

ALRAD Instruments Newsletter

October 2023

Welcome to our October 2023 Newsletter.

In this month's issue we focus on some of the products that we will be showcasing at the SPIE Photonex 2023 Exhibition which will be held this week at the Scottish Events Campus (SEC), Glasgow Scotland on 24th ~ 26th October

We will have two stands at the exhibition, one focusing on our Imaging and Electronics Divisions product lines and one focusing on our Photonics Division offerings.

We are also pleased to announce that Roberto Foddis, Regional Sales Manager Berkeley Nucleonics Europe and John Pepper, Director of Sales and Marketing, Innovations in Optics Inc. will be joining us at the exhibition

Please visit the ALRAD Team on Stands 201T and 203T:



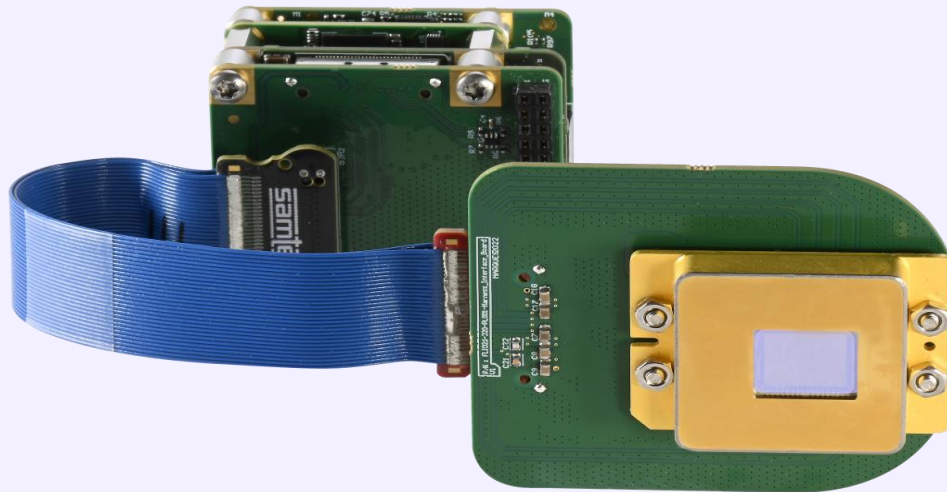
We will be showcasing some of the following products at the exhibition:

- C-RED New Space - Space-designed High Speed SWIR Camera Core
- C-RED 2 Lite - Very High Speed Stabilised InGaAs Short Wave Infrared SWIR Camera.
- WIC Industrial - IP67 Thermal Camera and Thermal Cameras for UAV applications including: Inspection, Security, Search and Rescue and Agriculture.
- USB 3.0 Monochrome Area Scan cameras from Omron Sentech - STC-MCA5MUSB3
- A great 12 Megapixel Machine Vision Combination - The Imaging Source 12 Megapixel Camera with Sony Pregius IMX545 Image sensor and the Ricoh 12 Megapixel High Resolution Compact 1.1" format lens.
- The Imaging Source 37 Series industrial cameras - Single-board cameras ideal for cost-sensitive and OEM applications.
- LensConnect - Motorised Machine Vision Lenses operated via USB for 12MP and 20MP high resolution applications.
- BNC DEI High Voltage Electronics:
- PCO-6131 | 125A OUTPUT CURRENT 125 A Pulsed/CW/QCW OEM Laser Diode Driver Module
- PCO-7121 Pulsed current Laser diode driver module
- Pulse / Delay Generators: Model 577 / Model 750
- The PVM-1001 Pulse Generator module
- The PVM-4210 Pulse Generator module
- LumiSpectra™ replacing Tungsten-Halogen and Xenon lamps in high radiance systems

- Sekonic C-7000 Spectrometer for Industrial Applications.
- Lasers for Machine Vision Applications - The Coherent StingRay Machine Vision Laser Range

C-RED New Space - Space-designed High Speed SWIR Camera Core

We are proud to introduce our latest innovation: C-RED New Space, a SWIR camera core specifically designed to uphold optical excellence and withstand the extreme conditions of space operations.



Based on a space-approved sensor and with space-designed electronics, the solutions can address applications ranging from high-speed laser beam detection (Free Space Optical communication, beacon beam tracking) to Earth observation and greenhouse gas detection. First Light Imaging can offer a high level of customisation on both the hardware, the electronic design and the firmware. With multiple on-going projects, C-RED New Space solution has already been successfully integrated into optical payloads.



Applications

- Earth Observation
- Gas Detection
- Data Exchange
- Space Exploration
- Cubesats
- FSO Communications

Software

- First Light Vision GUI
- SDK (C, C++, C#, Python, MatLab) / LabVIEW / μ Manager / Halcon)

Key Features

- Customisable SWIR camera core
- Designed for space
- Board level for easy integration to satellite optical payloads
- up to 600 FPS full frame
- 30 electrons read out noise
- VGA InGaAs, 15 μ m pixels pitch
- Wavelength from 0.9 to 1.7 μ m
- Flat QE (1.0 to 1.65 μ m) 70%
- Data interface: CameraLink™
- Electronic shutter <5 μ s
- On-board processing
- User preset configurations
- Multiple sync configurations
- 93 dB linear dynamic range
- True 16 bits HDR
- ROI for increased speed
- Removable structure for boards protection during lab testing

C-RED 2 Lite - Very High Speed Stabilised InGaAs Short Wave Infrared SWIR Camera



C-RED 2 Lite is the stabilised version

of C-RED 2, able to run at 600 FPS with 32 electrons readout noise. To achieve this performance, C-RED 2 Lite integrates a 640 x 512 InGaAs PIN Photodiode detector with 15 μ m pixel pitch for high resolution, which embeds an electronic shutter with integration pulses shorter than 5 μ s. The camera has no fan and is thermally stabilised, it can also be watercooled for better performance with an optional cooling plate. C-RED 2 Lite is specially designed for high-end industrial applications, science and surveillance.

First Light Imaging's cameras, from Ultraviolet, through Visible to Short Wave Infrared, offer incredible possibilities in various fields. With high sensitivity, high speed, high resolution, get the maximum performance for your application. Be ready to: MAKE THE INVISIBLE VISIBLE !

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

Thermal Inspection The WIC Industrial IP67 Camera

Designed and manufactured for easy and user-friendly plug & play integration for all process control and quality control applications. Customers can choose from two types of camera resolution, i.e. 640x512 or 336x256 pixels, and also from several different lenses. Temperature range can be chosen to 1,500 °C. 30mK sensitivity is offered as standard. Internal electronics are protected by a high IP66/IP67 rating enclosure and can be installed in harsh conditions from -50 °C to +200 °C.



One Thermal Camera for all your needs: Temperature measurement is the second most common measurement in industry today. WIC thermal cameras are already enabling contact-free temperature measurement in hundreds of different applications around the world, including: Laser Welding, Soldering, Laminating and Windscreen heat testing.

Thermal Cameras for UAV Applications:



We also provide Thermal cameras for a range of UAV applications including Inspection, Search and Rescue and Agricultural applications.

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:

ALRAD Thermal

**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 μ m 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](#)

A Great 12 Megapixel Machine Vision Combination - The Imaging Source and Ricoh



DFK 33GX545



FL BC3518-9M

For many years 2~5 Megapixel resolution GigE cameras and lenses have been the defacto machine vision imaging component, however, with the introduction of larger format, higher resolution backlit image sensors the ability to capture bright higher resolution images at speed has been realised and we are starting to see increasing demand in this area.

The Imaging Source have launched a number of new GigE cameras in their 33G and 38G Series which use the latest large format Sony Pregius S global shutter image sensors. For example the 12.3 Megapixel DFK 33GX545 Camera which uses the IMX545 1/ 1.1" format sensor and provides a full frame rate speed of 9 fps and much higher with a reduced region of interest (ROI) enabled. Couple this with the Ricoh High Resolution compact 12 Megapixel 1.1" optical format lens and you have a new winning combination for high speed, high resolution machine vision imaging.

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:

ALRAD Industrial Cameras

TIS 37 Series industrial cameras Single-board cameras ideal for cost-sensitive and OEM applications.

If you are looking for a cost sensitive solution for Machine Vision and Automation, The Imaging Source has expanded its product portfolio to include new cameras equipped with **onsemi AR0234 sensors**. These cost-optimised sensors, can be found in The Imaging Source's 37 Series industrial and board-level cameras, providing a flexible customisation concept for systems engineers and OEMs:

- Resolution: 2 MP
- Frame Rate: 100 fps
- Sensor Type: Global shutter
- Interface: USB 3.1 (Gen1 - Type C, 5MBit/s)
- Excellent performance even at low-light conditions

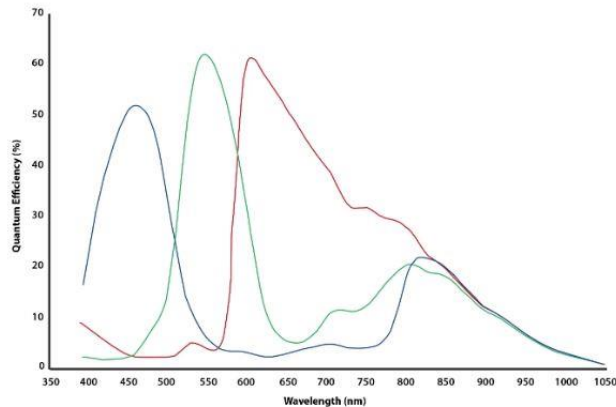


Form Factors:

These compact, single-board cameras offer a reduced hardware footprint and are available in a variety of form factors:



Region of interest (ROI): Sample photo above has been resized (1920x1080 to 640x400). Automatic white balance. Color enhancement "on". Gamma set to 0.61.



Spectral diagram for onsemi AR0234

ALRAD provides the complete range of The Imaging Source cameras including: Industrial Cameras, Board level, Embedded, Autofocus and Zoom cameras and Polarising cameras.

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:

[ALRAD Industrial Cameras](#)

LensConnect - Motorised Machine Vision Lenses for 12MP and 20MP Resolution

The new LensConnect series from Computar is a range of motorised machine vision lenses designed to be easily controlled via a single USB cable.

Features include:

- Focus, Iris and Zoom can be controlled via USB
- Easy operation in areas where manual adjustment is not possible
- Stepper motor provides precise control
- Plug-and-play for easy deployment

RF Series



- New motorised lenses, enable power supply & control through USB (Available for I2C ver.)
- Floating focus design achieves ultra-high resolution from Near to Far.
- Stepper motors for precise focus control
- Easy-to-install by free control software
- 1" 20MP, Suitable for large format sensor (eg: Sony IMX183)

- New motorised lenses, enable power supply & control through USB (Available for I2C ver.)
- Inner focus mechanism achieves high speed focusing as well as reducing aberration due to WD fluctuation
- Stepper motors for precise focus control
- Easy-to-install by free control software

BH Series



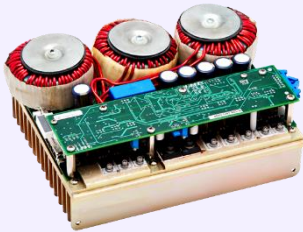
- Suitable for 1/1.1" 12MP sensor (Brand-new optical design for Sony IMX535/545/565)

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:

LensConnect Series

BNC DEI High Voltage Electronics

PCO-6131 | 125A OUTPUT CURRENT 125 A Pulsed/CW/QCW OEM Laser Diode Driver Module

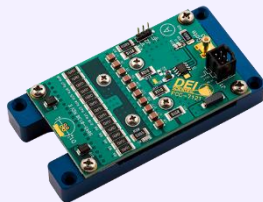


The PCO-6131 is a compact, OEM-style high power pulsed/CW current source designed to drive diode lasers, bars and arrays in pulsed, QCW or CW modes. It delivers up to 125 A of output current with pulse widths from less than 100 ns to DC and pulse repetition frequencies from single-shot to 500 kHz at duty cycles up to 100%.

The PCO-6131 features a user-adjustable variable rise time control. This innovative feature allows the user to adjust the rise time within a range of 2.5 μ s by means of a PCB-mounted potentiometer to optimize the driver's rise time for the user's application.

The PCO-6131 is based on a hysteretic, average current, switch-mode regulator. This type of regulator is a variable-frequency, variable pulse width design which maintains current in an energy storage inductor between a minimum and maximum level. This architecture provides a high-performance driver in a small form factor, with high operating efficiency and low stored energy.

At 125 A output current, the stored energy in the driver is approximately 7 Joules, dramatically lower than the stored energy in comparable linear current sources.



PCO-7121 Pulsed current Laser diode driver module

The PCO-7121 is a compact and economical 5 A to 50 A, 22 ns to 1 μ s OEM pulsed current laser diode driver module.

It is designed to provide extremely fast high-current pulses for driving laser diodes in rangefinder, LIDAR, ADAS, atmospheric communications and other applications requiring high-current nanosecond pulses. This module offers variable output current from 5 A to 50 A with pulse widths from 22 ns to 1 μ s at frequencies up to 1 MHz.

Features

- 5 A To 50 A Output
- 22 ns to 1000 ns variable pulse width
- ≤ 12 ns Rise Time at 20 A to 50 A Output
- ≤ 10 ns Fall Time at 20 A to 50 A Output
- Pulse Repetition Frequency To 1 MHz
- Pulsed Current Monitor Output

Applications

- Rangefinders
- LIDAR (Light Detection And Ranging)
- ADAS (Advanced driver-assistance systems)
- Other applications requiring high-current nanosecond pulses

Pulse / Delay Generators



Model 577 | 0.001 Hz to 20 MHz Digital Delay / Pulse Generator

- Channels: 4 or 8 Independent Channel Outputs
- Resolution: 250 ps
- Accuracy: 1 ns \pm .0001 x setpoint
- RMS Jitter: < 50 ps (channel to channel)
- Voltage: 5V Peak for TTL, 45V Peak for Adjustable.
- Pulse Width: 10 ns - 1000 s
- Memory: 12 Storage Slots



Model 750 | 50 MHz Pulse/Delay Generator

- Channels: 4 or 8 Independent Channels
- Resolution: 100 ps
- Frequency: 0.1 to 50MHz
- Ch-Ch Jitter: 50 ps
- Pulse Amplitude: 1.5 to 5 V into 50 Ω (or 3 to 10V into Hi-Z)
- External Ref Clock: 10 MHz to 250 MHz

The PVM-1001 Pulse Generator module



The PVM-1001 can achieve zero to +950 V in less than 10 ns (Rise Time). Capable of providing pulse widths from 55ns to 10,000ns with a standard frequency range up to 1 MHz.

The PVM-1001 can also provide a 5 MHz burst. The module is designed for a 50 ohm resistive load.

The output pulse width and frequency are controlled by an external trigger source. The PVM-1001-P requires an external positive high voltage supply. Two models are available, one for positive and another for negative output.

The rear panel of the PVM-1001 has connectors for high voltage input and pulsed high voltage output. The front panel has an SMB connector used for triggering the instrument.

Features:

- Output Voltage Range 0 V to +950 V
- Frequency Range ≤ 1 MHz
- Burst Mode ≤ 5 MHz
- Trigger pulse width $55 \text{ ns} \leq \text{Pulse Width} \leq 10,000 \text{ ns}$
- Rise Time $\leq 8 \text{ ns}$ @ 200 V to 950 V
- Positive or Negative polarity modules available
- Maximum Output Power 208 W
- Simple to set up and use

Applications:

Typical applications are instrument calibration, component testing, beam steering and PMT and MCP gating.

The PVM-4210 Pulse Generator module



The PVM-4210 pulse generator module provides two pulse output channels, controlled by a common control logic. When the control logic receives a gate signal, both channels pulse simultaneously. One channel pulses from ground to the positive high voltage, and the other channel pulses from ground to the negative high voltage. Therefore each output can be connected to the electrodes of a Pockels Cell or Q-Switch, or to a pair of deflection plates, providing a 1,900 V differential pulse across the cell or plates.

These outputs may also be inverted, to pulse from the high voltage potential to ground. The width and frequency of the output pulses follow the width and frequency of the TTL input gate. The amplitude of the output pulse voltage for each channel is independently adjustable from 0 to 950V using screwdriver-adjustable potentiometers readily accessible on the end panel of the pulser module.

Features:

- Simultaneous Positive And Negative 0 To +950 V and 0 To -950 V
- >20 kHz Pulse Repetition Frequency
- Internal High Voltage Power Supplies

Applications:

The PVM-4210 is optimised for differential drive of deflection plates for electrostatic modulation of particle beams in time-of-flight mass spectrometers and accelerators. It will also drive any high impedance, capacitive load such as Pockels Cells and Q Switches, electrodes, microchannel plates, acoustic transducers, image intensifiers and

photomultiplier tubes. The exceptional pulse fidelity of the PVM-4210 will optimise the performance of any system in which it is used.

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:

Berkeley Nucleonics

Corporation (BNC)

LumiSpectra™ replacing Tungsten-Halogen and Xenon lamps in high radiance systems



LumiSpectra™ Features

- Two options:
 - Optical fiber for up to 6mm diameter
 - Direct illumination by lens
- Radiant power output > 0.30 mW/(nm-mm²-sr)
- Contiguous Spectrum 430nm ~ 990nm
- Custom wavelength range available (UV ~ NIR)

LumiSpectra™ Illuminator

The LumiSpectra™ Illuminator provides a unique solid state lighting solution with a continuous broadband spectrum in the 400~1000nm region to replace Xenon and Tungsten Halogen lamps. Backed by over 60 patents, the Innovations in Optics' light engines deliver superior reliability and performance.

Proprietary optical designs capture more photons and deliver highly uniform and concentrated light output to the target. Novel thermal management allows individual LEDs to be driven harder without sacrificing lifetime, resulting in high radiance and optical stability.

Two user-friendly options are available in CW or Pulsed modes with external trigger and fast rise time. Wavelengths can be turned on one at a time in quick succession for improved productivity in multispectral applications without the need for a filter wheel. In addition, the LED wavelength distribution can be customised to suit the application. The output of the fiber coupled option is designed to a standard endoscopic NA of 0.66 and can accept up to 6mm diameter fiber bundles. Remote digital control is enabled by RS485 interface with Modbus RTU communication protocol.

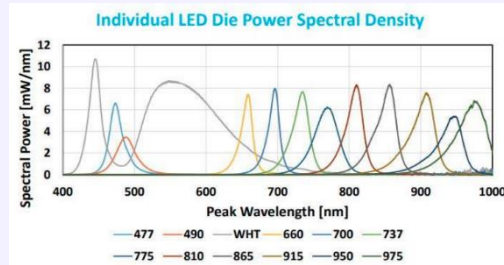
Applications:

LumiSpectra™ can be used as a broadband multispectral source in agricultural inspection for crop health and food quality control, and industrial inspection of semiconductor wafers and printed circuit boards. The product provides a contiguous broadband light source for Hyperspectral Imaging and Multispectral Imaging. Its tunability and customisable wavelengths facilitate

endoscopy, medical diagnostics, and surgery where viewing differences in tissues and early detection are critical. The spectrum can be extended further into the NIR, and coupled with InGaAs camera technology, comprises a multispectral imaging system. Other areas of interest include forensic science, archaeology, pharmaceutical production, artworks, and waste sorting.

The unique features of LumiSpectra™ as it compares to existing solutions? Historically, lamps have been used to provide broadband illumination with contiguous spectrum. Lamps with filter wheels are used to select wavelengths, which limits their ability to quickly access individual wavelengths.

Individual access to the LED die allows various wavelengths to be used simultaneously to mix and match wavelengths. Since the die are controlled individually, the user can adjust the output power of the wavelengths, which is not possible with conventional lamps.



Application Areas:

Medical & Life Sciences:

- Endoscopy and diagnostic imaging
- Xenon or tungsten halogen lamp replacement

Industrial & Commercial:

- Inspection
- Multispectral illumination

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:

Innovations In Optics

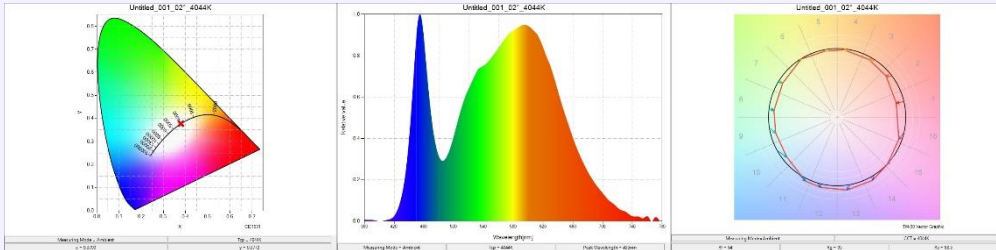
Sekonic C-7000 Spectrometer for Industrial Applications



The C-7000 is a compact and lightweight spectrometer that can be carried on-site. By adopting a CMOS linear image sensor for the spectral sensor, the C-7000 can accurately measure a variety of light sources such as LED, organic EL, HMI, fluorescent light and natural light, etc. In addition, Sekonic's proprietary technology enables flash light measurement using the spectroscopic method. This single unit can measure various types of light regardless of the sources.

Various display modes:

In addition to the text mode that displays measured values numerically and the spectrum mode that displays the wavelength of the light source, various display modes such as CRI mode, 5 color rendering evaluation modes, chromaticity diagram mode (CIE1931, CIE1976), chromaticity diagram comparison mode (CIE1931, CIE1976), etc. are available.



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:

Spectrometers

Lasers for Machine Vision Applications

The Coherent StingRay Machine Vision Laser Range

With a compact modular design measuring only 19 mm in diameter and using the industries' premier laser diodes, the StingRay delivers best-in-class performance. High-quality glass optics and sophisticated drive electronics deliver the power and control to your application to improve signal-to-noise and measurement speed.



StingRay is the highest-performing top-hat-profile laser available that comes in a variety of fan angles to create the line you need for measurement and profiling applications. The StingRay allows the user to optimise the focus location for the best measurement resolution. With optional RS-232 control the laser power is adjustable and includes onboard diagnostics for operating hours, diode current, output power, temperature, and more. Selected StingRay models also include the μ Focus and Fiber-Ready (FR) versions.

The Coherent StingRay Developers Kit:



Supports eight (8) different pattern configurations, delivering optical power from 1 mW to 100 mW and patterns from a simple dot to line lengths of 0.5 meters, whilst maintaining the highest level of performance and reliability.

This kit enables end users, integrators, researchers and educational labs to quickly configure, set up, and evaluate 3D applications in which structured light lasers provide solutions.

For more information and to order, please follow the [link](#) → or call the ALRAD Photonics Team on 01635 937000 , we will be happy to help:

[Coherent Laser Solutions](#)

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 Instruments Limited celebrated its 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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