

DH310

SLIM PC



PROCESSOR	Supports Intel® 8th generation Core® i3/i5/i7 series, Pentium, and Celeron® LGA 1151 65W processors	
MEMORY	2 x 260 pin DDR4 2400/2666 MHz (PC4-19200/21300) SDRAM at 1.2V Supports dual channel up to 32GB (16GB x 2)	
VIDEO GRAPHICS	Intel HD Graphics	
VIDEO OUTPUT	HDMI + DisplayPort, Supports dual independent displays, Supports 4K Ultra HD	
AUDIO	Realtek ALC662 HD audio	
ETHERNET	Intel i211 x 2 Dual LAN 10/100/1000 MB/s operation	Supports Wake on LAN function Supports Teaming mode
STORAGE INTERFACE	SATA 6 GB/s	
ONBOARD CONNECTORS	(1) 4 pin fan connector (1) RS232 voltage switch (1) SATA power w/ connector	(1) VGA connector (for PVG01 use) (1) Auto power on header (1) Front audio header
FRONT PANEL	(1) Power Button (1) Power LED (1) HDD LED (2) USB 2.0	(2) USB 3.0 (1) External microphone jack 1/8" (1) External headphone jack 1/8" (1) SD Card Reader
BACK PANEL	(1) HDMI 2.0 [1]* (1) DisplayPort 1.2 [2]* (2) USB 3.0 (2) Gigabit LAN ports (2) Kensington Lock (1) RS232* [3]*	(1) RS232/RS422/RS485* (1) Clear CMOS button (1) USB 2.0 (2) Wireless Antenna holes (1) VGA connector (optional PVG01) [5]* (1) DC-in
DRIVE BAYS	(1) 2.5" HDD/SSD bay	
DIMENSIONS	7.5(L) x 6.5(W) x 1.7(H) inches	
POWER	Input: 100 - 240V AC Output: 19V/4.74A DC or 12V/7.5A	90W power supply
ACCESSORIES	Quick Guide Screw package SATA cable Power cord	VESA mount VESA mount quick guide Driver DVD 802.11 b/g/n WLAN module (optional)
EXPANSION SLOT	(1) M2. MAX to 2280 Type M	(1) M.2 MAX to 2230 Type E key socket
OS SUPPORT	Windows 10, Linux	

*RS232 ports support a max of 500mA, 0/5/12V output (please refer to voltage settings in quick guide)

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CHASSIS	<p>Black slim type metal chassis Kensington lock slot on the back as part of anti-theft system Dimensions: 7.5 (L) x 6.5 (W) x 1.7 (H) inches Weight: 2.8 LBS (net) / 4.6 LBS (gross)</p>
MAINBOARD AND CHIPSET	<p>Shuttle mainboard FS310, Shuttle form factor proprietary design for XPC DH310 Chipset: Intel® H310 Supports hardware monitoring and watch dog functionality Solid capacitors for sensitive areas provide excellent heat resistance for enhanced system durability</p>
BIOS	<p>AMI BIOS, SPI Interface, 16 MB Flash-EPROM 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>
POWER SUPPLY	<p>External 90W power adapter (fanless) AC input voltage: 100 - 240V, 50 - 60 Hz Output: 19V DC 4.74A This system can also be powered by a power adapter with an output voltage of 12V or 19V DC</p>
OPERATING SYSTEM	<p>The system comes without an operating system installed. Compatibility: Windows 10, Linux 64bit</p>
PROCESSOR SUPPORT	<p>LGA 1151v2 Socket supports Intel® Core® i3/i5/i7, Pentium, and Celeron processors Supports the 8th generation Intel Core processors, codename "Coffee Lake-S" Max supported processor power consumption (TDP): 65W 14nm process technology, up to 12MB of L3 cache The unlock function for Intel® K-Series processors is not supported with this model The processor integrates PCI-Express, the memory controller, and graphics engine on the same die (performance features depend on the processor type) Please refer to the support list for more detailed processor information at global.shuttle.com</p>
SYSTEM COOLING	<p>Shuttle I.C.E. (Integrated Cooling Engine) advanced heatpipe cooling technology, two 60 mm fans</p>
MEMORY SUPPORT	<p>2 x 260 pin SODIMM slots Supports DDR4 2400/2666 MHz memory (PC3-19200/21300) at 1.2V Supports Dual Channel mode Supports a max. of 16GB per DIMM, up to 32GB total Supports two unbuffered DIMM modules (no ECC or registered)</p>
DRIVE BAYS	<p>1 x 2.5" drive bay supports one hard disk or SSD drive, max height 12.5 mm</p>
M.2 SLOTS	<p>M.2 2280 M slot provides the following interfaces: PCI-Express Gen 3.0 X4 (supports NVMe), SATA v3.0 (6 GB/s) interface</p> <p>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>M.2 2230 E slot provides the following interfaces: PCI-Express v2.0 X1, USB 2.0 interface</p> <p>Supports M.2 cards with a width of 22 mm and a length of 30 mm (type 2230) Supports WLAN extension cards (optional WLN-M accessory)</p>
AUDIO	<p>Realtek® ALC 662 5.1 channel HD audio Two analog audio connectors (3.5 mm) on the front panel: 2 channel line-out (headphones), Microphone input Digital multi-channel audio output (HDMI and DisplayPort)</p>

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INTEGRATED GRAPHICS	<p>Intel HD graphics function features depend on the processor type used</p> <p>This model has two video outputs: DisplayPort 1.2 and HDMI 2.0</p> <p>Supports displays with 4K Ultra HD resolution at 3840 x 2160</p> <p>Supports two independent displays with integrate graphics function</p> <p>Supports Blu-Ray playback with HDCP content protection [1]*</p> <p>Hardware video decoding/encoding: H.264, H.265 (8 and 10 bit, encoding via QuickSync), VP9 (10 bit decoding)</p> <p>DisplayPort and HDMI support multi-channel digital audio over the same cable</p> <p>Optional analog VGA video output [5]*</p>	
MULTI-CHANNEL AUDIO	<p>High Definition Audio with Realtek ALC662 codec</p> <p>Front: MIC in, Headphones in</p> <p>Back: Line-in (blue), line-out (green), MIC in (pink)</p> <p>5.1 channel Digital Audio via HDMI and DisplayPort outputs</p>	
GIGABIT LAN CONTROLLER	<p>Two RJ45 ports</p> <p>Intel i211 Ethernet Controller with MAC, PHY, and PCIe interface</p> <p>Supports 10/100/1000 MB/s operation</p> <p>Supports Wake-on-LAN</p> <p>Supports Teaming mode [6]*</p> <p>Supports network boot by Preboot eXecution environment (PXE)</p>	
SATA CONNECTORS	<p>The mainboard provides one Serial-ATA interface, max 6GB/s supported</p> <p>Serial-ATA power connector (onboard)</p>	
CARD READER	<p>Integrated card reader supports SD, SDHC, SDXC (up to v3.01) memory flash cards</p> <p>Supports boot up from SD card</p>	
FRONT PANEL CONNECTORS	<p>Microphone input</p> <p>Headphone output (line-out)</p> <p>2 x USB 3.0</p> <p>2 x USB 2.0</p>	<p>Power button</p> <p>Power indicator (Blue LED)</p> <p>Hard disk drive indicator (Yellow LED)</p> <p>SD Card Reader</p>
BACK PANEL CONNECTORS	<p>HDMI 2.0 [1]*</p> <p>DisplayPort 1.2 [2]*</p> <p>VGA connector (optional PVG01) [5]*</p> <p>USB 3.0 x 2</p> <p>USB 2.0 x 2</p> <p>Kensington Lock x 2</p>	<p>Clear CMOS button</p> <p>Gigabit LAN (RJ45) x 2</p> <p>WLAN antenna holes x 2</p> <p>RS232 x 2 (1 x RS232/RS422/RS485) [3]*</p> <p>DC-input connector for external power adapter (12V/19V)</p>
OTHER CONNECTORS (ONBOARD)	<p>Analog VGA graphics (2x1 pin) [5]*</p> <p>RS232 COM port x 2</p> <p>Connector for CMOS battery</p>	<p>Fan connectors x 1 (4 pin), one occupied by cooling system</p> <p>Power on after power failure (hardware solution by jumper) [8]*</p>
INCLUDED ACCESSORIES	<p>XPC installation guide</p> <p>Driver DVD</p> <p>SATA and power cables</p> <p>Heatsink compound</p>	<p>External 90W power adapter with cord</p> <p>VESA mount (75/100mm standard)</p> <p>Screw pack</p> <p>Protector cap for CPU socket (don't use if heatpipe/fan is mounted)</p>
OPTIONAL ACCESSORIES	<p>Vertical stand (PS02)</p> <p>WLN-M (WLAN module)</p>	<p>VGA port adapter (PVG01) [5]*</p>
ENVIRONMENTAL CRITERIA	<p>Operating temperature: 0 - 50°C [7]*</p>	<p>Humidity: 10 - 90% (non-condensing)</p>
CERTIFICATIONS	<p>EMI: FCC, CE, BSMI, RCM, VCCI</p> <p>Safety: ETL, CB, BSMI</p>	<p>Other: RoHS, Energy Star, ErP</p>
	<p>This model is classed as a technical information equipment (ITE) in class B and is intended for use in living rooms and offices. The CE mark approves conformity by the EU directives:</p> <p>(1) 2004/108/EC relating to electromagnetic compatibility (EMC)</p> <p>(2) 2006/95/EC relating to Electrical Equipment designed for use within certain voltage limits (LVD)</p> <p>(3) 2009/125/EC relating to eco-design requirements for energy related products (ErP)</p>	

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[1] HDMI OUTPUT

HDMI output supports DVI-D with optional adapter

[2] HOW TO CONVERT DISPLAYPORT TO HDMI/DVI

The DisplayPort output can be converted into a HDMI or DVI output using an additional passive adapter cable.

The integrated graphics automatically detects the connected display and outputs 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.

[3] SERIAL PORTS

This PC features two serial RS232 ports with 9 pin VGA connectors on the back panel (pin 9 is a multi-functional signal). The left COM1 port can also be configured as RS422 and RS485 in the BIOS setup. 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).

[4] 4K ULTRA HD RESOLUTION

A 4K display with Ultra HD resolution (3840 x 2160) should be connected via DisplayPort (this port only supports a higher refresh rate of 60 Hz). There are certain displays will require a MST (Multi-Stream Transport) mode to be enabled, which sends two separate images at half resolution each to the display. The two images are then combined and put in the correct order by the Intel graphics driver when in Collage mode. HBR2 mode (High Bit Rate 2) must be supported by each display to have two of them run at 4K resolution. The video playback performance depends on the video format, bit rate, and processor used. For HBR2 mode (High Bit Rate 2), it must be supported by each display to have more than one of them run at 4K resolution.

[5] OPTIONAL VGA CONNECTOR

The mainboard features one analog graphics port (CN6). This 15 pin VGA connector can be lead to the outside of the back panel by using an optional adapter PVG01. Doing so will occupy one serial port (COM) on the back panel.

[6] TEAMING MODE

The teaming function allows for grouping both available network adapters to work as a single adapter. This mode enables load balancing and failover (the driver download can be found here: https://downloadmirror.intel.com/22283/eng/23_2.zip)

[7] HIGH AMBIENT TEMPERATURE

For high ambient temperature over 40°C, SSDs are strongly recommended instead of hard disk drives (supporting at least 70°C) and rugged SODIMM memory modules for temperature ranges 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 behavior after a power failure: (1) unconditional power on, (2) restore former status, or (3) keep system turned off. This function may fail after short power failures, but the DH110 comes with a hardware based solution in these cases. By removing the Jumper JP2 on the mainboard (behind the power button), the system will start unconditionally once power is supplied.

BIOS DOWNLOADS: <http://global.shuttle.com/products/productsDownload?productId=2261>

SUPPORT LIST: <http://global.shuttle.com/products/productsSupportList?productId=2261>

FAQ LIST: <http://global.shuttle.com/support/faq>

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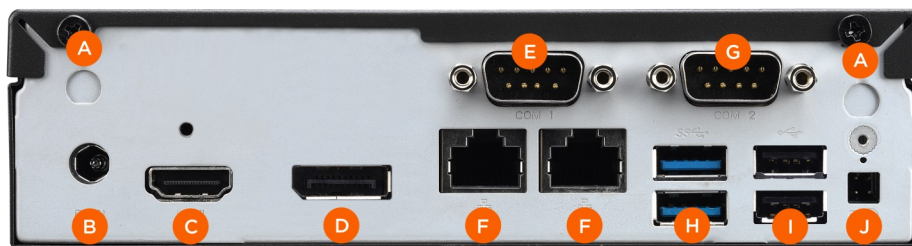
SLIM PC

Front View



- | | |
|--------------------|------------------|
| 1 Microphone input | 5 Power Button |
| 2 Headphone input | 6 SD Card Reader |
| 3 Power LED | 7 USB 3.0 x 2 |
| 4 Hard Disk LED | 8 USB 2.0 x 2 |

Back View



- | | |
|-------------------------|----------------------------|
| A WLAN antenna hole x 2 | F RJ45 Gigabit LAN |
| B DC power input | G RS232/RS422/RS485 (COM2) |
| C HDMI 2.0 video output | H USB 3.0 x 2 |
| D DisplayPort 1.2 video | I USB 2.0 x 2 |
| E RS232 (COM1) | J Clear CMOS connector |



Kensington lock hole on left and right side

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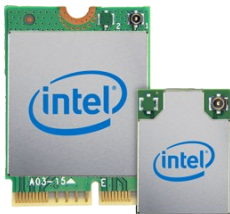
INTEL[®] 8TH GENERATION PROCESSORS

Equipped with a LGA 1151v2 socket, the DH310 supports Intel[®] Celeron[®], Pentium[®], and Core[®] 65W processors. Support for up to 32GB DDR4 2400/2666 MHz memory, integrated UHD graphics, and PCI-E controllers provide outstanding graphics performance.



VESA MOUNTABLE

The supplied 75/100mm VESA mount allows for installation of the DH310 on walls or monitors, for use in company buildings, public institutions, or other industry buildings. With a thickness of 43mm, it allows for versatile integration into hardware systems and well suited for areas with limited space.



NEXT GEN INTEL[®] CNVi WI-FI SUPPORT

With an onboard M.2 2230 expansion slot, the DH310 is Intel[®] CNVi function ready to support installation of a CNVi wireless module* for efficient and optimized gigabit wireless networking.

*CNVi devices: Intel[®] Wireless AC 9560, Intel[®] Wireless AC 9462, Intel[®] Wireless AC 9461



GREAT CONNECTIVITY

In addition to two video outputs for dual displays, the DH310 also features four USB 3.1 Gen 1 ports, four USB 2.0 ports, two RS232 interfaces, and an SDXC card reader for convenient and flexible connectivity options.



SMART FAN DESIGN

A heat-pipe cooling system with smart fan design can be set in the BIOS for faster fan speed automatically when CPU temperature increases for high stability and low noise during long term operation.

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ACCESSORY	PS02
DESCRIPTION	The PS02 stand is required for placing 1.3L slim PC models into a vertical orientation.
COMPATIBILITY	DX30, DL10J, DS61, DS81, DH110, DH110SE, DH170, DQ170, DH270, DH310, DH370, DH02U



ACCESSORY	PVG01
DESCRIPTION	The PVG01 equips compatible slim PCs with an analog VGA output, For slim 1L PCs, this means only one serial interface (COM 1) can be used after installation.
SPECIFICATIONS	Length: 6.3 inches, Back panel connector: 15 pin Mini D-sub female socket, Internal connector: Subminiature 2x10 pin female
REMARKS	Slim PCs with H81/H110 chipsets can support up to two displays at the same time, so only two out of the available video outputs can be used.



ACCESSORY	WLN-M
DESCRIPTION	The WLN-M wireless LAN kit can be used to equip XPC cube and slim series models with the wireless LAN standard 802.11 n/ac at 2.4/5 GHz. The combo device supports Bluetooth 4.0.
REMARKS	M.2 2230 (NGFF) WLAN card, Antenna cable (XPC slim) x 2, Antenna cable (XPC cube) x 2, Dipole antenna x 2, Quick Guide, Driver DVD
OS SUPPORT	Windows 7, Windows 8.1, Windows 10, Linux (32/64 bit)

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DH110 vs DH310

SLIM PC



MODEL	DH110	DH310
CHIPSET	Intel H110	Intel H310
PROCESSOR SUPPORT	LGA 1151, max TDP 65W 14nm Skylake (6th Gen Core CPU) 14nm Kabylake (7th Gen Core CPU) Intel® Core™ i3/i5/i7, Pentium, Celeron	LGA 1151v2, max TDP 65W 14nm Coffee Lake (8th Gen Core CPU) Intel® Core™ i3/i5/i7, Pentium, Celeron
MEMORY	2 x 16GB DDR3L 1333/1600 MHz max	2 x 16GB DDR4 2400/2666 MHz max
VIDEO OUTPUT	HDMI + DisplayPort, Supports dual displays, Supports 4K Ultra HD	HDMI 2.0 + DisplayPort 1.2, Supports dual displays, Supports 4K Ultra HD
AUDIO	Realtek AL662, 5.1 channel HD audio	Realtek AL662, 5.1 channel HD audio
ETHERNET	Intel i211 + i219LM 10/100/1000 MB/s operation Supports Wake on LAN function Supports Teaming mode	Intel i211 x 2 10/100/1000 MB/s operation Supports Wake on LAN function Supports Teaming mode
SATA ONBOARD	SATA 6G x 1 eSATA x 1	SATA 6G x 1
FRONT PANEL	Power button with LED, HDD LED, MIC-in, Headphone out, SD Card Reader, USB 3.0 x 2, USB 2.0 x 2	Power button with LED, HDD LED, MIC-in, Headphone out, SD Card Reader, USB 3.0 x 2, USB 2.0 x 2
BACK PANEL	HDMI, DisplayPort USB 3.0 x 2, USB 2.0 x 1 PS/2 combo port Gigabit LAN (Intel i211 + i219LM) x 2 RS232 + RS232/RS422/RS485 WLAN antenna x 2 (optional) Clear CMOS button	HDMI, DisplayPort USB 3.0 x 2, USB 2.0 x 2 Gigabit LAN (Intel i211) x 2 RS232 + RS232/RS422/RS485 WLAN antenna x 2 (optional) Clear CMOS button
DRIVE BAYS	(1) 2.5" HDD/SSD bay	(1) 2.5" HDD/SSD bay
OPTIONAL ACCESSORIES	Vertical Stand (PS02) VGA adapter (PVG01) WLAN kit (WLN-M)	Vertical Stand (PS02) VGA adapter (PVG01) WLAN kit (WLN-M)
EXPANSION SLOT	M.2 2260 BM slot M.2 2230 AE slot, Supports optional WLAN	M.2 2280 M slot M.2 2230 E slot, Supports optional WLAN
OS SUPPORT	Windows 7, Windows 8.1, Windows 10, Linux 64 bit	Windows 10, Linux 64 bit

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8th Generation Intel Core Desktop Processors (LGA 1151v2 14 nm Coffee Lake-S)

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

Name	Model	Cores/Threads	CPU Clock	Turbo Clock	Cache	TDP	Graphics	Graphics Clock
Core i7	8700K	6 / 12	3.7 GHz	4.7 GHz	12 MB	95W	HD 630	350 - 1200 MHz
	8700	6 / 12	3.2 GHz	4.6 GHz	12 MB	65W	HD 630	350 - 1200 MHz
	8700T	6 / 12	2.4 GHz	4.0 GHz	12 MB	35W	HD 630	350 - 1200 MHz
Core i5	8600K	6 / 6	3.6 GHz	4.3 GHz	9 MB	95W	HD 630	350 - 1150 MHz
	8600	6 / 6	3.1 GHz	4.3 GHz	9 MB	65W	HD 630	350 - 1150 MHz
	8600T	6 / 6	2.3 GHz	3.7 GHz	9 MB	35W	HD 630	350 - 1150 MHz
	8500	6 / 6	3.0 GHz	4.1 GHz	9 MB	65W	HD 630	350 - 1100 MHz
	8500T	6 / 6	2.1 GHz	3.5 GHz	9 MB	35W	HD 630	350 - 1100 MHz
	8400	6 / 6	2.8 GHz	4.0 GHz	9 MB	65W	HD 630	350 - 1050 MHz
	8400B	6 / 6	2.8 GHz	4.0 GHz	9 MB	65W	HD 630	350 - 1150 MHz
	8400T	6 / 6	1.7 GHz	3.3 GHz	9 MB	35W	HD 630	350 - 1050 MHz
Core i3	8350K	4 / 4	4.0 GHz	-	8 MB	91W	HD 630	350 - 1150 MHz
	8300	4 / 4	3.7 GHz	-	8 MB	62W	HD 630	350 - 1150 MHz
	8300T	4 / 4	3.2 GHz	-	8 MB	35W	HD 630	350 - 1150 MHz
	8100	4 / 4	3.6 GHz	-	6 MB	65W	HD 630	350 - 1100 MHz
	8100T	4 / 4	3.1 GHz	-	6 MB	35W	HD 630	350 - 1100 MHz
Pentium	G5600	2 / 4	3.9 GHz	-	4 MB	51W	HD 630	350 - 1100 MHz
	G5500	2 / 4	3.8 GHz	-	4 MB	51W	HD 630	350 - 1100 MHz
	G5500T	2 / 4	3.2 GHz	-	4 MB	35W	HD 630	350 - 1100 MHz
	G5400	2 / 4	3.7 GHz	-	4 MB	51W	HD 630	350 - 1050 MHz
	G5400T	2 / 4	3.1 GHz	-	4 MB	35W	HD 630	350 - 1050 MHz
Celeron	G4920	2 / 2	3.2 GHz	-	2 MB	54W	HD 610	350 - 1050 MHz
	G4900	2 / 2	3.1 GHz	-	2 MB	54W	HD 610	350 - 1050 MHz
	G4900T	2 / 2	2.9 GHz	-	2 MB	35W	HD 610	350 - 950 MHz

K = unlocked, T = power optimized, HT = hyper threading. The DH310 does not support the unlock function of Intel K-series processors.

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