Multipurpose Drive Electronics; On-Board Systems; DPU with subsystems MMU, PCDU, RTU, SDR; Space qualified On-board Computer (OBC, OBDH); Secure Communication; SATCOM, QKD; True Random Generator; Payloads: Hyperspectral Cameras, Lidars, Ionizing Radiation Detectors Space Pix: EGSEs/SCOEs; Avionics for Unmanned Systems.

esc Aerospace

escMDE

Multipurpose Drive Electronics

Designed to drive up to four stepper motors used in the satellites on-board applications.

POSSIBLE APPLICATIONS

- Antenna Pointing Mechanisms
- Deployable Sunshield Assembly Structure
- Solar Array Drive Electronics
- Propulsion Pointing Drivers
- Instrument Pointing Devices
- Pointing of Scanning Systems
- Mechanism Manipulator

PROTECTIONS

- Motor over-current protection
- Relay on each motor output
- Power supply under-voltage, over-voltage and over-current protections

KEY FEATURES

- Four motor driver outputs (4xN/4xR)
- Fully redundant design
- Redundant communication interfaces
- Full stepping
- Voltage mode outputs
- Over-current protection on each output
- Flexible configuration via NVM
- End position control: step counting, end-switch activation, angular position setpoint

Contact us
+ 420 284 683 784
info@esc-aerospace.com
www.esc-aerospace.com

Making things fly | esc Aerospace © 2026

TECHNICAL SPECIFICATIONS

Performance	
Start-up time	< 2 sec
Housekeeping rate	up to 10 Hz
Motor drive voltage	28.5 V
Max. motor current	0.7 A (configurable)
Motor speed	0-500 full-steps per sec.
Thermistor accuracy	±1.5°C in range -40°C to +110°C
Potentiometer accuracy	±0.3% of full-scale
Standby power consumption	< 9 W

Environment	
Size	180 x 180 x 136 mm
Mass	4.3 kg
Operating temperature	-20°C to +40°C
Non-operating temperature	-25°C to +55°C
Cold start	-30°C
Radiation	TID typ. 50 kRad (Si)

Interfaces	
Communication	redundant RS-422
Primary power bus	+28 V (unregulated)
External thermistors (motor monitoring)	
Coarse and fine potentiometers for each motor actuator	
Micro-switches (NC+NO)	

esc Aerospace

Products & Services

esc Aerospace

escQTN

Quantum Trusted Node

Key building block of your QKD (Quantum Key Distribution) infrastructure and your getaway to existing or future satellite or terrestrial QKD solutions.

Contact us
+ 420 284 683 784
info@esc-aerospace.com
www.esc-aerospace.com

esc Aerospace as product neutral systems integrator and HW/SW product developer with a focus on Space and Defence offers: Mission Critical Software; Multipurpose Drive Electronics; On-Board Systems; DPU with subsystems MMU, PCDU, RTU, SDR; Space qualified On-board Computer (OBC, OBDH); Secure Communication; SATCOM, QKD; True Random Generator; Payloads: Hyperspectral Cameras, Lidars, Ionizing Radiation Detectors Space Pix: EGSEs/SCOEs; Avionics for Unmanned Systems.

esc Aerospace

escQTN

Quantum Trusted Node

Key building block of your QKD (Quantum Key Distribution) infrastructure and your getaway to existing or future satellite or terrestrial QKD solutions.

MAIN BENEFITS

- Streamlined transfer of quantum keys to the end users
- Point-to-point data transfer using quantum keys
- Secure data storage with data access auditing features
- Flexible connectivity that allows you to build your own QKD network that suits your needs

TECHNICAL SPECIFICATIONS

Features	
Fiber channel max. length	20/40/80 km
Key storage capacity	30.000 keys
Data storage capacity	960 KiB
Secure Erase	Yes
Classification	call*

Interfaces	
GNSS	2x
Fiber channel	2x
Ethernet ports	4x
USB	2x
LCD	E-paper
QKD Terrestrial	call*
QKD Satellite	call*

Environmental parameters	
Power Supply Input	12 V ±10%
Operating temperature range	+5°C to +55°C
RoHS compliance	Yes
CE Safety	IEC 62638-1:2018 IEC60825-1:2014

Dimension	
Width	19''
Height	2U

Contact us
+ 420 284 683 784
info@esc-aerospace.com
www.esc-aerospace.com

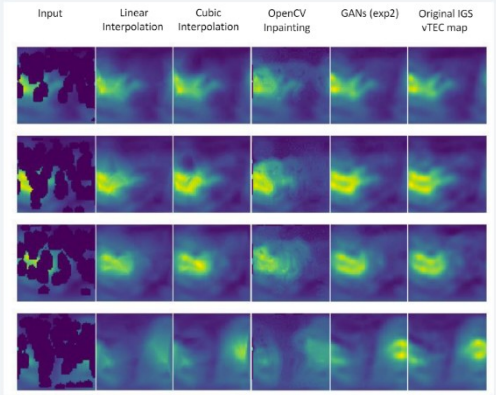
esc Aerospace

Products & Services

escAI in Space

GERANIUM

The project researches the applicability of Generative Adversarial and Neural Networks in Earth observation, focusing on scenarios with limited source data. The developed methods can provide more accurate results than conventional methods.



Contact us
+ 420 284 683 784
info@esc-aerospace.cz
www.esc-aerospace.com

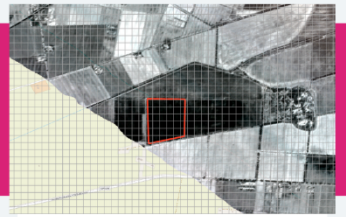
esc Aerospace as product neutral systems integrator and HW/SW product developer with a focus on Space and Defence offers: Mission Critical Software; Multipurpose Drive Electronics; On-Board Systems; DPU with subsystems MMU, PCDU, RTU, SDR; Space qualified On-board Computer (OBC, OBDH); Secure Communication; SATCOM, QKD; True Random Generator; Payloads: Hyperspectral Cameras, Lidars, Ionizing Radiation Detectors Space Pix; EGSEs/SCOEs; Avionics for Unmanned Systems.

esc Aerospace

escAI in Space

GERANIUM

The project researches the applicability of **Generative Adversarial Networks** and **Neural Networks** in general in Earth observation. It focuses on cases where a lack of source data is present. The applicability is demonstrated through two scientific problems described below.



Generation of thermal-infrared features

The developed method identifies relations between ground and aerial thermal-infrared data through inversion models based on deep learning. The problem with production of input data is solved by augmenting training datasets using generative models of artificial intelligence. In comparison with state-of-the-art models improvement can be seen.

Data sets for vertical Total Electron Content models

The goal is to use generative models as gap a filler, how they can improve density of points in Global Ionosphere Maps and if data sets from anomalies can be produced as well as for using them as synthetic ionospheric (i.e. in case of geomagnetic storms). Finally, the Neural Network prediction model developed at ESTEC is applied and the results validated.

POSSIBLE APPLICATIONS

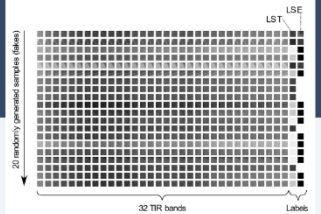
- Quality checks of EO data
- Processing FLEX data (or any other where gorund/aerial or space relations are researched)
- Processing GNSS Reflectometry data

BENEFITS OF DEVELOPED METHODS

Cost efficiency
The primary goal is to reduce overall expenses associated with data collection.

Targeted data acquisition
The methods allow for the collection of only the specific data fragments necessary for training the Neural Network relevant to the specific problem.

Universal application
Once developed, the methodology can be applied across a wide range of similar problems.



Contact us
+ 420 284 683 784
info@esc-aerospace.cz
www.esc-aerospace.com

Making things fly | esc Aerospace © 2026

esc Aerospace

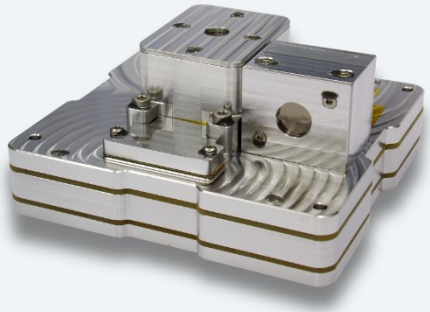
Products & Services

esc Aerospace

esc2SD

SPACEPIX DOSIMETRY SYSTEM

A compact Space Dosimetry System designed for CubeSat platforms. Powered by a 32-bit ARM processor, it controls SXRM and SXM detectors and efficiently processes collected data.



Contact us
+ 420 284 683 784
info@esc-aerospace.cz
www.esc-aerospace.com

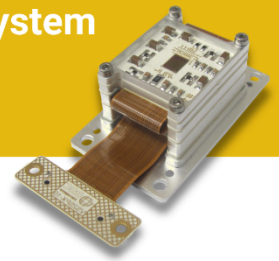
esc Aerospace as product neutral systems integrator and HW/SW product developer with a focus on Space and Defence offers: Mission Critical Software; Multipurpose Drive Electronics; On-Board Systems; DPU with subsystems MMU, PCDU, RTU, SDR; Space qualified On-board Computer (OBC, OBDH); Secure Communication; SATCOM, QKD; True Random Generator; Payloads: Hyperspectral Cameras, Lidars, Ionizing Radiation Detectors Space Pix; EGSEs/SCOEs; Avionics for Unmanned Systems.

esc Aerospace

esc2SD

SpacePix - Dosimetry System

A unique Space Dosimetry System built for CubeSat platforms. The sensor flew on the satellite VZLUSAT-2, launched in 2022. The powerful data processing system is based on a 32-bit ARM processor, which controls two detectors: SXRM and SXM, and processes the acquired data.



SXRM (SpacePix Radiation Monitor)

A radiation monitor based on the revolutionary SpacePix® ASIC for a wide range of space radiation monitoring applications, featuring:

- Designed for charged particle energy and particle species determination
- Provides pattern recognition techniques and partial reconstruction of the particle trajectory
- Supports operational modes of radiation imaging, clustering, tracking, and LET (Linear Energy Transfer) histogramming
- Includes alert capability in the event of elevated radiation
- Enegry ranges for particle species determination
  - 80 keV - 10 MeV (electrons)
  - 1.5 - 150 MeV (protons)
  - 0.5 - 100 MeVcm^2 mg^{-1} (heavy ions)

The detectors of 2SD SpacePix® are directly sensitive to galactic cosmic rays, solar wind, and trapped radiation electrons and protons.

The proton energy detection threshold is 1.5 MeV, electron energy detection threshold is 80 keV (SXRM). Particle identification capability by analysis of the detector hit signature is also available.

SXM (Soft X-Ray Monitor)

Based on the XChip03 SXR ASIC, the SXM detector is designed to measure the flux and spectrum of soft X-rays photons emitted during transient events in the solar magnetosphere, such as X-Ray flares during magnetic reconnection.

- Sensitive to photons in energy range 4 to 20 keV
- Maximum X-ray flux of 10^5 photons cm^{2}s^{-1}
- Charged particle discrimination functionality
- Data products include raw frames, X-ray flux and spectra

TECHNICAL SPECIFICATIONS

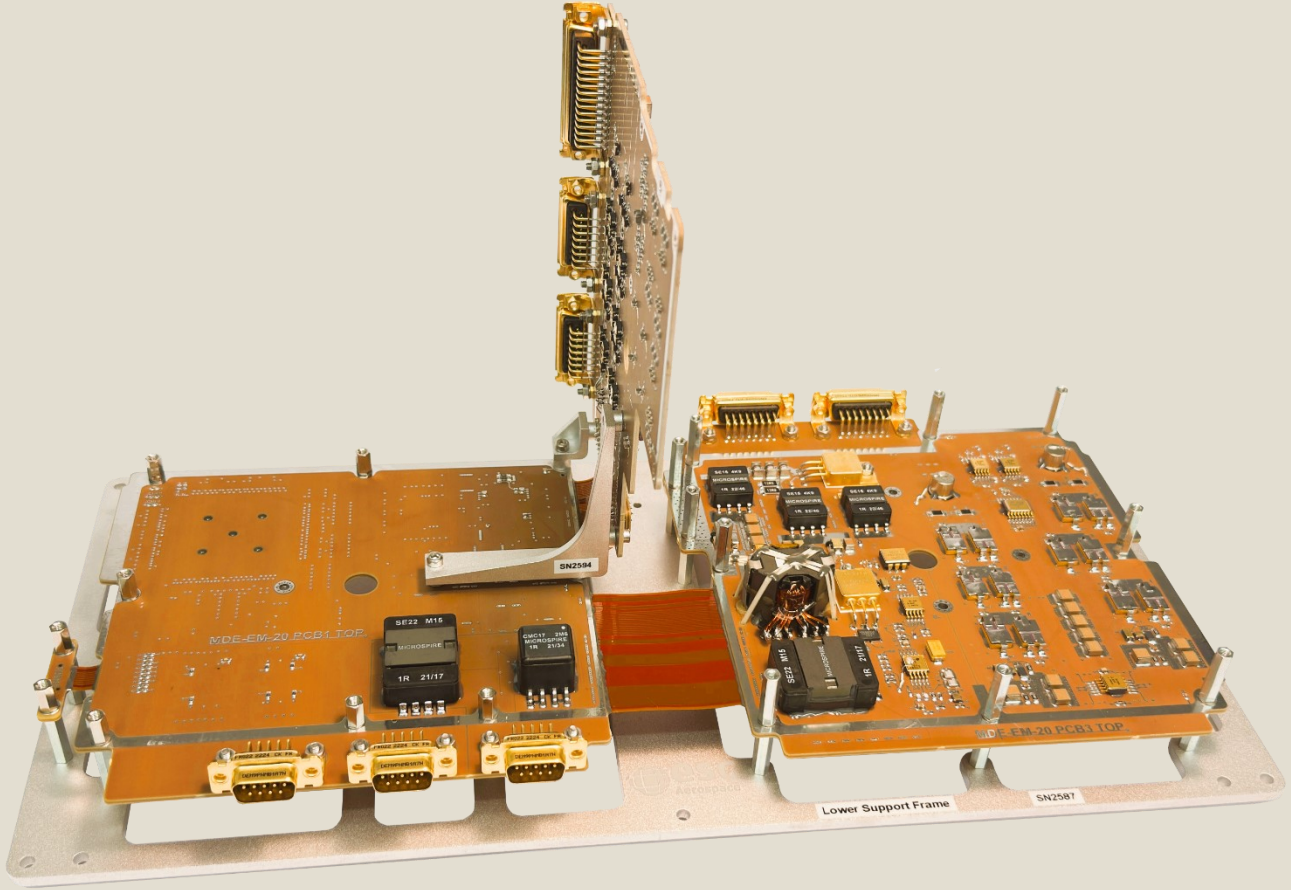
Features	
Dimensions	90 x 96 x 45 mm
Mass	300 g
Operating temperature	-40°C to +65°C
Average power consumption	~150 mW (peak 550 mW)
Power supply	3.3 V / 5V
Communication	CAN bus or RS-422

Contact us
+ 420 284 683 784
info@esc-aerospace.cz
www.esc-aerospace.com

Making things fly | esc Aerospace © 2026

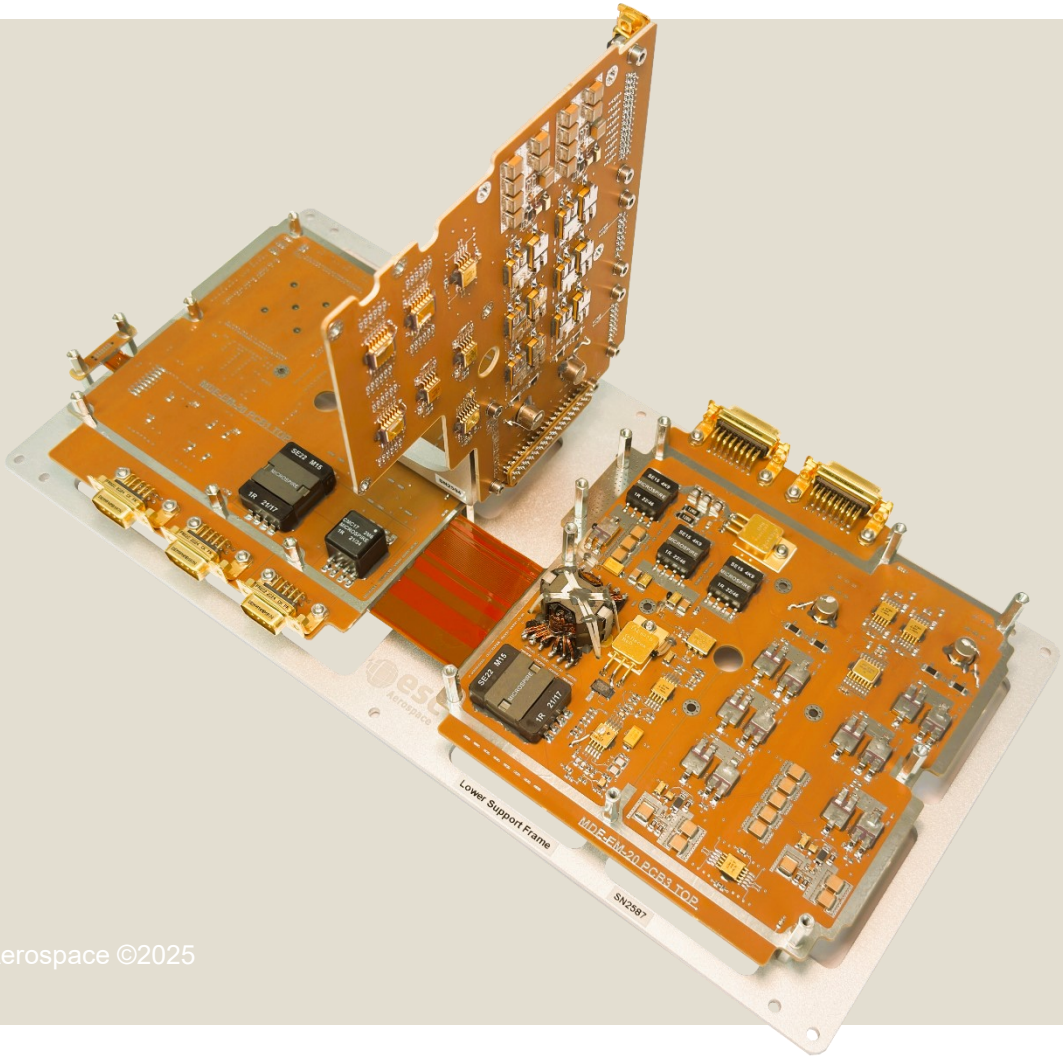
esc Aerospace

Products & Services



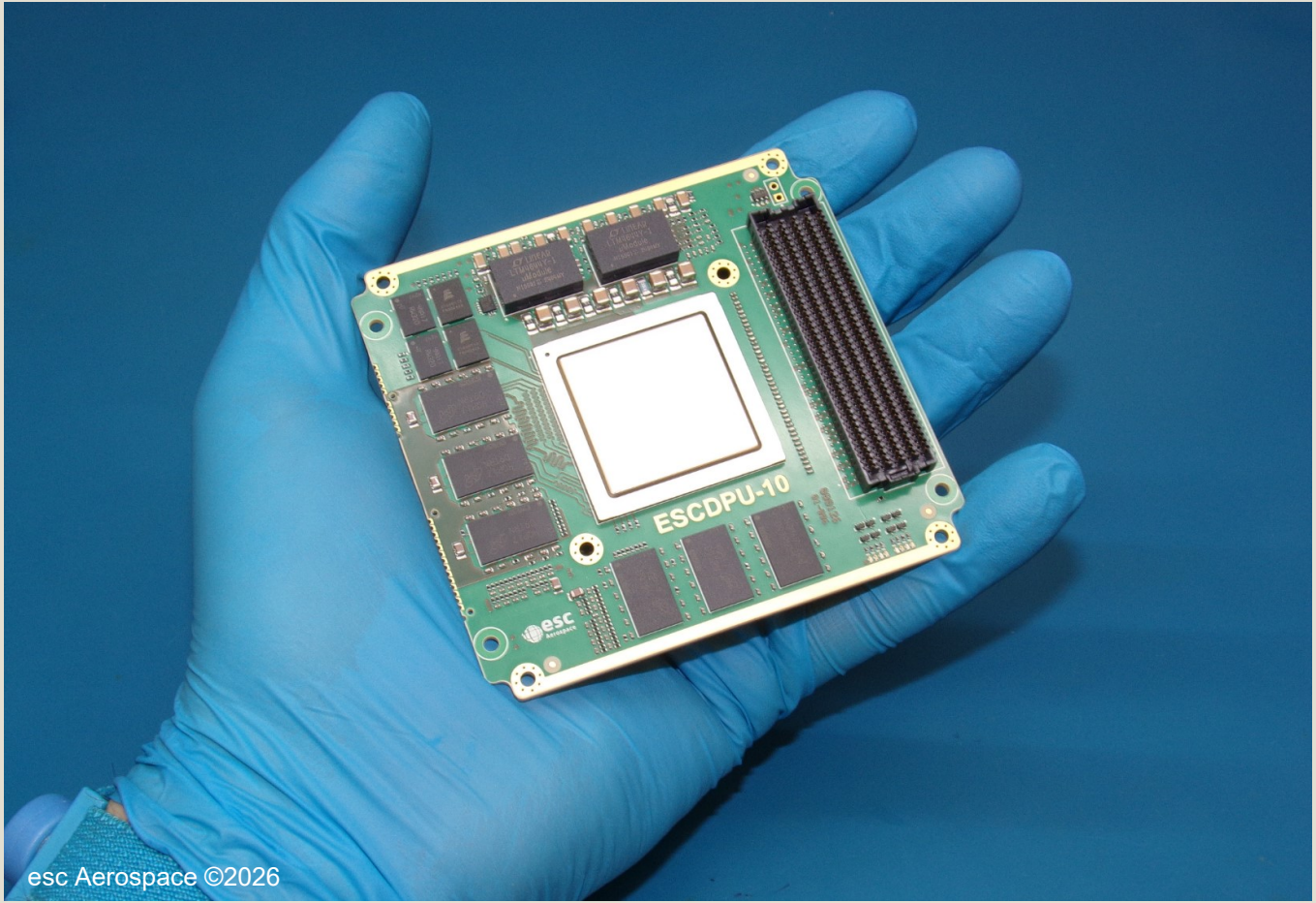
esc Aerospace

Products & Services



esc Aerospace

Products & Services



esc Aerospace

Products & Services

esc Aerospace

Meet us & Contacts

Richard Sysala, CEO

Meet us, SPEXA Tokio 5/26, Eurosatory Paris 6/26, Space Tech Expo Bremen 11/26

Call & Write us, +420 604 347 014, richard.sysala@esc-aerospace.com

Visit us, Cs. armady 14, Prague, Czech Republic, Europe

Distributors, Hamburg, Prague, Munich, Orlando, Perth, Toronto, Seoul