New Products

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

LAWRENCE G. RUBIN

Focus on Photonics

Diode Laser Arrays

Opto Power Corp announces a line of diode laser arrays that can deliver up to 60 W of output power from a 1.1 mm diameter fiber bundle. The enhanced brightness of the fiber-coupled FB series affords increased power density and depth of focus, two of the requirements for many medical and solid-state laser-pumping applications. The series is available in wavelengths of 830, 915 and 940 nm. An optional optical converter permits coupling 50 W from the 60 W source into a 400 m diameter single-core fiber with a 0.37 numerical aperture, a design that could benefit medical equipment manufacturers. *Opto Power Corp, 3321 East Global Loop, Tucson, Arizona 85706*

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BBO Pockels Cell Q-Switcher

The new Light-Gate Pockels cells from Cleveland Crystals provide an alternative to conventional acousto-optic and electro-optic Q-switch technologies for diode-pumped solid-state lasers. The cells' damage resistance is similar to that of deuterated potassium dihydrogen phosphate (B-KDP) devices, but the Light-Gate cells are much less susceptible to thermal lensing than are the B-KDP devices. The Light-Gate 3 has a 3 mm aperture; the 7 model comes with a 7 mm aperture.

The Light-Gate cells employ two transverse field BBO (beta barium borate) elements for a DC quarter-wave voltage of 2.8 kV at 1064 nm. Extinction between crossed polarizers (voltage off) reaches 3000:1, while single-pass transmission exceeds 98% at that wavelength. Because the effects of acoustic ringing are virtually eliminated, the devices can be operated at significantly higher repetition frequencies than can B-KDP-based Pockels cells. *Cleveland Crystals Inc, 19306 Redwood Avenue, Cleveland, Ohio 44110-2738*

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Gallium Nitride Detector

The UV-100 series of photodetectors introduced by APA Optics is fabricated using a gallium nitride III–V materials system. These Schottky barrier devices provide a responsivity that drops by more than three orders of magnitude across the cutoff wavelength of 365 nm, thereby reducing filter requirements and making them attractive for visible blind applications. The devices' standard sensitive area is 250 μm in diameter; each device is packaged in a TO-5 can. All of the photodetectors in the series have been designed to operate at high speeds in the photovoltaic mode and require no external power supply. Applications include flame sensing, ozone and pollution monitoring, blood analysis, spectroscopy and UV source control. *APA Optics Inc, 2950 Northeast 84th Lane, Blaine, Minnesota 55449*

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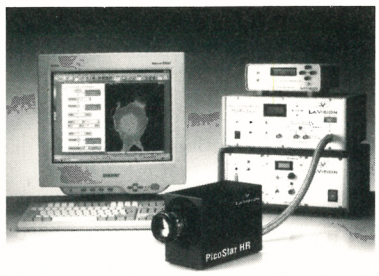
Fast-Gated, Intensified CCD Camera

LaVision is now offering PicoStar HR, its ultrahigh-repetition-rate, fast-gated, intensified charge-coupled device (CCD) camera. Features include an optical gate width of down to 200 ps; a gating repetition rate of up to 110 MHz; gain modulation of up to 800 MHz; UV and near-infrared spectral range; single photon sensitivity; two-dimensional photon counting mode; dynamic range of up to 16 bits; and high spatial resolution. The camera was developed for applications such as two-photon and fluorescence lifetime imaging microscopy; single molecule, Raman and pump-probe spectroscopy; combustion research; picosecond imaging of semiconductor chips; and time-gated imaging and spectroscopy in conjunction with high-repetition-rate



mode-locked lasers. The system is completely computer controlled, and comes with Windows-compatible software. *LaVision GmbH, Gerhard Gerdes Strasse 3, D-37079 Göttingen, Germany*

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Solid-State Pockels Cell Driver

Analog Modules has announced the model 8251, a solid-state Pockels cell driver designed to provide continuous high-voltage pulses for applications such as controlled Q-switching of solid-state lasers. The driver incorporates a miniature internal power supply to generate high voltage from the +15 V DC power input. An optional external voltage control or an internal trimpot can be used to adjust the output amplitude to 6 kV. The opto-isolated trigger input improves noise immunity, and the push-pull output configuration minimizes electromagnetic interference. The circuit's fast switching mechanism enables output rise and fall times of ≤15 ns. An optional buffered low-voltage DC monitor provides a scaled representation of the output pulse amplitude voltage. The 6 kV maximum high-voltage pulse amplitude and fast transition times could make the model 8251 attractive for many BBO (beta barium borate) crystal applications. *Analog Modules Inc, 126 Baywood Avenue, Longwood, Florida 32750-3426*

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UV Solar-Blind Imager

PixelVision has announced the release of what is said to be the first commercially available ultraviolet transmission detection imager that is truly solar blind. The SBI-1 permits UV imaging uncorrupted by solar light—that is, it shows no response to solar radiation even when it is looking directly into the summer noontime Sun. High UV sensitivity to single photon levels makes the SBI-1 useful in the detection of even the weakest UV signals. The imager incorporates a UV-sensitive CCD camera, a UV lens and a proprietary polymer-based solar-blind filter.

UV detection is used in a wide variety of applications, such as fire and gunfire detection, monitoring of high-voltage electric lines and equipment for corona discharges (the faint glow adjacent to the surface of an electrical conductor at high voltage), and imaging of objects illuminated by UV light sources. *PixelVision Inc, 14964 Northwest Greenbrier Parkway, Beaverton, Oregon 97006*

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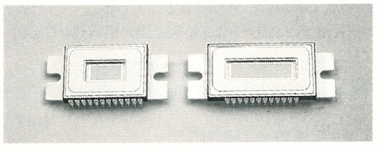
Low-Light-Level CCD Image Sensors

The S7010, S7011 and S7015 front-illuminated CCD area image sensors from Hamamatsu are designed for scientific applications requiring detection of very low levels of light. The sensors employ binning operation, which allows them to be used as linear image sensors in spectrophotometry. Binning significantly improves the signal-to-noise ratio and signal processing speed compared to conventional methods, in which signals are digitally added by an external circuit. The new sensors also feature extremely low noise and dark current, resulting in high sensitivity and dynamic range; this in turn allows long integration times for very weak signals. They are compatible



with the company's multichannel detector heads that allow area scanning or full line-binning operation.

The sensors are available uncooled (S7010) or cooled (S7011 and S7015) and have an effective pixel size of 24×24 μm. The image areas range from 512×60 to 1024×252 pixels. *Hamamatsu Corp, 360 Foothill Road, Bridgewater, New Jersey 08807-0910*

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Wide Bandwidth PIN Photodiodes

Discovery Semiconductors has announced that its indium gallium arsenide photodiodes for 1.3 to 1.6 μm fiber optic applications now handle up to 200 mW of electrical power dissipation (40 mA of reverse current with 5 V bias). This specification is for the DC to 8, 12 and 18 GHz bandwidth models; the 28 GHz unit is rated at 100 mW, and the 40 GHz models at 50 mW. Designers of high-power microwave cable TV, ground and intrasatellite links

who want to avoid the loss of 11 dB per 100 m in coaxial cable can now take advantage of the low loss characteristic of optical fibers (0.1 dB/100 m). The devices' front-illuminated p-i-n diode structure maintains its low ripple factor and ultrawide bandwidth from low to high light levels, with good linearity.

The company's photodiode analog bandwidths support digital bit rates of 2.5, 10, 17, 25, 40 or 50 Gbits per second. The diodes are available in hermetically sealed microwave packages with single-mode fiber pigtails. *Discovery Semiconductors Inc, 186 Princeton-Hightstown Road, Cranbury, New Jersey 08512*

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Large-Area Avalanche Photodiodes

The cooled-head large-area avalanche photodiodes in Advanced Photonix's 571 series are intended as solid-state replacements for photomultiplier tubes (PMTs) in many low-light detection applications. They offer quantum efficiencies of up to 90%; typical PMTs have quantum efficiencies of only about 10–25%. The new detectors have a gain of ~300 over a spectral range of 350 to 850 nm. The built-in thermoelectric cooler and thermistor ensure stable operation over a wide ambient temperature range, while minimizing dark current and noise. Active area diameters of 5, 10 and 16 mm are available. Compared to PMTs, the 571 series offers several key advantages, such as compact, rugged construction, immunity to stray magnetic fields, greater dynamic range, minimum settling time and simpler driving circuitry. In addition, the photodiodes will not be overloaded or easily damaged by exposure to bright light. *Advanced Photonix, 1240 Avenida Acaso, Camarillo, California 93012-8727*

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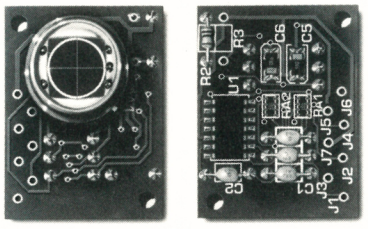
Position Sensing Quadrant Photodiode

Centro Vision presents the QD50-0-SD, which uses a quadrant silicon photodiode with a total active diameter of 7.98 mm and an active area of 50 mm^2. The width of the quadrant separator is 0.2 mm; smaller separations are available. Each quadrant is connected to a transimpedance amplifier with a gain of 10 kΩ; a higher gain can be provided upon request. The circuit contains all the necessary amplifier elements to provide both the sum and difference of the outputs of all four quadrants. The difference outputs consist of the upper-minus-lower quadrants and the left-minus-right quadrants. These outputs make this circuit–photodiode combination suitable for both light beam nulling and position applications. The circuit requires a +15 V supply and draws less than 50 mA current in the quiescent state.



The photodiode's spectral response ranges from 300 to 1100 nm. The segment capacitance at 0 V is 120 picofarads. *Centro Vision Inc, 2088 Anchor Court, Newbury Park, California 91320*

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High-Power Laser Diode Arrays

Industrial Microphotonics's Silver Bullet is a building block for constructing high-power diode arrays. Each block consists of one to three continuous-wave or pulsed laser diode bars mounted on a beryllium oxide substrate. At wavelengths from 780 to 980 nm, the individual units have a full width at half maximum of 2 nm. Every Silver Bullet comes with a data packet that includes efficiency, center wavelength, wavelength shift and power and voltage versus current curves; also included is a near-field image of the emission pattern. Laser diode bar cavity lengths of up to 1 mm are available. *Industrial Microphotonics Co, 20 Point West Boulevard, St. Charles, Missouri 63301*

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New Literature

Mikron Instrument's 250-page temperature sensing handbook covers the company's line of portable infrared thermometers, infrared thermal imaging systems and blackbody thermal reference calibration sources. Included are technical data on emissivity values and atmospheric transmittance characteristics and recommendations on installation and construction of infrared thermometers. *Mikron Instrument Co, 16 Thornton Road, Oakland, New Jersey 07436* ■

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