

## Robust 1-litre Slim PC supports Hexa core processors and three UHD displays

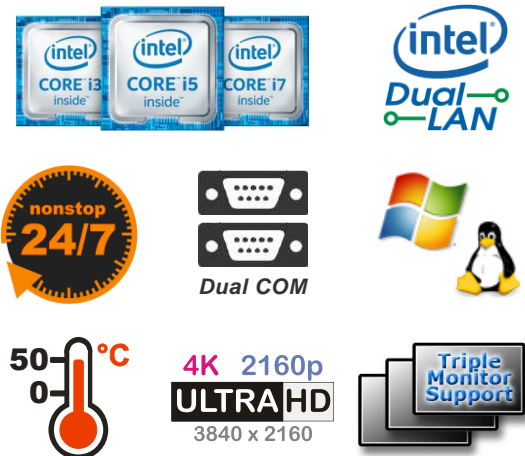
The Shuttle XPC slim Barebone DH370 is a robust 1.3l Barebone PC for Intel LGA1151v2 desktop processors, code-named "Coffee Lake". It allows for three Ultra HD displays to be operated at the same time via HDMI 2.0 and DisplayPorts and offers Dual Intel LAN, four USB 3.1 Gen. 2 and two COM ports. Its slim metal chassis comes with a VESA mount included, provides versatile connectivity and reliable operation in environments with ambient temperatures of up to 50 °C. This platform is targeted at professional applications such as Digital Signage, POS, POI, gambling machines, office, healthcare and industry.

## XPC slim Barebone DH 370



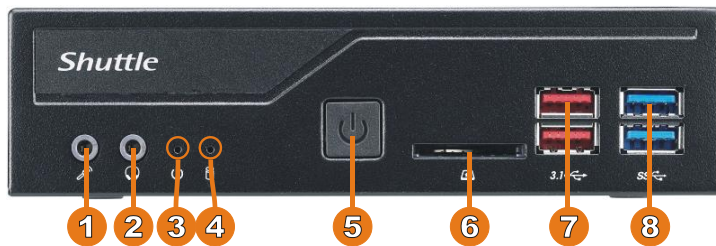
Images for illustration only.  
Processor, memory, storage and operating system not included.

Feature Highlights	
<b>Slim Design</b>	<ul style="list-style-type: none"> <li>• Slim 1.3-litre metal chassis, black</li> <li>• 190 x 165 x 43 mm (LWH)</li> <li>• Operating temperature: 0~50 °C</li> <li>• Including VESA mount (75/100 mm)</li> </ul>
<b>Operating System</b>	<ul style="list-style-type: none"> <li>• The operating system is not included</li> <li>• Supports Windows 10 and Linux (64-bit)</li> </ul>
<b>Processor</b>	<ul style="list-style-type: none"> <li>• Supports LGA 1151v2 "Coffee Lake" processors up to a max. TDP of 65 W</li> <li>• Supports Core i7 / i5 / i3, Pentium, Celeron</li> <li>• Heatpipe cooling system with two fans</li> </ul>
<b>Chipset</b>	<ul style="list-style-type: none"> <li>• Intel H370 Chipset</li> </ul>
<b>Memory</b>	<ul style="list-style-type: none"> <li>• 2x 260-pin SO-DIMM slot</li> <li>• Supports DDR4-2400/2666, max. 2x 16 GB</li> </ul>
<b>Graphics</b>	<ul style="list-style-type: none"> <li>• Integrated Intel UHD graphics, 4K support (features depend on processor)</li> <li>• Supports three Ultra HD displays</li> </ul>
<b>Storage</b>	<ul style="list-style-type: none"> <li>• 1x 2.5" bay for SATA hard disk or SSD</li> </ul>
<b>M.2 slots</b>	<ul style="list-style-type: none"> <li>• 1x M.2 2280M slot (PCIe x4, SATA)</li> <li>• 1x M.2 2230E for optional WLAN (WLN-M)</li> </ul>
<b>Connectors</b>	<ul style="list-style-type: none"> <li>• HDMI 2.0a, 2x DisplayPort 1.2, optional VGA</li> <li>• SD card reader, 2x audio (line out, mic)</li> <li>• 8x USB 3.1 (4x Gen. 2), 1x USB 2.0 onboard</li> <li>• 2x Intel Gigabit LAN (RJ45)</li> <li>• 2x COM port (RS232 + RS232/RS422/RS485)</li> <li>• Connector for external power button</li> <li>• "Always on" Jumper</li> </ul>
<b>Power Supply</b>	<ul style="list-style-type: none"> <li>• External 90W / 19V power adapter</li> </ul>
<b>Optional Accessories</b>	<ul style="list-style-type: none"> <li>• WLAN Module (WLN-M), Vertical Stand (PS02)</li> <li>• VGA Port (PVG01), Rackmount kit (PRM01)</li> <li>• Cable for external power button (CXP01)</li> </ul>



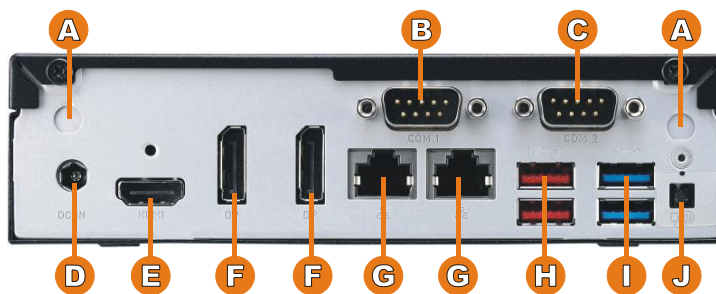
## Shuttle XPC slim Barebone DH370 – Front and Back Panel

### Front view



- 1 Microphone input
- 2 Headphones output
- 3 Power LED
- 4 Hard disk LED
- 5 Power Button
- 6 SD Card Reader
- 7 2x USB 3.1 Gen. 2 (red)
- 8 2x USB 3.1 Gen. 1 (blue)

### Rear view



- A 2x WLAN perforation
- B COM1 supports RS232 (or optional VGA port for analog displays)
- C COM2 supports RS232/RS422/RS485
- D DC power input
- E HDMI 2.0 video output
- F 2x DisplayPort (DP 1.2) video output
- G 2x RJ45 Gigabit LAN
- H 2x USB 3.1 Gen. 2 (red)
- I 2x USB 3.1 Gen. 1 (blue)
- J Connector for external power button, Clear CMOS and 5 V DC voltage (4-pin, 2.54 mm pitch)
- K 2x hole for Kensington Lock
- L VESA mount (two parts)

### Right side



### Left side



#### COM port Pin 9 Configuration

Pin 9 is a multi-functional signal. Based on jumper JP1 configuration on the mainboard, it can be configured as Ring Indicator (RI) or external power supply with either 5 V or 12 V voltage level (each COM port separately).



## Shuttle XPC slim Barebone DH370 – Required Components

The following components need to be added to make it a fully-configured Mini PC

**LGA1151v2 processor**  
 “Coffee Lake” TDP max. 65 W  
 Core i7 / i5 / i3, Pentium  
 or Celeron



**2.5” SATA hard disk  
 or Solid State Disk (SSD)**  
 (max. height: 12.5 mm)

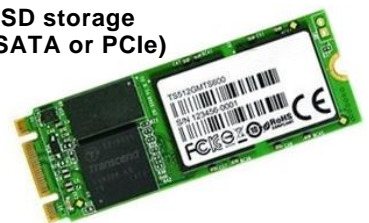
**Windows 10 / Linux  
 Operating System**



**Up to two DDR4-2400/2666  
 SO-DIMM memory modules**  
 max. 16 GB each



**Optional:**  
**M.2 2280/2260/2242  
 SSD storage**  
 (SATA or PCIe)



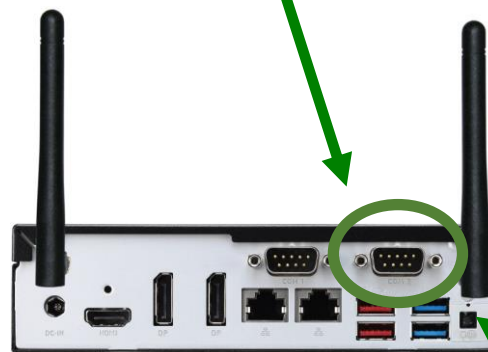
## Optional Accessories

**VGA port Accessory PVG01**  
 Installing PVG01 means  
 one serial port (COM) less  
 can be used at the backpanel.



**WLAN-Accessory WLN-M**  
 M.2-2230 card supports  
 IEEE 802.11 b/g/n/ac  
 including 2 antennas

**Vertical Stand PS02**  
 for vertical operation



**Cable for external push  
 button switch CXP01**  
 (without button)



**Rack Mount Kit PRM01**  
 2U front plate to install two 1.3L  
 Shuttle XPCs in a 19" cabinet.



## Connectivity / Applications

The Shuttle XPC slim Barebone DH370's wealth of ports makes it well-suited for a wide field of applications and external devices.



The DH370 is your powerful 1.3-litre Slim PC solution for particularly:

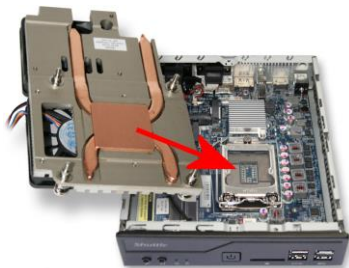
- Digital Signage with up to three displays simultaneously
- In-store Audio/Video entertainment
- Gambling
- Home-Media
- Office
- Call Centre
- Education
- Kiosk
- Point of Sales (POS)
- Medical
- Automation
- Small Server

## Shuttle XPC slim Barebone DH370 – Product Features



### Robust, stylish and particularly small

You should have held it in your own hands to see how small it actually is. At barely a volume of 1.35 litres, its steel chassis gives it the appropriate stability required for professional applications in digital signage. Despite its dimensions of 19 x 16.5 x 4.3 cm (LWH), the overall system performance is very high thanks to support of Intel Core desktop processors of the Coffee Lake generation. The interior of the DH370 is very tidy too so that it won't take long to set up. Its sleek and stylish looks let it easily find a place in both home and office environments.



### Low noise thanks to heatpipe cooling system

An active dual-fan heatpipe cooling system ensures whisper-quiet operation and system stability.



### Extended temperature range and reliability

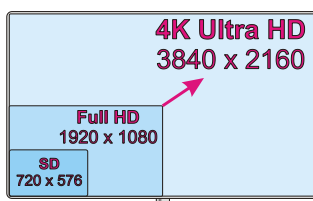
The DH370 is outstandingly robust thanks to its rugged chassis. With an ambient temperature range from 0-50 °C it is suitable for use in the most demanding environments. Solely designed with all solid capacitors, the DH370 is guaranteed to deliver maximum stability, reliability and longer system lifetime for long-term applications like digital signage.

**Caution:** For high ambient temperatures over 40 °C we strongly recommend to use SSDs (supporting at least 70 °C).



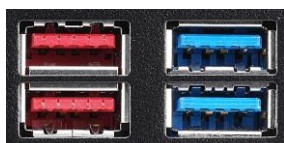
### Triple Display with HDMI 2.0a and 2x DP (optional VGA)

DH370 features three digital video outputs: HDMI 2.0a and 2x DisplayPort 1.2. This multi-monitoring technology offers multiple display support on up to three separate monitors. This helps improve on productivity by allowing for spreading multiple windows across three monitors while working with them simultaneously. Furthermore, the DH370 supports an optional D-Sub/VGA port (Accessory PVGA01).



### Supports 4K Ultra HD at 60 Hz

The DH370 supports three digital displays running at 4K (3840 x 2160 / 2160p) high resolution at 60 Hz 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.



### Eight USB 3.1 Ports

The DH370 features eight USB 3.1 connectors type A – four blue and four red ones. The red-coloured ports support the latest USB 3.1 Gen. 2 standard (Super Speed Plus), which can provide outstanding data transfer rates up to 10 Gigabit per second. All USB connectors are downward-compatible with USB 2.0.



**One M.2-2280M-Slot for SSD card**

The M.2-2280M slot supports one M.2 SSD storage card with NVMe PCIe or SATA interface.

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.



**M.2-2230E-Slot for optional WLAN**

The M.2-2230E slot is intended for Wireless LAN (Wifi), Bluetooth, GSM/UMTS cards and others.

Shuttle offers the optional accessory „WLN-M“ (see picture), which provides WLAN 802.11ac and Bluetooth 4.0 functionality.



**VESA mount**

The supplied 75/100mm VESA mount allows for installation on to walls or monitors which is particularly interesting for the industry segment, company buildings and public institutions. Other than this, the chassis bears numerous threaded holes (M3) enabling it to be fitted almost anywhere.



**Kensington Lock**

This is a small, metal-reinforced hole as part of an anti-theft system. The DH370 provides an appropriate hole on both sides of its chassis. The lock and cable are not included.



**External power button by separate remote line**

If, because of space constraints (e.g. in case of fixed installation), the machine cannot be switched on by pressing the front power button, it can be powered on by a separate remote line. You will find an appropriate four-pin connector at the back panel of the DH370 (pitch 2.54 mm). Furthermore, this connector provides a Clear CMOS function and +5V DC voltage supply for external devices.

+5V voltage (2)  (4) Power Button  
 Clear CMOS (1)  (3) Ground

- Front Panel -



**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: (1) unconditional power on, (2) restore former status (3) keep system turned off (4) Power-On by LAN or (5) Power-On by Real-Time-Clock. As a matter of the nature of this function, it may fail after short power failures. This is why the DH370 also comes with a hardware-based solution. By removing Jumper JP2 (see image) the system will start unconditionally once power is applied.

Product Comparison

	DH110SE	DH110	DH170 [1]	DH310S	DH310	DH370
Processor support	Socket LGA1151, TDP max. 65 W "Skylake" (Gen. 6) or "Kaby Lake" (Gen. 7)			Socket LGA1151v2, TDP max. 65 W "Coffee Lake" (Gen. 8)		
Chipset	Intel H110	Intel H110	Intel H170 [1]	Intel H310	Intel H310	Intel H370
Operation system support	Windows 10 and Linux Windows 7/8.1 with Skylake only [2]			Windows 10 and Linux		
Multi-display	max. 2	max. 2	max. 3	max. 2	max. 2	max. 3
Max. memory (SO-DIMM)	2x 16 GB DDR4-2400	2x 16 GB DDR3L-1600		2x 16 GB DDR4-2400/2666		
2.5" bay	1x 2.5" SATA drive bay (max. height: 12.5 mm)					
M.2 SSD slot	M.2-2260M [3]	M.2-2260M		M.2-2280M		
WLAN slot	M.2-2230AE	Mini-PCIe Half-Size		M.2-2230E		
Buttons / LEDs	Power Button, 2x LED (Power, HDD)			Power Button, 2x LED (Power, HDD)		
SD card reader	Yes			Yes		
Graphics-ports	HDMI 1.4b DP 1.2	HDMI 1.4b DP 1.2	HDMI 1.4b 2x DP 1.2	HDMI 1.4b DP 1.2	HDMI 2.0a DP 1.2	HDMI 2.0a 2x DP 1.2
USB 3.1 Gen. 2	-	-	-	-	-	4
USB 3.1 Gen. 1	2	4	-	4 [5]	4	4
USB 2.0	6	3 [4]	-	4	4	-
PS/2 combo	-	1	-	-	-	-
COM ports	-	2	2	-	2	2
Gigabit network	Single LAN Realtek 8111G	Dual LAN Intel 211/219LM		Single LAN Realtek 8111G	Dual LAN 2x Intel 211	
Audio	Realtek ALC662, Mic-Input, Line-Out			Realtek ALC662, Mic-Input, Line-Out		
Optional Accessories [6]	WLAN: <b>WLN-M</b> Stand: <b>PS02</b> Rack: <b>PRM01</b> Cable: <b>CXP01</b> VESA: <b>PV04</b>	WLAN: <b>WLN-P</b> Stand: <b>PS02</b> Rack: <b>PRM01</b> VGA: <b>PVG01</b> Cable: <b>CXP01</b>	WLAN: <b>WLN-P</b> Stand: <b>PS02</b> Rack: <b>PRM01</b> VGA: <b>PVG01</b> Cable: <b>CXP01</b>	WLAN: <b>WLN-M</b> Stand: <b>PS02</b> Rack: <b>PRM01</b> VGA: <b>PVG01</b> Cable: <b>CXP01</b> VESA: <b>PV04</b>	WLAN: <b>WLN-M</b> Stand: <b>PS02</b> Rack: <b>PRM01</b> VGA: <b>PVG01</b> Cable: <b>CXP01</b>	WLAN: <b>WLN-M</b> Stand: <b>PS02</b> Rack: <b>PRM01</b> VGA: <b>PVG01</b> Cable: <b>CXP01</b>
VESA mount	optional	supplied	supplied	optional	supplied	supplied
19 V power adp.	90 W / 19 V			90 W / 19 V		
12 V support?	No	Yes	No	No	Yes	No

- [1] Another product **DQ170** is similar to DH170, but features Q170 chipset, Hardware TPM and vPro support
- [2] Windows 7 and 8.1 is only supported in combination with the 6th generation Intel Core processors "Skylake".
- [3] This M.2 slot supports SATA interface but no PCI-Express
- [4] One USB 2.0 port is designed as eSATA/USB combo port
- [5] One USB 3.1 Gen. 1 port at the front panel is implemented as "type-C"
- [6] **WLAN**: WLAN card with two external antenna, **Stand**: two feet for vertical operation, **Rack**: 2U rack mount kit to install two Slim-PCs in a 19" server rack, **Cable**: 2-meter cable to connect an external power button, **VESA**: VESA mounting kit, **VGA**: D-sub adapter to connect an analog VGA monitor



## Shuttle XPC cube slim DH370 - Specifications

<b>Chassis</b>	<p>Slim PC with black chassis made of metal                  Dimensions: 190 x 165 x 43 mm (LWH) = 1.35-litre                  Weight: 1.3 kg net and 2.1 kg gross                  Two holes for Kensington Locks and numerous threaded holes (M3) at both sides of the chassis</p>
<b>Power Adapter</b>	<p>External 90 W power adapter (fanless)                  Input: 100~240 V AC, 50/60 Hz                  Output: 19 V DC, 4.74 A, max. 90 W                  DC Connector: 5.5/2.5 mm (outer/inner diameter)</p>
<b>Operation System</b>	<p>This system comes without operating system.                  It is compatible with Windows 10 and Linux (64-bit)</p>
<b>Processor Support</b>	<p>Processor Socket LGA 1151v2                  Supports Intel Core i7 / i5 / i3, Pentium and Celeron processors                  Supports the 8th generation Intel Core processors, codename "Coffee Lake-S" in 14+ + nm process technology                  Maximum supported processor power consumption (TDP) = 65 W                  Up to 6 CPU cores, 12 threads and 12 MB of L3 cache                  Does not support the unlock-function of Intel K-Series processors.                  Not compatible with older Socket LGA 1151 processors (6th Gen. "Skylake" and 7th Gen. "Kaby Lake").                  The processor integrates PCI-Express, memory controller and the graphics engine on the same die (performance features depending on processor type)                  Please refer to the support list for detailed processor support information at <a href="http://global.shuttle.com">global.shuttle.com</a>.</p>
<b>Processor Cooling</b>	<p>Heatpipe processor cooling with two 60 mm fans on the upper side of the chassis</p>
<b>Mainboard &amp; Chipset</b>	<p>Shuttle mainboard FS370, Shuttle form factor, proprietary design for XPC DH370                  Chipset/Southbridge: Intel® H370                  Passive chipset cooling with heat sink                  The Northbridge is integrated in the processor.                  Solid Capacitors for sensitive areas provide excellent heat resistance for enhanced system durability</p>
<b>BIOS</b>	<p>AMI BIOS, SPI Interface, 16 MB Flash-EPROM                  Supports Hardware Monitoring and watch dog functionality                  Supports Firmware-TPM (fTPM) v2.0                  Supports boot up from external USB flash memory                  Supports Unified Extensible Firmware Interface (UEFI)                  Supports power on after power failure [8]</p>

© 2019 by Shuttle Computer Handels GmbH (Germany). All information subject to change without notice . Pictures for illustration purposes only.

<p><i>Memory Support</i></p>	<p>2x SO-DIMM slot with 260 pins            Supports DDR4-2400/2666 (PC4-19200/21300) 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>Integrated graphics</i></p>	<p>The features of the integrated Intel UHD graphics function depend on the processor type used.            Supports DirectX 12, OpenGL 4.5            The PC features three video outputs which support 1080p/60 and 2160p/60:            - 1x HDMI v2.0a            - 2x DisplayPort v1.2            Supports displays with 4K Ultra HD resolution at 3840 x 2160            Supports three independent displays with the integrated graphics function            Supports Blu-ray (BD) playback with HDCP content protection [1]            Hardware video decoding/encoding: H.264, H.265 (8- and 10-bit, encoding via QuickSync), VP9 (10-bit VP9 can only be decoded)            DisplayPort and HDMI support multi-channel digital audio over the same cable.            Optional analog D-Sub/VGA video output [5]</p>
<p><i>Storage Bay</i></p>	<p>1x 6.35 cm / 2.5" storage bay supports one hard disk or SSD drive with SATA connector            Device height: 12.5 mm (max.)</p>
<p><i>SATA Connector</i></p>	<p>1x Serial-ATA III, 6 Gb/s (600 MB/s) bandwidth            With Serial-ATA power connector (onboard)</p>
<p><i>M.2-2280M SSD Slot</i></p>	<p>The M.2 2280M slot provides the following interfaces:            - PCI-Express Gen. 3.0 X4, supports NVMe            - 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 SSDs with SATA or PCI-Express interface</p>
<p><i>M.2-2230 Slot</i></p>	<p>Interfaces: PCI-Express Gen. 2.0 X1 und USB 2.0            Supports M.2 cards with a width of 22 mm and a length of 30 mm (type 2230)            Supports WLAN extension cards (optional Shuttle accessory: WLN-M)            Supports CNVi function of the processor to support compatible CRF modules with WLAN/Bluetooth function [9]</p>
<p><i>Audio</i></p>	<p>Audio Realtek® ALC 662 5.1 channel High-Definition Audio            Two analog audio connectors (3.5 mm) at the front panel:            1) 2-channel line-out (headphones)            2) microphone input            Digital multi-channel audio output: by HDMI and DisplayPort</p>

© 2019 by Shuttle Computer Handels GmbH (Germany). All information subject to change without notice. Pictures for illustration purposes only.

<p><i>Dual Gigabit-LAN Controller</i></p>	<p>Dual network with two RJ45 ports                  Used network chips:                  2x Intel i211 Ethernet Controller with MAC, PHY and PCIe interface                  Supports 10 / 100 / 1.000 MBit/s operation                  Supports WAKE ON LAN (WOL)                  Supports network boot by Preboot eXecution Environment (PXE)                  Supports Teaming mode [6]</p>
<p><i>Card Reader</i></p>	<p>Integrated card reader                  Supports SD, SDHC and SDXC up to v3.01 memory flash cards                  UHS-I interface supports up to 104 MB/s (SDR104) transfer speed                  Realtek RTS5227S chip with PCIe chipset interface                  Supports boot up from SD card</p>
<p><i>Front panel Connectors and Buttons</i></p>	<p>Microphone input                  Audio Line-out (headphones)                  2x USB 3.1 Gen 2                  2x USB 3.1 Gen 1                  SD card reader                  Power button                  Power LED (blue)                  HDD LED (yellow)</p>
<p><i>Back Panel Connectors</i></p>	<p>1x HDMI 2.0a connector [1]                  2x DisplayPort 1.2 connector (DP) [2]                  Optional: 1x D-Sub VGA connector (Accessory PVG01 [5])                  2x USB 3.1 Gen 2                  2x USB 3.1 Gen 1                  2x Gigabit LAN (RJ45)                  2x RS232 serial port, 9-pin D-Sub (5/12V, 1x RS422/RS485) [3]                  1x DC-input connector for external power adapter (supports 19V±5%)                  1x 4-pin connector (2.54 mm pitch) supports:                  - external power on button                  - Clear CMOS function                  - +5V DC voltage for external components                  2x Perforation for optional Wireless LAN antennas                  2x hole for Kensington Locks</p>
<p><i>Other Connectors (onboard)</i></p>	<p>1x jumper for power-on-after-power-fail (hardware solution) [8]                  1x analog VGA graphics output CN6 (2x 1-pin, 1 mm pitch) [5]                  2x serial interface (COM) occupied by back panel connectors                  1x USB 2.0 (4-pin)                  1x fan connector (4-pin) occupied by the cooling system                  1x connector for CMOS battery (occupied)</p>

<p><i>Supplied Accessories</i></p>	<p>Multi-language user guide (EN, DE, FR, ES, JP, KR, SC, TC)                  VESA mount for 75/100 mm standard (two metal brackets)                  Four screws M3 x 5 mm (screws together VESA mount and PC)                  Four screws M4 x 10 mm (to affix VESA mount on the PC)                  Four screws M3 x 4 mm (to mount a 2.5" storage device into the bay)                  Two screws M3 x 5 mm (silver colour, to mount two M.2 cards)                  Driver DVD (Windows 64-bit)                  Serial ATA cable for 2.5" drive including power cable                  External 90 W power adapter with power cord                  Protection cap for CPU socket (do not use if heatpipe or fan is mounted)                  Heatsink compound</p>
<p><i>Optional Accessories</i></p>	<p><b>PVG01:</b> optional D-Sub VGA video output [5]  <b>WLN-M.</b> WLAN module in M.2-2230 format with two external antennas supports IEEE 802.11ac and Bluetooth 4.0  <b>PS02:</b> Stand for vertical operation  <b>CXP01:</b> adapter cable for external power button  <b>PRM01:</b> 2U rack mount front plate for two Shuttle XPC slim PCs</p>
<p><i>Environmental Spec</i></p>	<p>Operating temperature range: 0~50 °C [7]                  Relative humidity, non-condensing: 10~90 %</p>
<p><i>Certifications Compliance</i></p>	<p>EMI: FCC, CE, BSMI, RCM, VCCI                  Safety: ETL, CB, BSMI                  Other: RoHS, Energy Star, ErP</p>
<p><i>Conformity</i></p>	<p>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)</p>

© 2019 by Shuttle Computer Handels GmbH (Germany). All information subject to change without notice. Pictures for illustration purposes only.

**Notes:**

[1] **HDMI output** supports DVI-D with optional adapter

**[2] How to convert DisplayPort into HDMI/DVI**

One DisplayPort output 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 through 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.

**[3] Serial Ports**

This PC features two serial RS232 ports with 9-pin D-Sub connectors at the back panel. The left COM port (COM1) can also be configured as RS422 and RS485 in BIOS. The COM ports are protected by black plastic caps.

Pin 9 of the D-Sub COM-Port is a multi-functional signal. Based on the Jumper JP1 configuration on the mainboard, it can be configured as Ring Indicator (RI) or external power supply with a voltage level of either 5 V or 12 V. Each COM port can be configured separately. The maximum current is 500 mA per connector.

**[4] 4K Ultra-HD resolution**

A 4K-display with Ultra-HD resolution (3840 x 2160) should only be connected via DisplayPort, as only this port supports a higher refresh rate of 60 Hz. Certain displays (e.g. Dell UP2414Q) however require MST mode (Multi-Stream Transport) to be enabled which sends two separate images at half resolution each to the display. These two images are then combined and put in correct order by the Intel graphics driver when in Collage mode. Please note that HBR2-mode (High Bit Rate 2) must be supported by each display to have more than one of them run at 4K resolution.

**[5] Optional D-Sub/VGA connector**

The mainboard features one analog graphics port CN6 on the mainboard. This signal can be lead to the outside as a 15-pin D-Sub VGA connector at the backpanel by using the optional adapter PVG01. However doing so means one serial port (COM) less can be used at the backpanel.

**[6] Teaming Mode**

The teaming function allows you to group both available network adapters together to function as a single adapter. The benefit of this approach is that it enables load balancing and failover.

Driver download: [https://downloadmirror.intel.com/22283/eng/23\\_2.zip](https://downloadmirror.intel.com/22283/eng/23_2.zip)

**[7] Operating temperature**

For high ambient temperatures over 40 °C we strongly recommend to use SSDs (supporting at least 70 °C) and rugged SO-DIMM memory modules with a temperature range of up to 95 °C.

**[8] 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: (1) unconditional power on, (2) restore former status or (3) keep system turned off. As a matter of the nature of this function, it may fail after short power failures. This is why the DH370 also comes with a hardware-based solution. By removing Jumper JP2 (on the mainboard behind the power button) the system will start unconditionally once power is supplied.

**[9] Intel CNVi function**

Since Intel moves the IP portion of WLAN cards (CNVi) into the processor, the M.2-2230 slot does not only support traditional WLAN cards, but also CRF modules (e.g. Intel® Wireless-AC 9560, 9462, 9461) which use the integrated CNVi function.

## 8<sup>th</sup> Generation Intel Core Desktop Processor Family

Socket LGA1151v2 14 nm++ "Coffee Lake S" processor overview (Date: May 2018)

Processors with a TDP>65W are **not** supported (marked in red)

Name	Model	Cores/ Threads	CPU Clock	Turbo Clock	Smart Cache	TDP	Memory Support	Graphics Engine (clock in MHz)
Core i7	8700K	6 / 12	3.7 GHz	4.7 GHz	12 MB	95 W	DDR4-2666	UHD 630, 350~1200 MHz
	8700	6 / 12	3.2 GHz	4.6 GHz	12 MB	65 W	DDR4-2666	UHD 630, 350~1200 MHz
	8700T	6 / 12	2.4 GHz	4.0 GHz	12 MB	35 W	DDR4-2666	UHD 630, 350~1200 MHz
Core i5	8600K	6 / 6	3.6 GHz	4.3 GHz	9 MB	95 W	DDR4-2666	UHD 630, 350~1150 MHz
	8600	6 / 6	3.1 GHz	4.3 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350~1150 MHz
	8600T	6 / 6	2.3 GHz	3.7 GHz	9 MB	35 W	DDR4-2666	UHD 630, 350~1150 MHz
	8500	6 / 6	3.0 GHz	4.1 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350~1100 MHz
	8500T	6 / 6	2.1 GHz	3.5 GHz	9 MB	35 W	DDR4-2666	UHD 630, 350~1100 MHz
	8400	6 / 6	2.8 GHz	4.0 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350~1050 MHz
	8400B	6 / 6	2.8 GHz	4.0 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350~1050 MHz
8400T	6 / 6	1.7 GHz	3.3 GHz	9 MB	35 W	DDR4-2666	UHD 630, 350~1050 MHz	
Core i3	8350K	4 / 4	4.0 GHz	-	8 MB	91 W	DDR4-2400	UHD 630, 350~1150 MHz
	8300	4 / 4	3.7 GHz	-	8 MB	62 W	DDR4-2400	UHD 630, 350~1150 MHz
	8300T	4 / 4	3.2 GHz	-	8 MB	35 W	DDR4-2400	UHD 630, 350~1150 MHz
	8100	4 / 4	3.6 GHz	-	6 MB	65 W	DDR4-2400	UHD 630, 350~1100 MHz
	8100T	4 / 4	3.1 GHz	-	6 MB	35 W	DDR4-2400	UHD 630, 350~1100 MHz
Pentium Gold	G5600	2 / 4	3.9 GHz	-	4 MB	51 W	DDR4-2400	UHD 630, 350~1100 MHz
	G5500	2 / 4	3.8 GHz	-	4 MB	51 W	DDR4-2400	UHD 630, 350~1100 MHz
	G5500T	2 / 4	3.2 GHz	-	4 MB	35 W	DDR4-2400	UHD 630, 350~1100 MHz
	G5400	2 / 4	3.7 GHz	-	4 MB	51 W	DDR4-2400	UHD 630, 350~1050 MHz
	G5400T	2 / 4	3.1 GHz	-	4 MB	35 W	DDR4-2400	UHD 630, 350~1050 MHz
Celeron	G4920	2 / 2	3.2 GHz	-	2 MB	54 W	DDR4-2400	UHD 610, 350~1050 MHz
	G4900	2 / 2	3.1 GHz	-	2 MB	54 W	DDR4-2400	UHD 610, 350~1050 MHz
	G4900T	2 / 2	2.9 GHz	-	2 MB	35 W	DDR4-2400	UHD 610, 350~1050 MHz

K = unlocked, T = Power optimized lifestyle, TDP = Thermal Design Power (max. Power Consumption).

Note: The Shuttle XPC slim Barebone DH370 does not support the Unlock-function of Intel K-Series processors.

Please refer to the support list for detailed processor support information at [global.shuttle.com](http://global.shuttle.com).