ALRAD Instruments Newsletter April 2024

Welcome to our April 2024 Newsletter.

In this month's issue we focus on:

- Advantech BitFlow Integration of NVIDIA Jetson AGX Orin Module with Cyton and Claxon CoaXPress Frame Grabbers
- iRAYPLE 5000 Series line scan cameras
- 5GigE+ Area-Scan Cameras with 400nm~1700nm Visible/SWIR range from Emergent Vision Technologies
- High speed SWIR C-RED Infrared cameras from First Light Imaging
- Workswell WIC SC - Scientific Thermal Camera for Instrumentation, Research & Development and Education - Available from Stock in the UK
- USB 3.0 Monochrome Areas Scan cameras from Omron Sentech - STC-MCA5MUSB3 - Available from Stock in the UK
- ALRAD Instruments Renews JOSCAR Registration

Advantech BitFlow Integration of NVIDIA Jetson AGX Orin Module with Cyton and Claxon CoaXPress Frame Grabbers

Advantech BitFlow has successfully integrated the unprecedented computing power of the NVIDIA® Jetson AGX Orin module, which can perform 275 trillion operations per second (TOPS), with the lightning-fast data rates of its CoaXPress (CXP) frame grabbers.

When combined with the NVIDIA AGX Orin Developer Kit, this cost-effective platform empowers engineers to prototype complex machine vision and autonomous inspection applications, leveraging AI accelerated image processing while simultaneously supporting up to four CoaXPress (CXP) cameras and multiple concurrent AI application pipelines. Groundbreaking new applications are more easily developed that augment rule-based machine vision with image-based analysis, making it possible to move beyond “pass/fail” to tasks such as image classification, image segmentation, and object detection.

Once proof-of-concept is established, a production model can move forward using the Advantech AIR-030 AI Inference System Box featuring PCI Express x16 and based on the NVIDIA Jetson AGX Orin. As a result of this innovation, Time to Market and associated development costs are significantly reduced.

50GB DATA TRANSFER

BitFlow CXP frame grabbers connect directly to the Jetson AGX Orin via a built-in x16 PCIe slot. Image data may then be transferred at speeds up to 50GB per second from CXP cameras to the NVIDIA Ampere GPU architecture — much faster than what NVIDIA Jetson users are typically limited to using USB3 or GigE Vision cameras. BitFlow CXP frame grabbers DMA directly into the embedded GPU memory for image capture, pre-processing, and machine learning inference, shifting the load from the host computer to avoid CPU overhead.

In addition to faster transfer speeds, the CoaXPress interface allows a single cable to carry all data, control, triggering, and up to 13W of power to connected cameras at distances as far as 100 meters. CoaXPress eliminates the need for multiple cables and a local power supply, therefore giving the system integrator far more flexibility for their prototype designs.

Seamless integration between the NVIDIA Jetson AGX Orin and BitFlow frame grabbers is achieved through BitFlow’s Linux AArch64 SDK. With the SDK being universal, not only is BitFlow’s full line of CXP frame grabbers (Cyton and Claxon families) supported, but additionally the BitFlow Axion Camera Link family is an option.

For more information and to order, please follow the link → or call the ALRAD Sales Team on 01635 937000 , we will be happy to help:

Advantech BitFlow

The iRAYPLE 5000 Series line scan cameras

The iRAYPLE line scan camera provides resolutions from 2K,4K, 8K to 16K. Supports data interfaces GigE, Camera Link, 10GigE, and CXP-6, enabling efficient transmission of high-frequency data and suitable for fast-paced production lines. It supports various ISPs and algorithms, making it versatile for use in industries like PV, EV, display panels, and printing.

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iRayple 5000 Series Line Scan

5GigE+ Area-Scan Cameras with 400nm~1700nm Visible/SWIR range

	Model	Chroma	Resolution	Frame Rate	Interface	Sensor Name	Pixel Size
	HE-5300-S-I	SWIR	5.24MP	130fps	1, 2.5, 5GigE	Sony IMX992	3.45×3.45μm
	HE-3200-S-I	SWIR	3.14MP	170fps	1, 2.5, 5GigE	Sony IMX993	3.45×3.45μm
	HE-1300-S-I	SWIR	1.31MP	135fps	1, 2.5, 5GigE	Sony IMX990	5×5μm
	HE-300-S-I	SWIR	0.33MP	260fps	1, 2.5, 5GigE	Sony IMX991	5×5μm

The 5 GigE+ Area-Scan Cameras HE Series from Emergent Vision includes 4 camera options which utilise the Sony Visible and Shortwave Infrared (SWIR) image sensors (types: IMX990, IMX991, IMX992 and IMX993) operating across the 400 nm to 1700 nm wavelength range.

The Eros 5GigE camera series is a groundbreaking lineup that brings a new dimension of versatility and affordability to the high-speed imaging market. This series is designed to cater to a wide range of applications, offering the perfect balance of performance, cost-effectiveness, and ease of integration whilst supporting 5GigE, 2.5GigE, and 1GigE speeds through auto-negotiation.

These new cameras maintain the renowned zero-copy imaging approach. This approach utilises built-in header splitting features in network interface cards (NICs) to perform zero-copy image transfer, a critical requirement for top performance in multi-camera configurations.

Four resolution / frame rate options:

- 0.33 Megapixel, 260 fps
- 1.31 Megapixel, 135 fps
- 3.14 Megapixels, 170 fps
- 5.24 Megapixels, 130 fps

Key Camera Features:

- High-speed 1, 2.5, 5GigE
- Sensitivity in the 400 to 1700 nm range
- Back-illuminated pixel structure
- 1, 2.5, 5x the speed of GigE
- High data/frame rates
- GigE Vision® and GenICam™ compliant
- Optional IP67 housing

Applications include:

- Food and Beverage Inspection
- Agricultural Imaging
- Semiconductor and Electronics Inspection
- Recycling / Material Sorting
- Medical Imaging

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HE Series 5GigE SWIR Cameras

High speed SWIR C-RED Infrared cameras from First Light Imaging

Why use a C-RED camera?

First Light Imaging offers a full range of cameras based on InGaAs sensors. The sensors are back-illuminated which enables to reach a fill factor of 100% and feature a CTIA (Charge TransImpedance Amplifier) readout technology for a linear response. All cameras feature USB 3.1 and/or CameraLink communication interfaces. Additional key features:

High speed. All C-RED cameras can run at 600 FPS in full frame mode (640 x 512 pixels) and up to 32,000 FPS in a 32 x 4 pixels window, enabling time-resolved laser beam profiling.

Variable integration time. The integration time can be tuned down to 10 µs. For short laser pulse duration, an optimized “short-exposure” mode enables reaching integration times down to 165 ns*.

Flexible synchronization. An externally generated trigger pulse can be used to trigger both the laser and the camera. Alternatively, the camera output synchronization signal can be used to trigger the laser. Such a scheme allows to avoid introducing a jitter.

Easy integration. The cameras can be easily integrated in your system thanks to interface positioning and threaded holes and a C-Mount/CS-Mount optical interface. All cameras are supported by our multi-camera software First Light Vision and versatile SDK (MatLab, LabView, Python, *etc*.)

Small beam size. For Laser Beam Profiling applications, the sensor’s 15 µm pixel pitch allows the profiling of small beams and acquisition of additional beam details (if the laser points directly at the camera**). With a sensor active area of 9.6 mm by 7.68 mm the recommended beam diameter ranges from 150 µm to 6 mm.

Three camera models are especially relevant for applications including laser beam profiling:

C-RED 3: windowless customisation

In the case of direct incidence of the laser beam on the sensor, interference fringes tend to degrade the measurement quality. First Light Imaging can provide the C-RED 3 camera with a window-less detector to avoid interference fringes. It is also possible for the user to place a custom window coated specifically for the wavelength of use.

C-RED 2 Lite: quantitative measurements

The ThermoElectric Cooling (TEC) integrated in the camera ensures perfect stabilization of the camera performance over extended periods of time. Thanks to this feature, the camera can be used for quantitative measurements, such as power monitoring in laser beam profiling. The C-RED 2 Lite camera is provided with a Sapphire window with an anti-reflective coating.

C-RED 2 Extended Range: for 2.05 µm lasers

Standard InGaAs sensors have a cutoff wavelength at 1700 nm. To address the need to profile lasers beyond this wavelength, First Light Imaging has developed the C-RED 2 ER 1.9µm and the C-RED 2 ER 2.2µm, which enable to detect wavelengths up to 1900 nm and 2200 nm, respectively.

For more information and to order, please follow the link → or call the ALRAD Sales Team on 01635 937000 , we will be happy to help:

First Light Imaging Cameras

Workswell WIC SC - Scientific Thermal Camera for Instrumentation, Research & Development and Education

The Workswell WIC SC is a thermal camera designed primarily for universities and research organisations. Thanks to the affordable price and parameters, this thermal camera is suitable for both R&D applications and for educational purposes at secondary schools and universities.

Available from stock in the UK

The camera offers a high resolution of 640 × 512 pixels, 60 Hz camera versions (9 Hz for export is also available) as well as an exceptional temperature sensitivity of 30 mK.

WIC SC - Package contents:
• Workswell WIC SC thermal imager with a premium sensitivity of 30 mK
• 2× CorePlayer software license
• 2× exchangeable interchangeable lenses
• WIC SDK for developing your own applications with a thermal imager
• IP65 protection kit in the package

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WIC SC Camera

USB 3.0 Monochrome Areas Scan cameras from Omron Sentech - STC-MCA5MUSB3

Available from stock in the UK

- USB 3.0 Area Scan
- 5 MP Resolution
- Color CMOS Sensor (Aptina MT9P031) 1/2.5" format, 2.2 µm pitch
- 14 fps
- Rolling Shutter
- Cased CS or C Mount (With Adaptor)

For more information and to order, please follow the link → or call the ALRAD Sales Team on 01635 937000 , we will be happy to help:

Omron Sentech Cameras

ALRAD Instruments Renews JOSCAR Registration

JOSCAR REGISTERED

Services for Aerospace, Defence & Security Sectors:

JOSCAR is a collaborative tool used by the Aerospace,Defence and Security industries to act as a single repository for pre-qualification and compliance information.

Using JOSCAR can determine if a supplier is “fit for business”.

ALRAD Instruments - Technology Divisions

ALRAD IMAGING | ALRAD PHOTONICS | ALRAD ELECTRONICS

ALRAD THERMAL | ALRAD MEDICAL | ALRAD VACUUM

ALRAD Instruments has six technology divisions and a wide portfolio of components and products for industrial, scientific, research, medical and academic fields - please check out our divisions below - we will be happy to help with any questions:

ALRAD 50 YEARS 1970 - 2020

ALRAD Instruments Limited celebrated it's 50th Anniversary in 2020. Set up in 1970, ALRAD Instruments has been serving the Industrial, Scientific, Medical and Instrumentation markets for five decades and has a wealth of experience in all aspects of Imaging, Photonics, Thermal and Medical sectors.

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