

Research and Development

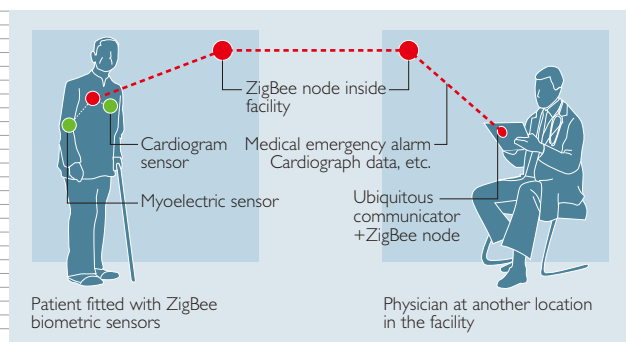
With the growing convergence of information and telecommunications, the Oki Group has made ubiquitous broadband networking technology a key focus for its research and development activities. Specific areas of interest include the ubiquitous networking of a wide range of devices and objects, and the creation of enriched human communications environments that even allow human emotions and realistic sensations to be carried across networks. Another priority is ubiquitous security, which is essential to allow people to use network-linked equipment and devices without anxiety. The Oki Group has also focused on the development of medium-sized mechatronics technology, especially ATMs and printers.

Ubiquitous Sensor Network Based on ZigBee Standard

Adopted as a standard in December 2004, ZigBee is the next-generation low rate wireless communication technology. There is intense interest in this new technology, which allows ubiquitous sensor networks to be created simply by embedding devices in buildings and roads. The Oki Group is conducting a variety of trials using ZigBee technology.

1 Ubiquitous Health Management Network with Biometric Sensors

The Oki Group has used ZigBee technology to develop compact biometric sensor nodes with cardiogram and myoelectric sensors, leveraging the advantages of ZigBee technology, namely low power consumption and compact size. Designed to be attached directly to the body, the sensor nodes provide physicians with instant and remote access to information about health problems, such as arrhythmia. Future development plans include the creation of a ubiquitous sensor network combining biometric monitoring with location information services.



2 Pedestrian Information Beacons Powered by Solar Batteries

ZigBee devices powered by solar batteries can be used to create street corner information beacons and fixed nodes as coordinates for personal positioning systems. Because no wiring is required and these nodes can be installed in any location, there is extreme interest in this as an important technology that expands the free mobility assistance service. In January 2005, the Oki Group conducted tests in Kobe City as part of preliminary trials for the Free Mobility Assistance Service project undertaken by Ministry of

Land, Infrastructure and Transport. A ubiquitous sensor network consisting of ZigBee devices and solar batteries was established to study the characteristics of the technology.

Gallium Nitride Power Transistor for Wireless Base Stations

The Oki Group has developed the GaN-HEMT*1, a high frequency wave power transistor for use in wireless base stations, including those used in mobile phone systems. The new device is smaller than existing gallium arsenide devices as its power density is an order of magnitude higher. It helps to conserve energy, since its operating current is only one-fifth to one-third that of earlier products. It also achieved a high output saturation power of 50.2W.

The GaN-HEMT is expected to become a key device for telecommunications infrastructure in Japan. Oki will continue to



GaN-HEMT

target further improvements in output power and reductions in size and cost as it works to develop commercial products for use in 3G mobile phone base stations and wireless MAN*2 systems.

*1 Gallium Nitride High Electron Mobility Transistor
*2 Metropolitan Area Network

Successful Trial of the World's First OCDM Transmission System

The Oki Group and the National Institute of Information and Communications Technology (NICT) have jointly conducted the world's first successful trial of a communications system based on OCDM*3 technology. This is the first time that the OCDM system, which is seen as an important next-generation transmission technology, has been used on an experimental network under simulated operational conditions.

The OCDM system allows transmission without specifying speeds or formats, which is extremely difficult to accomplish with conventional systems. The technology also supports large numbers of addresses for flexible routing and simpler network configuration. There is also keen interest in ability of OCDM to support highly secure communications based on security measures in the physical layer.

*3 Optical Code-Division Multiplexing

Industry's First MPEG-AVC/H.264 Video CODEC

In April 2004, the Oki Group achieved an important industry-first with the successful development of the MPEG-AVC/H.264 software CODEC, which allows television-quality video to be compressed and decompressed in real time. MPEG-AVC/H.264 is a next generation video CODEC standard with better compression performance than the current MPEG-2 and MPEG-4 CODECs. It is expected to play an important role in the creation of enhanced communications tools for the broadband distribution and broadcasting of high-quality video content.