



Participating in the University Programme



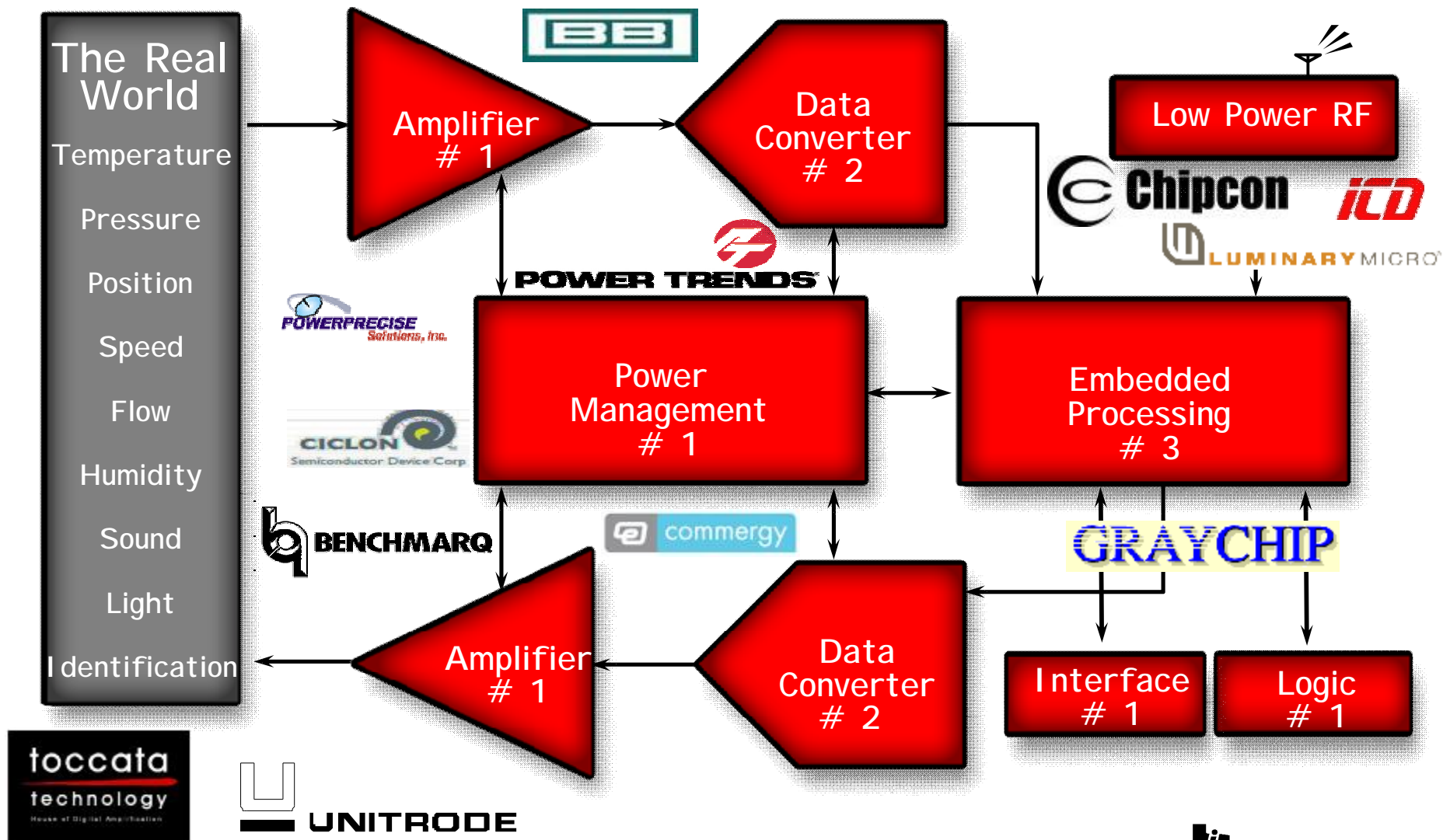
Robert Owen.

University Programme Manager
e-mail: rcwo@ti.com

www.ti.com/EUP
Follow: twitter.com/UniPgm



TI supports the entire signal chain





Why “Real-Time” in Universities...?

Teaching

- Ø Equipping the next generation of Engineers with the skills to tackle tomorrow's problems

Research

- Ø Widening the potential applications of real-time Analog & DSP technologies by stimulating innovation

Realisation

- Ø Building productive links with industry to enable research to be brought to market rapidly



Goal

Our Support to You

- Ø Enable the widest possible use of real-time signal processing to be achieved in the classroom using industry standard TI processors, software and analog

“Market”

>1200 E&EE/Computer Eng. Universities in Europe/ME&A !

Support

- Ø University Pricing, Communications and Training
- Ø “Teaching ROMs”, Workshop Notes, Books, Articles...
- Ø Technical Assistance from the ECSC
- Ø Tools for Projects/Master Thesis/Diploma Work
- Ø The MCU, DSP & Analog tools to set-up new Labs!

www.ti.com/europe/university





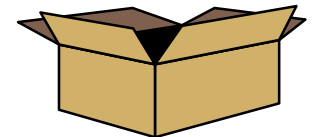
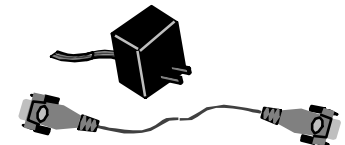
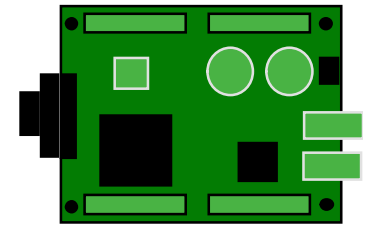
UNIVERSITY PRICE LIST

We sell HW and SW Development Tools to academia at cost !

Ø Free Sample Devices: www.ti.com/sc/docs/sampreq.htm

Ø Purchase Tools from any of TI's Authorised Distributors

Ø Catalogue channel: academic specialists: Farnell www.farnell.com



Country	Company Name	Website - local language	Sales Tel	Sales Email	Office
Austria	Farnell	http://at.farnell.com	0043 (0) 662 2180 680	verkauf.at@farnell.com	Oberhaching
Belgium	Farnell	http://be.farnell.com	0032 (0) 3 475 28 10	belgiumsales@farnell.com	Utrecht
Denmark	Farnell	http://dk.farnell.com	0045 44 53 66 44	salg@farnell.com	Herlev
Finland	Farnell	http://fi.farnell.com	0358 9 5607780	myynti@farnell.com	Helsinki
France	Farnell	http://fr.farnell.com	0033 (0) 474 689999	ventes@farnell.com	Villefranche-sur-Saône
Germany	Farnell	http://de.farnell.com	0049 (0) 89 61 39 39 39	verkauf@farnell.com	Oberhaching
Ireland	Farnell	http://ie.farnell.com	1800936198	irelandsales@farnell.com	Leeds
Italy	Farnell	http://it.farnell.com	0039 02 93995 200	vendite@farnell.com	Lainate
Netherlands	Farnell	http://nl.farnell.com	0031 (0) 30 241 73 73	hollandsales@farnell.com	Utrecht
Norway	Farnell	http://no.farnell.com	0047 800 146 70	bestill@farnell.com	Hvalstad
Portugal	Farnell	http://pt.farnell.com	0034 93 475 88 04	vendaspt@farnell.com	Barcelona
Spain	Farnell	http://es.farnell.com	0034 901 20 20 80	ventas@farnell.com	Cornellá, Barcelona
Sweden	Farnell	http://se.farnell.com	0046 08 730 50 00	Sweden-sales@farnell.com	Malmö
Switzerland	Farnell	http://ch.farnell.com	0041 44 204 64 64	verkauf.ch@farnell.com	Oberhaching
UK	Farnell	http://uk.farnell.com	0044 (0) 8447 11 11 11	sales@farnell.co.uk	Leeds,
Export	Farnell	http://export.farnell.com	0044 (0) 870 1200 208	export@farnell.com	
Country	Company Name	Website - local language	Sales Tel	Sales Email	
Export	Farnell	http://export.farnell.com	0044 (0) 870 1200 208	export@farnell.com	

www.ti.com/pricelist





Useful TI Training

Topics & Types of Training:

TI is a pro-active source of real-time skill development!

- Ø Low-Power RF, C2000, C6000 DSP, MSP430 MCU, Power Management, Data Conversion, Interface ...
- Ø DSP Optimisation/Integration, Digital Motor Control, Video/Imaging, DSP BIOS, Digital PSU, "Green" Technologies...
- Ø Workshops: 1 day, Design workshops: 4 days, "Tech Days" ...
- Ø Get started, fast!

Locations:

- Ø **Many!** Paris, Munich, Milan, Stockholm, Kiev, Istanbul, Moscow...

Cost:

- Ø Default: **50%** discount for all Universities
- Ø By special request: free places as part of donations

www.ti.com/europe/workshops





Teaching Made Easy!



C2000, C5000 & C6000 Teaching ROMs

Lectures on the basics of DSP

“Get you started” guides

Comprehensive sources of Classroom & Self-Study materials, with access to .doc & .ppt files. Practical application examples.

Fully commented programs with source-code

Materials for our DSKs & Low-Cost Tools:

- ∅ C2000: for F28335 Delfino, F28027 Piccolo with CCSv3.3 and CCSv4 (+F2812, F243 & LF2407 DSKs)
- ∅ C5000: C5505/C5515 “eZdsp” sticks, and C5416, C5510 DSKs
- ∅ C6000: for C6713, C6416 and C6711 DSK
- ∅ Mathworks & TI: “From MatLab & Simulink to Real-Time with TI DSP”
- ∅ MSP430: complete guide to low-power microcontrollers
- ∅ 2 new releases this year: C6748/OMAP-L138 & Stellaris Cortex M3

Free on request: www.ti.com/rd/roms or Download



Really effective support!

THE EUROPEAN CUSTOMER SUPPORT CENTER: ECSC

- ∅ Access to TI expertise: product information & technical support
- ∅ Dedicated position to organise University support resources:
- ∅ Languages: English, French, German, Italian, Spanish, Czech/Slovak, Russian, Polish, Hungarian
- ∅ The ECSC is TI's main support to post-grads in Academia...
We rely on YOU to support your under-grads !



e-mail: epic@ti.com
www.ti.com/europe/csc





The European University Programme

Online Support

Ø [Twitter.com/UniPgm](https://twitter.com/UniPgm) follow us!

Ø E2E Forums:

§ [Russian Forum](#)

§ [European University Program](#)

§ University Program Presentation Video:
<http://e2e.ti.com/media/p/50177.aspx>

§ All brochures and Teaching ROMs now downloadable

§ Promotions to increase online activity:
- giveaways, useful info, issues...
(e.g. CCSv3.3 vs 4.0!)

§ Increase routine posting of FAQs online

Ø Web:

§ New [EMEA website: www.ti.com/EUP](http://www.ti.com/EUP)

§ ALL Brochures and Teaching ROMs now downloadable

The image shows two screenshots from a Windows Internet Explorer browser. The top screenshot displays the Texas Instruments website for the European University Program, featuring navigation menus, a search bar, and a video player showing Robert Owen, the program manager. The bottom screenshot shows the E2E Community forum page with a table of forum topics.

Forums	Latest post	Threads	Posts
Teaching material We have a full range of Teaching Materials which enable you to set up a classroom using our DSPs and Microcontrollers	Re: Available Teaching... by Harris UH - University... 30 Aug 2009 4:32 AM	2	6
About us & Brochures This forum gives a quick overview of the European University Program and brochures we are offering	Brochures-New and... by Jayne Hodgson 18 Nov 2009 5:52 AM	4	4
FAQs	Support for Textbooks... by Robert Owen 4 Nov 2009 2:13 PM	7	16
New Information	NEW! C2000 Teaching... by Jayne Hodgson 9 Nov 2009 9:32 AM	3	5

Европейская университетская программа


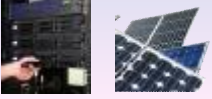

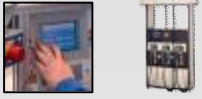






Embedded Processors for Academia

Microcontrollers (MCUs)	ARM®-Based Processors	Digital Signal Processors (DSPs)
-------------------------	-----------------------	----------------------------------

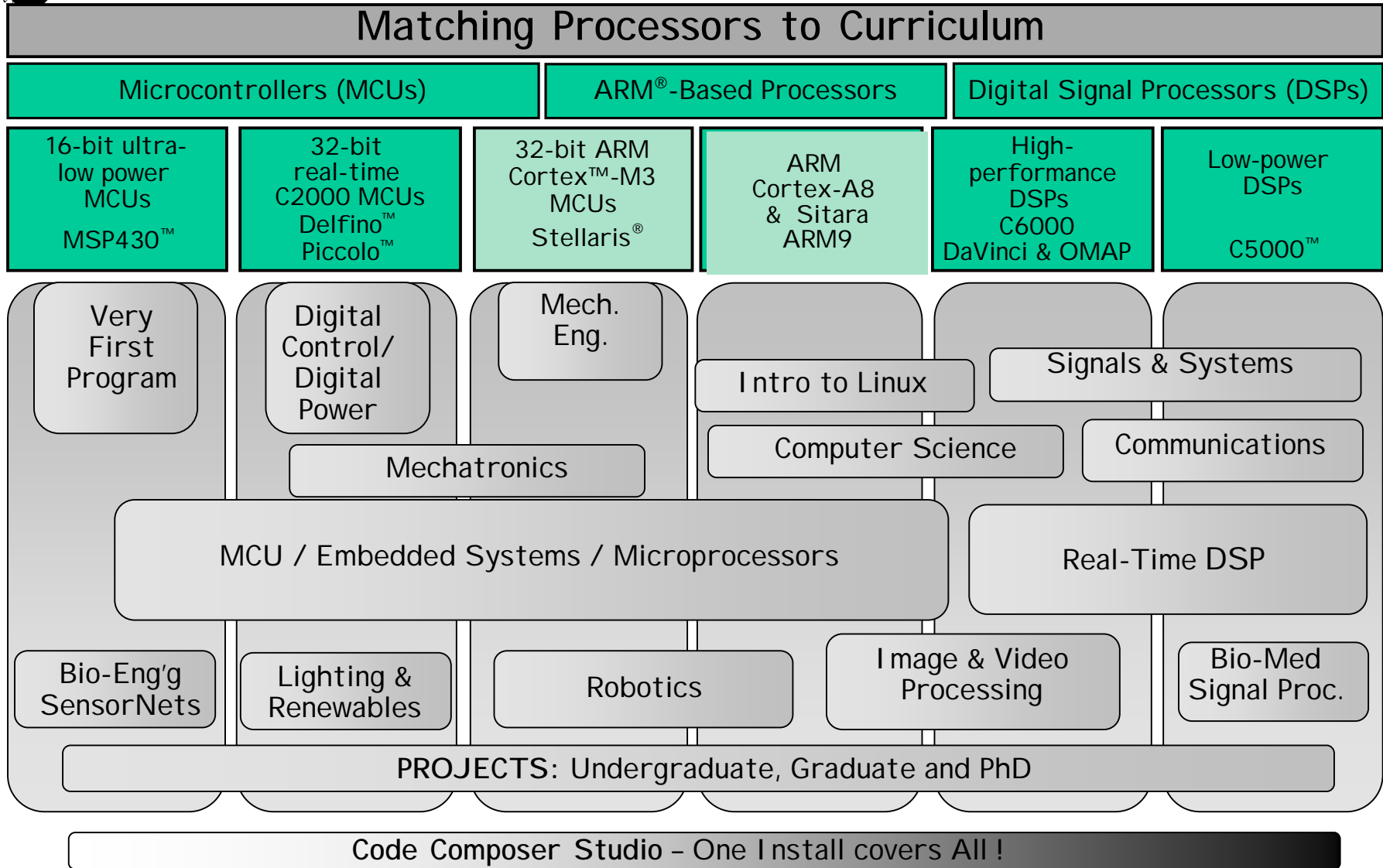
16-bit ultra-low power Microcontrollers	32-bit real-time Microcontrollers	32-bit ARM Cortex™ M3 Microcontrollers	ARM Cortex A8 Microprocessors	High-performance DSPs	Low-power DSPs
---	-----------------------------------	--	-------------------------------	-----------------------	----------------

<p>MSP430™</p> <p>Up to 25 MHz</p> <hr/> <p>Flash 1 KB to 256 KB</p> <hr/> <p>Analog I/O, ADC LCD, USB, RF</p> <hr/> <p>Measurement, Sensing, General Purpose</p> <hr/> <p>\$0.49 to \$9.00</p> 	<p>C2000™ Delfino™ Piccolo™</p> <p>40MHz to 300 MHz</p> <hr/> <p>Flash, RAM 16 KB to 512 KB</p> <hr/> <p>PWM, ADC, CAN, SPI, I²C</p> <hr/> <p>Motor Control, Digital Power, Lighting, Ren. Energy</p> <hr/> <p>\$1.50 to \$20.00</p> 	<p>Stellaris® ARM® Cortex™-M3</p> <p>Up to 100 MHz</p> <hr/> <p>Flash 64 KB to 256 KB</p> <hr/> <p>USB, ENET MAC+PHY CAN, ADC, PWM, SPI</p> <hr/> <p>Connectivity, Security, Motion Control, HMI, Industrial Automation</p> <hr/> <p>\$1.00 to \$8.00</p> 	<p>Sitara™ ARM® Cortex™-A8 & ARM9</p> <p>300MHz to >1GHz</p> <hr/> <p>Cache, RAM, ROM</p> <hr/> <p>USB, CAN, PCIe, EMAC</p> <hr/> <p>Industrial computing, POS & portable data terminals</p> <hr/> <p>\$5.00 to \$20.00</p> 	<p>C6000™ DaVinci™ OMAP™</p> <p>300MHz to >1GHz +Accelerator</p> <hr/> <p>Cache RAM, ROM</p> <hr/> <p>USB, ENET, PCIe, SATA, SPI</p> <hr/> <p>Test & Meas., Video, audio, security, imaging, infrastructure</p> <hr/> <p>\$5.00 to \$200.00</p> 	<p>C5000™</p> <p>Up to 300 MHz +Accelerator</p> <hr/> <p>Up to 320KB RAM Up to 128KB ROM</p> <hr/> <p>USB, ADC McBSP, SPI, I²C</p> <hr/> <p>Port. Telecom, audio, medical monitor & diag, industrial</p> <hr/> <p>\$3.00 to \$10.00</p> 
--	---	--	---	---	--

		<h2>Code Composer Studio</h2>			
---	---	-------------------------------	---	---	---

Teaching Materials available



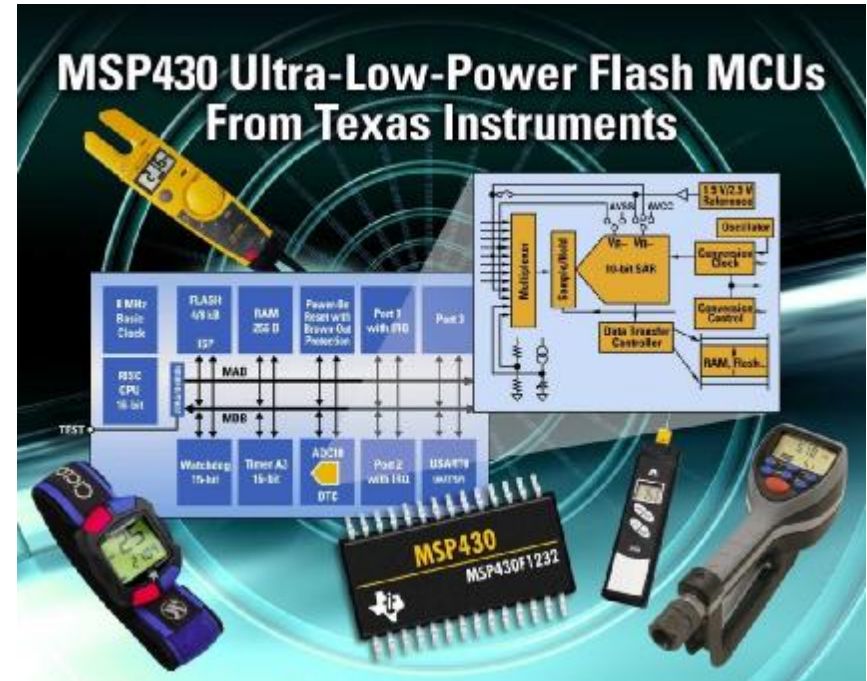




MSP430 Microcontrollers

The world's lowest power MCU!

- Ø 0.1uA RAM retention
- Ø 0.8uA real-time clock mode
- Ø 250uA / MIPS active
- Ø A>D for precise measurements
- Ø In-system programmable Flash
- Ø 16-bit RISC CPU, 27 instructions
- Ø Completely orthogonal architecture
- Ø Ready-made Teaching materials
- Ø The easiest MCU to program!



eZ430-Chronos
Wireless Development Tool

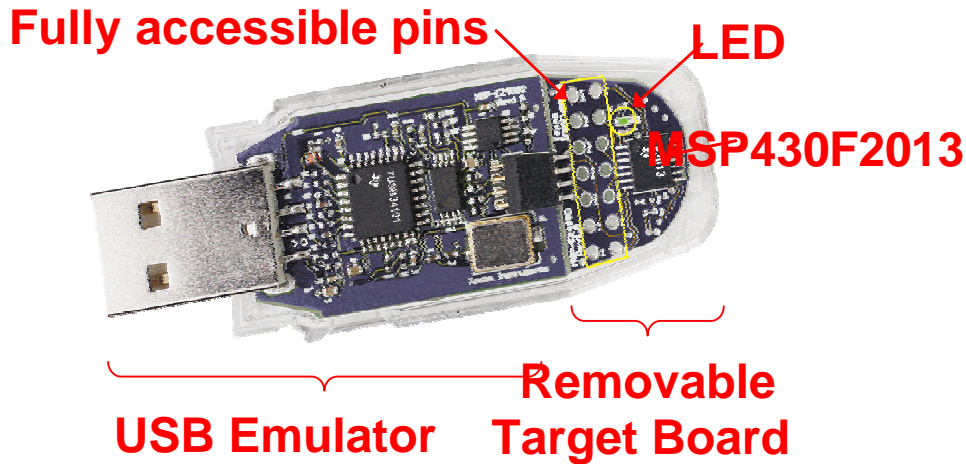


- Ø "CCS" Code Composer Studio, version 4:
 - 120 day Student version
 - 100 seat Academic Edition
 - Supports C5000/C6000 DSP & ARM7/9/A8/M3 as well
- Ø Tools from \$20 !





Perfect Tools for Labs & Projects!



- Ø eZ430-F2013 USB dev't tool
- Ø Detachable F2013 target board
- Ø LED indicator
- Ø IAR Kickstart user interface: assembler, linker, simulator, debugger, and limited C-compiler
- Ø Full documentation on CD-ROM
- Ø Just \$20 !!

www.ti.com/ez430

“Experimenter’s Board”

- Ø Integrated 12-bit $\Sigma\Delta$ ADC & DAC, Op-Amps, DMA, Multiplier, LCD Controller
- Ø Board: mic, buzzer, LCD, touch-pad, buttons, proto space, RS232, JTAG, 3.5mm audio jack
- Ø Chipcon expansion: CCxxxOEMK EVM interface
- Ø Interfaces: SPI, UART, I2C, IrDA
- Ø FET required to program & debug
- Ø \$59



MSP-EXP430FG4618

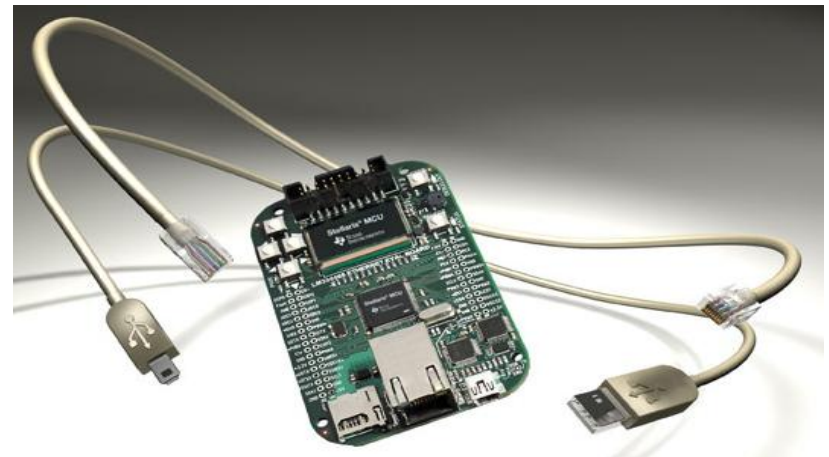




Stellaris Cortex M3 Microcontrollers

LM3S6965 Ethernet Evaluation Kit

- Ø Fully integrated 10/100 Ethernet
- Ø OLED Display (128x64 pixel resolution)
- Ø 8 Ω Magnetic speaker with amplifier
- Ø Up to 47 I/O available on breakout pads
- Ø MicroSD card slot
- Ø The most compact & versatile platform!
- Ø Part #: EKS-LM3S6965 \$69



LM3S9B96 Development Kit



- Ø Ethernet, CAN, and USB OTG/Host/Device
- Ø External Peripheral Interface (EPI) for FPGA, CPLD, or M2M communication
- Ø 8 MB SDR SDRAM module
- Ø Bright 3.5" QVGA LCD touch-screen display
- Ø ARM® 10-pin JTAG debug connector
- Ø Integrated Interchip Sound Audio Interface
- Ø Part #: DK-LM3S9B96 \$449



Stellaris Support

StellarisWare®

The easiest way to develop applications with verified codes!

- Ø Peripheral Driver Libraries
- Ø Graphics Libraries
- Ø Code Examples (More than 30 for each evaluation board!)

Free Training Materials:

- Ø The Stellaris® One Day Workshop by TI
- Ø Additional Stellaris® Training Materials
- Ø Download from www.ti.com/EUP

Textbooks:

- Ø "Micrium µC/OS-III Real Time Kernel" including Robot kit.
By: Jean J. Lebrosse & TI's Stellaris team.
- Ø "The Definitive Guide to the Cortex M3".
By: Joseph Yiu.





F28335 Floating Point Starter Kit



- Socketed TMS320F28335 Digital Signal Processor operating at 150 Mhz
- On-chip 32-bit Floating-Point
- 256 kBytes off-chip SRAM memory
- On board RS232 with line
- On board CAN 2.0 interface with line driver and connector
- Expansion connectors (analog, I/O) - unpopulated
- Expansion header compatible with F2812 and F2808 eZdsp
- Onboard embedded IEEE 1149.1 JTAG controller with USB interface
- Onboard IEEE 1149.1 JTAG emulation connector

<http://focus.ti.com/docs/toolsw/folders/print/tmdxez28335.html>

Part Number: TMDXEZ28335

\$495 USD



“Piccolo” controlSTICK

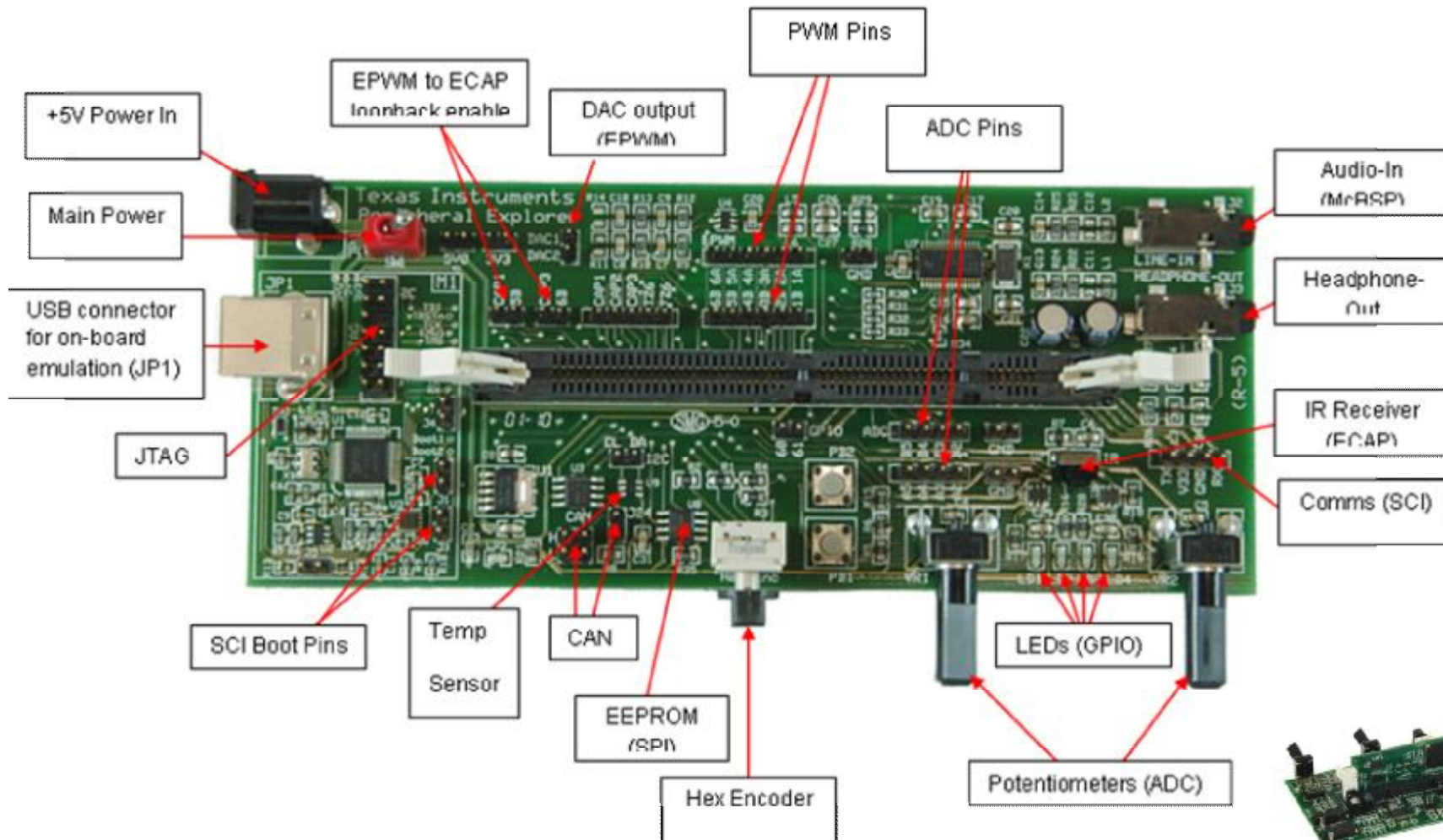
- Simple USB stick evaluation tool
 - Piccolo F28027
 - Onboard USB JTAG emulation
 - Header pins provides access to most Piccolo pins
- 11 example projects explain most Piccolo peripherals
- Jumpers and patch cords to easily connect pins together
- USB extension cable
- Code Composer Studio V3.3 with 32KB code size limit
- Complete hardware documentation
- Gerbers, schematics, etc

TMDS28027USB: \$39!





Peripheral Explorer Kit



TMDSPREX28335 University Price \$150!





“DSP in your pocket”

Hardware

- TMS320C5505 fixed-point low power DSP
- TLV320AIC3204 Stereo codec
- I2C EEPROM
- Embedded XDS100 JTAG emulation
- Expansion Connector
- Evaluation capability of C5504/5 low power DSP

New Teaching Materials for 5505 & 5515 OUT NOW!



Community

- On-line community
- Code examples with software
- Promotions for example contribution

Software

- Chip Support Library
- CCS IDE™ Rev 4.0

Documentation

- Quick Start Guide
- Technical Reference Manual
- Schematics

Order Information

- TMDX5505eZDSP
- Price: \$49





C6713 & C6416 DSKs



TMDSDSK6713-0E	\$395
TMDSDSK6416-0E	\$495

Hardware

DSP Board

- | DSP: 6713 float 225MHz, 1350 MFLOPS or 6416 fixed 1.2GHz, 9,600 MIPS
- | 16-bit stereo codec (stereo in & out)
- | Four 3.5 millimeter audio jacks
- | 512K non-volatile Flash memory
- | 16MB SDRAM

Emulation

- | 14 and 60-pin emulation and JTAG interfaces
- | Plug and play JTAG support via USB
- | +5-volt universal power supply
- | Expansion port connectors for plug-in modules

Software

- | DSK-specific Code Composer Studio™
- | Fast Simulators enabling Cache Analysis and Multi-event profiler
- | Fast run-time library available on the web
- | DSP/BIOS™ RTOS and eXpressDSP™ Software support
- | MATLAB 30-day FET
- | Third party daughter card support
- | DSK quick-start guide & technical reference





Next Generation: OMAP/C6748 Kits



Development Kit Contents:

- | OMAP: ARM9 & C6748 processors
- | Evaluation board
- | Documentation
- | Code Composer Studio™ IDE
- | On-board JTAG Emulation
- | Linux and DSP Peripheral Drivers
- | Optional Touch screen LCD
- Link to download latest software and docs

New Teaching Materials:
C6748 beta-test 3Q'11

Tool name	Price	Availability	Part number
OMAPL137/ C6747 Starter Kit	\$395	TI	TMDSOSKL137
OMAPL138/ C6748 Experimenter's Kit	\$495 (mid 2011 \$249)	TI	TMDXL138LOGICEXP-B



Beagleboard: "a PC in your Pocket"

Performance

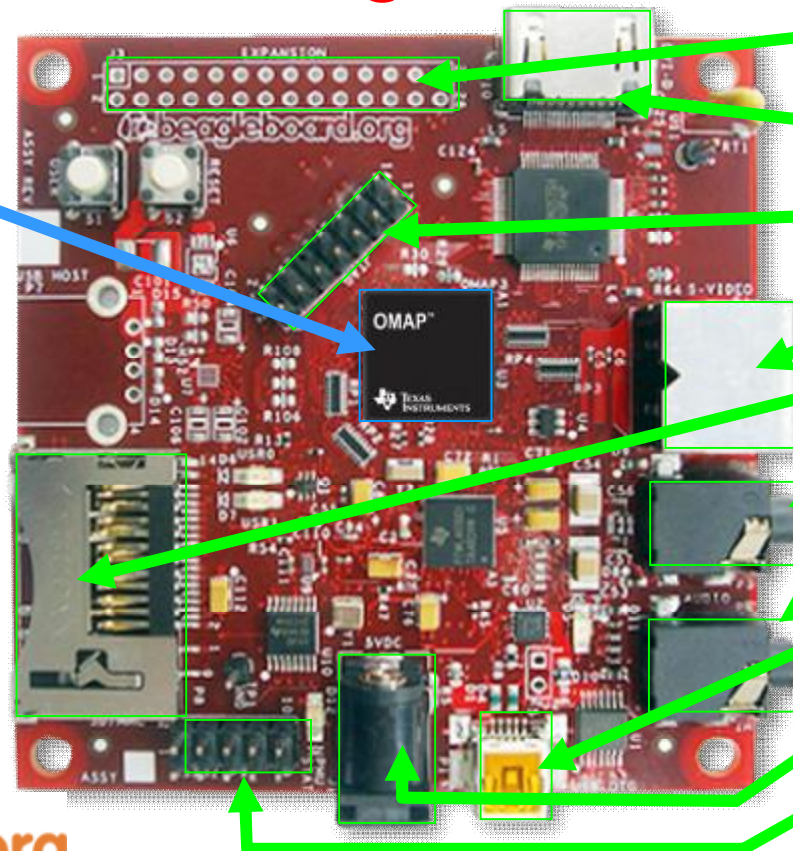


\$149 !

3"

Expansion

- TI OMAP3530
- Ø 600 MHz superscalar ARM[®] Cortex[™]-A8
- Ø More than 1200 Dhrystone MIPS
- Ø Up to 10 Million polygons per sec graphics
- Ø HD video capable C64x+[™] DSP core
- Memory
- Ø 128MB LPDDR RAM
- Ø 256MB NAND flash

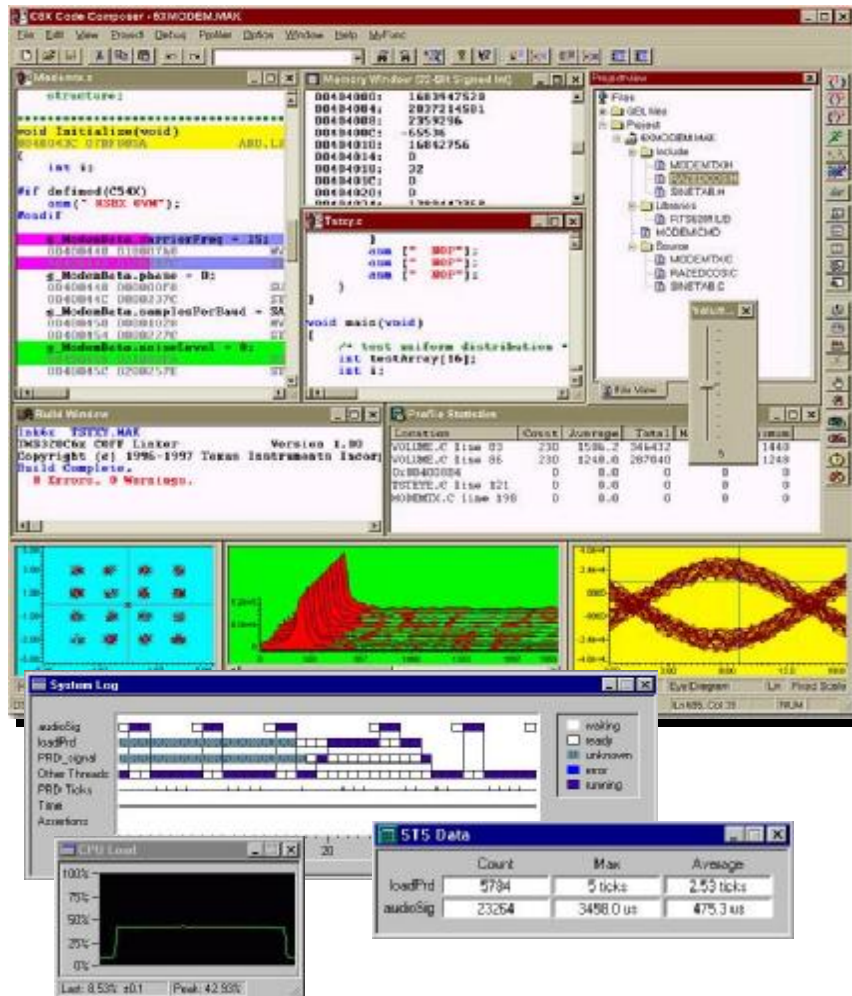


- Ø I²C, I²S, SPI, MMC/SD
- Ø DVI-D
- Ø JTAG
- Ø S-Video
- Ø SD/MMC+
- Ø Stereo Out
- Ø Stereo In
- Ø USB 2.0 HS OTG
- Ø Alternate Power
- Ø RS-232 Serial





Code Composer Studio



- u The most comprehensive, Integrated Development Environment (IDE)
- u Advanced visualization
- u Intuitive & easy to use
- u Third-party plug-ins
- u Full version with Simulator and Updates included
- u 100 seat Academic version
- u Eclipse-based CCS v4: one IDE, ALL TI Processors!

dspvillage.ti.com/docs/dspvillagehome.jhtml



Data Conversion & Power Management



ADC Pro™

- Ø Test board with pre-programmed DSP
- Ø Evaluate ADC performance with PC & LabVIEW
- Ø ADS1258EVM-PDK, ADS1278EVM-PDK, more to follow

Analog eLAB™

<http://www.ti.com/analogdesigncenter>

- Ø Everything you need to get started!
- Ø Download TINA-TI: spice-based, easy to use circuit simulation program
- Ø Access TI's power design software for SWIFT™ (integrated FET), TPS40K & TPS62K families of DC/DC converters

Data Converters			
THS1206M-EVM	ADC	12 bits	6 MSPS
ADS1258EVM	ADC	24 bits	125 KSPS
ADS1625EVM	ADC	18 bits	1,25 MSPS
TLVAIC33EVM	ADC	16/24 bits	8 to 96 KHz
DAC8554EVM	DAC	16 bits	200 KSPS
DAC8534EVM	DAC	16 bits	93 KSPS
DAC8581EVM	DAC	16 bits	3000 KSPS

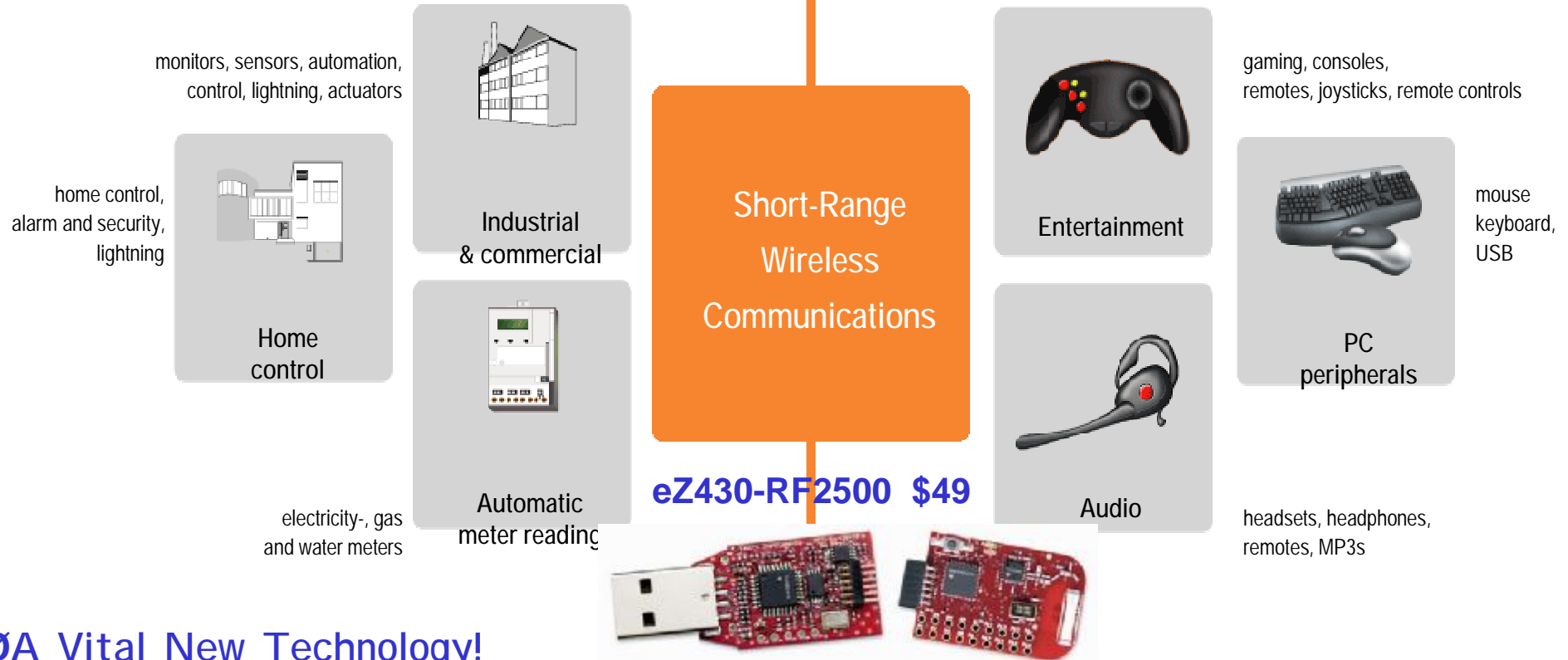
Power Managers	
BQ20Z90EVM-001 "Gas Gauge"	BQ24730EVM Li-ion charger
TLC5940EVM-106 LED Driver	UCC28600EVM AC/DC Controller
TPS63000EVM-148 Buck boost (portable)	TPS54010EVM-067 High current Buck



Building Wireless Networks

HOME AND BUILDING AUTOMATION

CONSUMER ELECTRONICS



ØA Vital New Technology!

§ Short distance wireless communications: Typical 100m range. 250-500Kbps. Low-power.

§ A complete System On Chip: integrated RF, multi-channel transceiver, and MCU

§ Support for "point to point" & "star" networks. "ZigBee" & SimpliciTI protocols



Analog Design Contest

Ø Criteria:

- § Project design using 3 TI chips. One can be a TI processor
- § Teams of 2 to 5 Students, at any level (under-grad to PhD)

§ First Contest - "ADC1" - Trial:

- § 45 entries registered from 17 Universities in 7 countries
- § Received 29 Project Reports
- § Awarded 15 First round prizes of €1,000 and 3 of €350
- § Second round for Engibus Prize between 15 teams:
 - 3 winners €6K, €3K & €2K

Ø Second Contest - "ADC2" - Everyone:

- § Launched November 18th 2010: www.ti.com/EUP
- § Open to ALL of Europe plus Russia, Turkey & Israel
 - 44 countries!
- § Prizes: 20 first round prizes of \$1K each
 - FINAL PRIZES: \$2.5K, \$2.5K, \$5K and \$10K!!
- § 155 entries received. Judging 3Q'11

Ø Third Contest - "ADC3" - launch Nov'11

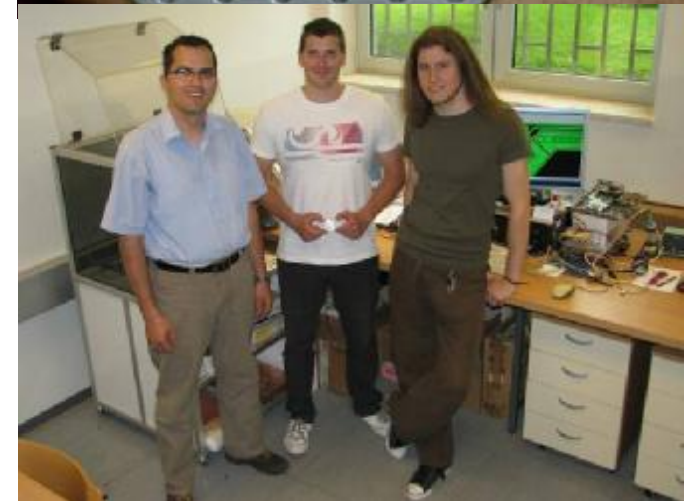
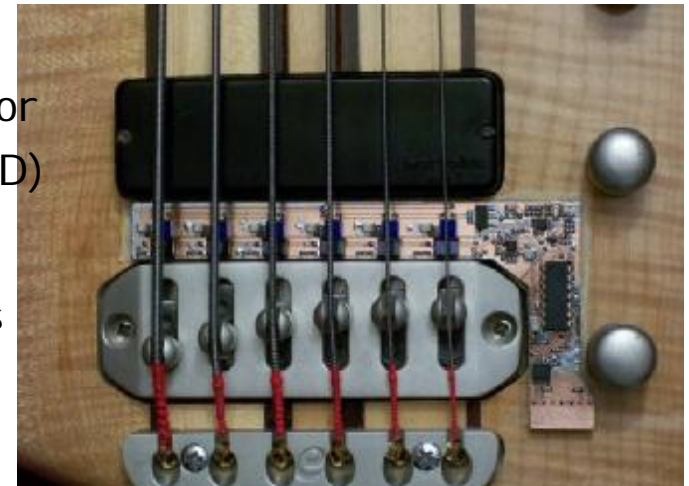


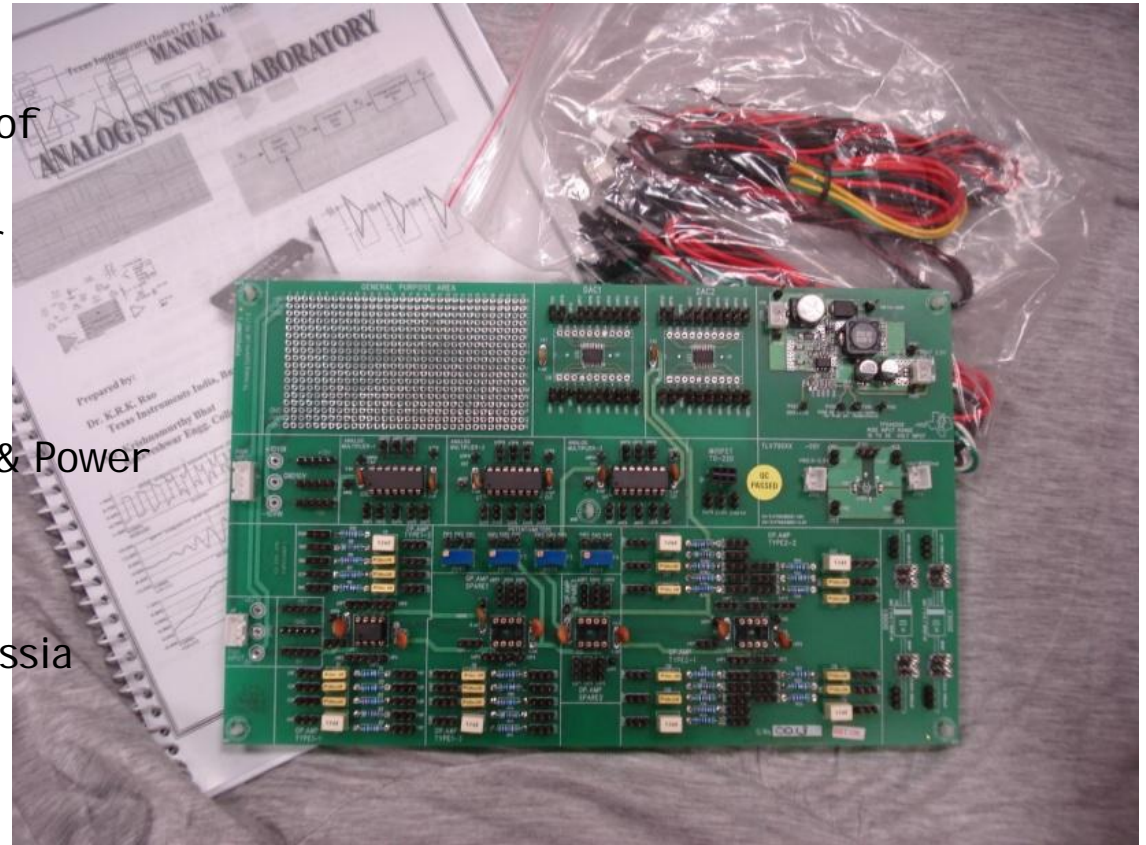
Illustration: Ljubljana, Slovenia.
"Interference Free Optical PickUp"



Analog

Ø Now:

- § Analog Design Contest underway
- § Donation support of a wide range of EVMs and Modules for projects
- § Signal Chain Prototyping System for DSP & C2000
- § New Brochures:
 - new: Amplifiers & Biomedical,
 - updates: LPRF, Data Conversion & Power



Ø Next:

- § Trial of Analog Systems Lab in Russia & E. Europe: Q2 2011
- § Sales through Mikroelektronika

Ø Later in 2011:

- § Launch of MAVRYK: a modular system allowing rapid Signal chain prototyping
- § Launch of National Instruments' (NI) "MyDAQ"

§ Illustration: TI India's "Analog Systems Lab"



The Excellence in Signal Processing Award

∅ Prize:

- § Personal copy of full CCS with upgrades for 5 years
- § Award listed on TI's University Programme website
- § Criteria:
 - For supported Universities with TI Labs
 - Students demonstrating superiority in real-time DSP/MCU to their Professor
 - Approx. Two students per year from each department/group

∅ To the Student:

- § Industry recognition of their signal processing skills
- § Significantly enhanced career prospects
- § Real value in their "personal tool box"

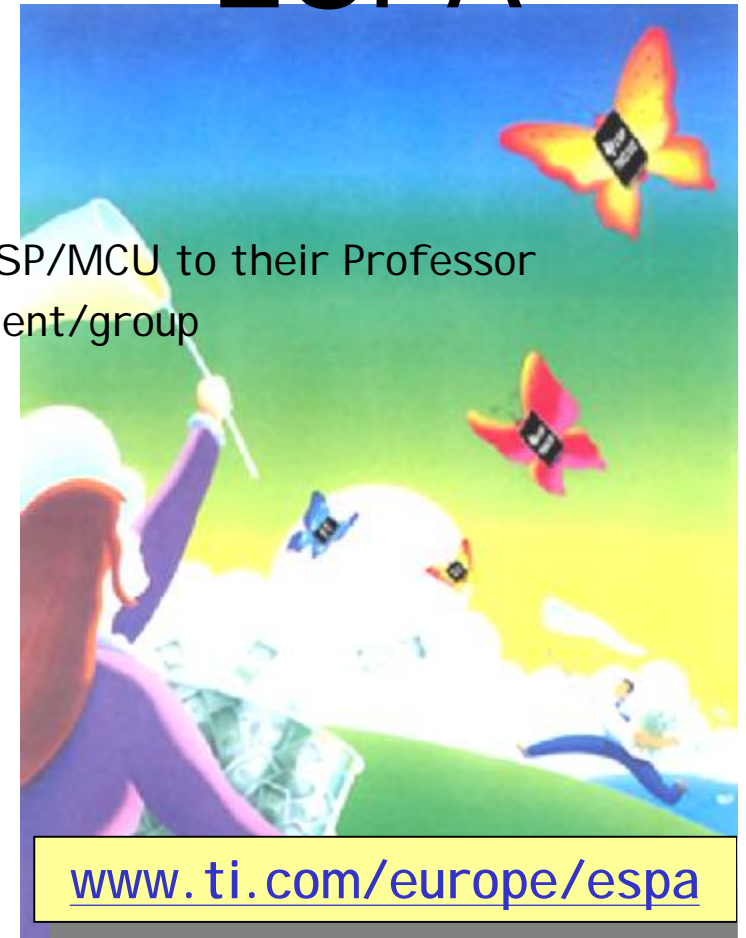
∅ To the Lecturer:

- § A real motivation tool, at no cost to the University
- § TI endorsement of their projects and Labs

∅ To TI:

- § A chance to see where the brightest and best go...
- § A boost to our customers who need real-time technology skills

ESPA





Gaining Support from TI...

Consult & Evaluate

- Ø Consult widely within your Department and across your University to decide on your priorities for real-time Education
- Ø Consult with other Universities
- Ø Evaluate TI's wide offering of Tools: MCU, DSP, and Analog
- Ø Consider whether you can purchase some of the tools to demonstrate commitment

Applying for Special Support

- Ø A simple brief proposal, by e-mail: What do you want to achieve? What are the outputs from this activity? Can you share them?What do you need from TI? (Care with part numbers! + weblink)
- See "Guide to TI Donation Support"
- Ø Support is tailored on a case-by-case basis. We will respond quickly!
- Ø We will ask you to complete an on-line form for our database



Why TI..?

- ∅ We have the technologies that are fast growing, highly pervasive, & exciting!
- ∅ We want to give all your Students access to real-time technologies in the Lab and for their projects
- ∅ We can help your colleagues: Computer Science, Mechatronics, Physics, Biomedical Sciences, Renewable Energies, Sensors....they all need real-time!
- ∅ With >15 years of experience, TI's University Programme is the most extensive and the best supported.
- ∅ One Development Environment - CCS - for ALL processors!
- ∅ Be part of a winning team: there are >1,000 TI DSP Labs & >250 MSP430 Labs in Europe & Middle East today!
- ∅ We genuinely want to help you and we have the resources to do it!
- ∅ Thanks for your time and attention.
- We look forward to working with you!