

## MASTER OBC

### CUBESAT ON-BOARD COMPUTER

MASTER is 2NDSPACE's flexible OBC, offering high versatility combined with **performances** and **reliability**. The product is designed to ensure high robustness and a wide range of capabilities and interfaces to support CubeSats and nanosatellite platforms to meet most operational-demanding missions.

The product family includes two solutions fully based on 2NDSPACE proprietary IP: MASTER, a flexible OBC designed for a wide range of CubeSat applications, and MASTER II, a cutting-edge solution offering exceptional performance and flexibility for demanding commercial missions and high-end small satellites.

Dual-core processor for real-time operation

Over-The-Air updates for in-orbit software implementation

13 communication interfaces and multiple sensor integrations

Supports FreeRTOS and MBed software ecosystems

Integrated libraries for interface with 2NDSPACE avionics

Integrated libraries for interface with reference COTS

Expandable with CHIEF payload data module,  
adding dedicated payload data processing unit



## PRODUCT FEATURES

|                                    | MASTER                                              | MASTER-CHIEF                                                                                                                               |
|------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions [mm]                    | 97 x 92 x 20                                        | 97 x 92 x 20                                                                                                                               |
| Mass [g]                           | 130 g                                               | 145 g                                                                                                                                      |
| Section 1 Processor                | ARM Cortex M7 @ 480 MHz + Cortex M4 @ 240 MHz       | ARM Cortex M7 @ 480 MHz + Cortex M4 @ 240 MHz                                                                                              |
| Section 2 Processor (Payload data) | -                                                   | Cortex M7 400MHz<br>1MB RAM size with ECC - 2MB Program memory size                                                                        |
| RAM                                | 32 MB SDRAM                                         | 32 MB SDRAM                                                                                                                                |
| Flash Memory                       | 16 MB NOR flash + 1Mb FRAM                          | 16 MB NOR flash + 1Mb FRAM                                                                                                                 |
| Operating System                   | FreeRTOS; Mbed                                      | FreeRTOS; Mbed                                                                                                                             |
| Storage                            | 2x SD slots up to 32GB                              | 3x SD slots up to 32GB                                                                                                                     |
| Interfaces                         | 2x CAN, 2x RS422, 2x RS485, 2x UART, 2x I2C, 2x SPI | 2x CAN, 2x RS422, 2x RS485, 2x UART, 2x I2C, 2x SPI <ul style="list-style-type: none"> <li>High-Speed LVDS Interface &gt;10Mbps</li> </ul> |
| ADC Inputs                         | 8x configurable                                     | 8x configurable                                                                                                                            |
| Sensors                            | 3x IMU 6DOF / 1x Temperature Sensor                 | 3x IMU 6DOF / 1x Temperature Sensor                                                                                                        |
| Operating Voltage                  | 5V                                                  | 5V                                                                                                                                         |
| Peak Power                         | 2W                                                  | 2W                                                                                                                                         |
| Operating Temp.                    | -40°C to +85°C                                      | -40°C to +85°C                                                                                                                             |

## QUALIFICATION AND ACCEPTANCE TEST

|                    | Functional/AIT | Electrical control | Vibration test                                    | Mechanical Shock                                  | TVAC Test                                         |
|--------------------|----------------|--------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| Qualification Test | ✓              | ✓                  | NASA GEVS: GSFC-STD-7000A<br>ESA ECSS-E-ST-10-03C | NASA GEVS: GSFC-STD-7000A<br>ESA ECSS-E-ST-10-03C | NASA GEVS: GSFC-STD-7000A<br>ESA ECSS-E-ST-10-03C |
| Acceptance Test    | ✓              | ✓                  |                                                   |                                                   |                                                   |

# 2NDSpace



**MASTER** is designed to meet the needs of CubeSat platforms from 1U to 16U, offering high versatility and consisting of a dual-core processing unit with integrated memory, data storage, and a comprehensive set of communication interfaces.

- **Modular architecture:** Dual-core processor for real-time operation and high-performance computing
- **Expansion module** for integrating and additional independent OBC
- **OTA Support:** Over-The-Air updates for continuous software improvement
- **Wide Range of Interfaces:** 13 communication interfaces and multiple sensor integrations
- **Compatible Environments:** Supports FreeRTOS and MBed software ecosystems

