Customer Assisted Power Quality Monitor

An innovative scheme that uses simple but advanced computational intelligence techniques coupled with systems model to achieve the monitoring and control of power quality within the house.

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Inventor
Clayton W. Bates, Jr., Ph.D.

Field
Opto Electronics & Solid State Physics

Technology
Long Wavelength Infrared Radiation (LWIR) detection

Key Features
- Detects low energy photons
- Eliminates the need of heterojunction barrier
- Fast response ~10^{-10} sec

Stage of Development
Prototype has been developed.

Status
Seeking development & licensing partner.

Patent Status
Patent issued

Technology
Howard University's (HU) professor Dr. Momoh proposed an innovative device that uses advanced computational intelligence techniques to achieve the monitoring and control of power quality within a residence. A significant competitive advantage is the flexibility of the device design to be put on electronic circuit chips that can be installed in a central location in a house or on appliances. Additional flexibility will allow the customer the ability to choose appropriate options of the power quality monitoring scheme to meet given goals subject to technical, economic, and regulatory constraints of power delivery, quality, and efficiency. In addition, the monitoring scheme will also take into consideration issues of safety, security and reliability.

Benefits of the Technology
Power-quality monitoring has become increasingly common as the capabilities of commercially available monitoring systems have increased and costs have fallen. Power-quality engineers have used various power-monitoring tools for many years. However, in recent years, several trends have converged, resulting in the wide application of power-monitoring systems beyond power quality or power-management specialists.
The proposed system would be the first to be introduced in the residential market. There is not a customer based assisted power quality monitoring scheme for real-time system viability in the residential market, schemes currently exist only for corporate, electric utility, and government agency customers.

Potential Application for Technology
The described technology is well suited for adoption by a company that is already established in the commercial, industrial, and utility segments of the power quality market. Other groups that may express interest in the technology would be existing energy management companies such as, Intermatic, Leviton and Honeywell. Other possibilities include marketing the technology to communications companies that already offer internet connectivity and may be interested in providing power quality monitoring as a monthly service or marketing to consumer electronics retailers, such as Best Buy or Circuit City, because these companies offer a direct point of contact to consumers interested in protecting electronic equipment and home appliances.

Stage of development
The described technology is currently in the conceptual stage and has not been reduced to practice. There is no indication that the concept has been proven effective in a residential setting. The inventor indicates that a prototype would take approximately six additional months to develop.

Howard University is looking for a research and/or licensing partner to further develop this system.

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INVENTOR:
Clayton W. Bates, Ph.D.
Professor
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EDUCATION
Ph.D., Physics, Washington University-St. Louis, 1996
M.E., Harvard University

SPECIALTY
Solid-State Physics; Optical and Electronic Transport Properties of Metal-Semiconductor Nano-phase Composite Systems

Relevant Publications:

- Q.Y. Chen and C.W. Bates, Jr., "Geometrical factors in enhanced photoyield from small metal particles", Phys. Rev. Lett. **57**(21), 2737 (1986)
- C.W. Bates, Jr., "Optical properties of metal-semiconductor composites" (review paper), Key Engineering Materials, Vols. **108-110**, pp. 355-380 (1995), Trans. Tech. Publications, Switzerland
- C.W. Bates, Jr. and Q.Y. Chen, "Segregation effects in Ag-Si Composites", Mater. Lett **23**, 7 (1995)
- I. Diagne, J. White, M. / Ndoye, C.W. Bates, Jr. and W.R. Thurber, "Chemical etch studies of Ag/n-Si metal-semiconductor composite films", Mater. Lett. **59**, 1640 (2005)
- C.W.Bates, J.C. White and C. Ekeocha, "Transmission electron microscopy study of Ag/n-Si composites grown on Si (111) substrates", Materials science and Engineering B **143**, 38 (2007)
- C.W. Bates, Jr. and C. Zhang, "Electric field dependence of quantum efficiencies of Ag/n-Si composites in the infrared at room temperature", Jour. Appl. Phys., **104**, 076101 (2008)