

Shuttle's XPC nano Series gets a performance boost

The NC03U series is powered by Intel's power-saving ULV (ultra-low-voltage) processors of the Kaby Lake generation. Compared with the NC02U series, it brings higher clock frequencies, improved graphics performance and support of faster DDR4 memory up to 2x 16 GB. Furthermore, one 2.5" drive up to 15 mm in height as well as one M.2-2280 NVMe SSD card can be installed. The DisplayPort connector delivers video resolutions of up to 4K at 60 frames per second while a second display can be connected via HDMI. USB peripherals use either the type A or type C ports. Professional users will appreciate Intel Gigabit-LAN and one serial port which indicates what purposes the NC03U series is mainly intended for: Digital Signage, POS, control, office or even multimedia.

Feature Highlights

Slim Design	<ul style="list-style-type: none"> • Slim plastic chassis, black, 835 ml • Dimensions: 142x142x42 mm (LWH), 847 ml • Incl. Stand & VESA mount (75/100 mm) • Hole for Kensington Lock • Operating temperature: max. 40 °C
Operating System	<ul style="list-style-type: none"> • An operating system is not included • Supports Windows 10, Linux (64-bit only)
Processor	<ul style="list-style-type: none"> • Intel Celeron 3865U, 1.8 GHz "Kaby Lake" • Intel HD610 Graphics, supports 2160p/60
Memory	<ul style="list-style-type: none"> • Supports up to 2x16 GB DDR4-2133 SO-DIMM
Drive Bay	<ul style="list-style-type: none"> • One 6.35 cm / 2.5" bay, 15 mm height supports one SATA hard disk or SSD
M.2 Slot	<ul style="list-style-type: none"> • M.2-2280 slot supports SSD card (SATA+PCIe)
Connectors	<ul style="list-style-type: none"> • HDMI 1.4, DisplayPort 1.2 supports 2160p/60 • 2x USB 3.0 (Type A/C), 2x USB 2.0, Gigabit LAN • SD card reader, Audio Combo, COM port
WLAN	<ul style="list-style-type: none"> • Wireless LAN 802.11n, internal antenna
Power Supply	<ul style="list-style-type: none"> • External 65 W fanless power adapter
Applications	<ul style="list-style-type: none"> • Home Media, Office, Digital Signage, etc

XPC nano Barebone NC03U (Celeron)



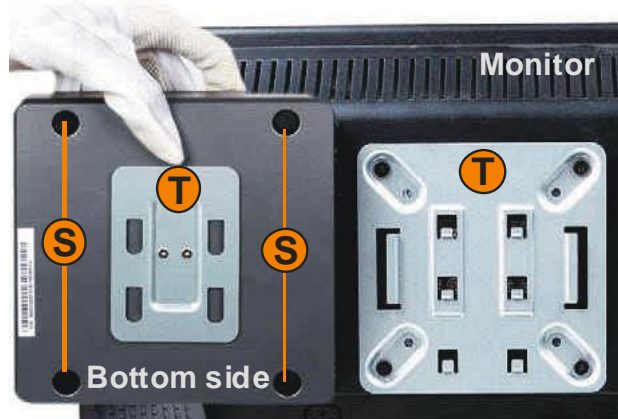
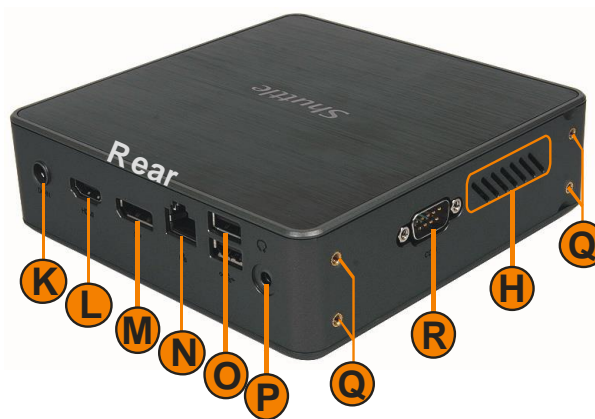
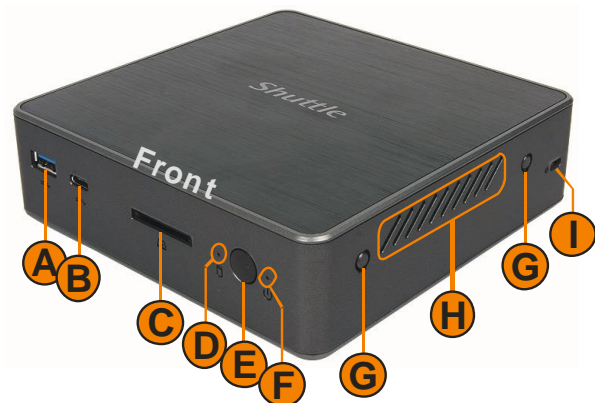
Images for illustration purposes only. This product does include the stand and VESA mount, but does not include memory, storage and operating system.



Products of the Shuttle XPC nano Barebone NC03U Series

Product	Processo	Cores	Threads	CPU Clock	Cache	Graphics	GPU-Clock
NC03U	Celeron 3865U	2	2	1.8 GHz	2 MB	HD 610	300~900 MHz
NC03U3	Core i3-7100U	2	4	2.4 GHz	3 MB	HD 620	300~1000 MHz
NC03U5	Core i5-7200U	2	4	2.5~3.1 GHz	3 MB	HD 620	300~1000 MHz
NC03U7	Core i7-7500U	2	4	2.7~3.5 GHz	4 MB	HD 620	300~1050 MHz

Shuttle XPC nano Barebone NC03U – Product Views



- | | |
|---------------------------------------------------|----------------------------------------------|
| A USB 3.0 Type A | K DC input for power adapter |
| B USB 3.0 Type C | L HDMI |
| C SD Card reader | M DisplayPort |
| D Hard disk LED indicator | N Gigabit LAN (RJ45) |
| E On/Off Button | O 2x USB 2.0 |
| F Power-on LED indicator | P Audio Combo (Headphones & Mic) |
| G 2x perforation for optional WLAN antenna | Q 4x Mounting hole for vertical stand |
| H Vents | R RS232/422/485 COM port *) |
| I Hole for Kensington Lock | S 4x Rubber foot |
| J 2x Vertical stand | T VESA mounting kit (2 pieces) |

*) Note: The serial connector (COM port) cannot be used, if NC03U is operated in vertical position.

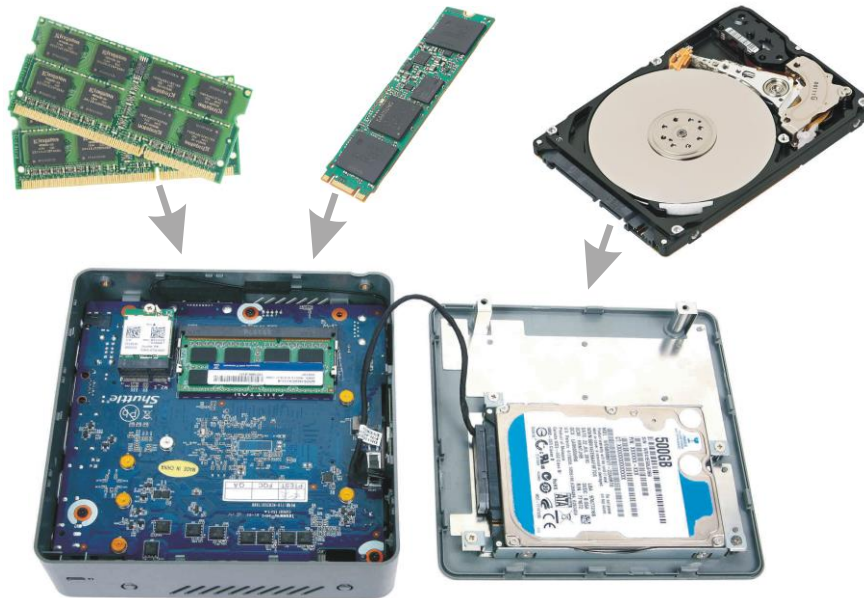
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Required Components

1~2 memory modules
up to 2x 16 GB DDR4-2133
in SO-DIMM format

One M.2 SSD storage
M.2-2242/2260/2280
SATA or PCIe 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 and coppery elements is certain to be the eyecatcher on your desk. Its volume of barely 850 ml makes it hardly noticeable as a PC, particularly when it is 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.



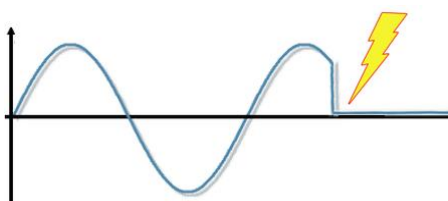
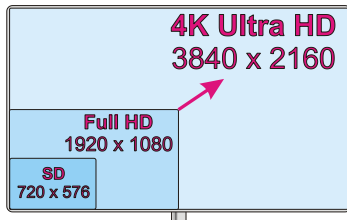
M.2-2280-Slot for SSD cards

The M.2-2280 BM slot supports M.2 SSD storage cards with SATA or with the more advanced PCIe interface with NVMe support. Type 2280 means, it supports the usual M.2 cards with a width of 22 mm and a length of 80 mm, but also 2242 and 2260 standard cards are supported.



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 for applications such as industrial automation systems, scientific analysis, POS systems and other such fields. The Shuttle XPC nano Barebone NC03U features one serial RS-232 interface with the traditional 9-pin D-Sub connector for easy connection of appropriate components. Note: The serial connector (COM port) cannot be used, if NC03U is operated in vertical position.



Dual Monitoring via HDMI and DisplayPort

The NC03U 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.

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

Supports 4K Ultra HD at 60 Hz

The NC03U supports displays running at 4K (3840 x 2160 / 2160p) high resolution at 60Hz frames per second when connected to its DisplayPort video output. 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.

USB 3.0 type A and type C

The Shuttle XPC nano Barebone NC03U has four USB ports, two of which are USB 3.0. USB 3.0 "SuperSpeed" provides a significant performance increase over previous USB generations making it the ideal interface for demanding, external peripherals. USB 3.0 supports up to 5Gb/s full duplex which means an up to 10 times greater performance than USB 2.0. One of the USB 3.0 connectors is a "type-C" connector with reversible plug orientation. This type of connector is especially intended to connect new-generation mobile devices.

Supports high-capacity drives

The NC03U supports 2.5 inch drives up to a maximum height of 15 mm. This makes overall capacities of up to 4 TB possible, 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 NC03U 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 NC03U provides an appropriate hole on both sides of its chassis. The lock-and-cable is not included.

Shuttle XPC nano Series – Comparison

	NC02U Series	NC03U Series
Chassis	142 x 142 x 42 mm (847 ml)	142 x 142 x 42 mm (847 ml)
Processor	Celeron, Core i3, Core i5 or Core i7 Intel “Skylake-U” (6th Gen) , ULV Technology: 14 nm, TDP: 15 W	Celeron, Core i3, Core i5 or Core i7 Intel “Kaby Lake-U” (7th Gen) , ULV Technology: 14 nm, TDP: 15 W
Graphics	Intel HD510 / HD520 , Dual Display	Intel HD610 / HD620 , Dual Display
Operation System	Windows 7 / 8.1 / 10 , Linux, 64-bit only	Windows 10 , Linux, 64-bit only
4K/UHD Support	Yes	Yes
Memory Support	2x SO-DIMM with 204 pins max. 2x 16 GB DDR3L-1600	2x SO-DIMM with 260 pins max. 2x 16 GB DDR4-2133
Audio	Realtek ALC662	Realtek ALC662
Ethernet LAN	Intel i211 Gigabit	Intel i211 Gigabit
Drive Bay	2.5” / 15 mm SATA	2.5” / 15 mm SATA
SSD card slot	M.2-2280 supports SATA and PCIe X4	M.2-2280 supports SATA and PCIe X4
WLAN	M.2-2230 card Realtek RTL8188EE supports 802.11n (1T1R)	M.2-2230 card Realtek RTL8188EE supports 802.11n (1T1R)
Connectors Front Panel	Power button, 2x LED, SD card reader 2x USB 3.0 (Type A and Type C)	Power button, 2x LED, SD card reader 2x USB 3.0 (Type A and Type C)
Connectors Back Panel	DisplayPort 1.2, HDMI 1.4b 2x USB 2.0, Gigabit LAN, Audio Combo DC input, 2x perforation for opt. antenna	DisplayPort 1.2, HDMI 1.4b 2x USB 2.0, Gigabit LAN, Audio Combo DC input, 2x perforation for opt. antenna
Left Side	1x RS232 COM port	1x RS232 COM port
Jumper	Always-on-Jumper, Clear CMOS Jumper	Always-on-Jumper, Clear CMOS Jumper
Supplied Accessories	Vertical Stand (aluminium with screws) VESA mounting kit	Vertical Stand (aluminium with screws) VESA mounting kit
Operation Temp.	max. 40 °C	max. 40 °C
Power Adapter	65 W / 19 V	65 W / 19 V
Front View		
Rear View		

Product models and processor features:

Shuttle Product	Processor Model	Cores / Threads	Clock / Turbo	L3-Cache	Intel Graphics	EUs	GPU Clock	TDP
NC02U	Celeron 3855U	2 / 2	1.6 / – GHz	2 MB	HD 510	12	300 ~ 800 MHz	15 W
NC02U3	Core i3-6100U	2 / 4	2.3 / – GHz	3 MB	HD 520	24	300 ~ 1000 MHz	15 W
NC02U5	Core i5-6200U	2 / 4	2.3 / 2.8 GHz	3 MB	HD 520	24	300 ~ 1000 MHz	15 W
NC02U7	Core i7-6500U	2 / 4	2.5 / 3.1 GHz	4 MB	HD 520	24	300 ~ 1050 MHz	15 W
NC03U	Celeron 3865U	2 / 2	1.8 / – GHz	2 MB	HD 610	12	300 ~ 900 MHz	15 W
NC03U3	Core i3-7100U	2 / 4	2.4 / – GHz	3 MB	HD 620	24	300 ~ 1000 MHz	15 W
NC03U5	Core i5-7200U	2 / 4	2.5 / 3.1 GHz	3 MB	HD 620	24	300 ~ 1000 MHz	15 W
NC03U7	Core i7-7500U	2 / 4	2.7 / 3.5 GHz	4 MB	HD 620	24	300 ~ 1050 MHz	15 W

Shuttle XPC nano Barebone NC03U - Specifications

<i>Chassis</i>	<p>Barebone PC with a black plastic chassis Dimensions: 142 x 142 x 42 mm (LWH) = 835 ml Weight: 0.4 kg net, 1.2 kg gross Hole for Kensington Lock Includes vertical stand and 75 / 100 mm VESA mount</p>
<i>Low Power Consumption</i>	<p>Power consumption in idle mode under Windows 10: ca. 5 W</p>
<i>Operation Position</i>	<p>1) Horizontal 2) Vertical with stand 3) VESA-mounted behind an appropriate monitor</p>
<i>Operation System</i>	<p>This barebone system comes without operating system. It is compatible with: - Windows 10, 64-bit - Linux 64-bit</p>
<i>Processor</i>	<p>Model: Intel Celeron 3865U (ULV) System-on-a-chip architecture (SoC): no chipset required BGA1356 package - directly soldered onto the mainboard Code name: Kaby Lake-U (7th Generation Intel Core) Cores / Threads: 2 / 2 Clock rate: 1.8 GHz L1/L2/L3 Cache: 128 kB / 512 kB / 2048 kB Memory controller: DDR4-2133 Dual Channel (1.2 V) TDP wattage: 15 W maximum Manufacturing process: 14 nm Maximum Tjunction Temperature: 100 °C Supports 64-bit, VT-x (EPT), VT-d, Enhanced SpeedStep, NX bit, AES-NI, SSE 4.1/4.2 Integrated graphics engine</p>
<i>Cooling fan</i>	<p>Built-in CPU cooling fan with 4-pin connector Supports temperature-controlled RPM fan speed</p>
<i>Integrated Graphics</i>	<p>Intel HD graphics 610 GPU clock frequency: 300~900 MHz Execution Units (EUs): 12 Two digital audio/video ports support two independent screens (dual monitoring): Supports Ultra HD / 4K resolution at 3840 x 2160 Pixels 1) DisplayPort 1.2 [1] supports Ultra HD @ 60 Hz 2) HDMI 1.4b supports Ultra HD @ 30 Hz</p>

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<p><i>Mainboard & BIOS</i></p>	<p>AMI BIOS in 8 MByte EEPROM with SPI interface Supports resume after power failure Supports Wake on LAN (WOL) Supports Power on by RTC Alarm Supports booting from USB devices and SD card reader Supports hardware monitoring and watch dog function Supports Unified Extensible Firmware Interface (UEFI)</p>
<p><i>Power Adapter</i></p>	<p>External 65 W power adapter (fanless) Input: 100~240 V AC, 50/60 Hz, max. 1.6 A Output: 19 V DC, max. 3.42 A, max. 65 W DC Connector: 5.5/2.5 mm (outer/inner diameter)</p>
<p><i>Memory support</i></p>	<p>2x SO-DIMM slots with 260 pins Supports DDR4-2133 (PC4-17000) SDRAM at 1.2 V Supports Dual Channel mode Supports a maximum of 16 GB per DIMM, maximum total size: 32 GB Supports two unbuffered DIMM modules (no ECC or registered)</p>
<p><i>2.5" Drive Bay</i></p>	<p>Supports one Serial ATA hard disk or one SATA SSD drive in 6.35 cm / 2.5" format Device height: 15 mm (max.) Supports Serial-ATA III, 6 Gb/s (600 MB/s) bandwidth</p>
<p><i>Card Reader</i></p>	<p>Integrated SD card reader Supports SD, SDHC and SDXC memory flash cards Supports booting from SD card</p>
<p><i>M.2 Slot for SSDs</i></p>	<p>The M.2 2280 BM slot provides the following interfaces: - PCI-Express Gen. 2.0 X4 with up to 32 Gbps Data Transfer Speed - SATA v3.0 (max. 6 Gbps) It supports M.2 cards with a width of 22 mm and a length of 42, 60 or 80 mm (type 2242, 2260, 2280). Supports M.2 SATA SSDs (with B+M key) and M.2 PCIe SSDs (with M key)</p>
<p><i>Audio</i></p>	<p>Audio Realtek® ALC 662 High-Definition Audio Codec 3.5 mm / 4-pole combo audio connector for headphones and microphone [2] Digital multi-channel audio output: via HDMI and DisplayPort</p>
<p><i>Gigabit LAN</i></p>	<p>Ethernet Controller Intel i211 Supports 10 / 100 / 1.000 MBit/s operation (Gigabit) Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE) IEEE 802.3az Energy Efficient Ethernet (EEE) Interface: PCIe v2.1</p>
<p><i>Wireless Network (WLAN)</i></p>	<p>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</p>

<p><i>Front Panel connectors</i></p>	<p>USB 3.0 type A USB 3.0 type C SD card reader (supports SD, SDHC, SDXC) Power button Power LED (blue, flashing when in suspend mode) HDD LED (orange)</p>
<p><i>Back Panel connectors</i></p>	<p>DisplayPort 1.2 [1] HDMI 1.4b 2x USB 2.0 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</p>
<p><i>Left Side connectors</i></p>	<p>Serial RS232 COM port (D-Sub, 9-pin) Note: The serial connector (COM port) cannot be used, if the NC03U is operated in vertical position.</p>
<p><i>Always-On Jumper</i></p>	<p>By removing Jumper JP1 (please refer to the Quick Installation Guide), the system will start unconditionally once power is applied. [4]</p>
<p><i>Clear CMOS Jumper</i></p>	<p>Short Jumper JP2 for about 10 seconds to restore factory settings of BIOS.</p>
<p><i>Supplied Accessories</i></p>	<p>Multi-language Quick Installation Guide Driver DVD for Windows VESA mount set (two parts, made of steel, with 6 screws) 2x aluminium stand with screws for vertical operation Bracket for a 2.5" drive with 8 screws Power adapter with AC power cord</p>
<p><i>Environmental Spec</i></p>	<p>Operating temperature range: 0~40 °C [3] Relative humidity range: 10~90% (non-condensing)</p>
<p><i>Conformity & Certifications</i></p>	<p>EMI: CE, FCC, BSMI, RCM, R&TTE, VCCI Safety: CB, BSMI, ETL, CCC 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) 2004/108/EC relating to electromagnetic compatibility (EMC), (2) 2006/95/EC 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) 1999/5/EC related to Radio and Telecommunications Terminal Equipment (R&TTE)</p>

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[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.

Connecting a UHD/4K display via the present HDMI port means the refreshing rate is limited to 24 Hz. 60 Hz can only be achieved by using the DisplayPort port. Should your display have a HDMI 2.0 connector, a refreshing rate of 60 Hz can be achieved by using an active adapter such as the Club 3D CAC-1070 for example.

[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.