Robust and powerful Slim PC to support three displays

The Shuttle XPC slim Barebone DH170 is a robust 1.3I Barebone PC with H170 chipset for Intel LGA1151 desktop processors, codenamed "Skylake". It allows for three displays to be operated at the same time and offers Dual Intel LAN and 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.

0 1 **Feature Highlights** Slim 1.3 litre metal chassis, black • 190 x 165 x 43 mm (LWH) Slim Design Operating temperature: 0~50°C uum (intel) (intel) CORE CORE 15 2160p **4K** RΔ

	 Including VESA mount (75/100 mm) 	• 11131
Operating System	 The operating system is not included Supports Windows 7, 8.1 / 10, Linux 64 bit 	100
Processor	 Supports LGA 1151 "Skylake" processors up to a max. TDP of 65W Supports Core i7 / i5 / i3, Pentium, Celeron Heatpipe cooling system with two fans 	Shu
Chipset	Intel H170 Chipset	
Memory	 2x 204-pin SO-DIMM slots Supports DDR3L-1600 (1.35V), max. 2x8 GB 	
Graphics	 Integrated Intel HD graphics, 4K support [4] (features depend on processor) HDMI, 2x DisplayPort, optional VGA [5] Supports three independent displays [3] 	
Storage Bays	 1x 2.5" bay for SATA hard disk or SSD Two Mini expansion slots: 1x M.2 2260 BM slot (PCIe x4, SATA) 1x Half-Size Mini-PCIe for optional WLAN [6] 	
Other Connectors	 SD card reader, 2x audio (line out, mic) 4x USB 3.0, 4x USB 2.0, 2x USB 2.0 onboard 2x Intel Gigabit LAN (RJ45), supports WOL 2x COM port (RS232 + RS232/RS422/RS485) Connector for external power button "Always on" Jumper onboard 	
Power Supply	• External 90W fanless power adapter	
Applications	• Digital Signage, POS, control device, etc.	

XPC slim Barebone DH170

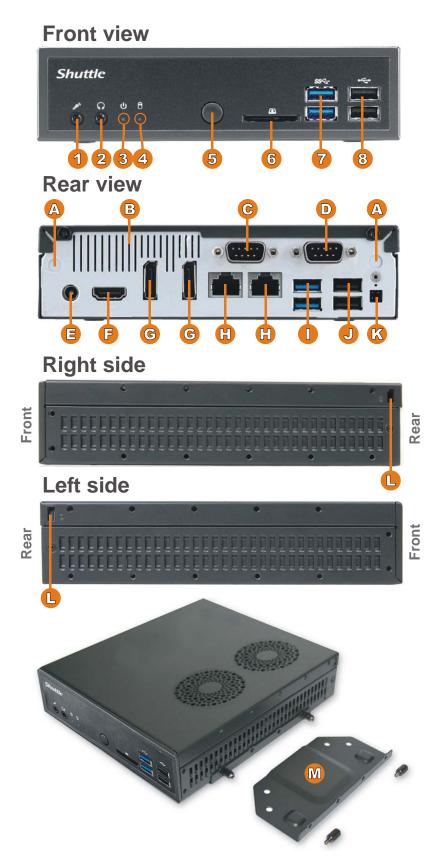






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Shuttle XPC slim Barebone DH170 – Front and Back Panel



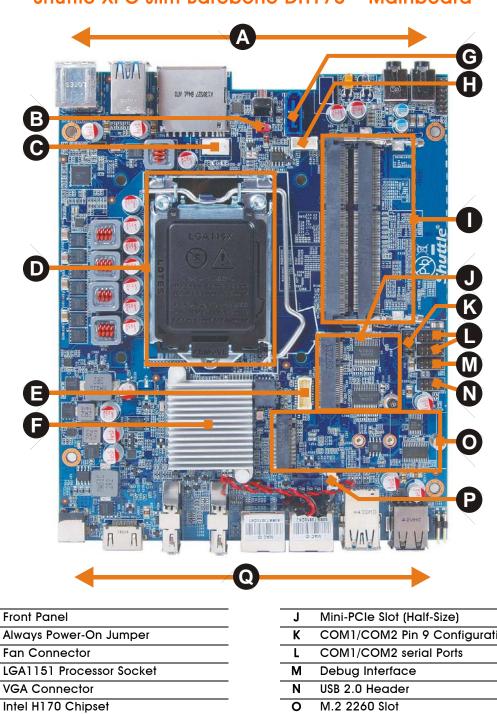
- 1 Microphone input
- 2 Headphone output
- 3 Power LED
- 4 Hard disk LED
- 5 Power Button
- 6 SD Card Reader
- 7 2x USB 3.0
- 8 2x USB 2.0
- A 2x WLAN perforation
- B Ventilation grille
- C COM1 supports RS232 (or optional VGA port for analog displays [5])
- D COM2 supports RS232/RS422/RS485
- E DC power input
- F HDMI video output
- G 2x DisplayPort (DP) video outputs
- H 2x RJ45 Gigabit LAN
- I 2x USB 3.0
- J 2x USB 2.0
- K Connector for external power button, Clear CMOS and 5V DC voltage (four pins, 2.54 mm pitch)
- L 2x hole for Kensington Lock
- M VESA mount (two parts)



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 5V or 12V voltage level (each COM port separately).

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Shuttle XPC slim Barebone DH170 – Mainboard

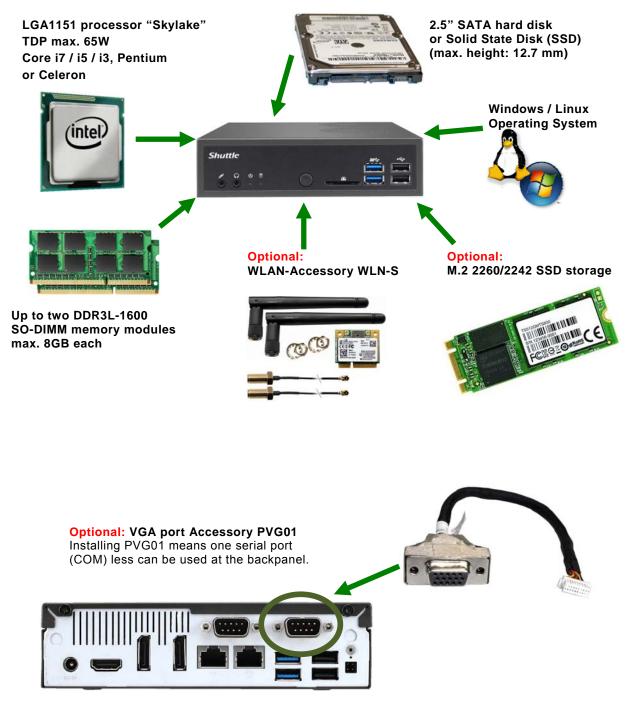
- **Front Panel** Α
- В Always Power-On Jumper
- С
- LGA1151 Processor Socket D
- Ε **VGA** Connector
- Intel H170 Chipset F
- G SATA 3.0 (6 Gbps) Connector
- Η SATA Power Connector
- SO-DIMM Socket for DDR3L Memory I

J	Mini-PCIe Slot (Half-Size)
К	COM1/COM2 Pin 9 Configuration
L	COM1/COM2 serial Ports
М	Debug Interface
Ν	USB 2.0 Header
0	M.2 2260 Slot
Ρ	Battery Connector
Q	Back Panel

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Shuttle XPC slim Barebone DH170 – Required Components

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



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Connectivity / Applications

The Shuttle XPC slim Barebone DH170's wealth of ports makes it well-suited for a wide field of applications and external devices.



The DH170 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 Center
- Education
- Kiosk
- Point of Sales (POS)
- Medical
- Automation
- Small Server

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Shuttle Slim-PC Barebone DH170 – Product Features



Robust, stylish and particularly small

You should have held it in your own hands to see how small it actually is. Barely measuring a volume of 1.35 litre, its steel chassis gives it the appropriate stability required for professional applications in digital signage. Despite its dimensions of $19 \times 16.5 \times 4.3$ cm (LWH), the overall system performance is very high thanks to support of Intel Core desktop processors. The interior of the DH170 is very tidy too so that it won't take long to set it up. Its sleek and stylish looks lets 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.

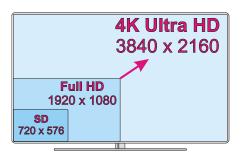


Extended temperature range and reliability

The DH170 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, DH170 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) and rugged SO-DIMM memory with a wide temperature tolerance (up to 95°C).

Triple Display with HDMI and 2x DisplayPorts (optional VGA)

DH170 features three digital video outputs: HDMI and 2x DisplayPort. 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 DH170 supports an optional D-Sub/VGA port.



Supports 4K Ultra HD at 60Hz

The DH170 supports displays running at 4K (3840 x 2160 / 2160p) high resolution at 60Hz frames per second when connected to its DisplayPort video outputs. Being the successor to the Full HD standard, Ultra HD delivers a four times higher resolution with a wider colour space and colour depth.

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2230

Mini PCle

(Half Size)



Two Mini-Slots: Mini PCI-Express and M.2

The Half-Size Mini-PCI-Express slot is intended for Wireless LAN adapter cards (e.g. the Shuttle Accessory WLN-S) as shown in the picture on the

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 DH170 (pitch 2.54 mm). Furthermore, this connector provides a Clear CMOS function and +5V DC voltage supply for external devices.



(4) Power Button (3) Ground

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 DH170 also comes with a hardwarebased solution. By removing Jumper JP2 (see image) the system will start unconditionally once power is applied.

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www.shuttle.eu

- Front Panel -

Comparison with the predecessors

	DS61 v1.1	DS81	DS87	DH170	
Availability	Oct'12 ~ June'15	from Mar'14	from Oct'14	from Oct'15	
Chassis	1.35L, 19 x 16.5 x 4.3 cm	1.35L, 19 x 16.5 x 4.3 cm		1.35L, 19 x 16.5 x 4.3 cm	
Processor Support	Socket LGA1155 Sandy Bridge, Ivy Bridge TDP max. 65W	Socket LGA1150 Haswell TDP max. 65W		Socket LGA1151 Skylake TDP max. 65W	
Chipset	Intel H61	Intel H81	Intel H87	Intel H170	
Operation System Support	Windows XP, 7, Vista, 8.1, 10 and Linux, 32 + 64 bit	Windows 7, 8.1 32 + 64 bit	10 and Linux	Windows 7, 8.1, 10 and Linux 64 bit	
Multi-Display Support	2	2	3	3	
UHD Support	No	HDMI: 2160p/30 DisplayPort: 21		HDMI: 2160p/30 DisplayPort: 2160p/60	
Memory Support	2x SO-DIMM max. 2x 8GB DDR3-1600	2x SO-DIMM max. 2x 8GB DI		2x SO-DIMM max. 2x 8GB DDR3L-1600	
Audio	Realtek ALC662	Realtek ALC662		Realtek ALC662	
Ethernet	2x Realtek 8111E	2x Realtek 8111G		Intel i211 + Intel i219LM	
Drive Bays	1x 2.5" / 12.5mm SATA	1x 2.5" / 12.5mm SATA		1x 2.5" / 12.5mm SATA	
Mini-Slots	1x Mini-PCIe Combo (supports Half / Full size)	1x mSATA 1x Mini-PCIe Half Size		1x M.2-2260 SATA/PCle 1x Mini-PCle Half Size	
Front Panel	Power button Power LED, HDD LED SD card reader Head phone, Microphone 4x USB 2.0	Power button Power LED, HDD LED SD card reader Head phone, Microphone 4x USB 2.0		Power button Power LED, HDD LED SD card reader Head phone, Microphone 2x USB 3.0, 2x USB 2.0	
Back Panel	HDMI, DVI-I 2x USB 3.0 2x Gigabit LAN RS232 + RS232/422/485 2x Kensington Lock 2x WLAN antenna (opt.) Ext. power button (opt.)	HDMI, 2x DisplayPorts 2x USB 3.0, 2x USB 2.0 2x Gigabit LAN RS232 + RS232/422/485 2x Kensington Lock 2x WLAN antenna (opt.) External power button (opt.)		HDMI, 2x DisplayPorts 2x USB 3.0, 2x USB 2.0 2x Gigabit LAN (Intel) RS232 + RS232/422/485 2x Kensington Lock 2x WLAN antenna (opt.) External power button (opt.)	
Optional Accessories	VESA mount (PV04) WLAN kit (WLN-S)	VESA mount (PV04) WLAN kit (WLN-S) D-Sub VGA port (PVG01)		VESA mount (PV04) WLAN kit (WLN-S) D-Sub VGA port (PVG01)	
Operation Temperature	max. 50°C	max. 50°C		max. 50°C	
Power Adapter	90W / 19V	90W / 19V (DS81L: 84W / 12V)		90W / 19V	
Front View				Shuttle	
Rear View					

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Shuttle XPC slim Barebone DH170 - Specifications

Chassis	Nettop 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
Storage Bay	1x 6.35 cm / 2.5" storage bay supports one hard disk or SSD drive Device height: 12.5 mm (max.)
Operation System	This system comes without operating system. It is compatible with Windows 10, 8.1, 8, 7 and Linux – 64 bit.
Mainboard Chipset BIOS	Chipset: Intel® H170 Chipset (Intel® DH82H170 PCH, code name "Sunrise Point") Platform Controller Hub (PCH) as Single-Chip-Solution AMI BIOS in 8 Mbit EEPROM with SPI interface All capacitors are high quality solid capacitors Supports hardware monitoring and watch dog functionality Supports Unified Extensible Firmware Interface (UEFI) Supports power on after power failure [8]
Power Adapter	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: 5.5/2.5mm (outer/inner diameter)
Processor Support	Socket LGA 1151 (H4) supports the sixth generation of Intel Core i7 / i5 / i3, Pentium and Celeron processors Maximum supported processor power consumption (TDP) = 65W Codename "Skylake", 14nm process technology, up to 8 MB of L3 cache Not compatible with Intel Xeon E3 V5 processors with Socket LGA1151 and processors with the older Socket LGA 1150.Does not support the unlock-function of Intel K-Series processors. 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 global.shuttle.com.
Processor Cooling	Heatpipe processor cooling with two 60 mm fans on the upper side of the chassis

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Memory Support	2x SO-DIMM slots with 204 pins Supports DDR3L-1333/1600 (PC3-10600/12800) SDRAM at 1.35V Supports Dual Channel mode Supports max. 8 GB per DIMM, maximum total size of 16 GB Supports two unbuffered DIMM modules (no ECC) Notice: This mainboard does only support 1.35V DDR3L memory modules. Note: DDR3L has a lower operation voltage compared to DDR3
Integrated Graphics	The features of the integrated graphics function depend on the processor type used. Three digital video outputs: 2x DisplayPort 1.2 and 1x HDMI 1.4 - supports three independent Full HD displays simultaneously [3] - supports Full HD resolution at 1920x1200 (1080p/60Hz) - supports 4K UHD resolution at 3840 x 2160 (2160p/60Hz on DP, 30Hz on HDMI) [4] - supports Blu-ray (BD) playback with HDCP - supports HD video plus multi-channel digital audio via a single cable. Optional analog D-Sub/VGA video output [5]
M.2 Slot	The M.2 2260 BM slot provides the following interfaces: - PCI-Express v3.0 X4 - SATA v3.0 (6 Gbps) - USB 2.0 It supports M.2 cards with a width of 22 mm and a length of 30, 42 or 60 mm (type 2230, 2242, 2260). Supports M.2 SATA SSDs, M.2 PCIe SSDs and other M.2 cards.
Mini PCIe Slot	Mini-PCIe Half-Size slot with PCIe 2.0 and USB 2.0 interface supports one optional Wireless Network (WLAN) card [6]
Audio	Audio Realtek® ALC 662 5.1 channel High-Definition Audio Two analog audio connectors (3.5mm) at the front panel: 1) 2-channel line out (headphones) 2) microphone input Digital multi-channel audio output: by HDMI and DisplayPort
Dual Gigabit LAN Controller	Dual network with two RJ45 ports Used network chips: 1) Intel i211 Ethernet Controller with MAC, PHY and PCIe interface 2) Intel i219LM PHY connected to the MAC of the processor Supports 10 / 100 / 1.000 MBit/s operation Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE) Supports Teaming mode [9]
Drive Connectors	1x Serial-ATA III, 6 Gb/s (600 MB/s) bandwidth With Serial-ATA power connector (onboard)

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Product Specifications

Card Reader	Integrated card reader Supports SD, SDHC and SDXC memory flash cards Supports boot up from SD card
Front Panel Connectors	Microphone input Audio Line-out (headphone) 2x USB 3.0 2x USB 2.0 SD card reader Power button Power LED (blue) HDD LED (yellow)
Back Panel Connectors	1x HDMI connector [1] 2x DisplayPort connector (DP) [2] Optional 1x D-Sub VGA connector (Accessory PVG01 [5]) 2x USB 3.0 2x USB 2.0 2x Gigabit LAN (RJ45) 2x RS232 serial port, 9-pin D-Sub (5/12V, 1x RS422/RS485) [10] DC-input connector for external power adapter 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
Other Onboard Connectors	 1x jumper JP2 - power on after power fail (hardware solution) [8] 1x analog VGA graphics output CN6 (2x10-pin, 1mm pitch) [5] 2x USB 2.0 (2x5-pin) 2x serial interface (COM) occupied by back panel connectors 1x fan connector (4-pin) occupied by the cooling system 1x connector for CMOS battery (occupied) 1x audio connector (line-out/microphone, 2x7-pin)
Supplied Accessories	Multi-language user guide (EN, DE, FR, ES, JP, KR, SC, TC) VESA mount for 75/100mm standard (two metal brackets) Four thumbscrews M3 x 5 mm (to affix VESA mount on the PC) Four screws M4 x 10 mm (to fix the VESA mount to the external device) Four screws M3 x 4 mm (to mount a 2.5" storage into the bay) Driver DVD (Windows 32-/64-bit) Serial ATA cable for 2.5" drive including power cable External 90W power adapter with power cord Protection cap for CPU socket (do not use if heatpipe or fan is mounted) Heatsink compound

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Optional Accessory	 WLN-S: Wireless LAN kit consisting of a Mini-PCle card, two antennas and appropriate antenna cables. PVG01: optional D-Sub VGA video output [5] <u>Note:</u> available upon special order request only: a TPM module (v1.2 or v2.0) can be soldered onto the mainboard ex works.
Environmental Specifications	Ambient temperature range: 0~50°C [7] Relative humidity, non-condensing: 10~90%
Conformity Certifications	 EMI: FCC, CE, BSMI, C-Tick Safety: CB, BSMI, ETL 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-guidelines: EMV-guideline 89/336/EWG electromagnetic tolerance LVD-guideline 73/23/EWG use of electric devices within certain voltage-limits

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Footnotes:

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

[2] 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: 1m, DisplayPort (male, 20p) to HDMI-A (male, 19p) DELOCK 82435: 5m, 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] Three independent displays simultaneously

The Shuttle XPC slim Barebone DH170 supports a maximum of two displays with the same input connector. For example: Two displays can be connected through HDMI input - the first one directly to the HDMI output, the second one to the DisplayPort output with an adapter. A third digital display, if required, must be connected directly to the DisplayPort output (without an adapter).

[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 60Hz. 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 an optional adapter PVG01. However doing so means one serial port (COM) less can be used at the backpanel.

[6] Optional Wireless LAN module

The Shuttle XPC slim Barebone DH170 supports an optional WLAN module, which consists of a half-size Mini-PCle WLAN card and an external antenna with an appropriate antenna cable. Shuttle offers a suitable accessory kit "WLN-S" with two antennas.

[7] Notice - 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 DH170 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] 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://downloadcenter.intel.com/download/21642

[10] 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 the BIOS setup. 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 5V or 12V. Each COM port can be configured separately. The maximum current is 500 mA per connector.

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6th Generation Intel Core Desktop Processor Family

Socket LGA1151 14-nm "Skylake-S" processor overview (Date: September 2015) Processors with a TDP>65W are <u>not</u> supported (marked in red)

Name	Model	Cores/ Threads	CPU Clock	Turbo Clock	Cache	TDP	Graphics Engine	Graphics Clock
Core i7	6700K	4 / 8	4.0 GHz	4.2 GHz	8 MB	91 W	HD 530	350~1150 MHz
	6700	4 / 8	3.4 GHz	4.0 GHz	8 MB	65 W	HD 530	350~1150 MHz
	6700T	4 / 8	2.8 GHz	3.6 GHz	8 MB	35 W	HD 530	350~1100 MHz
	6600K	4 / 4	3.5 GHz	3.9 GHz	6 MB	91 W	HD 530	350~1150 MHz
	6600	4/4	3.3 GHz	3.9 GHz	6 MB	65 W	HD 530	350~1150 MHz
	6600T	4 / 4	2.7 GHz	3.5 GHz	6 MB	35 W	HD 530	350~1100 MHz
Core i5	6500	4 / 4	3.2 GHz	3.6 GHz	6 MB	65 W	HD 530	350~1150 MHz
	6500T	4/4	2.5 GHz	3.1 GHz	6 MB	35 W	HD 530	350~1100 MHz
	6400	4 / 4	2.7 GHz	3.3 GHz	6 MB	65 W	HD 530	350~1150 MHz
	6400T	4 / 4	2.2 GHz	2.8 GHz	6 MB	35 W	HD 530	350~1100 MHz
	6320	2/4	3.9 GHz	-	4 MB	65 W	HD 530	350~1150 MHz
	6300	2/4	3.8 GHz	-	4 MB	65 W	HD 530	350~1150 MHz
Core i3	6300T	2/4	3.3 GHz	-	4 MB	35 W	HD 530	350~1100 MHz
	6100	2/4	3.7 GHz	-	4 MB	65 W	HD 530	350~1150 MHz
	6100T	2/4	3.2 GHz	_	4 MB	35 W	HD 530	350~1100 MHz
	G4520	2/2	3.6 GHz	-	3 MB	51 W	HD 530	350~1150 MHz
	G4500	2/2	3.5 GHz	-	3 MB	51 W	HD 530	350~1150 MHz
Pentium	G4500T	2/2	3.0 GHz	-	3 MB	35 W	HD 530	350~1100 MHz
	G4400	2/2	3.3 GHz	-	3 MB	51 W	HD 530	350~1150 MHz
	G4400T	2/2	2.9 GHz	-	3 MB	35 W	HD 530	350~1100 MHz
	G3920	2/2	2.9 GHz	-	2 MB	51 W	HD 530	350~1050 MHz
Celeron	G3900	2/2	2.8 GHz	-	2 MB	51 W	HD 530	350~1050 MHz
	G3900T	2/2	2.6 GHz	_	2 MB	35 W	HD 530	350~950 MHz

K = unlocked, S = Performance optimized lifestyle, T = Power optimized lifestyle, HT = Hyper Threading (SMT).
 Note: The Shuttle XPC slim Barebone DH170 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.

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