

ORIGAMI MODULE B20

production module with extreme connectivity

driven by a FPGA, the B20 features a modular architecture allowing the combination with any of the ORIGAMI carrier board, as the B21 or the C10

Application fields

- advanced video
- Video system cloud computing



► Overview

The Origami B20 Module is a production module with extreme connectivity and processing power.

With its **business card size** and its dedicated Z-Ray connector, the B20 can easily be integrated onto standard (as B21 or C10) or custom carrier boards to perfectly fit every application.

The B20 is organized around a Xilinx Kintex UltraScale 060 FPGA. The B20 features 2 banks of high bandwidth DDR4 memories. It incorporates on-board DC-DC converters.

The B20 offers special provision for **security**. It allows to secure IP-Cores, Firmware and processed content with strong encryption, key management and physical security enclosure. It includes a battery powered real time clock and tamper detection circuitry with FPGA bitstream encryption.

The B20 is particularly convenient for **advanced video** applications. It is capable of handling multiple video codecs and of interfacing and processing video streams up to 8K UHD-2 in uncompressed & TICO and up to 4K UHD-1 in uncompressed, TICO, JPEG 2000, HEVC IP, AVC and MPEG 2.

Using his extreme connectivity the B20 is made to support up to 100Gigabit Ethernet and future 24G-SDI streams.

► Ready to use

Combine the B20 module with an existing carrier board (B21 or C10) or make your own design



ORIGAMI B21
application driven carrier board

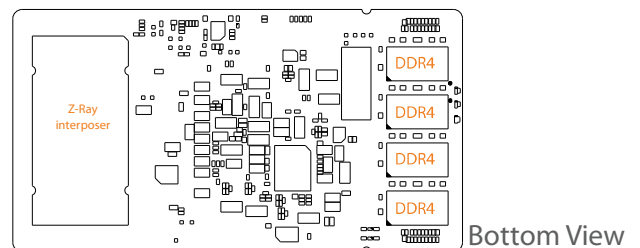
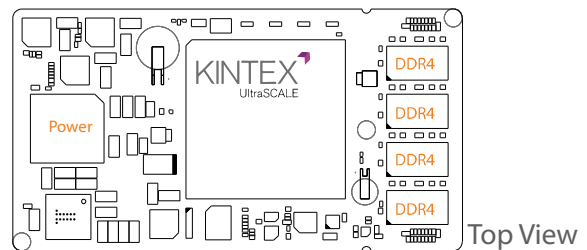
ORIGAMI C10
PRO-AV application carrier board



► Features

Interfaces	Interposer connector - 2 unit Module (Z2-50) <ul style="list-style-type: none"> • 23 x 50 pins • 28x Gigabit Transceivers • JTAG • HPIO / HRIO • I²C & ISP control bus • 12V & 3,3V Power lines LEDs for debug
Security	RTC with battery back-up Tamper Detection on Security Enclosure FPGA encryption
On board Clock	200 Mhz Oscillator +- 30ppm 300 MHz Oscillator +- 10ppm
FPGA	Xilinx Kintex UltraScale: XCKU060 -2 speed grade in FFVA1156 package
Memory	4GByte DDR4 SDRAM: 16Gbits per bank 2 banks x (4 chips x 256Mbits depth x 16 width)
Flash Mem	512 Mbit Configurable flash
Dimensions	2 Unit Origami Module 93.75 x 52.60 x 20 mm

► Hardware Diagram



ORIGAMI CARRIER B21

application driven carrier board

combined with the B20 ORIGAMI module and with its 3 SFP cages, the B21 allows interfacing through PCIe, 12G-SDI, HDMI, 10GEth, in copper or fiber version

Application fields

- advanced video
- 8K video streams
- 12G-SDI
- 10G-ethernet



► Overview

The Origami B21 Carrier offers a flexible PCIe platform to experiment and deploy fast and efficiently high end video applications using the extreme power and connectivity of the Origami B20 Module.

With its **half-height half-length low profile** PCIe size, the B21 can easily be integrated into any PC based systems.

Featuring a PCIe GEN3 x8/x16 bus, the B21 can reach throughput supporting up to uncompressed **8K-60p** video streams simultaneously as input and output.

With its **3 SFP cages**, the B21 allows interfacing through **12G-SDI, HDMI, 10 Gb Ethernet**, in copper or fiber version.

Coupled with the Origami B20 Module, the B21 is particularly convenient for **advanced video applications**. It is capable of handling multiple video codecs and of interfacing and processing video streams up to 8K UHD-2 in uncompressed & TICO and up to 4K UHD-1 in uncompressed, TICO, JPEG 2000, HEVC IP, AVC and MPEG 2.

► Reference Designs & Development Kits

A set of development kits are available (under license) to help you develop your own carrierboard:

Hardware Development Kit (HDK)

- Interposer schematics, PCB layout
- Interposer reference design and pinout
- Reference design, Bill of Materials

Software Development Kit (SDK)

- API

Firmware Development Kit (FDK)

- Pre-validated IP-cores and pre-build firmwares
- **QuickPlay** tool to develop firmwares in HLS

► Features

Interfaces	3x SFP Cages - MSA and non-MSA compliant PCIe Gen3 up to x16 Interposer connector Z2-50 for 1 (or 2) unit Origami Module(s) <ul style="list-style-type: none"> • 6x Gigabit Transceivers toward the 3 SFP Cages • 16x Gigabit Transceivers toward the PCIe bus • 2x JTAG • HPIO / HRIO • I²C & ISP control bus • 12V & 3,3V Power lines USB and JTAG connectors for module programming Reset buttons and LEDs for debug
Clock	2x Clock Generators based on 48MHz oscillators 1x Clock Generator based on 25MHz oscillator
Dimensions	Low Profile - Half length - PCIe card 68.90 x 167.65 mm

► Hardware Diagram

