

## Fourth generation of Shuttle's XPC nano Series brings Whiskey Lake support

The NC10 series is powered by Intel's power-saving ULV (ultra-low-voltage) processors of the Whiskey-Lake-U generation and comprises four models with processors from Celeron to Core i7. All four models support two digital video outputs for UHD/4K displays with 60 Hz and one 2.5" drive that is up to 15 mm in height as well as one M.2-2280 NVMe SSD card. Professional users will appreciate Intel Gigabit-LAN and one serial port which indicates what purposes the NC10 series is mainly intended for: Digital Signage, POS, control, office or even multimedia.

### Feature Highlights

<b>Slim Design</b>	<ul style="list-style-type: none"> <li>• Slim plastic chassis, black</li> <li>• Dimensions: 142x142x42 mm (LWH), 847 ml</li> <li>• Incl. Stand &amp; VESA mount (75/100 mm)</li> <li>• Hole for Kensington Lock</li> <li>• Operating temperature: max. 40 °C</li> </ul>
<b>Operating System</b>	<ul style="list-style-type: none"> <li>• An operating system is not included</li> <li>• Supports Windows 10, Linux (64-bit only)</li> </ul>
<b>Processor</b>	<ul style="list-style-type: none"> <li>• Intel Core i3-8145U, Dual Core, 15 W TDP</li> <li>• Intel ULV "Whiskey-Lake-U" Generation</li> <li>• Integrated Intel UHD graphics 620, DX12</li> </ul>
<b>Memory</b>	<ul style="list-style-type: none"> <li>• Supports up to 2x 32 GB DDR4-2400 SO-DIMM memory modules</li> </ul>
<b>Drive Bay</b>	<ul style="list-style-type: none"> <li>• One 6.35 cm / 2.5" bay, 15 mm height supports one SATA hard disk or SSD</li> </ul>
<b>M.2 Slot</b>	<ul style="list-style-type: none"> <li>• M.2-2280 slot supports SSD card (SATA+PCIe)</li> </ul>
<b>Connectors</b>	<ul style="list-style-type: none"> <li>• HDMI 2.0a, DisplayPort 1.2</li> <li>• 2x USB 3.2 Gen 1 (Type A/C), 2x USB 2.0</li> <li>• Intel Gigabit LAN, RS232 COM port</li> <li>• SD card reader, Audio Combo</li> </ul>
<b>WLAN</b>	<ul style="list-style-type: none"> <li>• Wireless LAN 802.11n, internal antenna</li> <li>• Optional upgradeable with Shuttle WLN-M</li> </ul>
<b>Power Supply</b>	<ul style="list-style-type: none"> <li>• External 65 W fanless power adapter</li> </ul>
<b>Applications</b>	<ul style="list-style-type: none"> <li>• Home Media, Office, Digital Signage, etc</li> </ul>

## XPC nano Barebone NC10U3 (Core i3)



Images for illustration purposes only. This product does include the stand and VESA mount, but does not include memory, storage and operating system.

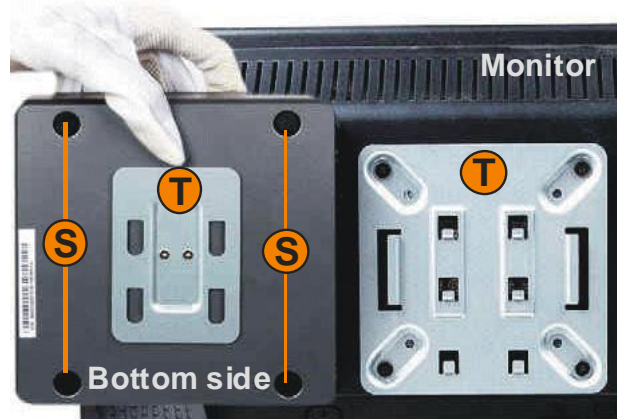
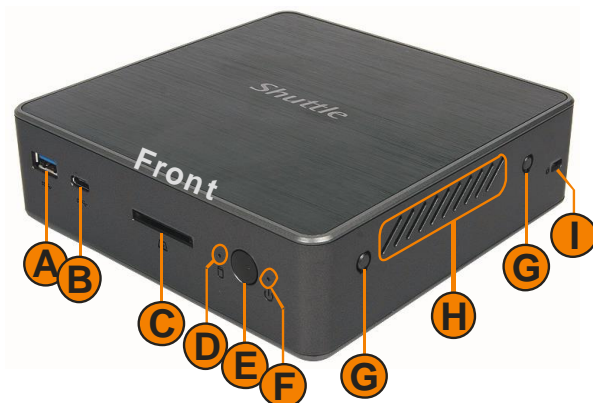


### Products of the Shuttle XPC nano Barebone NC10 Series

Product	Processo	Cores	Threads	CPU Clock	Cache	Graphics	GPU-Clock	Memory
NC10U	Celeron 4205U	2	2	1.8 GHz	2 MB	HD 610	300 ~ 900 MHz	DDR4-2133
NC10U3	Core i3-8145U	2	4	2.1 ~ 3.9 GHz	4 MB	HD 620	300 ~ 1000 MHz	DDR4-2400
NC10U5	Core i5-8265U	4	8	1.6 ~ 3.9 GHz	6 MB	HD 620	300 ~ 1100 MHz	DDR4-2400
NC10U7	Core i7-8565U	4	8	1.8 ~ 4.6 GHz	8 MB	HD 620	300 ~ 1150 MHz	DDR4-2400



## Shuttle XPC nano Barebone NC10U3 – Product Views



- |                                                   |                                              |
|---------------------------------------------------|----------------------------------------------|
| <b>A</b> USB 3.2 Gen 1 Type A (Blue)              | <b>K</b> DC input for power adapter          |
| <b>B</b> USB 3.2 Gen 1 Type C                     | <b>L</b> HDMI                                |
| <b>C</b> SD Card reader                           | <b>M</b> DisplayPort                         |
| <b>D</b> Hard disk LED indicator                  | <b>N</b> Gigabit LAN (RJ45)                  |
| <b>E</b> On/Off Button                            | <b>O</b> 2x USB 2.0                          |
| <b>F</b> Power-on LED indicator                   | <b>P</b> Audio Combo (Headphones & Mic)      |
| <b>G</b> 2x perforation for optional WLAN antenna | <b>Q</b> 4x Mounting hole for vertical stand |
| <b>H</b> Vents                                    | <b>R</b> RS232 COM port *)                   |
| <b>I</b> Hole for Kensington Lock                 | <b>S</b> 4x Rubber foot                      |
| <b>J</b> 2x Vertical stand                        | <b>T</b> VESA mounting kit (2 pieces)        |

\*) Note: The serial connector (COM port) cannot be used, if NC10U3 is operated in vertical position.

### Required Components

#### 1~2 memory modules

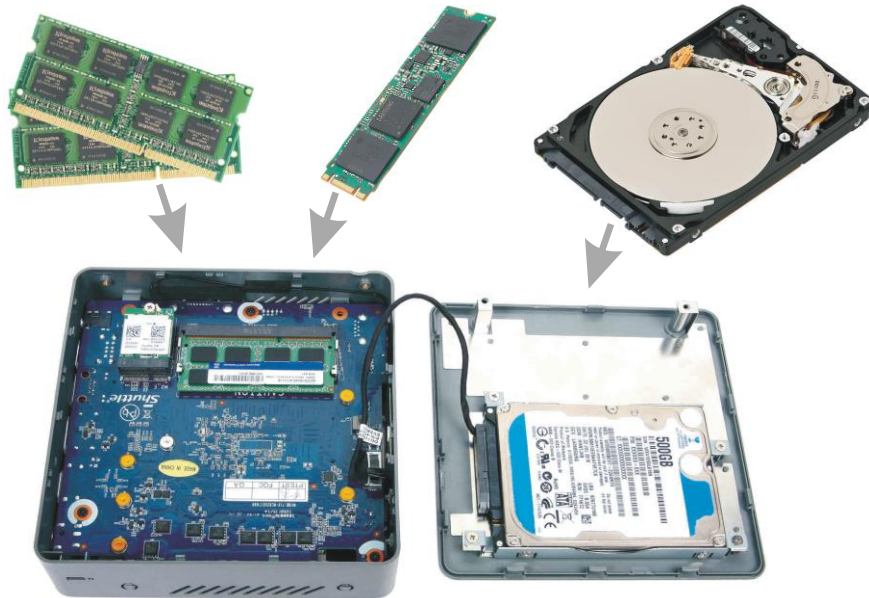
Up to 2x 32 GB DDR4-2400 in SO-DIMM format

#### One M.2 SSD

M.2-2242/2260/2280  
SATA or PCIe NVMe interface

#### One 2.5" drive

SSD or HDD with SATA connector  
(up to 15 mm in height)



### Operating Positions

1. Horizontal
2. Vertical with Stand
3. VESA-mounted behind a monitor

Stand and VESA mount with screws are included.



### Product Features



#### Stylish and absolutely small

The black plastic case with its curves is certain to be the eyecatcher on your desk. At a volume of barely 850 ml, it may also be elegantly hidden behind monitors thanks to the supplied VESA mount. Despite its dinky dimensions, it provides generous connectivity options and even room for one 2.5 inch drive which can be an SSD or HDD.



#### Easy installation

Remove just two screws to unmount the two chassis covers.



#### SD Card Reader

The built-in SD card reader at the front side makes file transfer from and to a digital camera easy. It takes SD, SDHC and SDXC memory flash cards in standard size format and also supports booting from bootable SD cards.



#### M.2-2280-Slot for SSD cards

The M.2-2280 BM slot supports M.2 SSD storage cards with SATA or the more advanced PCIe interface with NVMe support.

Type 2280 means, it takes the usual M.2 cards with a width of 22 mm and a length of 80 mm, but also 2242 and 2260 standard cards can be installed.



#### Serial Port

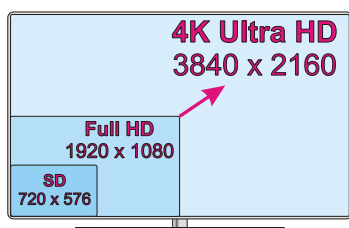
Many PCs do not have these legacy ports any longer, since they have been superseded and replaced by USB for most consumer applications, but they are still commonly used in industrial automation systems, scientific analysis, POS systems and others. The Shuttle XPC nano Barebone NC10U3 features one serial RS-232 interface with the traditional 9-pin D-Sub connector for easy connection to appropriate components. Note: The serial connector (COM port) cannot be used, if the NC10U3 is operated in vertical position.



#### Dual Monitoring via HDMI and DisplayPort

The NC10U3 can connect two digital displays through its HDMI and DisplayPort. Dual monitoring helps improve on productivity by allowing for spreading multiple windows across two monitors while working with them simultaneously.





### Supports 4K Ultra HD at 60 Hz

The NC10U3 supports two displays running at 4K (3840 x 2160 / 2160p) high resolution at 60Hz frames per second. Being the successor to the Full HD standard, Ultra HD delivers a four times higher resolution with a wider colour space and colour depth.

Note: Dual channel memory (two identical modules) is required to support 4K Ultra-HD resolution (2160p).



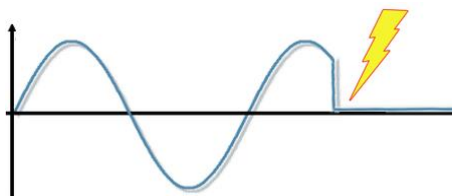
### USB 3.2 type A and type C

The Shuttle XPC nano Barebone NC10U3 has four USB ports, two of which are USB 3.2 Gen 1 with up to 5 Gb/s full duplex which means an up to 10 times greater performance than USB 2.0. One of the USB 3.2 connectors is a "type-C" connector with reversible plug orientation. This type of connector is especially intended for use with next-gen mobile devices.



### Supports high-capacity drives

The NC10U3 supports 2.5 inch drives up to a maximum height of 15 mm. This makes overall capacities of up to 5 TB possible (correct in November 2019), while many other PCs in a similar form factor are limited to drives with a maximum height of 7 to 9.5 mm.



### Power-on after Power Fail





The BIOS setup provides a "Power-on after Power Fail" function that can be found under "Power Management Configuration". As the name indicates, this function determines the PC's behaviour after power failure. As a matter of the nature of this function, it may fail after short power failures. This is why the NC10U3 also comes with a hardware-based solution. By removing Jumper JP1 (see Quick Installation Guide), the system will start unconditionally once power is applied.



### Kensington Lock

This is a small, metal-reinforced hole as part of an anti-theft system. The Shuttle XPC nano Barebone NC10U3 provides an appropriate hole on both sides of its chassis. The lock-and-cable is not included.

## Shuttle XPC nano Series – Comparison

	NC03U Series	NC10U Series
<b>Chassis</b>	142 x 142 x 42 mm (847 ml)	142 x 142 x 42 mm (847 ml)
<b>Processor</b>	Celeron, Core i3, Core i5 or Core i7 Intel "Kaby Lake-U" (7 <sup>th</sup> Gen), ULV Technology: 14 nm, TDP: 15 W	Celeron, Core i3, Core i5 or Core i7 <b>Intel "Whiskey Lake-U" (8<sup>th</sup> Gen)</b> , ULV Technology: 14 nm, TDP: 15 W
<b>Graphics</b>	Intel HD610 / HD620, Dual Display	Intel UHD610 / UHD620, Dual Display
<b>Operating System</b>	Windows 10, Linux, 64-bit only	Windows 10, Linux, 64-bit only
<b>4K/UHD @ 60 Hz</b>	Yes, with DisplayPort	<b>Yes, with DisplayPort and HDMI</b>
<b>Memory Support</b>	2x SO-DIMM with 260 pins max. 2x 16 GB DDR4-2133	2x SO-DIMM with 260 pins <b>max. 2x 32 GB DDR4-2133/2400 [1]</b>
<b>Audio</b>	Realtek ALC662	Realtek ALC662
<b>Ethernet LAN</b>	Intel i211 Gigabit	Intel i211 Gigabit
<b>Drive Bay</b>	2.5" / 15 mm SATA	2.5" / 15 mm SATA
<b>SSD card slot</b>	M.2-2280 supports SATA and PCIe X4	M.2-2280 supports SATA and PCIe X4
<b>WLAN</b>	M.2-2230 card Realtek RTL8188EE supports 802.11n (1T1R)	M.2-2230 card Realtek RTL8188EE supports 802.11n (1T1R)
<b>Connectors Front Panel</b>	Power button, 2x LED, SD card reader 2x USB 3.1 Gen 1 (Type A and Type C)	Power button, 2x LED, SD card reader 2x USB 3.2 Gen 1 (Type A and Type C)
<b>Connectors Back Panel</b>	DisplayPort 1.2, HDMI 1.4b 2x USB 2.0, Gigabit LAN, Audio Combo DC input, 2x perforation for opt. antenna	DisplayPort 1.2, <b>HDMI 2.0a</b> 2x USB 2.0, Gigabit LAN, Audio Combo DC input, 2x perforation for opt. antenna
<b>Left Side</b>	1x RS232 COM port	1x RS232 COM port
<b>Jumper</b>	Always-on-Jumper, Clear CMOS Jumper	Always-on-Jumper, Clear CMOS Jumper
<b>Supplied Accessories</b>	Vertical Stand (aluminium with screws) VESA mounting kit	Vertical Stand (aluminium with screws) VESA mounting kit
<b>Operation Temp.</b>	max. 40 °C	max. 40 °C
<b>Power Adapter</b>	65 W / 19 V	65 W / 19 V
<b>Front View</b>		
<b>Rear View</b>		

[1] The NC10U with Celeron processor supports DDR4-2133

## Product models and processor features:

Shuttle Product	Processor Model	Cores / Threads	Clock / Turbo	L3-Cache	Intel Graphics	EUs	max. GPU Clock	TDP	Passmark CPU Mark
<b>NC03U</b>	Celeron 3865U	2 / 2	1.8 / – GHz	2 MB	HD 610	12	900 MHz	15 W	1918
<b>NC03U3</b>	Core i3-7100U	2 / 4	2.4 / – GHz	3 MB	HD 620	24	1000 MHz	15 W	3758
<b>NC03U5</b>	Core i5-7200U	2 / 4	2.5 / 3.1 GHz	3 MB	HD 620	24	1000 MHz	15 W	4561
<b>NC03U7</b>	Core i7-7500U	2 / 4	2.7 / 3.5 GHz	4 MB	HD 620	24	1050 MHz	15 W	5119
<b>NC10U</b>	Celeron 4205U	2 / 2	1.8 / – GHz	2 MB	HD 610	12	900 MHz	15 W	1977
<b>NC10U3</b>	Core i3-8145U	2 / 4	2.1 / 3.9 GHz	4 MB	HD 620	24	1000 MHz	15 W	5483
<b>NC10U5</b>	Core i5-8265U	4 / 8	1.6 / 3.9 GHz	6 MB	HD 620	24	1100 MHz	15 W	8003
<b>NC10U7</b>	Core i7-8565U	4 / 8	1.8 / 4.6 GHz	8 MB	HD 620	24	1150 MHz	15 W	8817

## Shuttle XPC nano Barebone NC10U3 - Specifications

Chassis	<p>Barebone PC with a black plastic chassis</p> <p>Dimensions: 142 x 142 x 42 mm (LWH) = 847 ml</p> <p>Weight: 0.4 kg net, 1.2 kg gross</p> <p>Hole for Kensington Lock</p> <p>Includes vertical stand and 75 / 100 mm VESA mount</p>
Low Power Consumption	<p>Power consumption in idle mode with 2.5" SSD under Windows 10: ca. 6 W only</p>
Operation Position	<p>1) Horizontal</p> <p>2) Vertical with stand</p> <p>3) VESA-mounted behind an appropriate monitor</p>
Operation System	<p>This barebone system comes without operating system.</p> <p>It is compatible with:</p> <ul style="list-style-type: none"> <li>- Windows 10, 64-bit</li> <li>- Linux 64-bit</li> </ul>
Processor	<p>Model: Intel Core i3-8145U (ULV)</p> <p>System-on-a-chip architecture (SoC) with integrated memory and graphics controller: no chipset required</p> <p>FCBGA1528 package - directly soldered onto the mainboard</p> <p>Code name: Whiskey Lake U (8th Generation Intel Core)</p> <p>Cores / Threads: 2 / 4</p> <p>Clock rate: 1.8 GHz</p> <p>Max. Turbo Frequency: 3.9 GHz</p> <p>L1/L2/L3 Cache: 128 kB / 512 kB / 4 MB</p> <p>TDP wattage: 15 W maximum</p> <p>Manufacturing process: 3rd-generation enhanced 14nm++</p> <p>Maximum Tjunction Temperature: 100 °C</p> <p>Supports 64-bit, VT-x (EPT), VT-d, Enhanced SpeedStep, NX bit, AES-NI, SSE 4.1/4.2</p>
Cooling fan	<p>Built-in CPU cooling fan with 4-pin connector</p> <p>Supports temperature-controlled RPM fan speed</p>
Integrated Graphics	<p>Intel UHD Graphics 620</p> <p>GPU clock frequency: 300~1000 MHz</p> <p>Execution Units (EUs): 24</p> <p>Supports DirectX 12</p> <p>Supports full H264, H265 8/10 bit, VP8/9, VC-1, AVC hardware decoding</p> <p>Supports Quick Sync Video and Clear Video HD technology</p> <p>Supports up to two independent screens:</p> <ol style="list-style-type: none"> <li>1) DisplayPort 1.2 supports Ultra HD @ 60 Hz</li> <li>2) HDMI 2.0a supports Ultra HD @ 60 Hz</li> </ol>

<i>Mainboard &amp; BIOS</i>	<p>AMI BIOS in 8 MByte EEPROM with SPI interface</p> <p>Supports resume after power failure</p> <p>Supports Wake on LAN (WOL) and Power on by RTC Alarm</p> <p>Supports booting from USB devices and SD card reader</p> <p>Supports hardware monitoring and watch dog function</p> <p>Supports Unified Extensible Firmware Interface (UEFI)</p> <p>Supports Firmware TPM v2.0 (fTPM)</p>
<i>Power Adapter</i>	<p>External 65 W power adapter (fanless)</p> <p>Input: 100~240 V AC, 50/60 Hz, max. 1.6 A</p> <p>Output: 19 V DC, max. 3.42 A, max. 65 W</p> <p>DC cable ca. 175 cm with coaxial connector: 5.5 / 2.5 mm (outer/inner diameter)</p> <p>The DC-input of the computer supports 19V±5%.</p> <p>AC cable, ca. 170 cm, with flat, two-pole Europlug</p>
<i>Memory support</i>	<p>2x SO-DIMM slot with 260 pins</p> <p>Supports DDR4-2400 (PC4-19200) SDRAM at 1.2 V</p> <p>Supports DDR4-2666 at 2400 MHz</p> <p>Supports Dual Channel mode</p> <p>Supports a maximum of 32 GB per DIMM, maximum total size: 64 GB</p> <p>Supports two unbuffered DIMM modules (no ECC or registered)</p>
<i>2.5" Drive Bay</i>	<p>Supports one Serial ATA hard disk or one SATA SSD drive in 6.35 cm / 2.5" format</p> <p>Device height: 15 mm (max.)</p> <p>Supports Serial-ATA III, 6 Gb/s (600 MB/s) bandwidth</p>
<i>Card Reader</i>	<p>Integrated SD card reader supports SD, SDHC and SDXC memory flash cards</p> <p>Supports booting from SD card</p>
<i>M.2 Slot for SSDs</i>	<p>The M.2 2280 BM slot provides the following interfaces:</p> <ul style="list-style-type: none"> <li>- PCI-Express Gen. 3.0 X4 with up to 4 GB/s data transfer rate</li> <li>- SATA v3.0 (max. 6 Gbps)</li> </ul> <p>It supports M.2 cards with a width of 22 mm and a length of 42, 60 or 80 mm (type 2242, 2260, 2280).</p> <p>Supports M.2 SATA SSDs (with B+M key) and M.2 PCIe SSDs with NVMe (with M key)</p>
<i>Audio</i>	<p>Audio Realtek® ALC 662 High-Definition Audio Codec</p> <p>3.5 mm / 4-pole combo audio connector for headphones and microphone [2]</p> <p>Digital multi-channel audio output: via HDMI and DisplayPort</p>
<i>Gigabit LAN</i>	<p>Ethernet Controller Intel i211</p> <p>Supports 10 / 100 / 1.000 MBit/s operation (Gigabit)</p> <p>Supports WAKE ON LAN (WOL)</p> <p>Supports network boot by Preboot eXecution Environment (PXE)</p> <p>IEEE 802.3az Energy Efficient Ethernet (EEE), Interface: PCIe v2.1</p>



<i>Wireless Network (WLAN)</i>	Built-in M.2-2230-A/E WLAN card and internal antenna Single-Chip 1T1R WLAN Controller Realtek RTL8188EE Supports IEEE 802.11b/g/n, max. 150Mbps up-/downstream Security: WPA/WPA2(-PSK), WEP 64/128-bit, IEEE 802.11x/i
<i>Front Panel connectors</i>	USB 3.2 Gen 1 Type A (max. 5 Gbps) USB 3.2 Gen 1 Type C (max. 5 Gbps) SD card reader (supports SD, SDHC, SDXC) Power button Power LED (blue, flashing when in suspend mode) HDD LED (orange)
<i>Back Panel connectors</i>	DisplayPort 1.2 [1] HDMI 2.0a 2x USB 2.0 Type A Gigabit LAN (RJ45) Audio Combo Port for headphones and microphone (3.5 mm jack, 4-pole) [2] DC-input connector for external power adapter 2x perforation for optional external WLAN antennas
<i>Left Side connectors</i>	Serial RS232 COM port (D-Sub, 9-pin) Note: The serial connector (COM port) cannot be used, if the NC10U3 is operated in vertical position.
<i>Always-On Jumper</i>	By removing Jumper JP1 (please refer to the Quick Installation Guide), the system will start unconditionally once power is applied. [4]
<i>Clear CMOS Jumper</i>	Short Jumper JP2 for about 10 seconds to restore factory settings of BIOS.
<i>Supplied Accessories</i>	Multi-language Quick Installation Guide Driver DVD for Windows 10 VESA mount set (two parts), made of steel, Six screws (4x M4x10, 2x M2.5x3) Bracket for a 2.5" drive with eight screws (M3x5) Two aluminium stands (110 mm width) with four screws M3x7 for vertical operation Four black, rounded rubber feet, ca. 10 mm diameter x 2.5 mm Two screws for mounting of M.2 cards Power adapter 65 W with AC power cord
<i>Optional Accessories</i>	<b>WLN-M:</b> Wireless LAN module with two external antennas, supports WiFi IEEE 802.11n/ac (2.4 / 5 GHz) and Bluetooth 4.0
<i>Environmental Spec</i>	Operating temperature range: 0~40 °C [3] Relative humidity range: 10~90% (non-condensing)

### Conformity & Certifications

EMI: CE, FCC, BSMI, RCM, RED, VCCI

Safety: CB, BSMI, ETL

Other: RoHS, Energy Star, ErP

This device is classed as a technical information equipment (ITE) in class B and is intended for use in living room and office. The CE-mark approves the conformity by the EU directives:

(1) 2014/30/EU relating to electromagnetic compatibility (EMC),

(2) 2014/35/EU relating to Electrical Equipment designed for use within certain voltage limits (LVD),

(3) 2009/125/EC relating to ecodesign requirements for energy-related products (ErP),

(4) 2014/53/EU Radio Equipment Directive (RED)

#### [1] How to convert DisplayPort into HDMI/DVI

The DisplayPort outputs can be converted to HDMI or DVI by an additional, passive adapter cable. For example:

DELOCK 82590: 1 m, DisplayPort (male, 20p) to HDMI-A (male, 19p)

DELOCK 82435: 5 m, DisplayPort (male, 20p) to DVI-D (male, 24p)

The integrated graphics automatically detects the connected display and puts out the appropriate electric signal - either DisplayPort (without an adapter) or HDMI/DVI (with an adapter).

However, a monitor with a DisplayPort connector cannot be connected to the HDMI port with a simple, passive adapter. In this case an active adapter like Delock 62496 is required.

#### [2] Audio connector

The 3.5 mm audio jack at the back panel of this device supports both a 4-pole connector for headphones and microphone and headphones with only a 3-pole connector. Headsets with separate connectors for headphones and microphone, though, require an appropriate adapter, if also the microphone should be used.

**[3] Caution: For high ambient temperatures** over 35 °C we strongly recommend to use SSDs (supporting at least 70 °C) instead of hard disks.

#### [4] Power-on after Power Fail:

The BIOS setup provides a "Power-on after Power Fail" function that can be found under "Power Management Configuration". This function determines the PC's behaviour after power failure. As a matter of the nature of this function, it may fail after short power failures. This is why this PC also comes with a hardware-based solution. By removing Jumper JP1 (please refer to the Quick Installation Guide), the system will start unconditionally once power is applied.