Active Silicon

ONCILLA MACHINE VISION COMPUTER Camera Link Frame Grabber System

- Oncilla Industrial PC
- FireBird Camera Link 80-bit 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 Camera Link 80-bit Frame Grabber installed.
- Supports Base, dual Base, Medium, Full and 80-bit (Deca) modes, with PoCL.
- ActiveDMA engine acquisition with zero CPU usage.
- Comprehensive I/O including end bracket I/O.
- Full GenICam for CLProtocol and GenCP cameras, (including GenTL Producer).
- Proven ActiveCapture & ActiveSDK included.



OVERVIEW

Oncilla Machine Vision Computer – Camera Link 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 Camera Link 80-bit Frame Grabber including support for PoCL 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 etc.

The heart of the **Oncilla Machine Vision Computer** is the FireBird Camera Link 80-bit Frame Grabber. This supports the latest version 2.1 Camera Link specification, including both 80-bit modes: 8-bit 10-tap and 10-bit 8-tap modes – often referred to as Camera Link "Deca", at clock rates up to 85 MHz. The PCIe 2.0 (Gen2) 4-lane interface used on the FireBird is fast enough to cope with the full data rate that the Camera Link Deca interface can support. The FireBird also supports capture from two simultaneous Base Camera Link cameras as well as single Base, Medium and Full configurations.

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

System: • 12th Generation Intel® Alder Lake-S Series CPU: Intel® Core™ 17-12700E (12 Cores / 35W TDP). Chipset: • • Intel R680E. Graphics: Display Ports: • 1x VGA connector (1920 x 1080 @ 60Hz). • 2x DisplayPort connector (4096 x 2304 @ 60Hz). • 1x HDMI connector (4096 x 2304 @ 60Hz). • 1x HDMI connector (4096 x 2160 @ 30Hz). • 1x HDMI connector (4096 x 2160 @ 30Hz). • 1x HDMI connector (4096 x 2160 @ 30Hz). • Supports quad independent displays. Graphics Chipset: • • Integrated Intel® UHD Graphics 770. //O: LAN: • 2x GbE LAN (RJ45) (GbE1: Intel® 1219 / GbE2: Intel® 1210). COM: • • 2x RS-232/422/485 with Auto Flow Control (Supports 5V/12V) (DB9). USB: • • 2x USB 3.2 Gen2x1 (10 Gbps) (Type A). • 4x USB 3.2 Gen1x1 (5 Gbps) (Type A). • 2x USB 2.0 (480 Mbps) (Type A). • 2x USB 2.0 (480 Mbps) (Type A). • 1x PS/2 (6 Pin Mini-DIN Female Connector). Storage: •	Oncilla Industrial PC	Processor:		
Chipset: Intel R680E. Graphics: Display Ports: 1 x VGA connector (1920 x 1080 @ 60Hz). 2 x DisplayPort connector (4096 x 2304 @ 60Hz). 2 x DisplayPort connector (4096 x 2160 @ 30Hz). 1 x HDMI connector (4096 x 2160 @ 30Hz). 1 x HDMI connector (4096 x 2160 @ 30Hz). 1 x HDMI connector (4096 x 2160 @ 30Hz). 2 x DisplayPorts quad independent displays. Graphics Chipset: 1 Integrated Intel® UHD Graphics 770. //O: ////O: //O: //O:	System:	 12th Generation Intel® Alder Lake-S Series CPU: Intel® Core™ i7-12700E (12 Cores / 35W TDP). 		
 Intel R680E. Graphics: Display Ports: 1x VGA connector (1920 x 1080 @ 60Hz). 2x DisplayPort connector (4096 x 2304 @ 60Hz). 2x DisplayPort connector (4096 x 2160 @ 30Hz). 1x HDMI connector (4096 x 2160 @ 30Hz). Verified maximum DP resolution (3840 x 2160 @ 30Hz). Supports quad independent displays. Graphics Chipset: 		Chipset:		
Graphics: Display Ports: • 1x VGA connector (1920 x 1080 @ 60Hz). • 2x DisplayPort connector (4096 x 2304 @ 60Hz). • 2x DisplayPort connector (4096 x 2304 @ 60Hz). • Verified maximum DP resolution (3840 x 2160 @ 30Hz). • 1x 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. //O: LAN: • 2x GbE LAN (RJ45) (GbE1: Intel® 1219 / GbE2: Intel® 1210). COM: • 2x RS-232/422/485 with Auto Flow Control (Supports 5V/12V) (DB9). USB: • 2x USB 3.2 Gen2x1 (10 Gbps) (Type A). • 4x USB 3.2 Gen1x1 (5 Gbps) (Type A). • 2x USB 2.0 (480 Mbps) (Type A). • 2x USB 2.0 (480 Mbps) (Type A). • 2x USB 2.0 (6 Pin Mini-DIN Female Connector). Storage: 1 x PS/2 (6 Pin Mini-DIN Female Connector). Storage: 256GB M.2 SSD. Storage Expansion (not fitted in standard build) • 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). • 3x mSATA Socket (SATA 3.0 shared by Mini-PCle socket). RAID Support: • RAID 0/1/5/10.		Intel R680E.		
 1x VGA connector (1920 x 1080 @ 60Hz). 2x DisplayPort connector (4096 x 2304 @ 60Hz). Verified maximum DP resolution (3840 x 2160 @ 30Hz). 1x HDMI connector (4096 x 2160 @ 30Hz). Supports quad independent displays. Graphics Chipset: Integrated Intel® UHD Graphics 770. //O: LAN: 2x GbE LAN (RJ45) (GbE1: Intel® I219 / GbE2: Intel® I210). COM:	Graphics:	Display Ports:		
 2x DisplayPort connector (4096 x 2304 @ 60Hz). Verified maximum DP resolution (3840 x 2160 @ 60Hz). 1x 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. //O: LAN: 2x GbE LAN (RJ45) (GbE1: Intel® I219 / GbE2: Intel® I210). COM:		 1x VGA connector (1920 x 1080 @ 60Hz). 		
 1x 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. //O: LAN: 		 2x DisplayPort connector (4096 x 2304 @ 60Hz). Verified maximum DP resolution (3840 x 2160 @ 60Hz). 		
 Supports quad independent displays. Graphics Chipset: Integrated Intel® UHD Graphics 770. //O: LAN: 		 1x HDMI connector (4096 x 2160 @ 30Hz). Verified maximum DP resolution (3840 x 2160 @ 30Hz). 		
Graphics Chipset: Integrated Intel® UHD Graphics 770. //O: LAN: 2x GbE LAN (RJ45) (GbE1: Intel® I219 / GbE2: Intel® I210). COM: 2x RS-232/422/485 with Auto Flow Control (Supports 5V/12V) (DB9). USB: 2x USB 3.2 Gen2x1 (10 Gbps) (Type A). 4x USB 3.2 Gen1x1 (5 Gbps) (Type A). 2x USB 2.0 (480 Mbps) (Type A). 2x USB 2.0 (480 Mbps) (Type A). PS/2: 1x 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) 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). 3x mSATA Socket (SATA 3.0 shared by Mini-PCle socket). RAID Support: RAID Support: RAID 0/1/5/10.		Supports quad independent displays.		
 Integrated Intel® UHD Graphics 770. I/O: LAN: 2x GbE LAN (RJ45) (GbE1: Intel® I219 / GbE2: Intel® I210). COM: 		Graphics Chipset:		
 I/O: LAN: 2x GbE LAN (RJ45) (GbE1: Intel® I219 / GbE2: Intel® I210). COM: 		Integrated Intel® UHD Graphics 770.		
 2x GbE LAN (RJ45) (GbE1: Intel® I219 / GbE2: Intel® I210). COM: 2x RS-232/422/485 with Auto Flow Control (Supports 5V/12V) (DB9). USB: 	I/O:	LAN:		
COM: 2x RS-232/422/485 with Auto Flow Control (Supports 5V/12V) (DB9). USB: 2x USB 3.2 Gen2x1 (10 Gbps) (Type A). 4x USB 3.2 Gen1x1 (5 Gbps) (Type A). 2x USB 2.0 (480 Mbps) (Type A). PS/2: 1x 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) 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). 3x mSATA Socket (SATA 3.0 shared by Mini-PCle socket). RAID Support: RAID 0/1/5/10.		 2x GbE LAN (RJ45) (GbE1: Intel® I219 / GbE2: Intel® I210). 		
 2x RS-232/422/485 with Auto Flow Control (Supports 5V/12V) (DB9). USB: 2x USB 3.2 Gen2x1 (10 Gbps) (Type A). 4x USB 3.2 Gen1x1 (5 Gbps) (Type A). 2x USB 2.0 (480 Mbps) (Type A). PS/2: 1x PS/2 (6 Pin Mini-DIN Female Connector). Storage: 16GB 4800MHz DDR 5 SDRAM. SSD Storage: 256GB M.2 SSD. Storage Expansion (not fitted in standard build) 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). 3x mSATA Socket (SATA 3.0 shared by Mini-PCle socket). RAID Support: RAID 0/1/5/10. 		COM:		
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: 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). RAID Support: RAID 0/1/5/10.		 2x RS-232/422/485 with Auto Flow Control (Supports 5V/12V) (DB9). 		
 2x USB 3.2 Gen2x1 (10 Gbps) (Type A). 4x USB 3.2 Gen1x1 (5 Gbps) (Type A). 2x USB 2.0 (480 Mbps) (Type A). PS/2: 1x 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) 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). 3x mSATA Socket (SATA 3.0 shared by Mini-PCle socket). RAID Support: RAID 0/1/5/10. 		USB:		
 4x USB 3.2 Gen1x1 (5 Gbps) (Type A). 2x USB 2.0 (480 Mbps) (Type A). PS/2: 1x PS/2 (6 Pin Mini-DIN Female Connector). Storage: 16GB 4800MHz DDR 5 SDRAM. SSD Storage: 256GB M.2 SSD. Storage Expansion (not fitted in standard build) 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). 3x mSATA Socket (SATA 3.0 shared by Mini-PCIe socket). RAID Support: RAID 0/1/5/10. 		• 2x USB 3.2 Gen2x1 (10 Gbps) (Type A).		
 EX OSB 2.0 (400 MiDps) (Type A). PS/2: 1x PS/2 (6 Pin Mini-DIN Female Connector). Storage: 16GB 4800MHz DDR 5 SDRAM. SSD Storage: 256GB M.2 SSD. Storage Expansion (not fitted in standard build) 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). 3x mSATA Socket (SATA 3.0 shared by Mini-PCle socket). RAID Support: RAID 0/1/5/10. 		 4x USB 3.2 Gen1x1 (5 Gbps) (Type A). 2x USB 2.0 (480 Mbps) (Type A). 		
 1x PS/2 (6 Pin Mini-DIN Female Connector). Storage: 16GB 4800MHz DDR 5 SDRAM. SSD Storage: 256GB M.2 SSD. Storage Expansion (not fitted in standard build) 		PS/2		
Storage: Memory: 16GB 4800MHz DDR 5 SDRAM. SSD Storage: 256GB M.2 SSD. Storage Expansion (not fitted in standard build) 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). 3x mSATA Socket (SATA 3.0 shared by Mini-PCIe socket). RAID Support: RAID 0/1/5/10.		 1x PS/2 (6 Pin Mini-DIN Female Connector). 		
 16GB 4800MHz DDR 5 SDRAM. SSD Storage: 256GB M.2 SSD. Storage Expansion (not fitted in standard build) 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). 3x mSATA Socket (SATA 3.0 shared by Mini-PCIe socket). RAID Support: RAID 0/1/5/10. 	Storage:	Memory:		
 SSD Storage: 256GB M.2 SSD. Storage Expansion (not fitted in standard build) 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). 3x mSATA Socket (SATA 3.0 shared by Mini-PCIe socket). RAID Support: RAID 0/1/5/10. 	Ū	16GB 4800MHz DDR 5 SDRAM.		
 256GB M.2 SSD. Storage Expansion (not fitted in standard build) 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). 3x mSATA Socket (SATA 3.0 shared by Mini-PCIe socket). RAID Support: RAID 0/1/5/10. 		SSD Storage:		
 Storage Expansion (not fitted in standard build) 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). 3x mSATA Socket (SATA 3.0 shared by Mini-PCIe socket). RAID Support: RAID 0/1/5/10. 		• 256GB M.2 SSD.		
 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0). 3x mSATA Socket (SATA 3.0 shared by Mini-PCIe socket). RAID Support: RAID 0/1/5/10. 		Storage Expansion (not fitted in standard build)		
 3x mSATA Socket (SATA 3.0 shared by Mini-PCIe socket). RAID Support: RAID 0/1/5/10. 		• 1x 2.5" Internal SATA HDD/SSD Bay (SATA 3.0).		
RAID Support: • RAID 0/1/5/10.		 3x mSATA Socket (SATA 3.0 shared by Mini-PCIe socket). 		
• RAID 0/1/5/10.		RAID Support:		
		• RAID 0/1/5/10.		

Expansion:

PCIe expansion slots:

- Slot 1: x 8 FireBird Camera Link frame grabber with PoCL support.
- Slot 2: x 8 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

Camera Link Interface:	FireBird is fitted with 26-way Camera Link Mini connectors (SDR/HDR) and screwlocks as specified in the Camera Link v2.1 specification. LEDs by each connector show the link status.		
	The interface supports the following configurations:		
	 Single Base. Dual Base. Single Medium. Single Full. Single 80-bit (Deca). 		
Camera Clock:	FireBird supports effective clock rates from DC to the Camera Link maximum of 85MHz, using the Camera Link Strobe (STB) and Data Valid (DVAL) signals.		
PoCL:	FireBird supports Power over Camera Link (PoCL) functionality and is able to provide power to PoCL enabled cameras via the Camera Link data cable, removing the need for a separate power supply. In addition to this, the FireBird implements SafePower, an intelligent sense mechanism which detects the presence of a PoCL camera before applying power to it. This ensures that power is not applied to conventional non-PoCL cameras.		
	FireBird can supply up to 4W at a nominal 12V to a Base mode PoCL camera, or 8W to Medium/Full/80-bit cameras, as required by the Camera Link specification. Both Camera Link connectors support PoCL, and SafePower.		
PCI Express:	PCIe 2.0 (Gen2) 4-lane interface typically providing 1.7 Gbytes/sec transfer from FireBird to the PC, subject to host workload.		
Buffer Memory:	320 MBytes of DDR3 memory is fitted to buffer data before the PCIe bus.		
I/O:	The following I/O lines are provided for triggers, optical shaft encoders, exposure control and general I/O:		
	 4x opto-isolated inputs. 4x opto-isolated outputs. 4x TTL inputs, 5V tolerant. 4x TTL I/O, 5V logic. 4x RS-422 inputs. 4x RS-422 outputs. 		
	A 15-way D-Type connector on the end panel and gives access to a subset of I/O:		
	 2x opto-isolated inputs. 3x TTL I/O, 5V logic. 2x RS-422 inputs. 1x RS-422 outputs. 		
Software:	ActiveCapture – image acquisition and control software. ActiveSDK – C/C++ libraries and example designs.		

Camera Link:	FireBird C	FireBird Camera Link 80-bit conforms to v2.1 of the Camera Link specification.		
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 to 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 syste	m EMC testing is currently on going, approvals data will be shown soon.		

CONFORMANCE

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-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.			
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-4XCOF-A	Oncilla Machine Vision Computer – CoaXPress over Fiber Standard 2024 1402 chassis, PCle riser with 2 x8 Slots, 1x AS-FBD-4XCOF12-3PE8, Microsoft Windows 11, ActiveCapture, ActiveSDK.			
Cable Solutions				
AS-CBL-CL-SP-y-xM	Camera Link cable x meters in length, Camera Link Mini (SDR/HDR) to Camera Link Mini (SDR/HDR), suitable for both PoCL and conventional cameras. y indicates different cable type options. The standard stock length is 4m. High-flex rating and longer length cables are also available, as well as Camera Link Mini (SDR/HDR) to Camera Link (MDR) cables –			

Active Silicon

CONTACT DETAILS

UK Office:

Active Silicon Ltd 1 Waterside Court, Waterside Drive, Langley, Berks, SL3 6EZ, UK.

Tel:+44 (0)1753 650600Emailinfo@activesilicon.comWebsite:www.activesilicon.com20-N0v-2024

US Office:

Active Silicon, Inc. 479 Jumpers Hole Road, Suite 301, Severna Park, MD 21146, USA.

Tel: +1 41 Email: info@ Website: www.a

+1 410-696-7642 info@activesilicon.com www.activesilicon.com