



# Texas Instruments

## Tech Day: Taipei - June 16, 2011

### Session Titles, Presenters, Abstracts

Track & Course	Abstracts
<b>Track 1 - Industrial</b>	
<p>Telehealth: Trends, Challenges and Solutions</p>	<p>Telehealth via portable patient monitoring enables independent elderly living, reduces health care costs, and improves access to health care services. It has been gaining tremendous momentum in the recent years due to the ongoing policy and infrastructure changes. This session will present the overview of telehealth systems and relevant technologies including new TI solutions for portable thermometer, blood pressure monitors, pedometers, and pulse oximetry. Specifically, we will look into the different components of a telehealth system design: processor, connectivity, power management and user interface. Solutions to enhance performance, improve connectivity, extend battery run times, and enable rich user experience will be proposed.</p>
<p>World's Smallest, Passive IR Temp Sensor and It's Implications on Tablet and other Designs</p>	<p>Introduction and Demonstration of the world's smallest &amp; most highly integrated passive IR temperature sensor. Smaller than the head of a pin and the TMP006 leverages the latest in MEMs technology and is over 165 time smaller than competing solutions. By slashing the size, power, and cost of IR temp sensing, the TMP006 enables a broad range of new markets and applications that can benefit from contactless temperature measurement. The TMP006 not only helps solves some of the toughest thermal challenges faced by tablets, smart phones, and notebooks, but enables a multitude of new user applications possibilities. As the processing demands on our mobile products continually increase while form factors shrink, the TMP006 is vital to getting the maximum performance from the system. Come see why!</p>
<p>Introduction to Touch Screen &amp; Haptic Technologies</p>	<p>Overview and comparison of different touch screen and haptic technologies in the market today. This session will discuss the fundamentals of operation and key design considerations when choosing between resistive and capacitive touch screen technologies. No longer is multi-touch a capacitive only feature. Making multi-touch affordable, we'll introduce the TSC2020 TI's Resistive Multi-touch Controller. We'll also delve into the need for greater tactile response from touch screens and the haptic options available to create a more immersive user experience.</p>
<p>Industrial Communications on Sitara</p>	<p>PROFIBUS is a leading industrial communication protocol. TI has integrated PROFIBUS into the newly announced AM1810 part. We will present the technical details of AM1810, system block diagram, PROFIBUS overview and how customers can develop PROFIBUS based</p>

Energy metering solutions using MSP430	Electronic metering is key to the success of any Smart metering/ Smart grid system. An electronic meter has numerous advantages in comparison to conventional electromechanical meters in its ability to communicate. TI's ultra-low-power microcontrollers MSP430 has a family of devices tailor made for this purpose. Key features include accurate on-chip analog, Real-time clock, UARTs, SPI etc. In this session you will learn about these devices, their differences in feature set to conventional MSP430s. The take away from this session is your ability to help customers understand the strengths of MSP430 and steps to quickly build a meter.
Developing Advanced GUI's in Test & Measurement Applications	Why DSP+ARM processors for Test and Measurement? How to create signal processing applications outputs run on displays? How to leverage of Open source code on ARM for creating interfaces? With the advent of Graphics technology 2D Graphics GUI interfaces are developed using Open Source Qt Embedded technology. Signal Analyzer and oscilloscope requires High intensive 2D Graphics display with graphs display on the multiple Graphics planes. DSP+ARM Integra processors best suited to do the Signal processing on DSP and display the processed signals on ARM. The Cortex A8 Neon core accelerates the 2D Graphics display and advanced display subsystem of the TI processors helps is showcasing the multiple Graphics plane architecture.
<b>Track 2 - Lighting &amp; Audio</b>	
Save Energy with LED Lighting and Intelligent Sensing	Main benefit of LEDs is that you can save energy by dimming the light. So what about an intelligent light which is aware of its environment and communicates to other lights on the need for illumination? From simple temperature measurement, ambient light and occupancy sensing using TI MCUs and DSPs to wired and wireless communication protocols TI's software and hardware solutions help to design Intelligent Lighting.
LED Lighting: Solutions that are ready by using TI Lighting Reference Designs	As LED Lighting is becoming more prominent, Texas Instruments continues to develop solutions for different LED Lighting situations and applications. This session will walk through several solutions that are available from TI in a reference design and discuss the technical details behind each such as operating voltage range, power-factor correction, efficiency, dimming, isolation methods, etc. We will also explain what we mean by an EVM (Evaluation Module) vs a Reference Design. Examples of some of the referenced designs discussed will be a 20W T8 Light Bulb Replacement that uses a single stage PFC Flyback Topology, a 9W PAR30/38 Light Bulb Replacement which uses a buck topology and is TRIAC dimmable, a 13W Light Bulb replacement using an isolated PFC Flyback topology which would take in a universal AC Input, and an MR16 Light Bulb replacement using new LEDs from Cree.

<p>Lighting Solutions from Microcontrollers to Analog</p>	<p>Microcontrollers have many benefits in lighting applications including the ability to dynamically adjust operating conditions for optimal efficiency, color mixing, intelligent lighting, ambient light sensing and adjustment, etc. This session gives an overview of the MCU solutions for lighting applications, including digital powered lighting and lighting control and communications. TI has a broad portfolio of products suitable to the lighting market from light bulb replacements to LCD backlights to digitally powered streetlights to advanced intelligent lightings controls such as power line communications or wireless 6LoWPAN and ZigBee. TI can address a wide swath of the new and existing markets. This session will also include an overview of digital power as it relates to lighting, reference designs available, and products and development kits that will be released within the next 6-12 months.</p>
<p>Solve DTV Design Challenges with TI LED Backlighting Solutions</p>	<p>Engineers face reliability and cost challenges when designing LED backlighting solutions for DTVs. This session will explain how TI's multitransformer group dimming solution (targetting DTVs typically below 47") and TI's current balancing local dimming solution at (targetting DTVs typically greater than or equal to 42") provide stable output current to improve efficiency and reliability. The presentation also discusses how these solutions address cost challenges by reducing component counts to lower system cost. A series of reference designs will also be highlighted, to enable customers to meet their specific design requirements and shorten their design cycles.</p>
<p>Design solutions for High Fidelity Wireless Audio using TI's Pure Path Technology</p>	<p>TI is introducing the CC8520 wireless audio transceiver which is capable of streaming uncompressed wireless audio at 44.1/48kHz and 16 bits resolution. This presentation will give a brief introduction to CC8520 and demonstrate the development tools used to build a wireless audio application. A live demonstration and measurement results from coexistence and range testing will be presented to illustrate the robustness of PurePath Wireless. Target applications for CC8520 is wireless point-to-point audio streaming, wireless subwoofer, wireless speakers and wireless headphones.</p>
<p>TI's Value Soundbar: PCM3070 using PurePath Studio</p>	<p>This training for TI's Value Soundbar shows the specification, part selection, schematic diagram, layout, assembly and firmware of this reference design. We will show how to transfer process flows developed for the PCM3070 using PurePath Studio to the Value Soundbar and how to tweak its performance. Part of the training is a slide presentation followed by a live demonstration using PurePath Studio, an example process flow and the programming tools for the Value Soundbar</p>
<p><b>Track 3 - Consumer</b></p>	
<p>Wireless Power: Total Solution for Charging Using the Wireless Power Consortium Standard</p>	<p>TI launched our first Wireless Power solution for the mass market called the bqTESLA100LP solution. This Qi-compatible kit includes both the transmit and receive ICs plus design to take a Wireless Power Consortium-based solution to market today. We will discuss the basics of Wireless Power, the Wireless Power Consortium and the TI devices that make up our first generation solution in this session.</p>

<p>Solving Battery Management Design Challenges Associated with E-bikes and Power Tools</p>	<p>Motor-based portable products present additional battery management challenges due to high potential "stall" currents, voltage transients, and unique usage profiles. TI's portfolio of battery protectors for Li-Ion e-bikes and power tools addresses the needs of these applications. This presentation will expose the key design issues and solutions using TI products.</p>
<p>MSP430 for tablet application</p>	
<p>Tablet Solutions using TI's Analog and Logic Products</p>	<p>Tablet PCs use multiple corechip platforms and all require low power, space savings and integrated IC solutions. During this session, TI will introduce total solutions for ESD, Level shifter, Little Logic, Analog switch, High speed switch, load switch and I2C which are suitable for any interface in tablet PCs. This presentation will highlight common designs widely used and discuss how TI products meet power, space and integration requirements in tablet PC applications.</p>
<p>Enabling &amp; Accelerating Android on Sitara, Integra &amp; DaVinci Devices</p>	<p>With the availability of Android for TI's Cortex-A8 devices, developers are now able to utilize the unique power of the Android application framework to create new, compelling designs. Attend this session to learn about the Android fundamentals including:</p> <ul style="list-style-type: none"> <li>- Overview &amp; Key Benefits</li> <li>- Architecture Review</li> <li>- How Android can benefit different end equipments and applications (including voice/video applications)</li> <li>- TI/Android Roadmap</li> </ul>
<p>Differentiate your Android/Linux-based Application Using C6EzAccel</p>	<p>Android is the hot new OS of choice for many system builders and integrators. Underneath the fancy GUI interface and Java Code base is a familiar Linux kernel, including native drivers and modules. These Linux underpinnings allow the use of the C6Run tool to quickly create applications and libraries that make use of the DSP for acceleration and offloading MIPS on TI's ARM+DSP silicon. This session will provide an overview of how best to integrate native C code that needs to be run on the DSP with the application layers written in Java, that can exist as part of the managed Android stack. C6Run is used for building the native code and communicating with the DSP, and example code for interacting between the Java Android layers and the native code that makes use of the DSP is provided.</p>
<p><b>Track 4 - Communications</b></p>	
<p>Flexible Power Line Communication Solution</p>	<p>From the Grid infrastructure to the Home Area Network Smart Grid applications are booming. From power analytics on the grid, to utility metering applications and beyond to in-home applications, TI is delivering all the ingredients of Smart Grid Solutions simplifying designer's choice and a unique system optimization level. Presentation will highlight the latest development in communication (PLC, LPRF), microcontrollers (metrology and Cortex) and system solutions tailored for the Smart Grid space.</p>

<p>Video Communications by Ittiam (Ittiam)</p>	<p>Communication has always been the quintessential part of human interaction and hence at the pinnacle of invention. We have come far from the days of Pigeon carriers to modern day cell phone communications. However, this has always been either text-only or voice-only communication and often non-real-time Today, with improvements in infrastructure, Video communications promises to bring people together closer than ever before through videophones or other video communications-enabled devices. Video conferencing, or video communication, is a real-time interactive event where the user feels truly and closely be 'connected'. The video in the video communication may range from pictures of the participants, video clips and documentations (such as photos, diagrams, charts, graphics, etc.) to live video; while the audio may include real-time audio signals from participants, as well as other audio and sound signals.</p> <p>With rapid development of communication infrastructures, broadband, 3G/4G wireless technologies, and availabilities of fast video processors, a simple peer-to-peer video telephony is no longer a big deal. The challenge needs to be taken to</p> <p>In this presentation, we intend to present the following topics to the audience.</p> <ol style="list-style-type: none"> <li>1. How video communication systems work</li> <li>2. A brief history of the video communication</li> <li>3. Video communication applications</li> <li>4. Audio and Video compression for video communication (audio/speech and video)</li> <li>5. Quality of Service (QoS) For video communication</li> <li>6. Protocols and standards for video communications (ITU H.3xx and SIP)</li> <li>7. Video communication system design consideration (Implementation on TI platform)</li> <li>8. A peek into the future of video communication</li> <li>9. Real-time demo of the video phone with a built-in HD AV bridge on TI platform</li> </ol>
<p>Enhancing Value of TI's Video SOCs Using Application Specific Video Codec Offerings</p>	<p>There are multiple application areas in video compression field including digital cinema, cable and satellite digital video transmissions; video telephony and telepresence; video surveillance and security; machine vision and recognition; medical imaging, mobile handsets, mobile Internet devices (MIDs) and other handheld devices (multimedia players, digital cameras/camcorder). Each one of them has their specific key care about. This session is focused on the key software features of video codecs which are market specific and highlighting them can make the case of TI's solution stronger. This session is mainly intended on Video codecs offering on DM36x, Netra(DM816x) and Centaurus(DM814x). Some features to be discussed are</p> <ul style="list-style-type: none"> <li>Different video codec standards</li> <li>SVC-T</li> <li>Smart Codec Features such as ROI</li> <li>Error Resiliency features</li> <li>VC market specific features such as low latency video codecs, H241 packetization, RCDO profile etc</li> <li>Analytic information sharing with application for video surveillance markets</li> <li>Multi channel capabilities</li> <li>Application specific knobs for different Rate Control algorithms</li> </ul> <p>At the end of this session you will be equipped with information on compression ca</p>

<p>Video Capture and Processing with the TMS320DM8127</p>	<p>TI provides a range of video encoding and processing solutions. The DM8127 is TI's latest Davinci Media processor. We will describe the advanced video capabilities of the DM8127 processor. We will also present a camera reference platform for the DM8127 which enables video capture, encoding, display and streaming. An in depth discussion of the features of the camera reference will present TI's complementary products which enable a complete camera solution.</p>
<p>Insight into a high performance SVC implementation on TI DM6467 (Ittiam)</p>	<p>Scalable Video Coding (SVC) is an amendment to the ITU-T H.264 specification that has been ratified recently. The temporal, spatial, and SNR scalability aspects offered by SVC are intended to achieve a highly efficient, yet scalable representation that can be used to adapt to different channel and receiver capabilities. The requirement of the base layer to be compatible with H.264 Base Profile (or High Profile) ensures backwards compatibility with existing H.264 (non-SVC) compliant terminals or Media-aware Network Elements (MANEs).</p> <p>The power of SVC is highly relevant to the following applications:</p> <ol style="list-style-type: none"> <li>1. Multi-point conferencing over heterogeneous networks and end-points</li> <li>2. Content hosting sites catering to a multitude of end devices over the Internet</li> <li>3. Video surveillance IP Netcams involved with storage, local monitoring, and remote monitoring</li> </ol> <p>In this talk, we will present a high level overview of the SVC extension to AVC, and the compression efficiency and complexity implications with SVC. While several x86 desktop solutions for SVC have been available in the market, we consider a comprehensive SVC decoder on a programmable platform with video a</p>
<p>RF4CE: The New RF Remote Control Technology with Enhanced User Interface</p>	<p>RemoTI is a new emerging RF Remote Control Technology. This is the Texas Instruments branding name of ZigBee RF4CE (RF for Consumer Electronics). The course will provide a broad overview of the technology with highlights on Architecture, Coexistence, Power Consumption, Frequency Agility, Transmission Options, and tools such as Serial Boot Loader and Over the Air Download. An iTunes or Windows Media Player Demo will be demonstrated at the end of class.</p>
<p><b>Track 5 - Basics</b></p>	
<p>ARM - Cortex A, R, M Overview</p>	<p>This session will detail the differences between Cortex-A, R and M. An explanation of target applications, architecture differences (including floating versus non-floating and how they communicate) will be covered. Join this overview presentation to better</p>
<p>The Art of Adding Wired Network Support to Your Embedded System</p>	<p>This session will provide an overview of major areas within an embedded system that must be considered when attempting to support a wired or wireless network. The presentation will include both hardware and software aspects of the design challenge and will be primarily focused on ZigBee &amp; SimpliciTI networks. Each aspect will include discussions regarding the design goals, challenges and proposed solutions along with explanations about how TI's Stellaris offerings can help address these successfully within an embedded system.</p>

<p>Enabling the highest efficiency and power density in low-to-medium input voltage systems with TI NexFET™, PowerBlock, and Power Stage technology</p>	<p>TI NexFET™, PowerBlock, and Power Stage technology enable ~92% efficiency at output currents &gt;100A is achievable today, and meet the ever increasing power density and efficiency demands in line and portable power systems. You will come away with a complete understanding of the system approach TI NexFET™s facilitate in TI Power Management Solutions, and will understand TI's NexFET™ Power MOSFET technology competitive advantages in the marketplace.</p>
<p>Solar Inverter Development using C2000</p>	<p>In an increasingly energy challenged world, solar power is a new and rapidly expanding technology. The need to generate power cheaply and efficiently are key requirements, and the C2000 'Piccolo' MCU offers powerful features which enable both making it a natural choice for solar inverter control.</p>
<p>Developing C6-Integra DSP+ARM Applications using the Linux EZ Development Kit</p>	<p>The Linux EZ Software Development Kit (EZ SDK) allows customers to evaluate their devices in minutes and begin development in less than an hour. This kit provides everything C6-Integra™ developers need to evaluate and start developing on the C6A816x DSP+ARM® processors. With the included Graphical User Interface (GUI)-based Application Launcher, launching demos, benchmarks, and applications is a snap. Furthermore, developers will find it easy to develop applications and add them to the Application Launcher. The EZ SDK also includes DSP-accelerated algorithms as well as tools, such as C6EZRun and C6EZAccel, to allow ARM developers to easily leverage the DSP for signal processing tasks. Join this session to learn more.</p>
<p>High Speed Amplifiers - Video Tips and Tricks</p>	<p>In this session, tips and tricks for designing with TI's integrated video line driver devices will be discussed. It will start with some of the basics for analog video including some general overviews and comparisons of the commonly used video interconnect signals. The session will also provide a brief overview of key video tests using the industry standard VM700 and VM5000 test systems. Known issues and solutions will be discussed relative to frequency response issues, how to interface to DAC/Encoder and the outside world, and issues to be aware of when replacing passive filters with our devices.</p>
<p><b>Track 6 - Motor Solutions</b></p>	
<p>Intro to Motors &amp; Motor Control</p>	<p>This session will talk about the different types of motors used in the industry; DC, Brushless DC, Steppers, Permanent Magnet Synchronous, and AC Induction. To gather a better understanding of motors, differences of these motors with advantages and disadvantages of each will be shown. Basic motor drive circuits will be discussed from full H-Bridge drive to half-bridge for 3-phase motors. Other drive concepts such as 6-step commutation along with drive issues such as current recirculation will be discussed. Field Oriented Control will also be discussed and how it has progressed with improving technology. This session will end with how to implement a motor control application using TI solutions from analog products, digital controllers and software to precisely control the position, velocity and torque of mechanical drives.</p>

<p>Analog Motor Drivers: Steppers, Micro-steppers, and DC Motors</p>	<p>This session will walk thru the TI Solutions for Motor Drivers, which are all inclusive to the DRV8x product family. Solutions will be provided for several stepper motor examples such as micro-stepping, driving two stepper motors from a single driver, dual H-bridge driver with micro-stepping indexer, and motor driver control through a serial interface. Many other features will be discussed such as PWM current control, programmable decay modes, and all the protection features that a motor driver should have. Coming out of this session, you will fully understand what TI products fit your application best.</p>
<p>Science and Art of your Stepper, Brushed, and 3- Phase Motor Driver</p>	<p>A careful view of all the "steps" needed to take a single stepper motor step into multiple microsteps and how you can take advantage of full integration into a single device. We will explore what makes a stepper tick and how we can improve motion profiles in order to minimize dreadful resonance and vibration, followed by techniques on how to connect different stepper topologies and how to route the PCB layout.</p>
<p>Digitizing Your Motor Control Solution</p>	<p>Today's motor control systems almost invariably use a microprocessor or microcontroller to close the control loop digitally. The economical advantages of this approach are obvious, but the impact to your system performance is much more subtle. How does quantization affect system performance? How can you analyze the stability of your composite analog/digital signal path? How do you know if your sampling frequency is high enough? What processor features are really important for optimized performance? Are there software tools and techniques you can use to ease the development effort? This session discusses some of the analytical methodologies you can use to answer these questions (including several motor control simulation examples), which take the guess work out of designing your digital motor control system.</p>
<p>Field Oriented Control of PMSM/BLAC Motors</p>	<p>Building on the previous session, we investigate the Field Oriented Control process in an easy to understand way using animations and simulations. We then introduce the topic of observers and how they can be applied in a field-oriented application to eliminate the motor shaft sensor, resulting in sensorless control.</p>
<p>Motor Solutions</p>	<p>Everything you need to know to get started and successfully deploy TI motor solutions</p>