

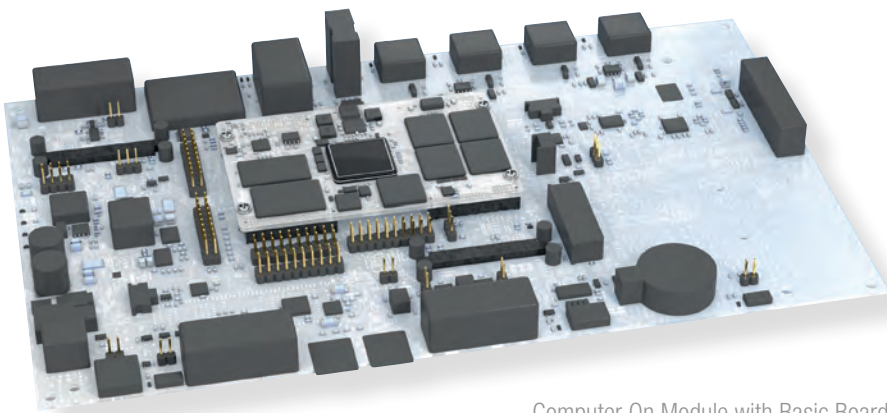


**TOUGH.  
FAST.  
WHITE.**

— introducing **WHITEspeed**

The groundbreaking Computer On Module. Designed & assembled by ERNI in Germany.

## — introducing **WHITeSpeed**



Computer On Module with Basic Board

**TOUGH.  
FAST.  
WHITE.**

ERNI presents ARM-based COM (Computer On Module) solutions with reliable MicroSpeed connectors for harsh industrial environments.

ERNI WHITeSpeed is a powerful, reliable and space-saving embedded computer. In developing these COM products, ERNI has been able to draw on its extensive experience in the field of board and backplane design in addition to its core competency in compact and high performance connectors. The implementation of the new WHITeSpeed interface standard benefits from the high speed and reliability of the MicroSpeed connectors. With this, the ERNI company is in particular addressing applications in harsh and demanding industrial environments such as in the field of transport, heavy engineering and automation exposed to high shock and vibration loads.

The popular ARM technology has now attained a level of performance that makes it attractive also for sophisticated embedded computing applications. Comprehensive operating systems and software support simplifies the development of software for numerous applications. With a new standard for ARM-based Computer On Modules, ERNI simplifies system development on hardware level and offers high signal integrity leveraging from the benefits of the MicroSpeed connectors.

## Next Generation of Computer On Module

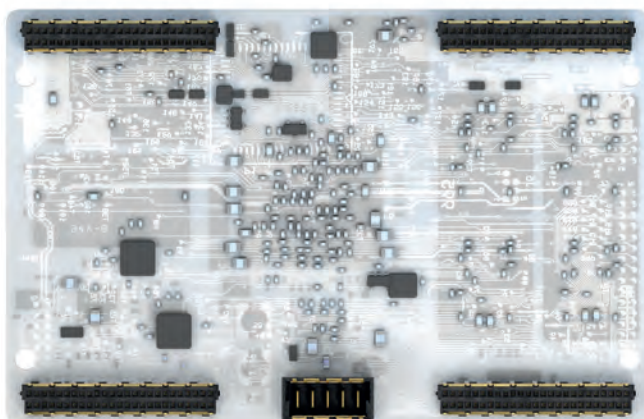
The portfolio comprises a WHITEspeed family of pin-compatible ARM-based mezzanine modules, which differentiate in terms of the CPU performance (clock rate, number of cores, coprocessors) and I/Os and memory capacity. In addition, a fully equipped, adaptable baseboard is available, which can be supplied also with an optional display. This carrier board is the development platform for the application software and, at the same time, the basis for customer-specific boards. Using four MicroSpeed signal connectors and one MicroSpeed Power Module, ERNI realises the new standardised interface (WHITEspeed 1.0) of the modules to the baseboard, which supports the following: Ethernet 10 MB/100 MB/1GB, SATA, PCIe x1/x4, Express Card, UART, USB 2.0 High Speed, CAN, I2C, SMB (System Management Bus), SPI, LVDS LCD display, SDVO (Serial Digital Video Out), HDA (High Definition Audio), Secure Digital memory card interface, GPIOs, RESET, Watchdog, PWM and optionally a camera interface.

On a credit card format (85mm x 55mm), the new mezzanine boards offer a powerful i.MX537 CPU from Freescale with an ARM Cortex-A8 core. To permit high-speed and reliable connection to the baseboard and I/Os, two-row 50-pin MicroSpeed connectors are available. The MicroSpeed connectors are characterised by the proven dual-leaf spring contact and the effective shielding. This allows high data rates (up to 10Gbps) to be transmitted reliably. This makes extremely compact, high-speed and reliable connections possible also in harsh industrial environments.

The use of MicroSpeed connectors offers decisive advantages with regard to reliability and robustness compared with alternatives using card-edge connectors or connectors with only one contact point. Thanks to the dual-leaf contacts, the MicroSpeed connectors not only offer high contact reliability but also an excellent mating tolerance.

As a CPU option for modules, ERNI initially offers an i.MX537 with ARM Cortex A8 (up to 800 MHz at -40°C to 85°C). The on-board memories include DDR3-RAM (1 to 2 GB), reliable NOR flash (64 to 256 MB) for the boot code, NAND flash (2 to 4 GB) and I2C-EEPROM with up to 128 kB for the configuration data. The CPUs also offer comprehensive power management functions.

For the product launch, Linux support is provided by a board support package (BSP). Real-time Linux, Windows (Windows Embedded) as well as additional operating systems are to follow on request.



ERNI Computer On Module in its full-size

# — ERNI WHITEspeed Technical Datas

## 1 Standardized WHITEspeed 1.0-Interface

Between module and baseboard via 4 x ERNI MicroSpeed + 1 x ERNI MicroSpeed Power Module

Ethernet 10/100	1
SATA	2
PCIe x1/x4 + Express Card	1 (Option)
UART	2
USB 2.0 High Speed Host respectively USB OnTheGo	3+1
CAN	2
I2C	1
System Management Bus (SMB)	1 (Option)
Serial Peripheral Interface (SPI) Master with two Slave Chipselects	1
LVDS LCD display	2
Serial Digital Video Out/Displayport/High Definition Multimedia Interface (SDVO/DP/HDMI)	1
Camera Interface	1 (Option)
Secure Digital Memorycard Interface (SD/MMC/MMCplus)	1*
High Definition Audio (HDA)	1
RESET, Watchdog, PWM ...	1
GPIOs	23
Debug Interface JTAG	1

\*HDMI optional

## 2 CPU-Modul "CA8-1"

Connector	4 x 50-pin ERNI MicroSpeed (female) and ERNI MicroSpeed Power Module (male)
Module Power Supply	3.3V (and 5V for HDMI)
Current Consumption/Power Dissipation	operating mode-dependent
Cooling	free convection or heatsink/conduction-cooled
Storage Temperature	-40°C to +85°C
Operating Temperature	0°C to +70°C -40°C to +85°C
Vibration	tdb
Shock	tdb
Humidity	10% to 90% non-condensing
Further environmental operating conditions	on request
Dimensions	credit card format - 85mm x 55mm drawing/3D models available upon request
<b>Processor</b>	<b>i.MX537</b>
ARM Cortex-A8 CPU (800 MHz @ -40°C to +85°C)	

System Control		Core/Internal Memory		Standard Connectivity	
Clock Reset	Temp Monitor	ARM® Cortex™-A8		Fast IrDA	UART x 5
Smart DMA	System Buses	Cache	ETM	CSPI	Keypad
<b>Timers</b>		Neon	VFP	I <sup>2</sup> C x 3	GPIO
GPT	Watchdog x 2	ROM	RAM	<b>Advanced Connectivity</b>	
PWM x 2	EPIT x 2	<b>Multimedia</b>		HS USB OTG + PHY	Ethernet + IEEE®1588
<b>Power Mgmt. and Analog</b>		<b>GPU</b>		HS Host + PHY	CAN x2/MLB 50
LDO Supply x 2	32 kHz Osc	OpenGL ES 2.0	OpenVG 1.1	HS ULPI Host x 2	Camera Interface
PLL x 4		<b>VPU</b>		<b>External Memory I/F</b>	
<b>Security</b>		Video Encode/Decode	TV Out	2 GB DDR2/DDR3/LV-DDR2/LP-DDR2	
eFuses	RTIC	<b>IPU</b>		<b>External Storage I/F</b>	
Sahara v4	SCC v2	Rezising and Blending	Image Enhancement	SLC/MLC NAND	SATA
TrustZone	SRTC	Inversion and Rotation	Camera Interface	NOR	eMMC/SD
<b>System Debug</b>		De-Interlacing/Combining		PATA	
Secure JTAG		<b>Audio</b>		<b>Display I/F</b>	
		ESAI	SPDIF Tx/Rx	Analog VGA Out	Parallel (from IPU)
		SSI/I <sup>2</sup> S x 3	ASRC	LVDS	

(picture © Freescale)

- Number cruncher and multimedia processing capabilities
  - Vector floating point coprocessor VFPv3
  - NEON SIMD media accelerator
- Graphics acceleration with 2D and 3D functionality
  - Direct on-chip LCD support
- Advanced hardware-enabled security features
  - TrustZone
  - Secure JTAG, real-time clock
  - Secure boot, secure software download, information encryption
- Smart speed on-chip power management features
- On-module Power Management support
  - Watchdog

On-Board Memory Population			
	Standard	Maximum	
DDR3-SDRAM	1 GB	2 GB	working memory
NOR-Flash	128 MB	256 MB	for bootloader
NAND-Flash	256 MB	4 GB	operating system and application software
I2C-EEPROM	128 kB	128 kB	configuration memory
Mass storage	off-module		
HDMI	optional		
Conformal Coating	optional		

**3 Base Board** (Development System without Display WHITESpeed Launch Board)

Power Supply	12VDC $\pm$ 5%	1 x ERNI 2-pin MaxiBridge
Current Consumption/Power Dissipation	tbd (module and operating mode dependent)	
Storage Temperature	-40°C to +85°C	
Operating Temperature	0°C to +70°C	[-40°C to +85°C for base board with components in target application grade]
Vibration	tbd	
Shock	tbd	
Humidity	10 % to 90 % non-condensing	
Dimensions drawing/3D models available upon request	241mm x 147.5mm	[about DIN A5 size excluding PCIe expansion slot]
<b>Interfaces/Features</b>		
WHITESpeed modul bay		
Connector	4 x 50-pin ERNI MicroSpeed (male) and ERNI MicroSpeed Power Module (female)	
Serial Interface RS232 (RxD, TxD, RTS, CTS)	DSUB 9-pin female	
Serial Interface RS485 (RxD, TxD, RTS, CTS)	DSUB 9-pin female	
USB	4 x USB-A receptacle/host	
Ethernet	1 x RJ45	10/100/1000, module-dependent
CAN	2 x interface assigned to single DSUB 9-pin female	
<b>Mass Storage</b>		
SATA		
	1 mSATA drive bay for mSATA SSD drive	
	1 eSATA connector for external SATA drive	
Combined socket for SD, MMC and MMCplus memory cards		
<b>Display-Ports</b>		
2 x LVDS connectors		
1 x HDMI 1.3 connector Type C (mini connector)		
<b>Audio</b>		
1 x 3.5mm jack plug		
<b>Others</b>		
JTAG Debug Interface	1 x	
PCIe	1 expansion slot for standard PCIe slot cards as development time expansion (optional)	
GPIO	on headers	
Push-button Switch for On/Off/Reset (like Personal Computers)		
<b>Display</b> (development system option)		
TFT	9 inch screen diagonal	

Important remark: Please note, certain feature of the base board may only be used if attached Computer On Module does support them.



#### 4 ERNI Services

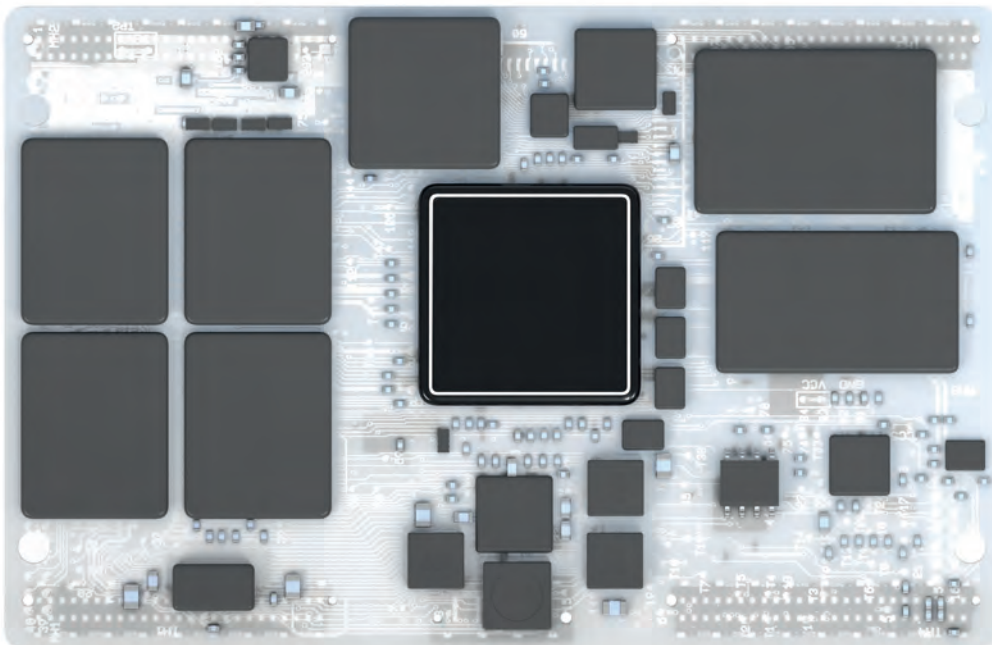
Application support  
Customer-specific modules for best cost/performance ratio

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Design services for application-specific basic boards and their manufacture

#### 5 Order Informations

170 464	CPU module "CA8-1"
170 525	Base board "Launch Board"
170 527	Development system with base board + CPU module
170 528	Complete development system with mains adaptor (without display - use HDMI display)



ERNI Computer On Modules with processors

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**ERNI Electronics GmbH**

Seestrasse 9  
73099 Adelberg/Germany  
Tel +49 7166 50-0  
Fax +49 7166 50-282  
info@erni.com  
www.erni.com



**ERMEC, S.L. BARCELONA**  
C/ Francesc Teixidó, 22  
E-08918 Badalona  
(Spain)

**Tel.: (+34) 902 450 160**  
**Fax: (+34) 902 433 088**  
[info@ermec.com](mailto:info@ermec.com)  
[www.ermec.com](http://www.ermec.com)

**ERMEC, S.L. MADRID**  
C/ Sagasta, 8, 1ª planta  
E-28004 Madrid  
(Spain)

**PORTUGAL**  
[portugal@ermec.com](mailto:portugal@ermec.com)  
**BILBAO**  
[bilbao@ermec.com](mailto:bilbao@ermec.com)