



# **TOUGH.** FAST. WHITE.

### introducing WHITEspeed \_\_\_\_\_

The groundbreaking Computer On Module. Designed & assembled by ERNI in Germany. ERMÈC C/ Francesc Teixidó, 22

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## — introducing WHITEspeed



# TOUGH. FAST. WHITE.

Computer On Module with Basic Board

## 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.

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### 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

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## — 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
PCle x1/x4 + Express Card	1 (Option)
UART	2
USB 2.0 High Speed Host respectively USB OnTheGo	3+1
CAN	2
12C	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	tbd
Shock	tbd
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
Processor ARM Cortex-A8 CPU (800 MHz @ -40°C to +85°C)	i.MX537



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



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#### 3 Base Board (Development System without Display WHITEspeed Launch Board)

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 gradel       Vibration     tbd	Power Supply	12VDC ±5%	1 x ERNI 2-pin MaxiBridge
Storage Temperature-40°C to +85°COperating Temperature0°C to +70°C(-40°C to +85°C to base board with components in target application gradeVibrationtbdShocktbdHumidity10% to 90% non-condensingDimensions drawing/30 models available upon request241 mm x 147.5mm[about DIN A5 size exuding PCle expansion slot]MHTEspeed modul bayConnector24150.5pin ERNI MicroSpeed Power Module (female)Serial Interface RS232 (RxD, TxD, RTS, CTS)DSUB 9-pin femaleSerial Interface RS485 (RxD, TxD, RTS, CTS)DSUB 9-pin femaleConnector1 x RJ4510/100/1000, module-dependentCAN2 x interface assigned to single DSUB 9-pin femaleStafa1 x RJ4510/100/1000, module-dependentCAN2 x interface assigned to single DSUB 9-pin femaleStafa1 x RJ4510/100/1000, module-dependentCAN2 x interface assigned to single DSUB 9-pin femaleStafa1 x RJ4510/100/1000, module-dependentCAN1 x RJ4510/100/1000, module-dependentCAN1 x RJ4510/100/1000, module-dependentCAN2 x interface assigned to single DSUB 9-pin femaleStafa1 x RJ47 drive bay torr SATA SSD drive1 x RJ451 x RJ47 drive bay torr SATA SSD driveCAN2 x VDS connector1 x RJ41, 1.3 connector Type C (mini connector)1 x RJ41, 1.3 connector Type C (mini connector)1 x RJ45 <t< td=""><td>Current Consumption/Power Dissipation</td><td>tbd (module and oper</td><td>rating mode dependent)</td></t<>	Current Consumption/Power Dissipation	tbd (module and oper	rating mode dependent)
Operating Temperature0°C to +70°C[-40°C to +85°C for base board with components in target application gradelVibrationtodShocktodHumidity10% to 90% non-condensingDimensions drawing/30 models available upon request241mm x 147.5mm[about DIN A size skluding PCIe expansion slot]Interface/Features[about DIN A size skluding PCIe 	Storage Temperature	-40°C to +85°C	
VibrationtbdShocktbdHuridity10% to 90% non-condensingDimensions241mm x 147.5mm [about DIN A5 size excluding PCle againsion slot]Interfaces/FeaturesInterfaces/FeaturesInterfaces/FeaturesUMHTEspeed modul bayConnectorA 2 Stopin ERNI MicroSpeed (male) and ERNI MicroSpeed (male) and ERNI MicroSpeed Power Module (female)Sorial Interface RS232 (RxD, TxD, RTS, CTS)DSUB 9-pin femaleSorial Interface RS435 (RxD, TxD, RTS, CTS)DSUB 9-pin femaleInterface RS435 (RxD, TxD, RTS, CTS)DSUB 9-pin female10/100/1000, module-dependentConnectorInterface RS435 (RxD, TxD, RTS, CTS)DSUB 9-pin femaleA 4 x USB-A receptacle/hostEthernet1 x RJ4510/100/1000, module-dependentConnectorInterface assign to tristrata StopineA stopInterface assign to tristrata Stop fiveInterface RS45 (RxD, TxD, RTS, CTS)DSUB 9-pin femaleInterface RS456 (RxD, TxD, RTS, CTS)DSUB 9-pin femaleInterface RS456 (RxD, TxD, RTS, CTS)Interface RS456 (RxD, TxD, RTS, CTS)Interface RS456 (RxD, TxD, RTS, CTS)Interface RS456 (RxD	Operating Temperature	0°C to +70°C	[-40°C to +85°C for base board with components in target application grade]
Shock     tod       Humidity     10% to 90% non-oursing       Dimensions     241mm x 147.5mm [about DIN Asize exkluding PCle expansion slot]       Interaces/Features     [about DIN Asize exkluding PCle expansion slot]       MHTEspeed modul bay     [about DIN Asize exkluding PCle expansion slot]       Granector     2 Size Schuding PCle Exhl MicroSpeed Fower Module (female)       Serial Interface RS232 (RxD, TxD, RTS, CTS)     DSUB 9-pin female       Stall Interface RS435 (RxD, TxD, RTS, CTS)     DSUB 9-pin female       USB     4 x USB-A receptacity       Stall Interface RS435 (RxD, TxD, RTS, CTS)     DSUB 9-pin female       USB     4 x USB-A receptacity       Star     1 x RJ45     10/10/1000, module-dependent       CAN     2 x interface assign-ts usingle DSUB 9-pin female       Marce     1 mSATA drive bar / motions for surger DSUB 9-pin female       Star     1 eSATA connector / motions for surger DSUB 9-pin female       Star     1 eSATA connector / motions for surger DSUB 9-pin female       Star     1 eSATA connector / motions for surger DSUB 9-pin female       StarDard Stormetor / motion for surger DSUB 9-pin female     1 eSATA connector       Star / DSUB 9-pin female     1 eSATA connector <td>Vibration</td> <td>tbd</td> <td></td>	Vibration	tbd	
Humidity   10% to 90% non-condensing     Dimensions   241mm x 147.5mm   [about DIN A5 size exluding PCle expansion slot]     Interfaces/Fatures   Image: Status and	Shock	tbd	
Dimensions drawing/3D models available upon request     241 mm x 147.5mm [about DIN A5 size exluding PCle expansion slot]       Interfaces/Features        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 receptacie/hoc       Ethernet     1 x RJ45     10/100/1000, module-dependent       CAN     2 x interface assigned to single DSUB 9-pin female       Mass Storage      1 mSATA drive bay for unsquares to single DSUB 9-pin female       SATA     1 mSATA drive bay for unsquares to single DSUB 9-pin female       Combined socket for SD, MMC and MMCplus memory cares        Systemators     1 eSATA connector for external SATA drive       Combined socket for SD, MMC and MMCplus memory cares        Systemators        1 x DSO connector Type C (mini connector)        2 x LVDS connector Type C (mini connector)        1 x B.Storage        1 x DSO somectors        1 x DSO somectors	Humidity	10% to 90% non-cor	ndensing
Interfaces/Features     WHITEspeed modul bay     Connector   4x 50-pin ERNI MicroSpeed Power Module (female) and ERNI MicroSpeed Power Module (female)     Serial Interface RS232 (RxD, TxD, RTS, CTS)   DSUB 9-pin female     Serial Interface RS2485 (RxD, TxD, RTS, CTS)   DSUB 9-pin female     USB   4x USB-A reception     USB   4x USB-A reception     CAN   2 x interface assigned to single DSUB 9-pin female     CAN   2 x interface assigned to single DSUB 9-pin female     GATA   1 x RJ45   10/1000, module-dependent     CAN   2 x interface assigned to single DSUB 9-pin female     GATA   1 x RJ45   10/1000, module-dependent     Mass Storage   1 x SATA drive bay for "SATA SSD drive   10/1000, module-dependent     SATA   1 eSATA connector for external SATA drive   10/1000, module-dependent     Combined socket for SD, MMC and MMCplus memory cards   1 x EVDS connectors   1 x EVDS     1 x HDMI 1.3 connector Type C (mini connector)   1 x EVIS   1 x EVIS     1 x SIST   1 x   1 x EVIS   1 x EVIS     1 X BOB   1 x EVIS   1 x EVIS   1 x EVIS     1 A Somm jack plug   1 x EVIS   1 x EVIS   1 x EVIS </td <td>Dimensions drawing/3D models available upon request</td> <td>241mm x 147.5mm</td> <td>[about DIN A5 size exluding PCIe expansion slot]</td>	Dimensions drawing/3D models available upon request	241mm x 147.5mm	[about DIN A5 size exluding PCIe expansion slot]
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     Mass Storage	Interfaces/Features		
Connector   4 x 50-pin 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     Mass Storage   Immodule for mSATA SSD drive     SATA   1 mSATA drive bay for mSATA SSD drive     Combined socket for SD, MMC and MMCplus memory cards   Immodule for mSATA SSD drive     Supplay-Ports   Immodule for memory cards     2 x LVDS connector   Immodule for mSATA SSD drive     1 x 3.5mm jack plug   Immodule for mset set set set set set set set set set	WHITEspeed modul bay		
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       Mass Storage     1 mSATA drive bay for mSATA SSD drive       SATA     1 eSATA connector for external SATA drive       Combined socket for SD, MMC and MMCplus memory cards     1       Display-Ports     2       2 x LVDS connectors     1       1 x ADMI 1.3 connector Type C (min connector)     1       Audio     1 x       1 x 3.5mm jack plug     1       Dthers     1       JTAG Debug Interface     1 x       PCle     1 expansion slot for standard PCle slot cards as development time expansion (optional)       GPIO     on headers       Push-button Switch for On/Off/Reset (like Personal Computers)     5       Display (development system option)     9 inch screen diagonal	Connector	4 x 50-pin ERNI Micro ERNI MicroSpeed Po	oSpeed (male) and wer Module (female)
Serial Interface RS485 (RxD, TxD, RTS, CTS)DSUB 9-pin femaleUSB4 x USB-A receptacle/hostEthernet1 x RJ4510/100/1000, module-dependentCAN2 x interface assigned to single DSUB 9-pin femaleMass StorageSATASATACombined socket for SD, MMC and MMCplus memory cardsCombined socket for SD, MMC and MMCplus memory cardsDisplay-Ports2 x LVDS connectors1 x HDMI 1.3 connector Type C (mini connector)Audio1 x 3.5mm jack plugDthersJTAG Debug Interface1 expansion slot for standard PCle slot cards as development time expansion (optional)GPIOPCle0n headersFUSH-buttor Grundt/freest (like Personal Computers)FIF9 inch screen diagonal	Serial Interface RS232 (RxD, TxD, RTS, CTS)	DSUB 9-pin female	
USB     4 x USB-A receptacle/host       Ethernet     1 x RJ45     10/100/, module-dependent       CAN     2 x interface assigned to single DSUB 9-pin female       Mass Storage     SATA       SATA     1 mSATA drive bay for mSATA SSD drive       1 nSATA drive bay for mSATA SSD drive     1 eSATA connector for external SATA drive       Combined socket for SD, MMC and MMCplus memory cards     I eSATA connector for external SATA drive       Songap-Ports     2 x LVDS connectors       2 x LVDS connector Type C (mini connector)     I respension determined for the second for t	Serial Interface RS485 (RxD, TxD, RTS, CTS)	DSUB 9-pin female	
Ethernet     1 x RJ45     10/100/1000, module-dependent       CAN     2 x interface assigned to single DSUB 9-pin female       Mass Storage     SATA       SATA     I mSATA drive bay for mSATA SSD drive       1     1 eSATA connector for external SATA drive       Combined socket for SD, MMC and MMCplus memory cards     I eSATA connector for external SATA drive       Display-Ports     I eSATA connector for external SATA drive       2 x LVDS connectors     I estata connector SUL       1 x HDM1 1.3 connector Type C (mini connector)     I estata soft drive       Audio     I estata soft drive       1 x 3.5mm jack plug     I expansion slot for standard PCle slot cards as development time expansion (optional)       GPIO     on headers       Push-button Switch for On/Off/Reset (like Personal Computers)     I expansion slot for standard PCle slot cards as development time expansion (optional)       GPIO     on headers       Push-button Switch for On/Off/Reset (like Personal Computers)     I expansion slot for standard PCle slot cards as development time expansion (optional)       GPISPIA     I expansion slot for standard PCle slot cards as development time expansion (optional)       GPIO     on headers       Push-button Switch for On/Off/Reset (like Personal Computers)<	USB	4 x USB-A receptacle	e/host
CAN   2 x interface assigned to single DSUB 9-pin female     Mass Storage     SATA     I mSATA drive bay for mSATA SSD drive     1 eSATA connector for external SATA drive     Combined socket for SD, MMC and MMCplus memory cards     Display-Ports     2 x LVDS connectors     1 x HDMI 1.3 connector Type C (mini connector)     Audio     1 x 3.5mm jack plug     Others     JTAG Debug Interface   1 x     PCle   1 expansion slot for standard PCle slot cards as development time expansion (optional)     GPIO   on headers     Push-button Switch for On/Off/Reset (like Personal Computers)     Display (development system option)   In screen diagonal	Ethernet	1 x RJ45	10/100/1000, module-dependent
Mass Storage     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     Display-Ports     2 x LVDS connectors     1 x HDMI 1.3 connector Type C (mini connector)     Audio     1 x 3.5mm jack plug     Others     JTAG Debug Interface   1 x     PCle   1 expansion slot for standard PCle slot cards as development time expansion (optional)     GPIO   on headers     Push-button Switch for On/Off/Reset (like Personal Computers)   on headers     TFT   9 inch screen diagonal	CAN	2 x interface assigned to single DSUB 9-pin female	
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     Display-Ports     2 x LVDS connectors     1 x HDMI 1.3 connector Type C (mini connector)     Audio     1 x 3.5mm jack plug     Others     JTAG Debug Interface   1 x     PCle   1 expansion slot for standard PCle slot cards as development time expansion (optional)     GPIO   on headers     Push-button Switch for On/Off/Reset (like Personal Computers)     Display (development system option)     TFT   9 inch screen diagonal	Mass Storage		
1 mSATA drive bay for mSATA SSD drive     1 eSATA connector for external SATA drive     Combined socket for SD, MMC and MMCplus memory cards     Display-Ports     2 x LVDS connectors     1 x HDMI 1.3 connector Type C (mini connector)     Audio     1 x 3.5mm jack plug     Others     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)   Image development system option)     TFT   9 inch screen diagonal	SATA		
1 eSATA connector for external SATA drive     Combined socket for SD, MMC and MMCplus memory cards     Display-Ports     2 x LVDS connectors     1 x HDMI 1.3 connector Type C (mini connector)     Audio     1 x 3.5mm jack plug     Others     JTAG Debug Interface   1 x     PCle   1 expansion slot for standard PCle slot cards as development time expansion (optional)     GPIO   on headers     Push-button Switch for On/Off/Reset (like Personal Computers)     Display (development system option)     TFT   9 inch screen diagonal		1 mSATA drive bay fo	r mSATA SSD drive
Combined socket for SD, MMC and MMCplus memory cards     Display-Ports     2 x LVDS connectors   2     1 x HDMI 1.3 connector Type C (mini connector)   4     Audio     1 x 3.5mm jack plug   -     Others     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)   -     Display (development system option)   9 inch screen diagonal		1 eSATA connector for	or external SATA drive
Display-Ports     2 x LVDS connectors     1 x HDMI 1.3 connector Type C (mini connector)     Audio     1 x 3.5mm jack plug     Others     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)     Display (development system option)     TFT   9 inch screen diagonal	Combined socket for SD, MMC and MMCplus memory cards		
2 x LVDS connectors     1 x HDMI 1.3 connector Type C (mini connector)     Audio     1 x 3.5mm jack plug     Others     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)     Display (development system option)     TFT   9 inch screen diagonal	Display-Ports		
1 x HDMI 1.3 connector Type C (mini connector)     Audio     1 x 3.5mm jack plug     Others     JTAG Debug Interface   1 x     PCle   1 expansion slot for standard PCle slot cards as development time expansion (optional)     GPIO   on headers     Push-button Switch for On/Off/Reset (like Personal Computers)     Display (development system option)   9 inch screen diagonal	2 x LVDS connectors		
Audio1 x 3.5mm jack plugOthersJTAG Debug Interface1 xPCle1 expansion slot for standard PCle slot cards as development time expansion (optional)GPIOon headersPush-button Switch for On/Off/Reset (like Personal Computers)Display (development system option)TFT9 inch screen diagonal	1 x HDMI 1.3 connector Type C (mini connector)		
1 x 3.5mm jack plug     Others     JTAG Debug Interface   1 x     PCle   1 expansion slot for standard PCle slot cards as development time expansion (optional)     GPIO   on headers     Push-button Switch for On/Off/Reset (like Personal Computers)     Display (development system option)     TFT   9 inch screen diagonal	Audio		
Others     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)     Display (development system option)   9 inch screen diagonal	1 x 3.5mm jack plug		
JTAG Debug Interface1 xPCIe1 expansion slot for standard PCIe slot cards as development time expansion (optional)GPIOon headersPush-button Switch for On/Off/Reset (like Personal Computers)Display (development system option)TFT9 inch screen diagonal	Others		
PCle   1 expansion slot for standard PCle slot cards as development time expansion (optional)     GPIO   on headers     Push-button Switch for On/Off/Reset (like Personal Computers/   Image: Computer Comput	JTAG Debug Interface	1 x	
GPIO on headers   Push-button Switch for On/Off/Reset (like Personal Computers)   Display (development system option)   TFT 9 inch screen diagonal	PCle	1 expansion slot for s as development time	tandard PCIe slot cards expansion (optional)
Push-button Switch for On/Off/Reset (like Personal Computers)     Display (development system option)     TFT   9 inch screen diagonal	GPIO	on headers	
Display (development system option)   TFT 9 inch screen diagonal	Push-button Switch for On/Off/Reset (like Personal Computer	s)	
TFT 9 inch screen diagonal	Display (development system option)		
	TFT	9 inch screen diagona	al

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



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#### 4 ERNI Services

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