E²Brain - we crack the nut for you!

More than you expect

E²Brain (Embedded Electronic Brain) is a highly application oriented open standard for advanced RISC based Computer-on-Modules.
The E²Brain specification defines a mechanical form factor and a set of functional interfaces providing a maximum of flexibility and scalability.

Computer-on-Module

E²Brain modules are complete computer cores integrating sophisticated CPUs, system memory and advanced communication and I/O controllers.
The modules are plugged on customized carrier boards which provide the phyiscal interfaces, connectors and power supply.

CPU independent

E²Brain is open for all CPU architectures including PowerPC, XScale and others.

Scalable performance

Compatibility of all E²Brain modules is ensured on a basic level represented by the system interface and a basic communications and I/O interface (220 pins).

To accomodate a much broader spectrum of applications, additional 220 pins are available to provide comprehensive interfacing capabilities. This concept provides a maximum of scalability and flexibility to satisfy the most demanding of applications.

Kontron - we even crack the toughest nuts!

E²Brain - one family, two branches

Communication Engines

- Are aimed for systems with enhanced requirements to communication interfaces and protocols.
- Provide an excellent core for subsystem controllers in the Telecom/Datacom infrastructure, and industrial gateways.

Advanced Computing Cores

- Deliver an excellent combination of computing power and application specific I/O.
- Are perfectly designed for use in real time control units for industrial, medical and mobile applications

Take what fits best, don't pay for more!

E²Brain Quick Reference Guide - Communication Engines

Onboard Features	EB8541	EB860	EB420/425
Processor	Freescale MPC8541 @ 660 MHz	Freescale MPC860T @ 80 MHz	Intel XScale IXP420/425 @ 266/533 MHz
Memory	128MB DDR-SDRAM soldered (up to 256MB possible)	32/64MB SDRAM soldered (up to 128MB possible)	32/64/256MB SDRAM soldered
Flash	8/16 MB Flash soldered (up to 32MB possible)	4/8MB Flash soldered (up to 32MB possible)	4/8/32MB Flash soldered
SRAM	1MB buffered by auxilary power (optional)	1MB buffered by auxilary power (optional)	1MB buffered by auxilary power (optional)
Fieldbus	CAN (optional)	CAN (optional)	CAN (optional)
Miscellaneous	RTC, watchdog, temperature sensor	RTC, watchdog	RTC, watchdog
Temperature Range	0°C up to 70 °C, -40°C up to +85°C (optional)	0°C up to 70 °C, -40°C up to +85°C (optional)	0°C up to 70 °C, -40°C up to +85°C (optional)
Power Consumption	10W typ.	3W typ.	3W typ.
Performance Dhrystone 2.1	1520	106	1066 (CPU core + 3 NPEs, 533MHz)
Evaluation Kit	EB8541-EVALKIT	EB860-EVALKIT	EB425-EVALKIT
Peculiarities	Powerful communication controller with impressive data throughput	Comprehensive set of interfaces	Extremely low power consumption
Application Areas	Demanding communication applications, e.g. DSLAM	Communication applications, e.g. industrial gateways	Communication applications, gateways, routers

Quick Reference Guide - Advanced Computing Cores

Onboard Features	EB8245	EB8540	EB405	EB8347
Processor	Freescale MPC8245 @ 330MHz with FPU	Freescale MPC8540 @ 660/800MHz with FPU	AMCC405EP @ 266 MHz	Freescale MPC8347(E) @ 533MHz with FPU
Memory	Up to 512MB SDRAM on SO-DIMM	Up to 256MB soldered DDR-SDRAM	Up to 256MB SDRAM soldered	Up to 256MB soldered DDR-SDRAM
Flash	4/8MB Flash soldered (up to 32MB possible)	8/16MB Flash soldered (up to 32MB possible)	4/8MB Flash soldered (up to 32MB possible)	4/8MB Flash soldered (up to 32MB possible)
SRAM	1MB buffered by auxilary power (optional)	1MB buffered by auxilary power (optional)		
Fieldbus	CAN (optional)	CAN (optional)		
Miscellaneous	RTC, watchdog, temperature sensor	RTC, watchdog, temperature sensor	RTC, watchdog	DVI graphics, AC97, 2x USB 2.0, RTC, watchdog, temp. sensor
Temperature Range	0°C up to 70 °C, -40°C up to +85°C (optional)	0°C up to 70 °C, -40°C up to +85°C (optional)	0°C up to 70 °C, -40°C up to +85°C (optional)	0°C up to 70 °C, -40°C up to +85°C (optional)
Power Consumption	5W typ.	12W typ.	4W typ.	5W typ.
Performance Dhrystone 2.1	465	1800 (800MHz)	404	1008
Evaluation Kit	EB8245-EVALKIT	EB8540-EVALKIT	EB405-EVALKIT	EB8347-EVALKIT
Peculiarities	Good performance/power consumption ratio, Versatile	Highest performance and Ethernet bandwith	Feature optimized, price aggressive	Comprehensive I/O, graphics, USB
Application Areas	Mid range performance real time control systems	Performance demanding real time control/com. systems	Price sensitive control applications	Embedded control systems with graphical user interface

E²Brain - Interfaces

Interfaces	EB8347	EB860	EB425	EB8245	EB8540/8541	EB405
System Interface						
PCI (32bit)	33/66MHz	33MHz	33/66MHz	33MHz	33MHz	33/66MHz
LPC	X	X	X	X	X	X
I†C	X	X	X	X	X	X
JTAG/BDM (Debug port)	X	X	X	X	X	X
Terminal ports	2	2	2	2	2	2
System Interface Extension						
CompactFlash/IDE	X		X	X	X	X
USB	2x USB 2.0		1.1 device			
SPI	X	X				
Graphics	DVI, flat panel					
Audio	AC97					
I/O Interface						
Serial port 1	async.	sync/async.	sync.	async.	async.	async.
Serial port 2	async.	sync/async.	sync.	async.	async.	async.
Serial port 3		sync/async.	async.	async.	async.	
Serial port 4		sync/async.	async.	async.	async.	
CAN			X	X	X	
Ethernet 1	10/100/1000	10/100	10/100	10/100	10/100	10/100
Ethernet 2			10/100		10/100 (EB8541)	10/100
Ethernet 3						
I/O Interface Extension						
Ethernet	10/100/1000				2x 10/100/1000	
UTOPIA		UTOPIA	UTOPIA 2			
GPIO	24					15
Miscellaneous	PWM, ZV-port					