The demonstration was staged at the Embedded World show in Germany by FME and its collaborator, OASIS SiliconSystems, a leader in MOST technology. It was convincing proof that the combination of the MOST bus, based on plastic optical fibre giving a bandwidth of 25Mbit/sec, and Fujitsu multimedia devices can provide a powerful, fully functional, yet easy to implement in-car entertainment and networking system.

Now, FME and OASIS have formed a collaboration to develop reference designs for multimedia car systems featuring Fujitsu’s MPEG Encoder. The new products are called VideoCompressor 4 MOST and DVDPlayer 4 MOST.

A further recent development is underway in Korea, where Hyundai Autonet, the largest automotive electronic devices manufacturer in Korea, has started work on the development of a complete audio-video system using the Reference System supplied by OASIS, which it aims to sell to automotive producers worldwide.

Based on a fibre-optic bus, MOST has emerged as the automotive industry’s high-speed digital networking standard, serving as the backbone technology for in-car infotainment systems. Using MOST networking technology enables car manufacturers and suppliers to easily add a host of multimedia devices, such as CD players, radios, TVs, DVD players, navigation systems, cell phones, and in-car PCs, as modular functions in the automotive environment, while meeting the specific requirements of any vehicle.

Already cars like the Audi A8, the BMW 5, 6 and 7 series, the Mercedes-Benz E and S classes, Rolls-Royce and Maybach, contain a MOST network, a total of 20 models at the end of 2003. MOST is set to reach more mid-range car models this year, such as the Mercedes A and C classes, and the BMW 1 and 3 series, bringing mass-produced MOST cars onto the road in 2004.

However, the majority of these implementations of MOST are supporting audio but not complete video functionality. Following the demonstration by FME and OASIS, many more comprehensively enabled multimedia in-car networks are certain to appear.
Recovery on the way as new President arrives

No one working in IT can look back on the last few years and say they never had a problem. First came the bursting of the dot.com bubble. Then there were over-expectations associated with 3G. Combined with a global slowdown in IT markets, these made the first years of the 21st century some of the toughest the industry has known since it emerged decades ago.

But many now are convinced the worst is behind us, and that is certainly how we see it at Fujitsu in Europe. The book to bill ratio is looking healthier. And as this issue of Infinity shows, we are investing heavily in the future, with major expansions of plants producing plasma displays and logic chips. Other newer markets covered in this issue, like fingerprint authentication and advanced in-car entertainment systems, have huge potential.

Coinciding nicely with this atmosphere of renewal and optimism, FME now has a new President!

Mr Shimpei Hirata took up duties at our European HQ on May 10th. Hirata-san succeeds Yutaka Suzuki, who has returned to Japan as Group Senior Vice President of Fujitsu’s Marketing & Sales Group, Electronic Devices.

Hirata-san was previously Marketing Strategy Planning Director at Electronic Devices and has held senior positions in Solution Development of System LSI. He started his career with Fujitsu in 1979 working for 12 years in engineering functions.

Welcome and good luck Hirata-san!

Dirk Weinsziehr
Senior Director, Marketing

Since 1996, OASIS SiliconSystems has developed and marketed mixed-signal ICs and optoelectronic systems for networking multimedia components in the automotive industry. The MOST technology, developed by the company’s founders, enables up to 64 multimedia peripheral devices to be networked – everything from a CD player, mobile phone, radios, TV and DVD player, to a navigation system, on-board computer, microphone, loudspeaker and monitor.

The combination of MOST with Fujitsu MPEG components gives great flexibility, because different content formats such as DVD, MP3, VCD and CDA are handled centrally within the player and re-encoded with a defined bandwidth according to the loading on the MOST bus. The re-encoding process compresses the content again to a single format for transmission over MOST.

Future extension of MOST is already being planned, with MOST 2 due to offer higher transmission rates of 50 and 150 Mbit/sec, which will motivate the implementation of new applications already being requested by many car manufacturers, such as rear cameras that require the lowest possible system delay. The Fujitsu MPEG encoder (MB86391) can compress the signals in a wide bit-rate range, from less than 1Mbit/sec to 15Mbit/sec, for high picture quality. This means the best possible trade-off between bandwidth and picture quality can be achieved.

mycable’s XXS3HC is a modular evaluation development and prototyping system for high-end embedded multimedia systems based on credit card size modules with a high density PCI interface.

Fujitsu’s MPEG devices, the MPEG Encoder and MPEG-2 Decoder (MB86H22), also called SmartMPEG, fulfil critical requirements for silicon components used in automotive applications, for example extended temperature range and low power dissipation. Both devices, when combined with the Fujitsu Graphic Display Controllers (GDC), such as the Coral P, provide a complete solution for Car Navigation and Entertainment Systems.

The concept for the MOST Co-operation began as an informal co-operative effort in 1997. Since the Co-operation was founded in 1998, 20 international car manufacturers and more than 50 key component suppliers are now working with MOST technology and contributing towards its innovation.

http://www.fme.fujitsu.com/company/MPEGProducts.html
GYRO-SENSOR EXPLOITS SAW MATERIAL
FOR GREAT ACCURACY

A new component developed by Fujitsu for use as a gyro-sensor within car navigation and stabilisation systems exploits the piezoelectric properties of the material Fujitsu uses to make its SAW filters, lithium niobate.

Use of lithium niobate in the sensor, the S1BG series, represents an important advance over other materials previously used for gyro-sensors, such as quartz and ceramic. It results in much greater resolution, lower output noise, and greater resistance to impact and vibration.

The sensor is shaped like a tuning fork and is continuously vibrated. As the car turns and the sensor is thereby rotated, the Coriolis force affects it in the direction perpendicular to the vibration. Another vibration occurs and this is converted into a proportional voltage, allowing the rotation to be measured.

The device was first produced for a Fujitsu robot, measuring rotation in 3 axes.

Its excellent performance characteristics give it great potential for car navigation. It has already had success in Japan, where dense road conditions make its high accuracy particularly useful.

It will also be valuable in other applications, like a rollover sensor, a vehicle stability controller, and in a parking assistant, where its accuracy will enable it to tell the driver the correct angle for reversing into a parking slot.

The S1BG series is available in an extremely compact package, just 1cm³, but next year it will be reduced still further in size to less than 0.5cm³.

gyro_info@fme.fujitsu.com

DEVELOPMENT KIT DESIGNED FOR EMBEDDED FINGERPRINT AUTHENTICATION SYSTEMS

A stand-alone kit for developing embedded fingerprint-based authentication solutions has been produced by FME to provide fingerprint capturing, processing, verification and storage – in a single package.

The MDFP200-EDK, featuring a built-in Fujitsu microcontroller (MCU) and CMOS single-touch fingerprint sensor, provides comprehensive functionality that will save customers development costs and ensure the fastest possible time to market for their products.

The fingerprint sensor used is the MBF200, which has a resolution of 500dpi and offers a 256 x 300 pixel array in a rugged, ultra thin design measuring only 1.4mm. It provides excellent, stable operation, independent of lighting conditions and temperature. The MCU is a Fujitsu FR Series 32 bit RISC processor, the MB91302, with the new FR60 core. It offers powerful functions such as built-in hardware...
company IKENDI, Fujitsu’s partner in the developing MDFP200-EDK, achieves this, being able to perform 1:1 matching for authentication in only one second. This is seen as the acceptable time limit for practical fingerprint authentication. The system also minimises the storage space required for templates, with a template size per finger of around 200 Bytes. If required, the system can store up to 100 templates, and this capacity can be increased via an external database.

Comprehensive application software

The MDFP200-EDK uses a highly efficient fingerprint matching algorithm that can perform 1:1 matching for authentication in only one second. It is available for use with the development kit, including IKENDI's minutiae-based software library that can be licensed directly from IKENDI, plus Flash utilities that can be used to download new applications, and the Fujitsu Softune Workbench for platform development.

Once customers have completed their design, they can integrate the resulting system easily into their own equipment by taking the first two layers of the development kit – the fingerprint sensor and the MCU and memory.

Fingerprintsensor_info@fme.fujitsu.com

NEW PLANTS TO INCREASE PRODUCTION CAPACITY OF PDPs AND LOGIC CHIPS

Fujitsu is now constructing two major new manufacturing plants, one to increase production capacity of plasma display panels (PDPs), the other for logic chips using 90 & 65nm process technologies and 300mm wafers.

The new PDP plant is being built by Fujitsu Hitachi Display Ltd. (FHP) next to its existing Miyazaki factory in southern Japan, and will cater for the rapid growth in demand for large-screen PDPs used in flat-screen TVs and commercial displays. Construction of the new factory, which will have a maximum production capacity of 150,000 units per month, will begin early 2005. Volume production of 50,000 units per month starts the end of that year. FHP is also accelerating plans to increase production capacity at its existing facility from 50,000 to 100,000 units per month by January 2005, four months ahead of the original schedule. By 2007, these expansion moves will bring combined maximum production capacity at the Miyazaki complex to 250,000 units per month, 3 million units annually, making it one of the world’s largest PDP manufacturing facilities.

As the shift to digital broadcasting gathers pace, together with continued growth in DVDs and other digital content, PDPs' large screen sizes, thin profile and excellent digital interface are making them very popular for use in flat-screen TVs and public information monitors. Unlike LCDs or projection-type displays, PDPs are self-luminescent devices that have won wide acclaim for their superior ability to display the subtlety and quality of high class video images.

Even greater demand is forecast for flat panel TVs thanks to various factors – expansion of digital broadcasting in Japan, the growing popularity of high-definition TV in North America, and forthcoming high-profile televised events such as the Athens Olympic Games this summer, and the soccer World Cup in Germany in 2006. FHP predicts these factors will dramatically increase the size
of the PDP market from 1.4 million units in 2003 to 10 million units in 2007.

FHP specialises in producing high resolution (XGA) large-screen PDPs, in several sizes – 32, 37, 55-inch, and the most popular size, 42-inch. Established in 1999 as a joint venture of Fujitsu Limited and Hitachi Ltd, its current production capacity of 50,000 units a month makes it among the world’s largest PDP manufacturers. It has developed several technological innovations for PDPs including the Alternate Lighting of Surfaces (ALIS), extended ALIS, and Technology of Reciprocal Sustainer (TERES) techniques, all of which will be featured in the PDPs produced in the new plant.

The expansion plans mean FHP expects to hire approximately 1,000 new employees, mainly engineers and operators, by 2007. Overall capital investment in the new production facilities is put at 550m Euros.

The new logic chip factory, located at Fujitsu’s Mie semiconductor plant in central Japan, will mass-produce logic chips using state-of-the-art 90nm volume process technology, as well as next-generation 65nm technology, and employing large-diameter 300mm wafers.

The new facility is scheduled to be operational from April 2005, with volume shipments commencing from September 2005, when demand for 90nm product is expected to intensify. Fujitsu will initially invest about 550m Euros for the first phase of construction through fiscal 2005, with phase two and subsequent investment to be made in stages, in response to market demand. Total investment in the facility is expected to reach about 1.2bn Euros. When fully equipped, the new facility will have a maximum production capacity of 13,000 wafers per month.

**BLUETOOTH® MODULES SUPPORT SERIAL PORT AND DIAL-UP NETWORKING PROFILES**

New Bluetooth® modules and development kits from FME are designed to make it as easy as possible for customers to design and implement Bluetooth® solutions for a wide range of applications.

In particular, by incorporating both lower and upper Bluetooth® software stacks, as well as a Serial Port Profile (SPP) and a Dial-up Networking (DUN) Profile, the aim is to facilitate the building of easy-to-use, low cost, low power solutions for establishing ad-hoc local wireless communication systems.

Two modules are available, both of them supported by comprehensive development kits. The MBH7BTZ03 is a Class 2 module, featuring an SPP profile. It contains a built-in protocol stack, a 1.5Mbit/sec UART hardware interface, and a text-based command interface, to make software development as easy as possible.

It measures just 10 x 9.5 x 1.9mm, in a land grid array package, making it one of the smallest embedded stack modules available. It has an operating temperature of -20 to +70°C, an -80dBm receive sensitivity, and power consumption of 65mA when performing data transfer, and only 30µA in deep sleep mode.
The second module, the MBH7BT08, has similar features but features both SPP and DUN profiles, has a slightly slower UART interface (921.6kbit/sec), and is somewhat larger (19.5 x 13 x 2.2mm). It comes in an SMD package for standard soldering and inspection. Power consumption is 55mA (maximum data transfer), or in deep sleep mode, 250µA. The design kits available for both modules provide comprehensive support for development of Bluetooth® solutions based on them, including a CD-ROM and printout of detailed application notes for the quickest possible start. Also, since the antenna is included, no RF expertise is required, but customers have the option to use a different antenna if they wish.

Fujitsu’s latest production facilities in Japan and recently Taiwan can cater for both volume requirements and specialised specifications. A ‘fast track’ product range is available, making the path from design to production extremely quick, and especially suitable for the low volume market, where any possible saving in design time and prototype costing can make the difference between success and failure of a new concept.

The complete range of standard sizes available are: seven-wire panels: 8.4, 10.4, 12.1, 15.0 and 17.0-inch; for the four-wire panels: 3.8, 5.7, 6.4, 7.9, 8.4, 10.4, 12.1 and 15.0-inch. Either Serial or USB controller-boards or microcontrollers are available, plus all the drivers and documentation needed for an easy integration.

An important new project using the Fujitsu touch panels is currently underway on London’s underground railway. Here, a new system is being installed that will provide a constant communications link between each platform and the central control room, increasing security and safety for passengers and staff.


TOUCH PANELS PROVIDE HIGH RELIABILITY AND TRANSPARENCY

The Fujitsu touch panels offer exceptional reliability of 10,000,000 touches/1,000,000 words, thanks to a unique method for sensing the co-ordinates using only the glass side of the touch screen.

Fujitsu’s range of highly transparent 4- and 7-wire resistive film-on-glass touch panels can be easily integrated into displays for a wide range of applications. The touch panels have been designed and developed to provide solutions for almost any requirement, and meet the most demanding specifications.

For example, the seven-wire touch panel, the FID-550, offers exceptional levels of reliability – 10,000,000 touches/1,000,000 words, thanks to a unique method for sensing the co-ordinates using only the glass side of the touch screen. This makes the seven-wire panels ideally suited to demanding, external applications, because the seven-wire design provides built-in redundancy. It also gives a greater linearity/lower power consumption than alternative solutions. The four-wire panels (FID-554) also offer excellent reliability and are best suited to internal applications.

Both the four-wire and seven-wire panels feature high levels of transparency, with a normal typical rating of 80% but options can take this up to an industry-leading 92% with a 5% (typical) haze. Clarity is further enhanced with anti-Newton ring technology and surface hardness is rated at a minimum of 2H with a maximum 1.5% linearity.

Both panel ranges offer OEMs interface options that are cost effective and easy to implement and use for a host of portable and fixed applications, from cash registers, kiosks, industrial and process control systems, portable and handheld PCs, PoS terminals, ATMs, medical equipment and Internet appliances.

Maximum power consumption of the touch panels is 20mA (15mA typical) in 5V operating mode, and they are available in a wide range of sizes, from just 3.8 up to 17.3-inch. This range is being continuously expanded, but customised sizes and optical treatments are available to meet specific needs, together with individual demonstration kits.

Key target applications for ad-hoc wireless networking systems include many areas of industrial markets and the construction industry, where the SPP and DUN profiles can be particularly useful, for example remote meter reading and barcode tracking of shipments, equipment monitoring and control. bluetooth_info@fme.fujitsu.com
Fujitsu’s FRlite family of compact 16/32 bit microcontroller unit (MCUs) has been developed especially for applications outgrowing the 16 bit world.

This core merges a new 16 bit architecture with the well established 32 bit features from the existing FR families. It combines the proven EMC qualities and low power consumption of Fujitsu’s 16 bit MCUs with object compatibility to Fujitsu’s 32 bit FR family. The objective is to give 16 bit MCU customers a migration path to the 32 bit world, with performance of up to 200 MIPS.

The first FRlite MCUs, the MB91F233 and MB91232L, integrate many resources including LCD controllers, and are designed to consume less power, making them ideal for use in mobile and digital consumer devices. Other FRlite series featuring CAN as well as LIN-UARTs dedicated to automotive and industrial applications are currently under development, as well as ones further in the future for storage and audio control.

The new family shares the same architecture as the rest of Fujitsu’s FR family of high-performance 32 bit microcontrollers. Making the most of Fujitsu’s extensive library of intellectual property assets, these new products support the same high-speed 33MHz operation as their predecessors, but in a smaller package. Furthermore, by optimising the clock driving circuitry, the power consumption of the CPU core has been slashed to 1mA per MHz, a 40% reduction compared to the company’s existing line-up of microcontrollers based on the 32 bit RISC CPU core.

Also newly available for the MB91230 series is a compact, low cost multifunctional evaluation board, the STARTERKIT MB91230, which can be used stand-alone for software development and testing, or as a simple target board to work with the MB2198 emulator system. The board allows designers to immediately begin software development before their own final target system is available.

The target board is delivered with the MB91F233 microcontroller, which contains a boot loader for programming the flash.

MVA TFT-LCDs MEET LATEST EXACTING QUALITY STANDARDS

Fujitsu is a world-leader in TFT-LCD technology, having invented what is accepted to be the best active matrix TFT-LCD technology yet developed, called multi-domain vertical alignment (MVA).

Now, the company is supplying the full range of its high quality MVA and ultra-high quality MVA-Premium TFT-LCD panels to the European marketplace.

Two models are available, a 17-inch unit with a 16 x 9 picture ratio, and a 19-inch unit with a 4 x 3 ratio. Both products include market-leading features such as high brightness, extremely wide viewing angle and high contrast ratio.

The 17-inch panel is set to be one of the highest selling units in the TFT-LCD TV market, with the UK nationwide consumer electronics retailer, Dixons, having become a major customer.

They are also two of the first TFT-LCD panels to meet the latest, most stringent standard specified for these products, TCO 03, produced by Swedish organisation Tjänstemännens Central Organisation, which includes new ergonomic and emission requirements. The Fujitsu panels also meet 100% of the colour requirements, as laid down by the European Broadcasting Union.

Most other competing products cannot achieve these levels of performance, typically meeting the less demanding TCO 99 standard, and only 85% of the EBU colour requirements.

The Fujitsu panels have also been enhanced significantly in terms of response time, a vital parameter for TFT-LCDs, since they are being used increasingly as high quality TVs and multi-functional monitors for showing moving images. Response time for both models is now a max of 12ms, compared with around 25ms two years ago.

A further enhancement for the 19-inch panel is its availability in slim bezel format, featuring a very thin metal frame, making for an extremely neat design format.


The 19-inch MVA TFT-LCD, giving XGA resolution in a WideScreen (16 x 9) picture ratio, is set to be one of the highest selling units in the TFT-LCD TV market.