

## Spacecraft Onboard Computers

### CDH1

#### Satellite On-Board Command & Data Handling Subsystem with Redundancy



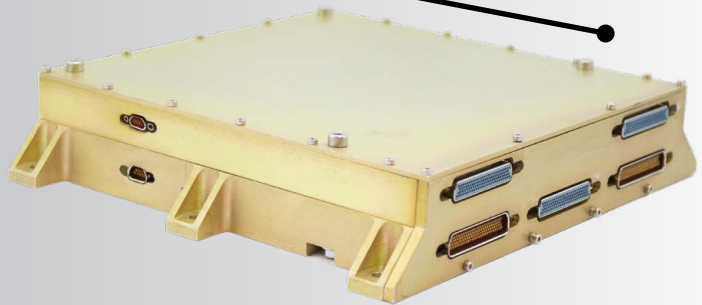
PIONEERING  
SPACECRAFT COMPUTING

The CAVU CDH-1 is a highly reliable and efficient FPGA-based satellite computing system that has been designed with utmost attention to detail. This state-of-the-art system ensures smooth and uninterrupted operation during critical space missions with its flexible architecture that allows for easy scalability and redundancy. The CDH-1 is also equipped with a smart 128CH Analog to Digital Converter card that enhances its capabilities and makes it a top choice for space operations.



INTELLIGENT REDUNDANCY

With precise timing, high throughput, and low power consumption, this powerful computer system can withstand a variety of space environments and guarantee smooth running of your satellite payload. Its advanced features provide automatic system recovery and self-diagnosis, which ensure that your deep-space mission stays on track. With the CAVU CDH-1, you can focus on your space operations and rest assured that your satellite computing needs are in good hands.




#### KEY FEATURES

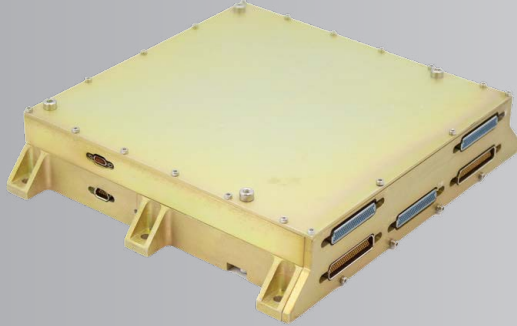
- Flash Based FPGA Architecture
- Separate ADC/DAC Module
  - Double Hot Redundant ADC Converters
- Configurable to more than 1 Module as Redundant:
  - CDH-FS
- Up to 3 Selectable Boot Regions from Bootloader
- Fully Customizable



#### ADVANCED SATELLITE COMMAND CONTROL

The CAVU CDH-1 spacecraft module, utilizing advanced Microchip/Microsemi SmartFusion2 & ProASIC3 Flash Based FPGA design, is resilient to space hazards and energy-efficient. It's designed to meet the intricate needs of the satellite industry, offering precise control for satellite systems and supporting a wide range of interfaces and GPIOs. The module allows customization to meet unique specifications, representing the forefront of satellite technology.

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## SPECIFICATIONS



## SPECIAL FEATURES

**Expected Life-time:**

3-5 years in LEO

**On-Board Current & Temperature Monitoring**

**On-Board Watchdog**

**Triple Real Time Clock**

**Hot Redundant On-Board Voltage Converters**



## PROCESSOR

ARM Cortex-M3 on FPGA

Microchip/Microsemi SmartFuion2 Flash Based FPGA

Microsemi ProASIC3 Flash Based FPGA for Interface

FPU on FPGA Upon Request

150 DMIPS @ 128MHz

SoftConsole or Keil Programming and Debug via JTAG



## INTERFACES

### DIGITAL/ANALOG

Digital Outputs (5V/3.3V)	100
Digital Inputs (5V/3.3V)	90
PWM/Pulse Outputs (5V/3.3V)	10
16bits Analog To Digital Converter (-10V~+10V)	128
Digital To Analog Converter (0V~5V)	2

### SERIAL

CAN2.0 Up to 1Mbps	5
Full-Duplex RS422	8
Half-Duplex RS485	8
RS232	1
I2C	1
SPI	1



## MEMORY

**RAM:**

160Mbits MRAM 40 bits width (128Mbits+32Mbits ECC)

**ROM:**

96Mbits MRAM (Configurable as Triple 32Mbits)

**Nonvolatile Flash Memory:**

Total 24Gbit SLC NAND Flash (Triple 8G)

256K Serial FRAM

256M Serial NOR



## ENVIRONMENT

**Radiation Hardness:**

Total Ionizing Dose: 30Krad (Si)/yr

Latch-up Immune

SEE @ 60MeV

**Temperature & Pressure:**

-40°C to +85°C @ 10<sup>-8</sup> bar

**Shocks:**

2000g, 2000-10000Hz

**Random Vibrations:**

14g(RMS) 3-Axis, 20~2000Hz



## BUDGET

**Dimensions:**

205x180x38mm

**Mass:**

1550gr

**Power Supply:**

5V ±5%

**Power Consumption:**

3W ~ 5W



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