

# TRISKEL

## OBC+TTC+OSW SOLUTION



TRISKEL is an integral solution for CubeSats command and data handling and communications that integrates the core of any platform, the OBC, TTC and OSW in one single module.

“Always-on” operation and “no-code” development for standard CubeSat missions. Customizable for high requirements and unique missions.



**OBC:** On-board Computer  
**TTC:** Telemetry, Tracking, and Command  
**OSW:** On-board Software

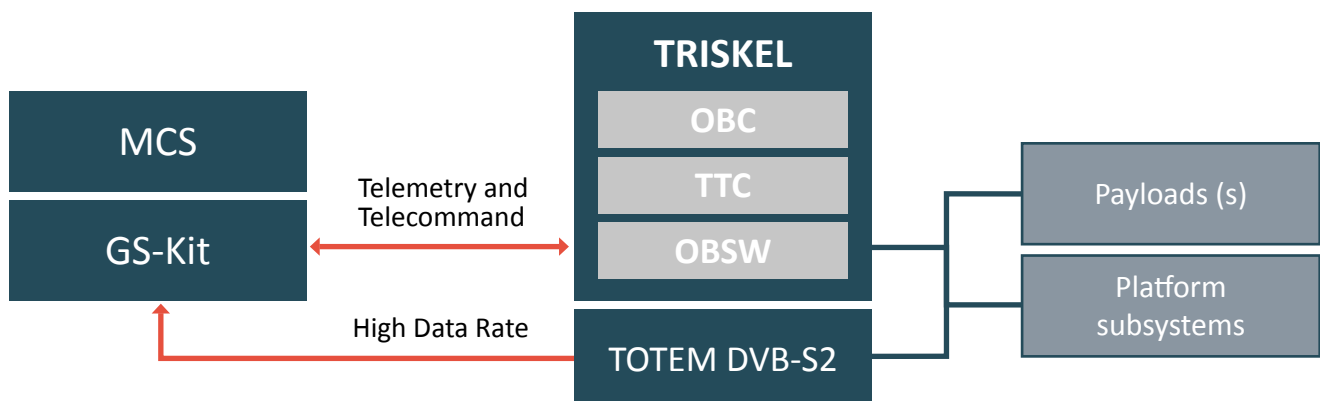
## Features

- Platform and subsystem agnostic command and data handling solution based on ECSS/ESA PUS standard.
- Independent Cortex-M7 microcontrollers for the OBC and TTC radio interface.
- Watchdog for single-event upset (SEU) and software error protection.

## Characteristics

- PC/104 board with shielding for radiation protection and better thermal stability.
- Operation temperature: -30°C to +85°C
- Integrated temperature and current sensors.

## Complete Data Handling Chain



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www.alen.space  
info@alen.space  
+34 986 119 366

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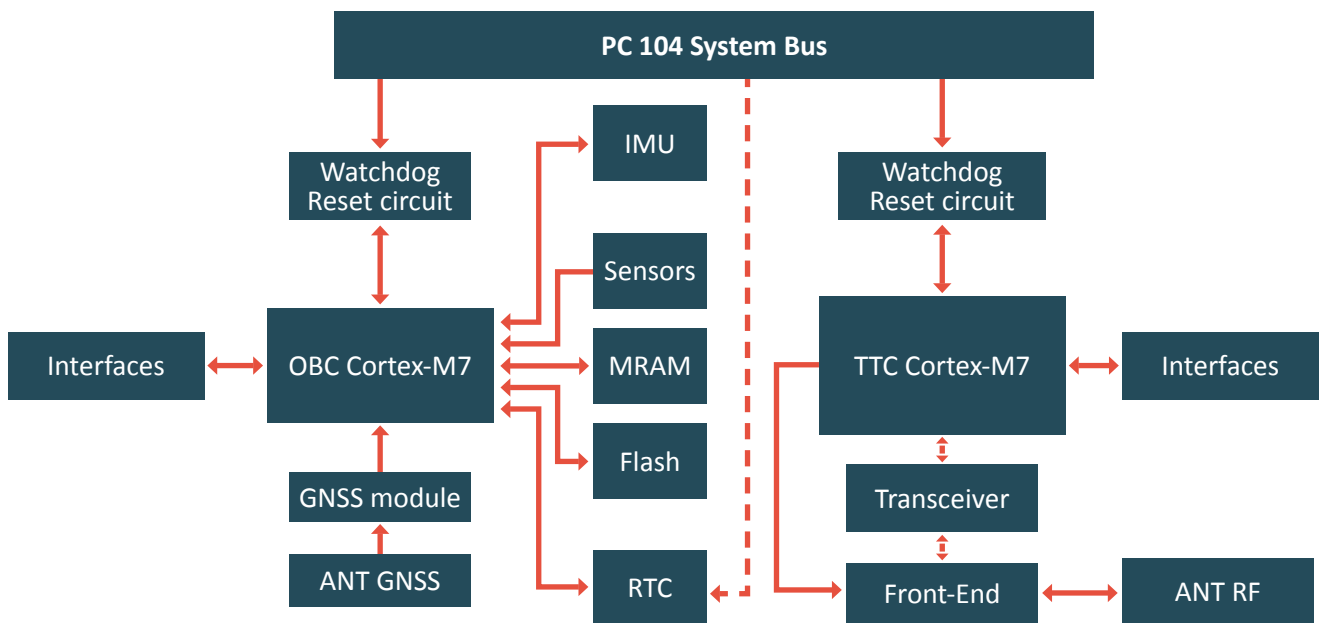


### Integration and Compatibility

- Plug and Play<sup>1</sup>
- Interfaces: CAN, 2xI2C, 2xRS-422, 2xUART, PL3, TTC UART, SPI, 2xRS422/RS485, PPS, 8xGPIO, 8xADC, 3xPWM
- Umbilical: UART, GPIO, JTAG

<sup>1</sup>Many vendors compatible out of the box

OBC SPECIFICATIONS	TTC SPECIFICATIONS	OSW	
		Core Services	Additional Services
<ul style="list-style-type: none"> <li>• Up to 280 MHz dual Cortex-M7</li> <li>• Real-time clock</li> <li>• Persistent memory:                             <ul style="list-style-type: none"> <li>· Program: 2 MB (Flash)</li> <li>· Data storage: 1 Gb (NAND)</li> <li>· External RAM: 8Mb (MRAM)</li> </ul> </li> <li>• Internal RAM: 640 kB</li> <li>• Massive storage: 2x MicroSD</li> <li>• IMU: Magnetometer, gyroscope</li> <li>• Optional internal GNSS module</li> <li>• Sensors: Temperature, current</li> </ul>	<ul style="list-style-type: none"> <li>• Frequency bands:                             <ul style="list-style-type: none"> <li>· UHF 395 - 410 MHz</li> <li>· UHF 430 - 440 MHz</li> </ul> </li> <li>• 400 or 435MHz band frontend</li> <li>• Half-duplex communication</li> <li>• GFSK modulation (GMSK)</li> <li>• Data rates up to 19.2 kbps</li> <li>• Transmission power: 30 dBm</li> <li>• Reception sensitivity: -123 dBm @1.2 kbps</li> <li>• Golay + Reed-Solomon codification</li> </ul>	<ul style="list-style-type: none"> <li>• Event reporting</li> <li>• Housekeeping</li> <li>• Configuration parameters management</li> <li>• Real-time forwarding control</li> <li>• On-board telemetry storage</li> <li>• Scheduler</li> <li>• On-board request sequencing for automation</li> <li>• Telecommand execution verification</li> <li>• On-board time management</li> <li>• Memory management</li> <li>• Test service</li> </ul>	<ul style="list-style-type: none"> <li>• Recovery system</li> <li>• FDIR for software and hardware</li> <li>• TMTC transfer layer</li> <li>• Autonomous payloads monitoring and data collection</li> <li>• PUS based hardware services to manage platform subsystems and payloads</li> <li>• Filesystem and file transmission protocol</li> </ul>



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