ONCILLA MACHINE VISION COMPUTER
CoaXPress over Fiber Frame Grabber System

- Oncilla Industrial PC
- FireBird 4xCOF-12 Frame Grabber
- RISC based ActiveDMA engine technology
- Ruggedized solution for Machine Vision

FEATURES

- 12th Gen Intel Alder Lake-S Series Core i7 12700TE Processor.
- 16GB DDR5 SDRAM.
- 256GB SSD Drive.
- FireBird CoaXPress over Fiber Frame Grabber installed.
- High performance CoaXPress over Fiber Bridge 1.1 with up to 40 Gbps input rate.
- ActiveDMA engine – acquisition with zero CPU usage.
- Comprehensive I/O including end bracket I/O.
- Supports PoCXP (Power over CoaXPress).
- Full GenICam support (including GenTL Producer).
- Proven ActiveCapture & ActiveSDK included.

OVERVIEW

Oncilla Machine Vision Computer – CoaXPress over Fiber is a rugged and compact industrial PC designed specifically for capturing and transmitting high-quality images and video while leaving plenty of compute power for other processing tasks. Incorporating a FireBird Quad COF-12 Frame Grabber and preinstalled operating system plus Active Silicon software and software development kit produces a complete machine vision system.

Oncilla systems are designed and thoroughly tested with Active Silicon's latest software and firmware and are part of the continuing regression testing program for new firmware and software releases. The PC hardware has passed multiple international certifications including those for rail and military industries, ensuring stable and reliable performance in diverse harsh environments. The system is designed with longevity in mind using long-term availability components and processor, the same system configuration availability is targeted at a minimum of seven years.

Having a known good platform to build a vision system on can save many hours of system integration, and including software as part of the system allows for swift application development. **Oncilla Machine Vision Computers** include a license for ActiveSDK, Active Silicon's Software Development Kit. This provides comprehensive example applications and optimized libraries. Coupled with the installed ActiveCapture tool for camera and frame grabber control, they allow rapid system development and integration (separate datasheets are available that describe ActiveCapture and ActiveSDK in detail).

Drivers for third party applications are also available such as Cognex VisionPro, HALCON, Common Vision Blox, StreamPix, LabVIEW, Matlab etc.

The heart of the **Oncilla Machine Vision Computer** is the FireBird Quad COF-12 Frame Grabber. CoaXPress over Fiber gives high speed data, and camera control all over a fiber optic cable. Using suitable optical transceivers, cameras can be situated many hundreds of meters from the Oncilla PC and, due to the galvanic isolation of the optical fiber, the camera can be situated in an electrically harsh environment, with no danger to the PC or operator.

Active Silicon was one of the primary authors of the international CoaXPress standard, which is hosted by the JIIA (Japan Industrial Imaging Association). The CoaXPress over Fiber Bridge Protocol v1.1 augments the CoaXPress v2.1 specification.

The **Oncilla system** with integrated FireBird frame grabber is designed for ultimate performance using Active Silicon's proprietary DMA Engine technology, "ActiveDMA". This technical innovation applies RISC based processor techniques and guarantees high speed and low latency image data transfers and zero CPU intervention. Finally, full GenICam support is provided with the frame grabber drivers, and this includes a GenTL Producer for data streaming as well as register accesses. Additional to functions that control the hardware, the libraries include general purpose functions for the manipulation and display of images.

INDUSTRIAL PC SPECIFICATION

Oncilla Industrial PC System:	Processor: • 12th Generation Intel® Alder Lake-S Series CPU: Intel® Core™ i7-12700E (12 Cores / 35W TDP). Chipset: • Intel R680E.
Graphics:	Display Ports: • 1 x VGA connector (1920 x 1080 @ 60Hz). • 2 x DisplayPort connector (4096 x 2304 @ 60Hz). Verified maximum DP resolution (3840 x 2160 @ 60Hz). • 1 x HDMI connector (4096 x 2160 @ 30Hz). Verified maximum DP resolution (3840 x 2160 @ 30Hz). • Supports quad independent displays. Graphics Chipset: • Integrated Intel® UHD Graphics 770.
I/O:	LAN: • 2 x GbE LAN (RJ45) (GbE1: Intel® I219 / GbE2: Intel® I210). COM: • 2 x RS-232/422/485 with Auto Flow Control (Supports 5V/12V) (DB9). USB: • 2 x USB 3.2 Gen2x1 (10 Gbps) (Type A). • 4 x USB 3.2 Gen1x1 (5 Gbps) (Type A). • 2 x USB 2.0 (480 Mbps) (Type A). PS/2: • 1 x PS/2 (6 Pin Mini-DIN Female Connector).
Storage:	Memory: • 16GB 4800MHz DDR 5 SDRAM. SSD Storage: • 256GB M.2 SSD. Storage Expansion (not fitted in standard build) • 1 x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). • 3 x mSATA Socket (SATA 3.0 shared by Mini-PCIe socket).

Storage (cont'd)	
	RAID Support:
	• RAID 0/1/5/10.
Expansion:	PCIe expansion slots:
	• Slot 1: x8 – FireBird 4xCOF-12 frame grabber.
	• Slot 2: x8 – Free for user expansion.
	Mini PCIe slots:
	• 3x Full-size Mini-PCIe socket.
	CMI (Combined Multiple I/O) Interface:
	• 2x High Speed CMI Interface.
	• 2x Low Speed CMI Interface.
	CFM (Control Function Module) Interface:
	• 1x CFM IGN Interface for optional CFM-IGN Module.

FIREBIRD FRAME GRABBER SPECIFICATION

CoaXPress over Fiber Interface:	One QSFP+ (QSFP10) transceiver cage. The 4xCOF-12 frame grabber supports:
	• Direct Attach Copper (DAC) cables (up to 1m in length).
	• 40GBASE-SR4 Optical Transceiver Modules – coupled with MTP/MPO connectors using OM3; maximum cable length is 100m.
	• 40GBASE-SR4 Optical Transceiver Modules – coupled with MTP/MPO connectors and OM4 optical cable; maximum cable length is 150m.
	• 40GBASE-SR Active Optical Cable; maximum cable length is 100m.
	• 40GBASE-LR Optical Transceiver Modules and a suitable LC-Duplex optical cable; maximum cable length is >2km.
	LEDs on the end bracket show the link status according to the CoaXPress over Fiber specification.
Buffer Memory:	Up to 4 Gbytes of DDR4 memory is fitted to the frame grabber for buffering between the card and PC memory.
PCI Express:	PCIe 3.0 (Gen3) 8-lane interface to support up to 6.8 Gbytes/sec transfer from FireBird to the PC, subject to host workload.
I/O:	The following I/O lines are provided for triggers, optical shaft encoders, exposure control and general I/O:
	• 4 opto-isolated inputs.
	• 4 opto-isolated outputs.
	• 4 TTL inputs, 5V tolerant.
	• 4 TTL I/O, 5V logic.
	• 4 RS-422 inputs.
	• 4 RS-422 outputs.
	All these I/O signals are provided on a 50-way header on the FireBird board.
	A 15-way D-Type connector is located on the end bracket and allows access to a subset of the above I/O:
	• 2 opto-isolated inputs.
	• 3 TTL I/O, 5V logic.
	• 2 RS-422 inputs.
	• 1 RS-422 output.
Software:	ActiveCapture – image acquisition and control software. ActiveSDK – C/C++ libraries and example designs.

CONFORMANCE

CoaXPress:	FireBird 4xCOF-12 3PE8 conforms to v2.1 of the CoaXPress specification, and CoaXPress over Fiber Bridge Protocol v1.1.	
Industrial PC Approvals:	EMC	CE, UKCA, FCC, ICES-003 Class A EN 50155 (EN 50121-3-2 Only)
	EMI	CISPR 32 Conducted & Radiated: Class A EN/BS EN 50121-3-2 Conducted & Radiated: Class A EN/BS EN IEC 61000-3-2 Harmonic current emissions: Class A EN/BS EN61000-3-3 Voltage fluctuations & flicker FCC 47 CFR Part 15B, ICES-003 Conducted & Radiated: Class A
	EMS	EN/IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN/IEC 61000-4-3 RS: 80 MHz to 1000 MHz: 20 V/m EN/IEC 61000-4-4 EFT: AC Power: 2 kV; Signal: 2 kV EN/IEC 61000-4-5 Surges: AC Power: 2 kV EN/IEC 61000-4-6 CS: 10V EN/IEC 61000-4-8 PFMF: 50 Hz, 1A/m EN/IEC 61000-4-11 Voltage Dips & Voltage Interruptions: 0.5 cycles at 50Hz
	Safety	UL, cUL, CB, IEC, EN 62368-1
	Shock and Vibration	MIL-STD-810G
FireBird Approvals:	EU	C€ mark for compliance with EMC EN 55022:2010 (class A) and EN 55024:2010 in accordance with EU directive 2014/30/EU. RoHS compliance with RoHS3 directive 2015/863/EU.
	USA	EMC FCC Class A. The printed circuit board is manufactured by UL recognized manufacturers and has a flammability rating of 94V-0.
Oncilla System Approvals:	Full system EMC testing is currently on going, approvals data will be shown soon.	

PHYSICAL AND ENVIRONMENTAL DETAILS

Dimensions (W x D x H):	227 x 261 x 128 mm.
Approximate weight:	5440g.
Power Input:	9-48VDC, 3-pin Terminal Block.
Storage Temperature:	-15°C to +85°C.
Operating Temperature:	0°C to +60°C (ambient environment). (According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14.)
Relative Humidity:	10% to 90% non-condensing (operating and storage).

ORDERING INFORMATION

PART NUMBER	DESCRIPTION
AS-ONC-1402-24W-4XCOF-A	**Oncilla Machine Vision Computer – CoaXPress over Fiber** Standard 2024 1402 chassis PCIe riser with 2 x8 Slots 1x AS-FBD-4XCOF12-3PE8 Microsoft Windows 11, ActiveCapture, ActiveSDK
AS-ONC-220W-PSU	**Oncilla 220W Mains Power Supply Unit** 110/240V AC Input, 24V DC Output Supply including IEC cables for EU, UK, USA.
Other Oncilla Machine Vision Solutions	
AS-ONC-1402-24W-4XCXP-A	**Oncilla Machine Vision Computer – CoaXPress** Standard 2024 1402 chassis PCIe riser with 1 x16 Slot (inc. PEG connector) + 1 x1 slot 1x AS-FBD-4XCXP12-3PE8 Microsoft Windows 11, ActiveCapture, ActiveSDK
AS-ONC-1402-24W-1XCLD-A	**Oncilla Machine Vision Computer – Camera Link** Standard 2024 1402 chassis PCIe riser with 2 x8 Slots 1x AS-FBD-1XCLD-2PE4 Microsoft Windows 11, ActiveCapture, ActiveSDK
Fiber Optic Cable Solutions	
	Please contact Active Silicon for details of fiber optic cabling and optical transceiver solutions.

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