

# Swiss Made Rugged Embedded Computer Family with Intel® Atom™ E3800 Processor

## General Description

The CEC10 product Family is a high performance, low power, and highly integrated rugged Embedded Computer. The solution is available in various chassis, a compact aluminum housing with DIN-Rail or flange mount, a rugged MIL IP67 case, or an open frame solution with a cooling plate. The unique chassis solution allows to operate the CEC10 products in a moderate and also in a harsh environment without the need of fan or ventilation holes, up to -40°C to +85°C. The design integrates standard connectors for easy connection or lockable headers, depending on housing choice. Therefore, the CEC10 Family boards can be used for any x86 application where a complete but still expandable solution is needed.

## CEC10 Family Highlights

The CEC10 Family housings offer sufficient space for a 2.5 inch HDD/SSD or other expansion requirements. With the integrated PCI-Express Mini Card slot, the new CEC10 can easy be expanded with any mPCIe module. The product comes with a unique board interface which offers 2 x PCIe, 2 x HSIC, 2 x UART, SATA, SDIO, LPC, and I2C. This allows a maximum on customization for any I/O Boards and allows to extend the system with additional interfaces. For example; GPIOs, additional serial ports, Gigabit fiber ports, CAN, additional miniPCIe slots, or even PCI/104-Express port. Particular precautions have been taken that the entire system EMC is within the CE and FCC limits and that standards like EN50155, IEC 60945 or MIL-STD-810 can be met.

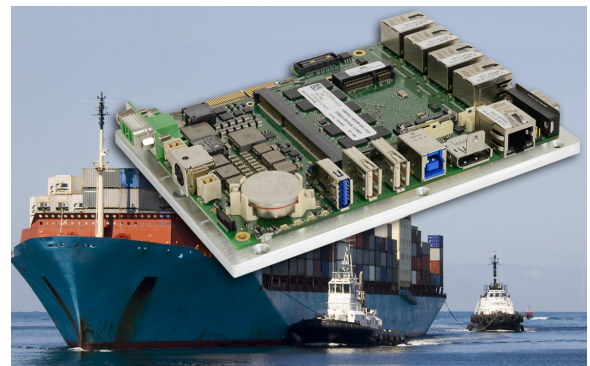
### Key features are:

- DDR3 ECC RAM up to 8GB
- 5 Gbit Ethernet ports on RJ45, M12, or fiber
- Fanless operation
- Long term availability\*
- Customizable IO board

The CEC10 Family has been designed to withstand any harsh environments and extreme temperature conditions. The special rugged design, combined with the best industrial-grade components, offer high reliability and long-term performance.

\* Typically 10 years or more, 20+ years repair-ability

**The CEC10 Family** is available for different Industries and is the perfect embedded computer solution for industrial environments, railway applications, MIL/ COTS applications, or whenever a rugged long-term available computer is needed.



**OPEN-CEC10** for integration in existing housings



**RAIL-CEC10** for rugged Railway Applications



**MIL-CEC10** for use in Military Environments

MPLAG is an ISO9001 certified company



## Technical Features

Board Key Data			
	CEC11	CEC12	CEC14
Processor	Intel Atom E3815	Intel Atom E3825	Intel Atom E3845
# of cores / threads	1 / 1	2 / 2	4 / 4
Clock speed	1.46GHz	1.33 GHz	1.91GHz
L2 Cache	521KB	1MB	2MB
Passmark (all cores)	356	560	1340
Chipset	System-on-chip (SoC) , 64-bit, Intel AES-NI, Intel VTx		
Memory	Up to 8GB DDR3L ECC memory on one 204-pin socket		
BIOS	On-board soldered 8MB Flash, MPL engineered BIOS (SecureCore by Phoenix), customizable		
Watchdog Timer	Configurable granularity 1-255 sec. or 1-255 min.		
Indicator LEDs	Power, 4 x LAN, 1 user programmable LEDs		
TPM	Optional: Trusted Platform Support		
<b>Mass Storage</b>			
on-board Flash	32GB eMMC on-board soldered Flash (optional up to 64GB)		
mSATA	1 x mSATA full size card socket, shared with mPCIe		
SATA	1 x SATA 2.0 ports, all ESD protected (optional)		
<b>Interfaces</b>			
Graphics Interfaces	Display Port (DP) up to 2560x1600 (DP), ESD protected (DVI over adapter) Dual display capable, VGA, DP, or 24-bit LVDS interface (optional )		
USB	1 x USB 3.0 ports, 2 x USB 2.0 ports		
LAN	5 x GbE ports (Intel i210) on RJ45 , ESD protected connectors, 2 x WoL (Wake on LAN) 3 x GbE ports (Intel i210) on M12 or fiber (optional)		
Serial Ports	1 x full modem RS232 port, ESD protected external DB9 connector 1 x RS232/485 optional		
HDAudio	Intel HDAudio signals, available on a 1 mm header, sound card (HDSOUND-1) is available		
<b>Expansions</b>			
mPCIe	1 x mPCIe full size card socket, shared with mSATA		
MPL Bus	2 x PCIe x1 / SDIO / SPI / 2x UART / LPC / SATA / 2 x HSIC ideal for customized expansions		
<b>Power</b>			
Input Voltage	8 - 36 VDC input range, ESD and EMC protected power input, Reset / Power button Over voltage protection, reverse polarity protection, and load dump protection Ignition input specifically for vehicles (available on a 4-pin Mini-DIN connector)		
Power consumption (all operational)	CEC11 6W typical, 10W max	CEC12 7W typical, 11W max	CEC14 9W typical, 14W max
<b>Environment</b>			
Storage Temperature	-45°C up to +85°C (-49°F to +185°F)		
Operating Temperature	-20°C to +60°C (-4°F to +140°F), with full CPU, 3D video and memory usage, fanless -40°C to +85°C, fanless , final test in climate chamber with test protocol (optional)		
Relative Humidity	5% to 95% non condensing, optional coating available		
<b>Standard Compliance</b>			
The CEC10 family is designed to meet or exceed the most common standards. Particular references are:			
EMC	EN 55022, EN 55024, EN 61000, MIL-STD-461E		
Shock & Vibration	EN 60068		
Environmental & Safety	EN 50155, MIL-STD-810G, EN 60601, EN 60950		
Approval List	CE, IEC 60945, IACS E10		

## Packaging

Chassis version	footprint	height	weight	
DIN Rail	62 x 120mm	162.1mm	1.2 kg (2.7 lb.)	custom color or foil available
Flange	62 x 123mm	198.05mm	1.25 kg (2.8 lb.)	custom color or foil available
Open Frame	min. 102 x 153mm	min. 23mm	0.6 kg (1.32 lb.)	custom cooling plate available
IP67 MIL	175 x 182mm	min. 66mm	2.1 kg (4.66 lb.)	custom housings and connectors available

The aluminum housings are internally chromated, externally powder coated or anodized, no ventilation holes

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