



- **Intel Atom x6000 Series**
- **Powerful Graphics**
- **Rugged and Fanless**
- **Dedicated Industrial Engine**
- **Real Time Computing**
- **Up to 3x 2.5GbE Ports**
- **Customizable**
- **Professional Services**

## Features

**Intel Atom x6000 Series** - The Atom x6000 Series delivers up to 40% more performance compared to the previous generation, while keeping within a similar power budget

**Powerful Graphics** - The new integrated GPU with up to 32 Execution Units is up to 2x faster than the previous generation and supports up to 3 independent high resolution screens

**Rugged and Fanless** - Operates from -40 to +85°C, with error correcting code memory and soldered memory

**Dedicated Industrial Engine** - An integrated and independent ARM core provides unprecedented industrial capabilities and a range of native industrial interfaces (CAN-FD, UARTS, ADCs, QEPs, GPIO, Ethernet)

**Real Time Computing** - Support for TCC (Time Coordinated Computing) and TSN (Time Sensitive Networking) enables soft Real Time applications

**Up to 3x 2.5GbE Ports** - Support for 2.5GbE ranges from one port (COM Express) to 3x ports (COM Express with proprietary expansions)

**Customizable** - Comes with optional personalization and full customization services, ranging from factory options to deep HW/SW configuration changes

**Professional Services** - Provides the foundation for Eurotech Professional Services that span from carrier board development to complete system design, certification and manufacturing

## Description

The CPU-161-19 is a COM Express module that features the Intel Atom x6000 Series. It comes in two variants: one is 100% COM Express Type 6 compliant and the other has proprietary extensions. The proprietary extensions provide additional features and are mapped on unused pins and deliver a range of novel interfaces that can greatly simplify the design of the carrier board and reduce its cost. Designed for fanless applications in harsh environments where long term reliability is a must, the CPU-161-19 delivers up to 4 CPU cores and 32 GPU execution units and in-band ECC RAM. It features an all-soldered down design to improve resilience and thermal coupling, and comes with a -40 to +85°C operating temperature.

Both the CPU and the integrated GPU deliver great performance improvements compared to the previous Atom generation, with a speed up that is up to 40% for traditional computing and up to 2x for graphics acceleration, while keeping the TDP at 12W or less. The CPU-161-19 fully exploits a new capability of the Atom x6000 series: an embedded ARM core provides an independent engine that manages a large number of native industrial interfaces, including Ethernet ports, ADCs, Quadrature Encoders, GPIOs, UARTs and CAN-FD.

The combination of the independent engine with Time Sensitive Networking (TSN) and Time Coordinated Computing (TCC) enables soft Real Time applications. TSN is an evolution of the Ethernet standard that provides time determinism to networked communications, while staying completely compatible with the existing Ethernet infrastructures. TCC bridges the synchronization of the internal clocks with the network to achieve microsecond accuracy.

Supported operating systems include Everyware Linux (based on Yocto) and Windows 10 IoT Enterprise; additionally, the CPU-161-19 supports Everyware Software Framework (ESF), a commercial, enterprise-ready edition of Eclipse Kura, the open source Java/OSGi middleware for IoT gateways. Professional Services are available for the CPU-161-19, starting from BIOS personalization and including carrier board design, system development and production. Deep module customization, such as feature changes are also available.

## Ordering code: CPU-161-19-XX

XX		-01	-02	-03	-21	-22	-23
PROCESSOR	CPU	Atom x6212RE 1.20GHz, 2 Cores	Atom x6414RE 1.50GHz, 4 Cores	Atom x6425RE 1.90GHz, 4 Cores	Atom x6212RE 1.20GHz, 2 Cores	Atom x6414RE 1.50GHz, 4 Cores	Atom x6425RE 1.90GHz, 4 Cores
GPU	Type	Integrated, 11th Generation					
	Execution Units	16EU@250MHz	16EU@400MHz	32EU@400MHz	16EU@250MHz	16EU@400MHz	32EU@400MHz
MEMORY	RAM	4GB DDR4 IBECC, 3200MT/s, Soldered Down	8GB DDR4 IBECC, 3200MT/s, Soldered Down	16GB DDR4 IBECC, 3200MT/s, Soldered Down	4GB DDR4 IBECC, 3200MT/s, Soldered Down	8GB DDR4 IBECC, 3200MT/s, Soldered Down	16GB DDR4 IBECC, 3200MT/s, Soldered Down
STORAGE	Embedded	1x SPI-Flash - 1x EEPROM					
	SATA	2x SATA 3.0 (up to 6Gb/s)					
	SD	1x SDXC (Factory Option)					
MULTIMEDIA	Video Ports	2x DDI (HDMI/DVI/DP++), 1x LVDS/eDP (eDP Factory Option), 1x VGA (Factory Option), Triple Display: VGA+DDI1+DDI2 or LVDS+DDI1+DDI2 or eDP+DDI1+DDI2					
	Video Resolution	DDI1 and DD2: 4Kp60 / VGA: 1920x1200@60Hz / LVDS: 1920x1200@60Hz, Dual Channel, 24bit					
	Video Acceleration	HW Encode: HEVC/H.265, H.264/AVC, VP9, M/JPEG; HW Decode: HEVC/H.265, H.264/AVC, VP8, VP9, VC1, M/JPEG, MPEG2					
	Audio	HDA Interface / Speaker				HDA Interface / Speaker / I2S / DMIC	
I/O INTERFACES	Ethernet	1x 10/100/1000/2500Mbps with TSN			1x 10/100/1000/2500Mbps with TSN 2x SGMII 10/100/1000/2500Mbps (Factory Option)		
	USB	2x USB 3.0 / 8x USB 2.0					
	Serial	2x UART (TX/RX)			3x UART 2-wire, 5x UART 4-wire		
	CANBus	1x CAN-FD (Factory Option)			2x CAN-FD		
	Digital I/O	4x GPI / 4x GPO (or SDXC)			5x GPI / 4x GPO / 3x GPIO or 1x GPI / 3x GPIO / SDXC (Factory Option)		
	Other Industrial	Not Available			6x ADC, 2x Quadrature Encoder		
	PCI Express	1x PCIe x4 Gen3 (or 2x PCIe x2 Gen3, or 4x PCIe x1 Gen3) 2x PCIe x1 Gen3 (Mutually Exclusive with SGMII)					
	System Bus	1x LPC / 1x I2C / 1x SPI / 1x SMBus			1x LPC / 2x I2C / 3x SPI / 1x SMBus		
OTHER	RTC	Yes					
	Watchdog	Yes					
	TPM	TPM 2.0 (Discrete Chip)					
	Sensors	Temperature					
POWER	Input	12V, 5VSBY, 3V_RTC (ATX Mode) / 12V, VCC_RTC (AT Mode)					
	Consumption	6W (CPU TDP)	9W (CPU TDP)	12W (CPU TDP)	6W (CPU TDP)	9W (CPU TDP)	12W (CPU TDP)
ENVIRONMENT	Operating Temp	-40 to +85°C					
	Storage Temp	-40 to +85°C					
	Humidity	5% to 90% RH					
CERTIFICATIONS	Regulatory	CE, FCC, ISED					
	Safety	EN 62368, UL 60950					
	Environmental	RoHS3, REACH					
	Compliance	PICMG COM Express R3.0, Type 6			Based on PICMG COM Express R3.0, Type 6, with Proprietary Extensions		
MECHANICAL	Dimensions	95x95mm (LxW) - COM Express Compact					

## Supported Software

SOFTWARE	OS	Everyware Linux, Windows 10 IoT Enterprise (Professional Services: Other Linux and RTOS)
	IoT Framework	Everyware Software Framework (Java/OSGi)

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