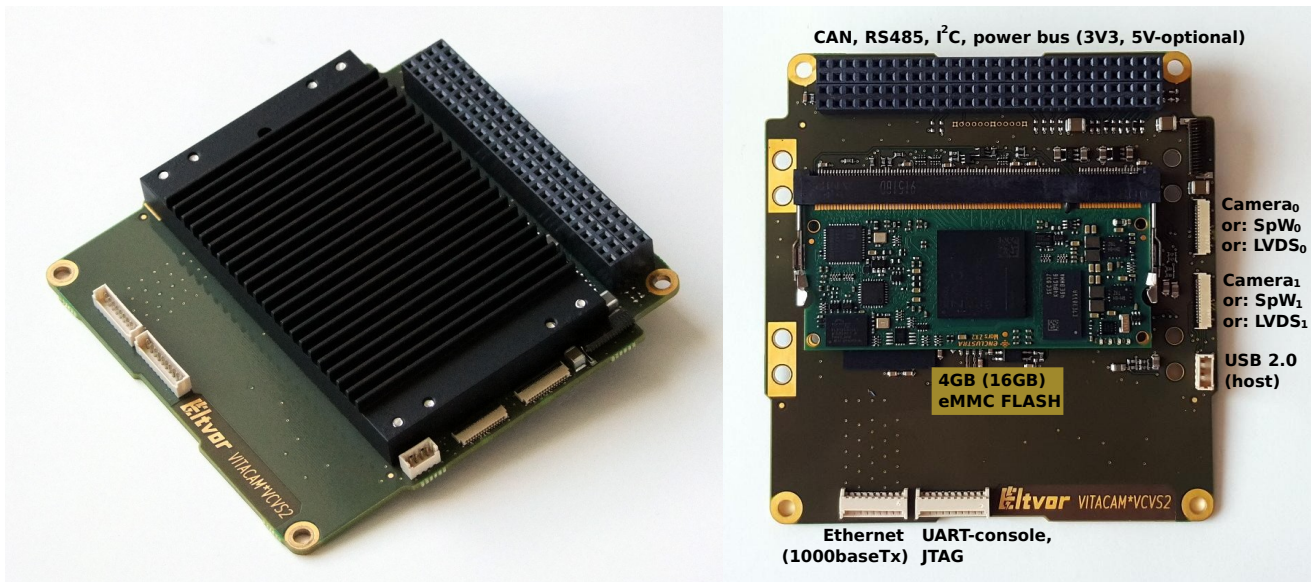


CubeSat (PC/104) on-board computer/FPGA

- originally designed to support two Eltvor vcam1m3 CubeSat cameras
- later re-used without any modification for another additional payload
- two mechanical variants (identical circuit):
 - vcv2 (reduced size: 89 x 72.2 mm)
 - vcv2st (standard PC/104 stack: 89 x 92 mm)



Features

HW:

- 1mm aluminum radiation shield (2 sided)
- high-Tg FR4 laminate for higher mechanical stability
- low-outgassing mask
- fully SnPb soldering (including custom BGA re-ball)
- galvanically isolated EGSE providing USB-UART, Ethernet and JTAG

Firmware/SW:

- redundant booting scheme (protection against FLASH bit flip/erasure)
- umbilical/JTAG scripts allowing to reliably initialize the FLASH

Processing platform

SoC (CPU+FPGA):	Xilinx Zynq 7z010
RAM:	256MB DDR3
PROM:	64MB FLASH for FPGA firmware, OS and user SW 4GB (16GB) eMMC mass storage

Interfaces

CAN	up to 1Mb/s
RS485	currently in use up to 3Mb/s
I2C	
Ethernet	1000baseTx (external magnetics needed)
USB	2.0 host allowing to connect external USB devices
LVDS	via 29pin flexible ribbon connector 2x camera or 2x SpaceWire or generic 14 LVDS pairs
UART	for SoC console
JTAG	for programming and in-system debugging

Power bus

3V3	mandatory for SoC
5V	optional for cameras
switches	3 independent power switches for: <ul style="list-style-type: none">• 2 cameras• eMMC mass storage

Tests and heritage

thermal-vacuum:	passed (EM: March 2020, PFM: August 2020)
vibration and shock:	passed (EM: July 2020, PFM: August 2020)
radiation test:	not yet performed awaiting in-orbit test or Co-60 TID opportunity
mission heritage:	<ul style="list-style-type: none">• 2 x vcvs2st for two payloads on board of VZLUSAT2• dual EO camera• X-ray camera• launch expected December 2020--January 2021