BAREBONE
XPC slim
DH32U

POWERFUL 1.3-LITRE PC WITH INTEL "TIGER LAKE-U" PROCESSOR SUPPORTS FOUR ULTRA HD DISPLAYS

This space-saving Slim PC integrates an energy-efficient Gen 11 Intel ULV processor "Tiger Lake-U" and supports no less than four Ultra HD displays at 60 Hz frame rate via HDMI 2.0b. Its slim metal chassis with a VESA mount included, versatile connectivity and reliable operation in ambient temperatures of up to 50 °C degrees, make it ideal for vertical applications such as Digital Signage, Kiosk, Surveillance, Control Room, Gambling Machines, Healthcare and Industry.

QUAD HDMI 2.0b	SUPPORTS 4x DISPLAY	2x 32 GB SUPPORT	NVMe SSD SUPPORT	2.5" HDD/SSD SUPPORT	DUAL INTEL LAN	DUAL COM	VESA MOUNT	REMOTE POWER	WLAN / LTE OPTIONAL	Max. 50 °C	24/7 SUPPORT

SLIM DESIGN
■ Slim 1.35-litre metal chassis, black ■ Dimensions: 190 x 165 x 43 mm (LWH) ■ Including VESA mount (75/100 mm) ■ Supports 24/7 Nonstop Operation ■ Operating temperature: 0~50 °C (non-condensing)

OPERATING SYSTEM
■ An operating system is not included
■ Supports Windows 10/11 and Linux (64-bit)

PROCESSOR
■ Intel Pentium Gold 7505 SOC processor, 2 Cores, 4 Threads, 2.0~3.5 GHz ■ Gen 11, codename "Tiger Lake-U", 10 nm process ■ 15W TDP
■ Cooling system with fan

GRAPHICS
■ Integrated Intel Gen. 12 Xe graphics architecture with 80 EUs
■ Supports four independent 4K/UHD displays at 60 Hz

MEMORY SUPPORT
■ 2x 260-pin SO-DIMM slot ■ Supports DDR4-3200 ■ max. 2x 32 GB

STORAGE – SATA / M.2
■ 1x 2.5" bay for SATA hard disk or SSD ■ 1x M.2-2280M slot (supports PCIe Gen. 4 X4 NVMe or SATA) ■ 1x M.2-2230E for optional WLAN

CONNECTORS
■ 4x HDMI 2.0b ■ optional VGA ■ 4x USB 3.2 Gen2 ■ 4x USB 3.2 Gen1
■ 1x internal USB 2.0 ■ 2x Intel Gigabit LAN (RJ45, i211)
■ 2x COM port (1x RS232/422/485) ■ SD card reader
■ 2x audio (line out, mic) ■ Connector for external power button
■ "Always on" Jumper

POWER SUPPLY
■ External 90W/19V power adapter

OPTIONAL ACCESSORIES
■ WLAN Module (WLN-M/M1) ■ Vertical Stand (PS02) ■ VGA Port (PVG01) ■ Rackmount kit (PRM01) ■ Cable for external power button (CXP01) ■ DIN-Rail mounting kit (DIR01) ■ LTE-kit (WWN03)

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MODELS OF THE DH32Ux SERIES

Product	Processor	Cores / Threads	CPU Clock	Cache	TDP	Graphics	UPC Code
DH32U	Intel Pentium Gold 7505	2 / 4	2.0~3.5 GHz	4 MB	15 W	UHD graphics, 48 EUs	887993004440
DH32U3 *)	Intel Core i3-1115G4	2 / 4	3.0~4.1 GHz	6 MB	28 W	UHD graphics, 48 EUs	upon special order only
DH32U5	Intel Core i5-1135G7	4 / 8	2.4~4.2 GHz	8 MB	28 W	Intel Gen. 12 Xe, 80 EUs	887993004464
DH32U7 *)	Intel Core i7 1165G7	4 / 8	2.8~4.7 GHz	12 MB	28 W	Intel Gen. 12 Xe, 96 EUs	upon special order only

*) upon special order only

PRODUCT FEATURES

1.3 L

19 cm — 16.5 cm

Only 4.3 cm tall

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 such as digital signage. Despite its dimensions of 19 x 16.5 x 4.3 cm (LWH), the overall system performance is very high thanks to the Intel Gen. 11 SoC processor. The interior of the DH32U 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.

Supports extended temperature range and 24/7 operation

The Shuttle XPC slim Barebone DH32U is officially approved for 24/7 permanent operation. Thanks to its efficient SoC processor, this PC runs highly reliably making it perfectly suitable for digital signage and POI/POS applications - even at ambient temperatures of up to 50 °C (non-condensing).
Caution: For high ambient temperatures over 40 °C we strongly recommend to use SSDs.

Intel 11th Generation Processor

Tiger Lake is the codename of Intel 11th generation Core mobile processors built on 10nm process technology, with Intel® UHD graphics providing high graphics performance for content creation. With dual-channel DDR4-3200 RAM up to 64GB, Shuttle DH32U provides excellent performance for multi-task computing. The 11th Gen Core processor provides accelerated AI-enhanced capabilities allowing higher efficiency in performing apps and handling multitasking.

Quad 4K Display support

The DH32U supports up to 4 independent UHD displays through its four native HDMI 2.0b outputs, running smoothly 4K UHD video at 60Hz, providing maximum flexibility and dynamic visualization for surveillance and digital signage applications.

One M.2-Slot for SSD cards

The M.2-2280 slot supports one M.2 SSD storage card with NVMe PCIe Gen 4 x4 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.

Dual Intel Gigabit LAN Network

The Shuttle XPC slim Barebone DH32U supports Dual Gigabit LAN with Intel network adapters, which are popular for their excellent performance and driver compatibility and are the preferred choice for professional environments.
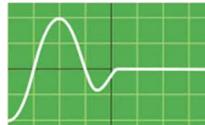
VESA mount

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.

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 DH32U also comes with a hardware-based solution. By removing Jumper JP2 the system will start unconditionally once power is applied.

External power button

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 SW3 at the back panel of the DH32U (pitch 2.54 mm). Furthermore, this connector provides a Clear CMOS function and +5V DC voltage supply for external devices.
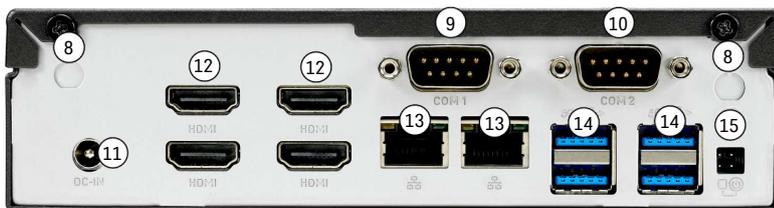
Ground — *Power Button*
Clear CMOS — *+5V Power*

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Front and Back Panel

Front panel

Back panel

1. Microphone input
2. Headphones output
3. LED indicator for power state
4. LED indicator for storage activity
5. Power button
6. SD card reader
7. 4x USB 3.2 Gen 2 port (red)

8. 2x perforation for optional WLAN antenna
9. COM port supports RS232/RS422/RS485
10. COM port supports RS232
11. DC-in connector for power adapter
12. 4x HDMI 2.0b port
13. 2x RJ45 Gigabit LAN port
14. 4x USB 3.2 Gen 1 port (blue)
15. 4-pin connector (2.54 mm pitch)
    for external power button, Clear CMOS button
    and 5V DC voltage

16. Hole for Kensington Lock
    (the lock-and-cable is not included)

17. VESA mount (two parts)

Mainboard

Back panel

Back view

Front view

Front panel

1. Jumper for COM port configuration
2. Onboard connectors for COM ports
3. Onboard USB 2.0 connector (4-pin)
4. M2-2230E slot for optional WLAN card
5. Onboard connector for CMOS battery
6. Onboard VGA connector (optional accessory PVG01 required)
7. M.2-2280M slot for SSD card (also supports M.2-2260/2242)
8. Always-Power-On jumper (JP2)
9. Debug Connector (reserved)
10. 2x SO-DIMM memory slot
11. Processor heat-sink with cooling fan
12. Onboard connector for cooling fan (4-pin)
13. SATA/Power connector für the 2.5" hard disk rack

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REQUIRED COMPONENTS

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

Shuttle XPC slim Barebone DS32U5
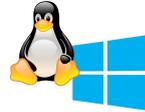with removed bay cover

Memory Modules
Up to two DDR4-3200
SO-DIMM memory modules
max. 32 GB each

2.5" Storage Drive
SATA hard disk or Solid State Disk (SSD)
(max. height: 12.5 mm)

M.2 SSD (optional)
M.2-2280/2260/2242
SSD storage (SATA or PCIe/NVMe)

Operating System
Windows 10/11 or Linux (64-bit only)

OPTIONAL ACCESSORIES FROM SHUTTLE

**WLAN-Accessory
WLN-M/WLN-M1**
M.2-2230 card supports
WLAN and Bluetooth
including 2 antennas

Vertical Stand PS02
for vertical operation

LTE Adapter Kit WWN03
allows the installation of an
M.2 LTE card and nano SIM
card (occupies the 2.5" bay).
The LTE card is not included.

DIN-Rail Kit DIR01
This mounting kit allows the in-
stallation on a standard 35
mm DIN-Rail

VGA port adapter PVG01
Installing PVG01 means one
serial port (COM) less can be
used on the backpanel.

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

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

Shuttle Product Comparison

MODEL	DH32U Series	DH02U Series
Processor *)	Intel Gen. 11 "Tiger Lake-U", TDP= 15/28W, 10 nm DH32U: Pentium 7505, 2/4 cores, 2.0/3.5 GHz DH32U3: Core i3-1115G4, 2/4 cores, 3.0/4.1 GHz DH32U5: Core i5-1135G7, 4/8 cores, 2.4/4.2 GHz DH32U7: Core i7-1165G7, 4/8 cores, 2.8/4.7 GHz	Intel Gen. 7 "Kaby Lake-U", TDP= 15W, 14 nm DH02U: Celeron 3865U, 2/2 cores, 1.8 GHz DH02U3: Core i3-7100U, 2/4 cores, 2.4 GHz DH02U5: Core i5-7200U: 2/4 cores, 2.5/3.1 GHz DH02U7: Core i7-7500U, 2/4 cores, 2.7/3.5 GHz
Graphics	Integrated Graphics Engine DH32U/U3: Intel UHD Graphics (48 EUs) DH32U5/U7: Intel Iris Xe (80/96 EUs)	Built-in MXM 3.0 graphics card (PCIe X4) NVIDIA GeForce 1050 4 GB GDDR5 VRAM 128 bit
Operating System	Windows 10/11, Linux (64-bit)	Windows 10, Linux (64-bit)
RAM Suppport	2x SO DIMM (260-pins) max. 2x 32 GB DDR4-3200	2x SO DIMM (260-pins) max. 2x 16 GB DDR4-2133
2.5 bay	Supports one 2.5" SATA drive max. height: 12.5 mm	Supports one 2.5" SATA drive max. height: 12.5 mm
M.2-2280 slot	M.2-2280 M supports NVMe/PCIe V4 X4 and SATA	M.2-2280 M supports NVMe/PCIe V2 X4 and SATA
Audio	Realtek ALC662/ALC888S	Realtek ALC662
Dual GIGABIT LAN	2x Intel i211	1x Intel i211
Front Panel	On/Off button Power LED, HDD LED 4x USB 3.2 Gen 2 (red) 2x Audio ports SD card reader	On/Off button Power LED, HDD LED 2x USB 3.2 Gen 1 (blue) 2x USB 2.0
Back Panel	4x HDMI 2.0b 4x USB 3.2 Gen 1 (blue) 2x Intel Gigabit LAN (RJ45) 2x COM (1x RS232/RS422/485) 4-pin power on connector	4x HDMI 2.0b 2x USB 3.2 Gen 1 (blue) 1x Intel Gigabit LAN (RJ45) 1x COM (RS232) 2x Audio ports 4-pin power on connector
Power Adapter	90 W (19V, 4.74A)	120 W (19V, 6.32A)
VESA Mount	included	included
Optional Accessories	CXP01: cable for ext. power button PRM01: 2U rack-mount kit DIR01: DIN-Rail mounting kit PVG01: VGA port instead of second COM port WLN-M/M1: WLAN kit with external antennas WWN03: LTE kit for 2.5" drive bay	CXP01: cable for ext. power button PRM01: 2U rack-mount kit DIR01: DIN-Rail mounting kit PVG01: VGA port instead of second COM port WLN-M/M1: WLAN kit with external antennas
Front View		
Back View		

*) **DH02U/DH32U** models with **Core i3** and **Core i7** processors are available upon special order only

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SHUTTLE XPC SLIM BAREBONE DH32U — SPECIFICATIONS

CHASSIS	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) on both sides of the chassis
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: 5.5/2.5 mm (outer/inner diameter) AC mains cable: 3 pins, ca. 1.7 m length, with C5/C6 coupler (called "Mickey Mouse" or "Clover-leaf") for the power adapter and CEE-7/7 plug with earth-contact (type E+F) for the power outlet
OPERATING SYSTEM	This system comes without an operating system. It is compatible with Windows 10/11 and Linux (64-bit)
PROCESSOR	Model: Intel Pentium Gold 7505 (ULV) System-on-a-chip architecture (SoC) with integrated memory and graphics controller: no chipset required FCBGA1449 package - directly soldered onto the mainboard Code name: Tiger Lake U (11th Generation Intel Core processors) Cores / Threads: 2 / 4 Base Frequency: 2.0 GHz Max. Turbo Frequency: 3.5 GHz Intel Smart Cache: 4 MB TDP wattage: 15 W maximum Manufacturing process: 10 nm SuperFin Maximum Tjunction Temperature: 100 °C
INTEGRATED GRAPHICS	Intel UHD Graphics Max. GPU clock frequency: 1.25 GHz Execution Units (EUs): 48 Supports DirectX 12.1, OpenCL 2.0 Supports up to four independent screens via HDMI 2.0b at 4096x2304@60Hz
PROCESSOR COOLING	Heat sink with 50 mm fan (temperature-controlled rotation speed)
MAINBOARD	Mainboard in a Shuttle form factor proprietary design for the XPC DH32Ux Solid Capacitors for sensitive areas provide excellent heat resistance for enhanced system durability
BIOS	AMI BIOS, SPI Interface, 32 MB Flash-EEPROM Supports Hardware Monitoring and Watchdog functionality Supports Firmware-TPM (fTPM) v2.0 [2] Supports boot up from external USB flash memory Supports Unified Extensible Firmware Interface (UEFI) Supports power on after power failure [7]
MEMORY SUPPORT	2x SO-DIMM slot with 260 pins Supports DDR4-3200 (PC4-25600) SDRAM at 1.2 V Supports Dual Channel mode Supports a maximum of 32 GB per DIMM, maximum total size: 64 GB
2.5" DRIVE BAY	1x 6.35 cm / 2.5" storage bay supports one hard disk or SSD drive with SATA connector Device height: 12.5 mm (max.)
SATA CONNECTOR	1x Serial-ATA III, data transfer rate max. 6 Gb/s (600 MB/s) With Serial-ATA power connector (onboard)
M.2-2280M SLOT FOR SSDs	The M.2-2280M slot provides the following interfaces: - PCI-Express Gen. 4.0 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
M.2-2230E SLOT FOR WLAN CARDS	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 expansion cards (optional Shuttle accessory: WLN-M/WLN-M1)

AUDIO	Audio Realtek® ALC662/ALC888S 5.1 channel High-Definition Audio Two analog audio connectors (3.5mm) on the front panel: 1) 2-channel line-out (head-phones) 2) microphone input Digital multi-channel audio output: by HDMI
DUAL GIGABIT LAN	Dual network with two RJ45 ports with two status LEDs each Used network chips: 2x Intel i211 Ethernet Controller (MAC, PHY) with PCIe interface Supports 100 / 1.000 MBit/s operation Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE) Supports Teaming mode **[5]**
CARD READER	Integrated card reader Supports SD, SDHC and SDXC memory flash cards
FRONT PANEL CONNECTORS	Microphone input Audio Line-out (headphones) 4x USB 3.2 Gen 2, max. 10 Gbps (red) SD card reader Power button Power LED (blue) HDD LED (yellow)
BACK PANEL CONNECTORS	4x HDMI 2.0b connector Optional: 1x D-Sub VGA connector (Accessory PVG01 **[4]**) 4x USB 3.2 Gen 1, max. 5 Gbps (blue) 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 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 Lock (on the side)
OTHER ONBOARD CONNECTORS	1x jumper JP2 for power-on-after-power-fail (hardware solution) **[7]** 1x analog VGA graphics output CN6 (2x 10-pin, 1 mm pitch) **[4]** 2x serial interface (COM) occupied by backpanel connectors 1x USB 2.0 (4-pin) for optional accessory WWN03 (LTE kit) **[1]** 1x fan connector (4-pin) occupied by the CPU fan 1x connector for CMOS battery (occupied)
SUPPLIED ACCESSORIES	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
OPTIONAL ACCESSORIES	**PVG01:** optional D-Sub VGA video output **[4]** **WLN-M/WLN-M1:** WLAN module in M.2-2230 format supports WLAN and Bluetooth with two external antennas. **WWN03:** LTE adapter kit with antennas, but without LTE card **[1]** **PS02:** Stand for vertical operation **CXP01:** adapter cable for external power button **PRM01:** 2U rack mount front plate for two Shuttle XPC slim PCs **DIR01:** DIN-Rail mounting kit
ENVIRONMENTAL SPECIFICATIONS	Operating temperature range: 0~50 °C **[6]** Relative humidity, non-condensing: 10~90 %

CONFORMITY & CERTIFICATIONS	Certifications: EMI: FCC, CE, BSMI, RCM, VCCI Safety: cTUVus, CB, BSMI 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)

Footnote:

[1] Optional Accessory WWN03 (LTE kit)
The Shuttle XPC accessory WWN03 allows this PC to be upgraded with an LTE/4G function for mobile network. The LTE card will occupy the 2.5" bay, so you will have to use an M.2 SSD as a mass storage device. The required LTE/4G card in M.2-3042 format and an activated Nano SIM card is not included in the scope of delivery.

[2] TPM Function
This product features Firmware-TPM (fTPM) v2.0. Besides this, it is prepared for a hardware TPM chip which can be fitted by factory on request if required.

[3] Serial Ports
This PC features two serial RS232 ports with 9-pin D-Sub connectors at the backpanel. The left COM port (COM1) can also be configured as RS422 and RS485 in BIOS.
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] 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 on the backpanel by using the optional adapter PVG01. However doing so means one serial port (COM) less can be used on the backpanel.

[5] 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.

[6] 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.

[7] 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 DH32Ux 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.