Mid Infrared (IR) Sensor -- Markets Reach $5 Billion By 2018

LEXINGTON, Massachusetts (December 12, 2011) – WinterGreen Research announces that it has a new study on Mid Infrared (IR) Sensors Market Shares and Forecasts, Worldwide, Nanotechnology 2012-2018. Products power sensor networks that are the base for smarter computing and for all manner of military and commercial management of devices.

Intelligent decision making depends on automated process and information gathered from sensors. The 2011 study has 717 pages, 136 tables and figures. Mid Infrared (IR) Sensors are evolving in the context of the development of solid state technology that provides vast improvements. Improvements in energy density are one of the benefits of energy harvesting give to traditional rechargeable and solid state batteries and sensors become much more useful in this context. The ability to locate self-sufficient sensors out in the field without replacing batteries is a significant market development. Lower cost and size of the mid IR sensors is another market aspect

Mid-infrared (MIR) optical chemical sensor technology in the spectral range of 3-12m is gaining importance in process monitoring, environmental analysis, security/surveillance applications, and the biomedical field. Design approaches for digitally dominated active pixel sensors: leveraging Moore's Law scaling in focal plane readout design. CMOS technology scaling has provided tremendous power and circuit density benefits for innumerable applications, focal plane array (FPA) readouts have largely been left behind.

Design and modeling of nanophotonic beam structures as optical NEMS sensors. Silicon photonic crystal (PhC) waveguide based resonator is designed by introducing a micro-cavity within the line defect. Silicon photonic crystals form the resonant band gap structure for PhC.

Mid IR sensors can measure chemical composition of materials and gas in a manner that is unmatched by any other technology, for a cost that is increasingly more competitive. Mid IR is being readied for use beyond military applications to commercial systems, including wireless network systems.

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Advances in QC laser technology and spectrometer hardware are combined with spectroscopic techniques. Intra pulse spectroscopy and similar techniques provide a major step change in sensitivity, speed of operation, fingerprinting capability, size and cost. They offer a major improvement on methods of gas detection.

Recent advances in spectrometer hardware relate to QC gas sensors which exploit recent technological advances including miniaturized integrated electronic systems, plug and play interfaces and micro optics. These will progressively replace the unwieldy, fragile and expensive instrumentation of the past.

The lasing wavelength for QCL's is determined by the choice of semiconductor material as with conventional lasers. By adjusting the physical thickness of the semiconductor layers new functionality is achieved. This removes the material barriers associated with conventional semiconductor laser technology. It opens the possibility of near-infrared through to THz spectral coverage.

An infrared spectroscopic laser source has no need for cryogenic cooling, provides high output powers, has large spectral coverage, provides excellent spectral quality, and has good tuneability.

The removal of the noise floor, without the need of complex fringe removal techniques or expensive optical isolators, enables the laboratory performance of this technology to be transferred to real world applications.

Mid-infrared (IR) laser sensors are able to measure change in device condition, chemistry, or temperature. The ability to measure change remotely, at an affordable price, is part of the emerging smarter planet initiative based on smart sensors. The coincident elaboration of the Internet availability leverages wireless devices. Worldwide demand is creating needs for remote connectivity to sensing devices.

Infrared is a portion of the electro-magnetic spectrum that is not visible by the human eye because its wavelength is too long. Unlike visible light, infrared radiation (or heat) is emitted directly by all objects above absolute zero in temperature. The mid IR spectrum goes from 3-12 m.

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Homeland security, military communications, infrared countermeasures, chemical warfare agent detection, explosives detection, medical diagnostics, industrial process controls, remote gas leak detection, pollution monitoring, and real-time combustion controls are uses for the mid IR sensors.

Military applications account for a significant portion of mid IR sensor markets in the first three quarters of 2011. The remaining part of revenue came from CO2 building sensors and units for a number of different markets. Markets are anticipated to grow as costs decrease from $5000 per unit to $200 and even to $1 or less per unit for some new technology. Prices will decline on average. The decrease in size of units from bench size devices to portable units makes them more useful across the board in every industry.

Mid Infrared (IR) sensors markets at $509 million market worldwide in 2011 is anticipated to increase tenfold to $5 billion by 2018. This strong growth is anticipated to come as units are less expensive and more effective in the same amount of space. Wireless sensor networks are useful almost everywhere, creating the opportunity to implement controls and mange every aspect of human activity in ways that have not even been imagined hitherto.

WinterGreen Research is an independent research organization funded by the sale of market research studies all over the world and by the implementation of ROI models that are used to calculate the total cost of ownership of equipment, services, and software. The company has 35 distributors worldwide, including Global Information Info Shop, Market Research.com, Research and Markets, Bloomberg, and Thompson Financial.

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