QuickSpecs
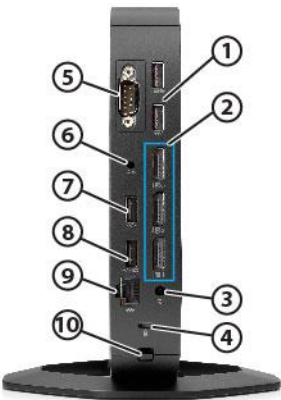
Overview

HP t640 Thin Client

FRONT

1. Power button (with integrated power indicator)
2. Flash memory activity indicator
3. (1) USB-A 3.1 Gen 1 port
4. (1) USB-A 3.1 Gen 2 port
5. (1) USB-C™ 3.1 Gen 2 port
6. 3.5 mm combo headset/audio jack
7. Access panel to information labels and VESA 100 mounting holes
8. System stand

BACK

1. (2) USB-A 3.1 Gen 1 port
2. (3) DisplayPort ™1.2 digital video outputs
3. 19V DC power input
4. Cable lock slot
5. Configurable Option Port supporting one of the following:
   - Blank; no optional configured port
   - 2 x USB-A 3.1 Gen 1 ports
   - DisplayPort™ over USB–C™ with USB Power Delivery
   - HDMI digital video output
   - VGA analog video output
   - External Wi-Fi antenna connector
   - Fiber Optic NIC connectors (SC or LC)
   - Serial port with configurable power (shown)
   - Dual serial ports (includes cable adapter)
6. 3.5 mm audio jack
7. (1) USB-A 2.0 port
8. (1) USB-A 2.0 port (designated for *Power-on with Keyboard* if equipped)
9. RJ45 GbE network connector
10. Rear I/O cover removal latch

QuickSpecs

Overview

AT A GLANCE

- AMD Ryzen R1505G System-on-Chip; 2.4 – 3.3 GHz; 2 cores, 4 threads[3]

- AMD Memory Guard Secure Run technology that encrypts data in main memory

- DDR4 dual-channel SDRAM system memory; up to 2400 MT/s transfer rate; two SODIMM slots

- (3) DisplayPort 1.2 video outputs supporting up to UHD/4K (3840 x 2160 @ 60 Hz) resolutions
  NOTE: DisplayPort cables and displays sold separately.

- Solid-state flash memory storage; M.2 form factor modules; one slot

- Gigabit Ethernet (GbE) network connection; support for DASH out-of-band remote management

- Optional Allied Telesis M.2 Fiber Optic NICs; Fast Ethernet (100 Mb/s) or Gigabit (1,000 Mb/s)

- Optional Intel Wireless-AC 9260 Wi-Fi/Bluetooth® adapter including antennas integrated internally in the chassis
  NOTE: Fiber optic and Wi-Fi NIC options cannot be supported together[1]

  NOTE: Wireless features, performance and support may vary depending on environmental variables such placement, settings and firmware of your access points. Please contact your wireless vendor for support of your wireless environment

- Optional remote external Wi-Fi antenna system

- Option Port with a selection of available factory options (see detailed listing later in this document)

- Integrated PC speaker for basic audio playback; 3.5 mm combo headset/audio port on front and 3.5 mm audio port on rear that can be configured as line in or line out supporting headphones, external speaker systems, or microphone

- 45W non-PFC external power adapter

- Security features include a TCG certified TPM version 2.0 and a system UEFI (BIOS) designed to address NIST SP 800-147 BIOS protection guidelines and NIST SP800-155 BIOS integrity measurement guidelines. A cable lock slot is provided for use with a cable lock to enable the system's physical security

- Passive thermal design (no cooling fans) and active thermal management technology that monitors the system operating temperatures, throttles SOC operation if appropriate and prevents unit thermal shutdown.

- Rated for a maximum ambient operating temperature of 40 degree C

- ENERGY STAR® certified configurations available and EPEAT® Silver registered in the United States (except for some models configured with Fiber Optic NIC networking options). See http://www.epeat.net for registration status in other countries

- Post-consumer recycled plastics content greater than 25% total unit plastics (by weight)

- Low halogen[2] material content

- All models TAA compliant in North America

[1] Wireless access point and Internet access is required; availability of public wireless access points is limited

[2] This product is low halogen except for power cords, cables and peripherals, as well as the optional Fiber Optic NIC module; service parts obtained aftermarket may not be low halogen

[3] Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. AMD's numbering is not a measurement of clock speed

Warranty

HP Customer Support: limited three-year hardware limited warranty in most regions; HP Care Packs are extended service contracts that go beyond your standard limited warranties; for more details visit http://www.hp.com/go/cpc

QuickSpecs

Technical Specifications

OPERATING SYSTEMS

- HP ThinPro, including HP /Smart Zero Core
- Windows 10 IoT Enterprise LTSC 2019

PROCESSOR

Model	CPU Frequency Max/Base	Cores/Threads	GPU Type	GPU Frequency
AMD Ryzen R1505G	3.3/2.4 GHz	2/4	Radeon Vega 3	1000 MHz

DISPLAY SUPPORT

Number of displays supported	A maximum of 3 displays are supported.
	Combination:
	3 x DisplayPort(onboard)
	2 x DisplayPort(onboard) + 1 x DisplayPort over USB-C(optional)
	2 x DisplayPort(onboard) + 1 x HDMI(optional)
	2 x DisplayPort(onboard) + 1 x VGA(optional)
Video outputs	3 x DisplayPort(onboard)
	2 x DisplayPort(onboard) + 1 x DisplayPort over USB-C(optional)

Video Resolution Support Matrix

Windows 10 IoT RS5	≤3 x FHD 1920 X 1080 @ 60Hz	1 x UHD/4K 3840 x 2160 @ 60Hz	2 x UHD/4K 3840 x 2160 @ 60Hz	3 x UHD/4K 3840 x 2160 @ 60Hz (2 x 4G RAM or above)
Static screen (no video)	✔	✔	✔	✔
1080 60fps(or below) video	✔	✔	✔	✔
4K 30fps video	✔	✔	✔	✔
4K 60fps video	✔	✔	✔	✔

ThinPro 7.1 (SP8.5)	≤3 x FHD 1920 X 1080 @ 60Hz	1 x UHD/4K 3840 x 2160 @ 60Hz	2 x UHD/4K 3840 x 2160 @ 60Hz	3 x UHD/4K 3840 x 2160 @ 60Hz (2 x 4G RAM or above)
Static screen (no video)	✔	✔	✔	✔

Technical Specifications

GRAPHICS

Number of displays supported:	3	
Video outputs:	Standard:	(3) DisplayPort™ 1.2
	Optional:	(1) DisplayPort™ over USB-C™ with USB Power Delivery (1) VGA analog output (1) HDMI digital output

NOTE: adding and optional output does not increase the number of displays supported.

Max. screen resolution:	3840 x 2160 @ 60 Hz

NOTE: HP recommends dual channel memory (two SODIMMs) configurations for optimal display resolution performance

MEMORY

Type:	DDR4 dual channel SDRAM
Data Transfer Rate:	Up to 2,400 MT/s
Peak Transfer Rate:	Up to 19,200 MB/s
Number of Slots	2 x SODIMM
Capacities:	4, 8, 16 and 32 GB

NOTES:

- The actual transfer rates will be dependent upon the specification of the SODIMM modules used

- The Graphics Processing Unit (GPU) uses part of the total system memory. System memory dedicated to graphics performance is not available for use by other programs

- HP recommends dual channel memory (two SODIMMs) configurations for optimal system performance

Technical Specifications

UEFI

UEFI Specification Revision	2.3.1
TPM 2.0	Meets requirements for Common Criteria, an independent third-party certification of trustworthiness
	Meets requirements for FIPS 140-2, a standard for cryptographic integrity
Security features	System UEFI designed to address NIST SP 800-147 BIOS protection guidelines and NIST SP800-155 BIOS integrity measurement guidelines

STORAGE

Type:	NAND flash memory; non-volatile
Number of Sockets:	(1) M.2
Capacities:	16 GB M.2 eMMC flash module
	32 GB M.2 eMMC flash module
	64 GB M.2 eMMC flash module
	128 GB M.2 SATA flash module
	256 GB M.2 NVMe flash module
	512 GB M.2 NVMe flash module

Input/Output

USB:	Front access:	(1) USB-A 3.1 Gen 1 port
		(1) USB-A 3.1 Gen 2 port
		(1) USB-C™ 3.1 Gen 2 port
	Rear access:	(1) USB-A 2.0 port
		(1) USB-A 2.0 port (designated for *Power-on from Keyboard* if equipped)
		(2) USB-A 3.1 Gen 1 ports
		(2) USB-A 3.1 Gen 1 ports (optional)
Video Outputs:	Standard:	(3) DisplayPort™ 1.2 digital outputs
	Optional:	(1) VGA analog output
		(1) HDMI digital output
		(1) DisplayPort™ over USB-C™ with USB Power Delivery

NOTE: adding an optional output does not increase the number of displays supported.

I/O Interfaces:	Standard:	(1) RJ45 network connector
		(1) 3.5 mm combo headset/audio jack (front)
		(1) 3.5 mm audio jack (rear)
	Optional:	(1) serial port with configurable power
		(2) serial ports enabled with an included cable adapter

Option Port: The rear I/O panel includes an Option Port that can be configured with one of the following factory options:

- Blank; no optional configured port
- 2 x USB-A 3.1 Gen 1 ports
- DisplayPort™ over USB-C™ with USB Power Delivery
- HDMI digital video output
- VGA analog video output
- External Wi-Fi antenna connector (requires Wi-Fi adapter option)
- Fiber Optic NIC connectors; SC or LC connector (requires Fiber Optic NIC option)

Technical Specifications

- Serial port with configurable power
- Dual serial ports enabled with an included cable adapter

AUDIO/VIDEO

Audio Subsystem
- Internal amplified speaker system for basic audio playback
- 3.5 mm combo headset/headphone/analog microphone audio jack (front access)
- 3.5 mm combo line-out/ line-in socket (rear access)

Audio CODECs
- MP3
- AAC Stereo
- HE AAC
- Includes hardware acceleration support

Video CODECs
- MPEG-4 part 2 (DivX, Xvid)
- MPEG-4 part 10 (H.264, AVC), Advanced Video Coding (AVC) (H.264 encode & decode)
- MPEG-H part 2, High Efficiency Video Coding (HEVC, available with Windows 10 IoT Only) (H.265 (8-bit / 10-bit) decode and (8-bit) encode
- WMV 7/8/9 VC-1 & ASF Demuxer
- Includes hardware acceleration support

NETWORKING

Local Area Networking
Realtek RTL8111EPH-CG Gigabit Ethernet (GbE) Controller with support for DASH out-of-band remote management

Wi-Fi Networking
Intel® Wireless-AC 9260 Wi-Fi/Bluetooth® combo; 2x2 802.11ac Wi-Fi and Bluetooth 5
Intel® Wireless ax200 wifi 6
Realtek 8852AE Wi-Fi6 +BT5.2 WLAN

NOTES: Wireless access point and internet access required. Availability of public wireless access points limited Wireless features, performance and support may vary depending on environmental variables such placement, settings and firmware of your access points. Please contact your wireless vendor for support of your wireless environment

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FIBER OPTIC NETWORKING

Adapter Options:
- Allied Telesis AT-27M2/SC Fiber Fast Ethernet M.2 Adapter
- Allied Telesis AT-29M2/SC or LC Fiber Gigabit M.2 Adapter

Features:
- IEEE 802.1p priority encoding/tagging (QoS, CoS)
- IEEE 802.1q VLAN tagging
- IEEE 802.3x flow control
- Buffer/FIFO: 2K transmit and 2K receive (AT-27M2)
- Buffer/FIFO: 22K transmit and 40K receive (AT-29M2)
- Loopback mode
- Descriptor-Based Buffer Management
- Wake-on-LAN from S3 (Sleep) and S4 (Hibernate) not supported
- Link Detection and PHY interface power; the PHY interface, Link detection and Link LED should be enabled by default at power-up

Technical Specifications

Performance:	AT-27M2	•	>= 85 Mbit/s receive, <= 30% CPU utilization
		•	>= 85 Mbit/s transmit, <= 30% CPU utilization
		•	>= 170 Mbit/s total bi-directional, <= 30% CPU utilization

NOTE: The minimum transfer size at 100 Mbit/s is 1 Gbps

	AT-29M2	•	>= 800 Mbit/s receive, <= 30% CPU utilization
		•	>= 800 Mbit/s transmit, <= 30% CPU utilization
		•	>= 1500 Mbit/s total bi-directional, <= 30% C:U utilization

NOTE: The minimum transfer size at 1000 Mbit/s is 1500 Gbps

External Interface: Complies with IEEE 802.3 1000BASE-X operation

Power:
- Uses less than 1775 mW of power at full performance (AT-27M2)
- Uses less than 2100 mW of power at full performance (AT-29M2)
- Supports all PCI Express bus states L0, L0s, L1 and L2

Non-volatile Storage: The MAC address is unique for each system; assigned from the board assembly manufacturer's IEEE registered allocation.

The PCI subsystem ID is unique to HP and unique to each design to allow Windows Update to be finely controlled.

QuickSpecs

Technical Specifications

SOFTWARE SUPPORT

Host Environment	Protocol	HP ThinPro	Microsoft Windows 10 IoT Enterprise 2019
Remote Desktop Services	Remote FX (RFX), RDP	✔	✔
Citrix®	ICA, HDX	✔	✔
VMware® Horizon	RDP, PCoIP, Blast Extreme	✔	✔

Protocol Clients	HP ThinPro	Microsoft Windows 10 IoT Enterprise 2019
Citrix® Workspace app	✔	✔
Microsoft Remote Desktop Client		✔
Free Remote Desktop Client	✔	
VMware™ Horizon View™ Client	✔	✔
HP Remote Graphics Software (RGS)	via add-on	✔
Turbosoft TTerm for Linux® Terminal emulation Software	via add-on	
Turbosoft TTWin Terminal emulation software		via add-on

Browser Support	HP ThinPro	Microsoft Windows 10 IoT Enterprise 2019
Mozilla Firefox	✔	
Internet Explorer		✔

Security	HP ThinPro	Microsoft Windows 10 IoT Enterprise 2019
Smart Card	✔	✔
Log-on Manager	✔	✔
Read only Operating System	✔	✔
802.1x	✔	✔
Microsoft Firewall		✔
HP Write Manager		✔

Technical Specifications

Microsoft Unified Write Filter		✔
NOTE: the HP Write Manager is the default active write filter. The Microsoft Unified Write Filter is disabled by default but can be enabled by the user if required.		

Management Tools	HP ThinPro	Microsoft Windows 10 IoT Enterprise 2019
HP Device Manager	✔	✔
HP ThinUpdate		✔
HP Easy Tools	✔	
HP Smart Zero Client Services	✔	
Microsoft SCCM/EDM agent		✔
HP USB Port Manager		✔

Additional Windows Components	HP ThinPro	Microsoft Windows 10 IoT Enterprise 2019
HP Easy Shell		✔
Windows Media Player		✔
Microsoft Direct Access		✔
Microsoft BranchCache		✔
Microsoft AppLocker		✔
Microsoft Sideloading		✔
CyberLink		✔

NOTE: Other add-on software available (see: http://www.hp.com/support for latest list of available add-ons). Software performance and support may vary depending on customer environment and backend.

Audio/Video CODECs	HP ThinPro	Microsoft Windows 10 IoT Enterprise 2019
MP3	✔	✔
WMA stereo	✔	✔
AAC stereo & HE AAC	✔	
Microsoft AC3 encoder		✔
MPEG-1	✔	

Technical Specifications

MPEG-4 part 2 (DivX, Xvid, H.263)	✔	✔
MPEG-4 part 10 (H.264, AVC)	✔	✔
WMV 7/8/9/ VC-1 & ASF Demuxer	✔	✔

Recommended TC config for Microsoft Teams media optimization

	TC CPU	VMware Teams Optimization	Citrix Teams Optimization
t430	1.10 GHz 2 Core	–	–
t530	1.50 GHz 2 Core	–	–
t540	1.50 GHz 2 Core	–	–
t630	2.00 GHz 4 Core	✔	✔
t628	1.99 GHz 4 Core	–	✔
t638	2.00 GHz 4 Core	✔	✔
t640	2.40 GHz 2 Core	✔	✔
t730	2.70 GHz 4 Core	✔	✔
t740	3.25 GHz 4 Core	✔	✔
mt21	1.80 GHz 2 Core	–	✔
mt22	1.90 GHz 2 Core	–	✔
mt31	1.80 GHz 2 Core	–	✔
mt32	2.70 GHz 4 Core	✔	✔
mt45	2.10 GHz 4 Core	✔	✔
mt46	2.50 GHz 4 Core	✔	✔
- Not recommended, ✔ recommended			

WEIGHTS & DIMENSIONS

W x D x H: (vertical orientation)	35 x 196 x 196 mm
Volume:	1.34 liter
System Weight (unit with stand)	994.5g
Shipping Weight	2878g

NOTE: All measurements are approximate; the addition of optional modules will increase the weight

QuickSpecs

Technical Specifications

EXTERNAL POWER SUPPLY

45W non-PFC Smart external power adapter

Worldwide auto-sensing 100 - 240 VAC; nominal voltage is 120 VAC; 50 - 60 Hz

Energy saving automatic power-down; surge tolerant

1.8m output cable

External power adapters are sourced from several suppliers in order to ensure adequate supply and availability is maintained. The actual dimensions of the power brick will vary by supplier.

HP P/N	Vendor	Dimensions:
L25296-001	Lite-On	94 x 40 x 26.5 mm
L25296-002	Chicony	95 x 40 x 26.5 mm
L25296-003	Delta	94 x 39 x 26.5 mm
L25296-004	AcBel	91.4 x 44 x 26.8 mm

Technical Specifications

COMPLIANCE/CERTIFICATIONS

Accessibility:	Section 508 Accessibility; VPAT report available.
Environmental Stewardship:	Worldwide (ENERGY STAR® configurations available, EPEAT 2.0, RoHS2, ERP, TCO Certified, CECP& SEPA, HP GSE, WEEE, Low Halogen, etc.)
Product Safety:	Worldwide (UL, CB, GS, CCC, BSMI, etc.)
Electromagnetic Compliance (EMC):	Worldwide (FCC/CISPR/EN/VCCI/ICES/AS/NZS/CNS/KCC) "Class B" EMI regulations
International Medical Safety Standard:	EN60601-1-2 (Medical Equipment EMC)

ENVIRONMENTAL

Operating Temperature Range:	50° to 104° F 10° to 40° C
Non-operating Temperature Range:	-22° to 140° F -30° to 60° C
Humidity:	Condensing: 20% to 80% Non-condensing: 10% to 90%

NOTE: Specifications are at sea level with altitude derating of 1° C/300m (1.8° F/1000ft) to a maximum of 3 Km (10,000 ft), with no direct, sustained sunlight. Upper limit may be limited by the type and number of options installed.

Basic Configuration (does not include a fiber optic NIC):

Energy Consumption	115 V ac, 60 Hz	230 V ac, 50 Hz	100 V ac, 60 Hz
Normal Operation (Short idle)	9.35 W	9.62 W	9.43 W
Normal Operation (Long idle)	8.45 W	8.62 W	8.52 W
Sleep	1.87 W	1.88 W	1.88 W
Off	1.85 W	1.71 W	1.71 W

Heat Dissipation*	115 V ac, 60 Hz	230 V ac, 50 Hz	100 V ac, 60 Hz
Normal Operation (Short idle)	32 BTU/hr	33 BTU/hr	32 BTU/hr
Normal Operation (Long idle)	29 BTU/hr	29 BTU/hr	29 BTU/hr
Sleep	6 BTU/hr	6 BTU/hr	6 BTU/hr
Off	6 BTU/hr	6 BTU/hr	6 BTU/hr

NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

System configuration includes: HP Thin Pro 64bit operating system, 128 GB storage, 32 GB system memory, USB keyboard & mouse

Optional Configuration (includes a fiber optic NIC):

Energy Consumption	115 V ac, 60 Hz	230 V ac, 50 Hz	100 V ac, 60 Hz
Normal Operation (Short idle)	10.9 W	11.19 W	11.13 W
Normal Operation (Long idle)	9.55 W	10.35 W	10.09 W
Sleep	2.99 W	2.98 W	3.02 W

Technical Specifications

Off	2.84 W	2.81 W	2.85 W

Heat Dissipation*	115 V ac, 60 Hz	230 V ac, 50 Hz	100 V ac, 60 Hz
Normal Operation (Short idle)	37 BTU/hr	38 BTU/hr	38 BTU/hr
Normal Operation (Long idle)	33 BTU/hr	35 BTU/hr	34 BTU/hr
Sleep	10 BTU/hr	10 BTU/hr	10 BTU/hr
Off	10 BTU/hr	10 BTU/hr	10 BTU/hr

NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

System configuration includes: Windows 10 IoT Enterprise LTSC 2019 operating system, 128 GB storage, 32 GB system memory, 100 Mbps SC Fiber Optic NIC, USB keyboard & mouse

Acoustic Noise Emission Declaration	
Measurement and declaration standards:	ISO 7779: Acoustics – Measurement of airborne noise emitted by information technology and telecommunications equipment
	ISO 9296: Acoustics – Declared noise emission values of computer and business equipment

Declared Noise Emission Values in accordance with ISO 9296

Product Configuration or Operating Mode # (see section below for description)	Declared Sound Power Level, L_{Wad} Bels			Declared Sound Pressure Level, L_{pAm} dBA		
				Tested on ISO Table		
	Idle	Operating		Idle	Operating	
	ECMA-74 C.15.3.2 Idle Mode	ECMA-74 C.9.3.2 Drive Random Seek	ECMA-74 C.15.3.3 g Active Mode	ECMA-74 C.15.3.2 Idle Mode	ECMA-74 C.9.3.2 Drive Random Seek	ECMA-74 C.15.3.3 g Active Mode
Vertical	2.5	2.5	2.5	13.7	13.7	13.7
Horizontal	2.5	2.5	2.5	N/A	N/A	N/A

The Product meets the acoustic noise limits of these voluntary Eco labels:	TCO Certified Blue Angel Nordic Swan EU Flower

NOTE: Measured under ISO 7779 and ISO 9296 measurement and declaration standards.

Summary of Changes

Date of change:	Version History:	Type of change	Description of change:
September 10, 2019	From v1 to v2	Added	Acoustic Noise Emission Declaration section
		Changed	Format page 2, changed Graphics, Memory, UEFI, WEIGHTS & DIMENSIONS and ENVIRONMENTAL sections
April 28, 2020	From v2 to v3	Added	DISPLAY SUPPORT section
May 18, 2020	From v3 to v4	Changed	AUDIO/VIDEO section
October 14, 2020	From v4 to v5	Changed	Energy Star certification
January 14, 2021	From v5 to v6	Changed	SOFTWARE SUPPORT section
October 8, 2021	From v6 to v7	Changed	NETWORKING section
December 1, 2021	From v7 to v8	Changed	TCO Certification