

# ONYX-HD

## HD Video situation awareness rugged computer



### ► RTCA DO-160 & MIL-STD Qualified COTS VIDEO Computer to capture, process, display with augmented reality, encode and stream new HD EO/IR sensors

ONYX-HD consists of fully integrated Video computing engine ready for deployment in SWaP-C extreme environment. It allows the unit to fit easily into available nooks on any platform making it ideal for situation awareness applications embedded in mobile space constrained such as manned & unmanned aircrafts, MALE and Tactical UAS, civilian and military helicopters, ground vehicles...

Qualified ONYX-HD profiles slash design risk, lower costs and speed deployment thanks to risk-lowering of proven technology, stress tests passed for maximum loads, saving up to \$60,000 and 2 months campaign.

ONYX-HD profile is based on modular mezzanines concept that offers customer a large flexibility and Long Life Management with revision control. It employs cutting edge Heterogeneous System Architecture composed with Intel® multi-core i7, KINTEX 7 capture engine added to the last generation AMD E8860 GPU dedicated to parallel image computing task to meet a wide variety of civilian and military with advanced Augmented Reality features like Video and Data Management, Digital Moving Map, Tactical Video Overlay, Mission Management System.

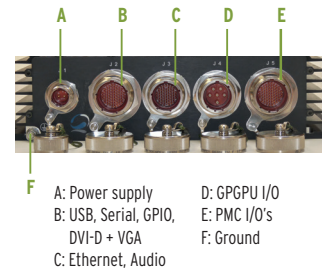
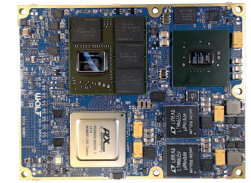
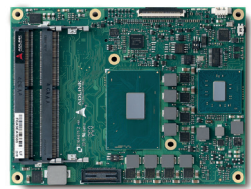
Particularly attention has been made on embedded image processing thanks to GPGPU/FPGA features that specifically targets high end HD-SDI digital and broadcast SMPTE inputs and outputs with augmented reality in real-time (ONYX-HD latency is less than 100ms glass to glass), H.264 AVC compression and EAS-NI encryption. Long life AMD E8860 GPGPU offer up to 768 GFLOPS parallel computing engine. Internal I/O routing from the backplane to the front panel MIL-DTL-38999 connectors is by means of solid-state transition module. It provides cable-free higher reliability and improved high speed signal integrity for HD-SDI throughputs.

- > INTEL Multi-Core i7 + KINTEX 7 + AMD E8860 with up to 768 GFLOPS GPGPU engine
- > 2x 3G/HD-SDI inputs
- > 2x HD-SDI outputs
- > 2x Analog NTSC/PAL inputs for legacy sensors
- > 1x VGA + 1x DVI-D Single Link (Intel HD Graphic)
- > H.264/AVC video encoding with streaming capabilities
- > Linux Metadata extraction/insertion
- > Embedded EGNOS-capable GPS
- > PMC and mini PCI Express sites for flexible I/O expansion and Wireless functions

- > Cable-free, fan less, MIL-DTL-38999 connectors
- > Real cold start at -40°C and up to +71°C operating temp (depend on configuration and cooling system)
- > Standard BOM Qualified DO-160F and MIL-STD-810G/461F/1275D/704
- > IP-67 Ingress protection
- > ITAR free without export control
- > Long Life Management with revision control
- > Only 80 Watts power consumption
- > High flexibility to Modified COST services
- > BIT functions

## System specifications

<b>Processor Module</b>	COM-Express Basic Size
Processor 6 <sup>th</sup> Generation Intel	Mobile 6 <sup>th</sup> Generation Intel® Xeon® and Core™ Processors - 14nm ("Skylake-H") Xeon® E3-1505L v5 2.0/2.8GHz (Turbo), 0.35-1.0GHz (Graphics), 8M, 25W (4C/GT2) Core™ i7-6822EQ 2.0/2.8GHz (Turbo), 0.35-1.0GHz (Graphics), 8M, 25W (4C/GT2)
Memory	Dual channel 1867/2133 MHz DDR4 memory up to 32GB
Processor 4 <sup>th</sup> Generation Intel	4 <sup>th</sup> Generation Intel® Core™ i7 Processors (Mobile) - 22nm ("Haswell") i7-4860EQ 2.4 GHz (3.2 GHz Turbo), 47W (4C/GT3) i5-4400E 2.7 GHz (3.3 GHz Turbo), 37W (2C/GT2) i5-4402E 1.6 GHz (2.7 GHz Turbo), 25W (2C/GT2)
Memory	Dual channel with ECC 1600/1333 MHz DDR3L memory up to 16GB
<b>Video outputs (Intel HD Graphic)</b>	1x VGA* + 1x DVI-D Single Link
<b>Video inputs / outputs (GP-GPU)</b>	Powered by the E8860 AMD GP-GPU (clocked at 300MHz) 2x 3G-SDI inputs, SMPTE-424M, 1080p60 or 2x HD-SDI inputs, SMPTE-292M, 1080p30 2x HD-SDI (or 2x DVI outputs on demand) 2 analog NTSC/PAL/SECAM inputs
<b>Ethernet</b>	3x 10/100/1000 BaseT
<b>Serial</b>	4x RS232/RS422/RS485 (software configurable)
<b>USB 2.0</b>	4x USB2.0 High / Full / Low speed
<b>USB 3.0 (38999 USB Field)</b>	With miniPCIe card. Limited to 250MBytes /sec, on rear panel
<b>Audio</b>	Intel® High Def Audio: 1x In and 1x Out Lines
<b>Discret I/O</b>	8x GPIO LV TTL - Reset, Power Button, Power Led, HDD Led, Fast Erase
<b>I/O expansion slots</b>	1x PMC slot 1x miniPCIe slot
<b>GP-GPU expansion slots</b>	Powered by the MXC-E8860-MVHD card
<b>Solid state disk (SSD) (internal)</b>	1x SSD 2.5" slot (MLC or SLC) - 1x cFast slot (MLC or SLC)
<b>Hardware monitoring</b>	Voltages, CPU, GPU, and carrier board temperatures
<b>Watchdog timer</b>	Programmable timer range to generate RESET



## Power supply

<b>Power Input</b>	+28VDC (+10VDC up to +36VDC) Hold-up capacitors for momentary power interruption protection (approx 120ms) MIL-STD-1275D / DO-160F / MIL-STD-461F / MIL-STD-704
<b>Power consumption</b>	Less than 90W

## SWaP-C constraints

<b>Size (WxDxH)</b>	270mm x 250mm x 88mm (2U)
<b>Weight</b>	7kg
<b>Cooling type</b>	Convection & radiation by fins, conduction by cold plate (conduction cooled inside)
<b>Connectors</b>	Military circular IP67 locking connectors (MIL-DTL-38999) Customizable front panel for specific application

## Environmental Qualification Tests

<b>Operating temperature</b>	-40°C / +71°C (depend on configuration and cooling system)	<b>Salt fog</b>	50% salt spray / 96h (DO-160F)
<b>Storage temperature</b>	Storage: -40°C / +85°C	<b>Dust</b>	Wind and fine dust particles (DO-160F)
<b>Ingress protection rating</b>	IP67	<b>Operating shock &amp; vibration</b>	MIL-STD-810G / DO-160F
<b>Altitude</b>	Up to 15000 feet (DO-160F)	<b>EMI / RFI</b>	MIL-STD-461F / DO-160F
<b>Humidity</b>	0%-95% relative humidity (DO-160F)	<b>CE certification</b>	EMC: 2014/30/UE ; EN 61000-6-2, EN55032, EN 55024 - SAFETY: 2014/35/UE ; EN60950-1 : 2006 2 <sup>nd</sup> edition A11 : 2009 + A1 : 2010 + A12 : 2011 + A2 : 2014

## Software corner

<b>Operating system</b>	Linux 32/64-bit. For other requirements, contact ECRIN Systems
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## Security & dependability

<b>Trusted platform module</b>	Atmel AT97SC3204; TPM 1.2/2.0 (TPM 2.0 release later)
<b>Built-In-Test</b>	BIT, monitoring functions library, maintenance L2 with SEMA library

## Export control classification

	ITAR Free - No export control (ECCN 4A003)
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## Other specifications

<b>Reliability</b>	Designed and manufactured using ISO 9001:2015 Certified Quality Program
<b>MTBF</b>	Calculated per MIL-HDBK-217F, available upon request
<b>Regulatory compliance</b>	European CE Mark, REACH, RoHS, WEEE
<b>Warranty</b>	1 year return to depot warranty (extended warranty available with service contract)
<b>Starter cable set</b>	Optional starter breakout cable set mates with MIL-DTL-38999 connectors to break out standard CPU I/O and power signals to traditional PC style interfaces for lab or bench testing purposes

\* Not available with Skylake processor

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