

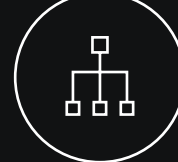


POWER-PACKED MONITOR FOR THE MODERN WORKFORCE

Workplaces are transforming, and businesses need to keep up with the evolving expectations. Millennials and Gen Z are hyperaware of the quality and user experience they want from their work monitors. The upgraded ThinkVision P27h-20, **engineered for tech-savvy professionals**, fits the bill perfectly. **QHD resolution** on this crisp display augments creativity and enables enhanced detailing. It delivers a premium, functional, and ergonomic experience with a stunning **27-inch, 4-side NearEdgeless In-Plane Switching** panel. Thanks to its **anti-glare screen**, this monitor is ideal for contemporary open offices. Designed to cater to your work style, you can easily connect to peripherals through the P27h-20's versatile connectivity ports, for a holistic experience. Moreover, this monitor's factory-calibrated color accuracy with average **Delta E<2, 99% sRGB, 99% BT.709, and multiple color spaces** offer excellent color performance. Integrated with Smart Power¹, the monitor offers full-functioned USB Type-C² one cable solution with the capability to deliver up to 90 W³ power delivery and an Ethernet signal. Equipped with ThinkColour Software,⁴ the ThinkVision P27h-20 lets you adjust advanced display settings to tailor your monitor to your specific needs. The ThinkColour menu is designed to be simple and convenient, so you can configure it in the best way for you.



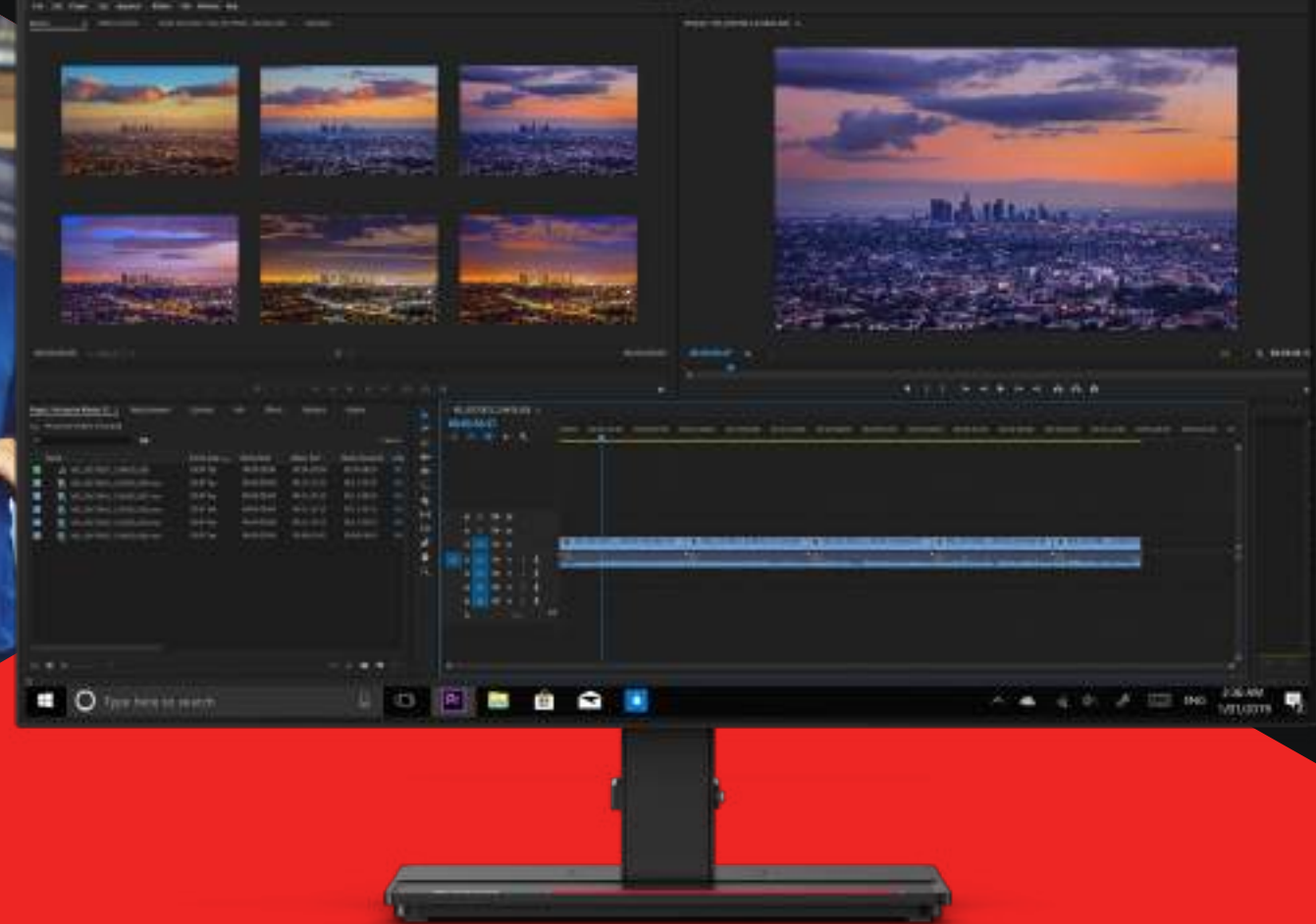
Amplified Viewing Experience



Advanced Connectivity



Functional Design



Impressive Visuals from Edge to Edge

The ThinkVision P27h-20 with its QHD resolution provides 1.77 times more clarity than a Full-HD display, enhancing the productivity of business professionals and content creators. Whether you are crunching numbers or editing visual content, you'll never miss a detail on the 4-side NearEdgeless In-Plane Switching panel and 178° viewing angles. The factory-calibrated 99% sRGB color gamut in addition to 99% BT.709 and 85% DCI-P3 provide the best color consistency and striking image quality. Lenovo exclusive ThinkColour software⁴ lets you effortlessly adjust advanced display settings using the mouse, enhancing efficiency and user experience.



Display
4-side NearEdgeless In-Plane Switching Panel



Color Gamut and Accuracy
99% sRGB
99% BT.709
85% DCI-P3
Delta E<2



Resolution
QHD (2560 x 1440)



Experience Superior Connectivity

Collaborate effectively by connecting to various peripherals with the USB Type-C² one-cable solution, which also doubles up as a power charging cable. Conduct meetings and presentations seamlessly with the ethernet port, audio out, video, and USB data slots on offer. Multitasking will now be a breeze as you can daisy chain and create a multi-monitor setup via the DisplayPort. Smart Power¹ intelligently distributes power to connected USB and USB Type-C² devices, maximizing power supply efficiency while also reducing overall consumption.



Connectivity
One-cable Solution for Ethernet, video, audio, and data via USB Type-C²



Smart Power¹
Up to 90 W³ power delivery via USB Type-C²



Collaboration
1 x USB-C Gen1 (DP1.2 Alt Mode)
1 x HDMI 1.4
1 x DP 1.2
1 x DP 1.2 (Out)
4 x USB 3.1 Gen1 (1 BC)
1 x Audio Out (3.5 mm)
1 x Ethernet



Efficient Workspace

The ThinkVision P27h-20 doesn't just look good but also enhances the user experience with ergonomic, space-saving, and easy-to-use features. Vertical stand with swivel, tilt, pivot, and increased lift functionality ensures easy positioning of the monitor and reduces strain on your neck and back. With flexible cable management system, wires don't get entangled, minimizing clutter. An integrated phone holder, VESA mount, and minimized square base also let you have an organized desk. The P27h-20 is TÜV Rheinland Eye Comfort-certified to minimize eye fatigue, ensuring you work exertion free.



Ergonomics
Full function Increased Lift Range (Max 135 mm)



Space-Saving
Upgraded family design Cable Management



Convenience
Phone holder

ThinkVision P27h-20 Monitor

Specifications

DISPLAY

Panel Size
27-inch

Screen Dimensions
596.74 mm x 335.66 mm

Panel Type
4-side NearEdgeless In-Plane Switching

Backlight
WLED

Aspect Ratio
16:9

Resolution
2560 x 1440

Pixel Pitch
0.2331 x 0.2331 mm

Dot/Pixel Per Inch (DPI/PPI)
109

Viewing Angle (H x V @ CR 10:1)
178° / 178°

Response Time
4ms (extreme mode)
6ms (normal mode)

Refresh Rate
60 Hz

Brightness (typical)
350 cd/m²

Contrast Ratio (typical)
1000:1

Dynamic Contrast Ratio (typical)
3M:1

Color Gamut
99% sRGB,
99% BT.709,
85% DCI-P3

Color Support (typical)
16.7 Million

Processor LUT
8-bit

Anti-glare
Yes

CONNECTIVITY

Video Signal
1 x USB Type-C² Gen1 (DP1.2 Alt Mode)
1 x HDMI 1.4
1 x DP 1.2
1 x DP 1.2 (Out)

Audio Output
1 x Audio Out (3.5 mm)

USB Hub
Yes

Ethernet
Yes (10M/100M/1000M)

USB Upstream
1 x USB 3.1 Gen1 (by USB Type-C Gen1)

USB Downstream
4 x USB 3.1 Gen1 (1 x BC1.2)

MULTI-MEDIA

Integrated Speakers
Yes (2 x 1W)

Optional Speaker Support
Yes (PN OA36190)

SPECIAL FEATURES

Factory Calibration
Yes (Avg. Delta E<2)

Software
Lenovo ThinkColour (Lenovo Display Control Center)⁴

POWER

Power Consumption (typ./max.)
27W / 150W

Power Consumption Sleep/Off Mode
< 0.5W

Power Consumption Switch-off Mode
< 0.3W

ENERGY STAR Power Consumption (P_{on}/E_{tec})
19W / 61kWh

Power Supply
Internal

USB Type-C Power Delivery (W)
Up to 90 W³

Smart Power¹
Yes

Voltage Required
AC 100 to 240 V (50-60 Hz)

MECHANICAL

Tilt Angle (front/back)
-5° / 35°

Swivel Angle (left/right)
+45° / -45°

Lift (max range)
135 mm

Pivot
-90° / 90°

VESA Mount Capability
Yes (100 x 100 mm)

Kensington Lock Slot
Yes

Cable Management
Yes

Bezel Color
Raven Black

Bezel Width (side)
2.0 mm

Bezel Width (top/bottom)
2.0 / 2.0 mm

DIMENSION

Size Packed (D x H x W, mm/inch)
182 x 463 x 722 mm
7.17 x 18.23 x 28.43 inches

Size Unpacked w/ Stand (D x H x W, mm/inch) (lowest position)
208 x 441.5 x 613.8 mm
8.19 x 17.38 x 27.17 inches

Size Unpacked w/ Stand (highest position)
208 x 576.5 x 613.8 mm
8.19 x 22.70 x 27.17 inches

Size Unpacked w/o Stand (head only) (D x H x W, mm/inch)
146.9 x 353.8 x 613.8 mm
1.85 x 13.92 x 27.17 inches

Min. Distance from Table to Panel (lowest pixel at bottom of screen, mm)
97.3 mm

Max. Distance from Table to Panel (highest pixel at top of screen, mm)
567.9 mm

Weight Packed (kg./lbs.)
9.55 kg / 21.01 lbs.

Weight Unpacked (kg./lbs.)
7.35 kg / 16.17 lbs.

Weight (monitor head only) (kg./lbs.)
4.87 kg / 10.71 lbs.

Full Container Load (40' STD / 20' STD)
792 / 352 units

WHAT'S IN THE BOX

Monitor with stand
1 x Power cable (1.8 m)
1 x DP cable (1.8 m) (NA only)
1 x USB Type-C to Type-A cable (1.8 m)
1 x USB Type-C to Type-A cable (1.8 m) (NA only)
Factory calibration report
Quick setup guide

CERTIFICATION

ENERGY STAR Rating
8.0

CCC
Yes

TCO
8.0

TCO Edge
2.0

PEAT
Silver

RoHS (EU 2002/95/EC)
Yes

Windows Certification
Windows 7, Windows 10

China Energy Efficiency Standard
Tier 1

TÜV Rheinland Eye Comfort
Yes

© 2021 Lenovo. All rights reserved. Depending on many factors such as the processing capability of peripheral devices, file attributes, and other factors related to system configuration and operating environments, the actual transfer rate using the various USB connectors on this device will vary and is typically slower than the data rates as defined by the respective USB specifications: - 5 Gbit/s for USB 3.1 Gen1, 10 Gbit/s for USB 3.1 Gen2 & 20 Gbit/s for USB 3.2. These products are available while supplies last. Prices shown are subject to change without notice. For any questions concerning prices, please contact your Lenovo Account Executive. Lenovo is not responsible for photographic or typographic errors. Warranty: For a copy of applicable warranties, write to: Warranty Information, 500 Park Offices Drive, RTP, NC 27709, Attn: Dept. ZPVA/B000. Lenovo makes no representation or warranty regarding third-party products or services. Trademarks: Lenovo, the Lenovo logo, Rescue and Recovery, ThinkPad, ThinkCentre, ThinkStation, ThinkVantage, and ThinkVision are trademarks or registered trademarks of Lenovo. Microsoft, Windows, and Vista are registered trademarks of Microsoft Corporation. Intel, the Intel logo, Intel Inside, Intel Core, and Core Inside are trademarks of Intel Corporation in the U.S. and/or other countries. Other company, product, and service names may be trademarks or service marks of others.

ThinkStation P340 Tower

For a modest budget advanced users can get this compact workstation and scale performance capabilities as they need. Although 5% smaller than the previous generation, it supports the latest 125W multi-core processors, up to NVIDIA Quadro RTX5000 graphics, 4 internal SATA drives plus up to 4x M.2 SSD. Users can quickly screen and identify potential system errors with the ThinkStation Diagnostics tool.

PROFESSIONAL MACHINES FOR ADVANCED USERS



ThinkStation P3 Series workstations provide affordable power-computing with a choice of processor technologies, expansion bays and support for multiple storage drives.



REASONS TO BUY

Lenovo Performance Tuner enables users to fine-tune power management, BIOS, processor priority, graphics features and more. Save settings in software-specific profiles or use the predefined profiles created by our experts for popular applications like ANSYS, AutoDesk and Solidworks.

Select Intel Xeon W processors and error-free ECC memory configurations to support data analysis workloads.

For graphic design, configure with multiple PCIe SSD drives, up to a 125W Intel Xeon processor and advanced NVIDIA Quadro graphics.

ThinkStation P340 Tower

KEY SPECIFICATIONS

Processor	up to Intel Xeon W-1290P or 10th Gen Intel Core i9 processor
Operating System	Powered by Windows 10 Pro for Workstations
Max Graphics	up to 1x NVIDIA Quadro RTX 5000
Memory	up to 128GB DDR4-2933 ECC or 128GB DDR4-2933 non-ECC
Max Storage Drives	Internal storage: 14TB (2x 6TB 3.5" SATA HDD + 2x 1TB 2.5" SATA HDD/SSD) or 4TB (4x 2.5" 1TB SATA SSD/HDD) M.2 SSD: 8TB (4x 2TB M.2 PCIe NVMe SSD - 2 onboard & 2 via PCIe to M.2 adapter) <i>Overall storage capacity depends on mix of Internal, M.2, PCIe cards and other options installed</i>
Storage Types Supported	3.5" SATA HDD 6Gb/s 7.2k RPM up to 6TB 2.5" SATA HDD 6GB/s 7.2k RPM up to 1TB FIPS 2.5" SATA SSD 6GB/s up to 1TB Optane Memory PCIe NVMe 32GB M.2 PCIe NVMe SSD up to 2TB RAID 0/1/10/5 supported
Storage Controllers	Onboard Intel RST SATA RAID Onboard Intel RSTe PCIe
Optical	optional DVD Burner
Power Supply	<i>One of the following</i> 300W 90% 500W 92%
Dimensions	Width: 170mm (6.7") Depth: 315.35mm (12.4") Height: 376mm (14.8")
Weight	Max configuration: 9.4kg (20.7lb)

GREEN CERTIFICATIONS

GREENGUARD. EPEAT Silver rating. ENERGY STAR 8.0, 80 Plus Platinum (500W, 300W PSU)

CONNECTIVITY

Front I/O	2x USB 3.2 Gen 1, 2x USB 3.2 Gen 2, 1x USB-C 3.2 Gen 1, mic-in, audio combo jack
Rear I/O	2x USB 3.2 Gen 1, 2x USB 2.0, ethernet (RJ-45), 1x COM, 2x DisplayPort, audio line-out
Optional Rear Ports	<i>One of the following</i> 1x PS/2 1x PS/2 + 1x Thunderbolt 1x PS/2 + 1x Video port, DP 1x PS/2 + 1x Video port, HDMI 1x PS/2 + 1x Video port, USB-C 1x Parallel 1x Parallel + 1x USB-C 1x Parallel + 1x Video port, HDMI 1x Serial 1x Serial + 1x PS/2 1x Serial + 1x Parallel 1x Serial + 1x Parallel + 1x PS/2 1x Serial + 1x Parallel + 1x Video port, DP 1x Serial + 1x Parallel + 1x Video port, HDMI 1x Serial + 1x Thunderbolt 1x Serial + 1x Video port, USB-C 1x Thunderbolt 1x Thunderbolt + 1x Video port, HDMI 1x USB-C 1x USB-C + 1x Video port, HDMI 1x USB-C + 1x Video port, USB-C 1x Video port, DP 1x Video port, HDMI 1x Video port, HDMI + 1x PS/2 + 1x Parallel + 1x Serial 1x Video port, HDMI + 1x PS/2 + 1x Serial + 2x USB 2.0 1x Video port, HDMI + 1x Thunderbolt + 2x USB 3.0 + 2x USB 2.0 1x Video port, HDMI + 1x USB-C + 1x Thunderbolt + 2x USB 3.0 + 2x USB 2.0 1x Video port, HDMI + 1x USB-C + 2x USB 3.0 + 2x USB 2.0 1x Video port, USB-C 2x USB 2.0 2x USB 2.0 + 1x PS/2 2x USB 2.0 + 1x Serial 2x USB 2.0 + 1x Serial + 1x USB-C 2x USB 2.0 + 1x Serial + 1x Video port, HDMI 2x USB 2.0 + 1x USB-C 2x USB 2.0 + 1x Video port, USB-C 2x USB 2.0 + 1x Video port, DP 2x USB 2.0 + 1x Video port, HDMI 2x USB 2.0 + 1x Video port, USB-C 2x USB 3.0 + 1x USB-C 2x USB 3.0 + 1x Video port, USB-C 2x USB 3.0 2x USB 3.0 + 1x USB-C 2x USB 3.0 + 1x Video port, DP 2x USB 3.0 + 1x Video port, USB-C

WLAN + Bluetooth

Intel AX201 11ax, 2x2 + BT5.1

SECURITY & PRIVACY

Chassis Intrusion Switch
Cable Lock
E-Lock
Kensington lock slot
Padlock slot
Cable lock
Hardware TPM 2.0

MANAGEABILITY

Intel vPro with AMT 14, DASH
Standard Manageability

ISV CER

ANSYS, Revit, A V8i, COI / Chang-Siemens

Recommended for this device



ThinkVision T32h-20

31.5" QHD (2560x1440) near-borderless monitor with 99% sRGB colour gamut

1x HDMI, 1x DisplayPort, 1x USB-C (data, video & data), 4x USB3.1, audio out

Lift, Tilt, Pivot, Swivel stand for viewing comfort. Integrated smartphone holder in base.



ThinkVision T34w-20

34" WQHD display with 1500R curvature, ultra-wide 21:9 aspect ratio, 3000:1 contrast ratio, 99% sRGB colour gamut

1x HDMI, 1x DisplayPort. Integrated USB hub (1x USB-C, 4x USB3.1). Audio out.

Lift, Tilt, Pivot, Swivel stand for viewing comfort. Integrated smartphone holder in base.

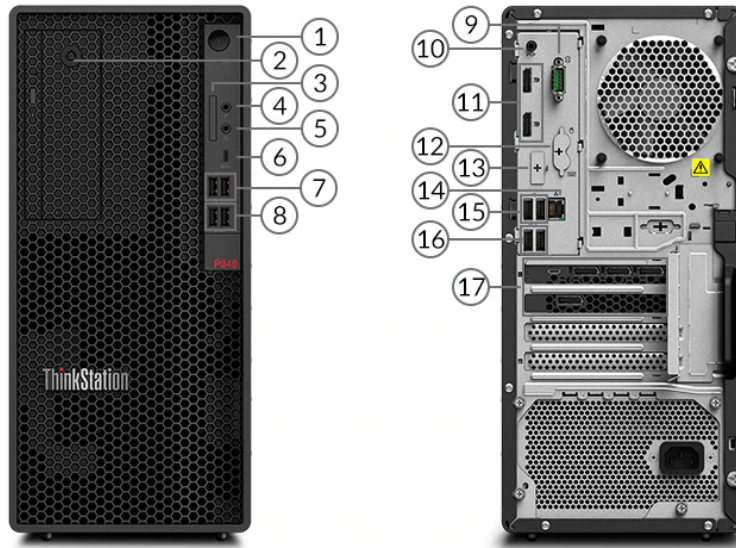


Technician Installed Customer Replaceable Unit

Add-on service for On-Site Warranty Upgrades and Premier Support

If a faulty device requires a Customer Replaceable Unit (CRU) part we will send a technician to your premises

OVERVIEW



1. Power button	10. Line-out (3.5mm)
2. Optical drive *	11. 2x DisplayPort
3. Card reader	12. 2x PS/2 ports (keyboard / mouse) *
4. Microphone (3.5mm)	13. Video port (DisplayPort, HDMI, or USB-C) *
5. Headphone / microphone combo jack (3.5mm)	14. Ethernet (RJ-45)
6. USB-C 3.2 Gen 1	15. 2x USB 2.0
7. 2x USB 3.2 Gen 1	16. 2x USB 3.2 Gen 1
8. 2x USB 3.2 Gen 2	17. Optional ports on expansion cards *
9. Serial	

Notes:

- Ports with * are only available on selected models

PERFORMANCE

Processor

Processor Family

Up to one Intel® Xeon®, Core™ i9, i7, i5, or i3 processor

Processor

Processor Name	Cores	Threads	Base Frequency	Max Frequency	Cache	Memory Support	Processor Graphics
Core i3-10100	4	8	3.6GHz	4.3GHz	6MB	DDR4-2666	Intel UHD Graphics 630
Core i3-10300	4	8	3.7GHz	4.4GHz	8MB	DDR4-2666	Intel UHD Graphics 630
Core i3-10320	4	8	3.8GHz	4.6GHz	8MB	DDR4-2666	Intel UHD Graphics 630
Core i5-10400	6	12	2.9GHz	4.3GHz	12MB	DDR4-2666	Intel UHD Graphics 630
Core i5-10500	6	12	3.1GHz	4.5GHz	12MB	DDR4-2666	Intel UHD Graphics 630
Core i5-10600	6	12	3.3GHz	4.8GHz	12MB	DDR4-2666	Intel UHD Graphics 630
Core i5-10600K	6	12	4.1GHz	4.8GHz	12MB	DDR4-2666	Intel UHD Graphics 630
Core i7-10700	8	16	2.9GHz	4.8GHz	16MB	DDR4-2933	Intel UHD Graphics 630
Core i7-10700K	8	16	3.8GHz	5.1GHz	16MB	DDR4-2933	Intel UHD Graphics 630
Core i9-10900	10	20	2.8GHz	5.2GHz	20MB	DDR4-2933	Intel UHD Graphics 630
Core i9-10900K	10	20	3.7GHz	5.3GHz	20MB	DDR4-2933	Intel UHD Graphics 630
Xeon W-1250	6	12	3.3GHz	4.7GHz	12MB	DDR4-2666	Intel UHD Graphics P630
Xeon W-1250P	6	12	4.1GHz	4.8GHz	12MB	DDR4-2666	Intel UHD Graphics P630
Xeon W-1270	8	16	3.4GHz	5.0GHz	16MB	DDR4-2933	Intel UHD Graphics P630
Xeon W-1270P	8	16	3.8GHz	5.1GHz	16MB	DDR4-2933	Intel UHD Graphics P630
Xeon W-1290	10	20	3.2GHz	5.2GHz	20MB	DDR4-2933	Intel UHD Graphics P630
Xeon W-1290P	10	20	3.7GHz	5.3GHz	20MB	DDR4-2933	Intel UHD Graphics P630

Processor Sockets

1x FCLGA1200

Operating System

Operating System

- Windows® 10 Pro 64
- Windows 10 Pro 64 for Workstations
- Ubuntu Linux LTS
- No operating system

Graphics

Integrated Graphics

- Intel UHD Graphics 630
- Intel UHD Graphics P630

Discrete Graphics Support

Supports up to one NVIDIA® Quadro® RTX 5000, or two NVIDIA Quadro P2200, 500W PSU is needed

Discrete Graphics Offering^[1]

Graphics	Memory	Power	Connector	SLI / NVlink
Quadro P400	2GB GDDR5	30W	3x miniDP	None
Quadro P620	2GB GDDR5	40W	4x miniDP	None
Quadro P1000	4GB GDDR5	50W	4x miniDP	None
Quadro P2200	5GB GDDR5	75W	4x DP	None
Quadro RTX 4000	8GB GDDR6	160W	3x DP, 1x VirtualLink	None
Quadro RTX 5000	16GB GDDR6	265W	4x DP, 1x VirtualLink	None

Notes:

- 1. NVIDIA Quadro RTX 5000 supports manufacture configure only, none standalone option is available

Monitor Support

Monitor Support

Supports multiple displays via onboard video ports and discrete graphics, the number of maximum monitors supported depends on the graphic card in use

Chipset

Chipset

Intel W480 chipset

Memory

Memory Type

- DDR4-2933 UDIMM ECC
- DDR4-2933 UDIMM non-ECC

Memory Slots

Four DDR4 UDIMM slots, dual-channel capable

Memory Protection

ECC on models with ECC DIMMs and Xeon processor

Max Memory⁽¹⁾

Up to 128GB DDR4-2933

Notes:

- 1. The max memory is based on the test results with current Lenovo® memory offerings. The system may support more memory as the technology develops.

Storage

Storage Support

Up to 2x 3.5" SATA HDD / 4x 2.5" SATA HDD / SSD + 4x M.2 PCIe SSD

- 3.5" HDD up to 4TB each
- 2.5" SATA HDD up to 1TB each
- 2.5" SATA SSD up to 1TB each
- M.2 PCIe SSD up to 2TB each
- Optional Intel Optane™ Memory

Storage Controllers

Storage Controller	Type	Interface	RAID	Cache
Onboard Intel RST SATA RAID	Standard	SATA 6.0Gb/s	0/1/10/5	None
Onboard Intel RST PCIe RAID	Standard	PCIe NVMe	0/1	None

Storage Type

Disk Type	Interface	RPM	Offering
2.5" SATA SSD	SATA 6Gb/s	-	512GB / 1TB
M.2 PCIe SSD	PCIe NVMe	-	256GB / 512GB / 1TB / 2TB
2.5" SATA HDD	SATA 6Gb/s	7.2K	1TB FIPS
Intel Optane Memory	PCIe NVMe	-	-
3.5" SATA HDD	SATA 6Gb/s	7.2K	1TB / 2TB / 4TB

Removable Storage

Optical Support

Optional one 9.0mm optical drive, DVD-ROM, DVD±RW, and Blu-ray

Card Reader

- SD card reader

- No card reader

Multi-Media

Audio Chip

High Definition (HD) Audio, Realtek® ALC623 codec

Power Supply

Power Supply

Power	Type	Efficiency	Key Features
300W	Fixed	90%	100V - 240V, 80 PLUS Gold qualified
500W	Fixed	92%	100V - 240V, 80 PLUS Platinum qualified

DESIGN

Mechanical

Form Factor

Tower (17L)

Dimensions (WxDxH)

170 x 315.35 x 376 mm (6.7 x 12.4 x 14.8 inches)

Weight

9.38 kg (20.68 lbs, maximum configuration)

Bays

- 1x 3.5" disk bay (standard)
- 1x 3.5" disk bay (optional, via Flex bay)
- 2x 2.5" disk bay (optional, comes with disk or optional upgrade kit)

M.2 Slots

Up to 4x M.2 SSD:

- 2 via onboard slots
- 2 via Single M.2 to PCIe adapter

Expansion Slots

- Two PCIe 3.0 x16
- One PCIe 3.0 x1

Expansion Slots Offering

Slot 1: PCIe 3.0 x16, full height, full length, links to CPU

Slot 2: PCIe 3.0 x1, full height, full length, links to PCH

Slot 3: PCIe 3.0 x16 (negotiable link width x4), full height, full length, links to PCH

CONNECTIVITY

Network

Onboard Ethernet

Gigabit Ethernet, Intel Ethernet Connection I219-LM, 1x RJ45, supports Wake-on-LAN

Optional Ethernet

Additional Ethernet options via PCIe adapter

WLAN + Bluetooth™

- Intel Wi-Fi 6 AX201, 802.11ax 2x2 Wi-Fi + Bluetooth 5.1, M.2 Card
- No WLAN and Bluetooth

Ports^[1]

Front Ports

- 2x USB 3.2 Gen 1
- 2x USB 3.2 Gen 2
- 1x USB-C 3.2 Gen 1

- 1x headphone / microphone combo jack (3.5mm)
- 1x microphone (3.5mm)

Rear Ports^[2]

- 2x USB 2.0
- 2x USB 3.2 Gen 1
- 1x serial (9-pin)
- 1x Ethernet (RJ-45)
- 1x line-out (3.5mm)
- 2x DisplayPort™

Optional Rear Ports

- 2x USB 2.0
- 2x USB-C 3.2 Gen 2 (via 2-port USB-C expansion card)
- 1x video (DisplayPort, HDMI®, or USB-C)
- 1x Thunderbolt™
- 2x USB 3.2 Gen 1 (via 2-port USB expansion card, PCIe x1)
- 1x serial
- 4x serial (via 4-port serial expansion card, PCIe x1)
- 1x parallel
- 2x PS/2

Notes:

1. The transfer speed of following ports will vary and, depending on many factors, such as the processing speed of the host device, file attributes and other factors related to system configuration and your operating environment, will be slower than theoretical speed.
USB 2.0: 480 Mbit/s;
USB 3.2 Gen 1 (SuperSpeed USB 5Gbps, formerly USB 3.0 / USB 3.1 Gen 1): 5 Gbit/s;
USB 3.2 Gen 2 (SuperSpeed USB 10Gbps, formerly USB 3.1 Gen 2): 10 Gbit/s;
USB 3.2 Gen 2x2 (SuperSpeed USB 20Gbps): 20 Gbit/s;
Thunderbolt 3: 40 Gbit/s;
FireWire 400: 400 Mbit/s;
FireWire 800: 800 Mbit/s
2. For video ports on discrete graphics, please see graphics section

SECURITY & PRIVACY

Security

Security Chip

Discrete TPM 2.0, TCG certified

Physical Locks

- (Optional) E-lock
- (Optional) Cable lock
- Kensington® Security Slot
- Padlock Loop

Chassis Intrusion Switch

- Chassis intrusion switch
- No chassis intrusion switch

BIOS Security

- Power-on password
- Administrator password

MANAGEABILITY

System Management

System Management

- Intel vPro with Intel AMT 14 (vPro-enable processor and WiFi needed)
- Standard Manageability

SERVICE

Warranty

Base Warranty

- 1-year limited onsite service
- 2-year limited onsite service
- 3-year limited onsite service

ENVIRONMENTAL

Operating Environment

Temperature

- Operating: 10°C (50°F) to 35°C (95°F)
- Storage: -40°C (-40°F) to 60°C (140°F)

Altitude

- Operating: 0 m (0 ft) to 3048 m (10,000 ft)
- Storage: 0 m (0 ft) to 12192 m (40,000 ft)

Humidity

- Operating: 20% to 80%
- Storage: 10% to 90%

CERTIFICATIONS

Green Certifications

Green Certifications

- EPEAT™ Silver
- ENERGY STAR® 8.0
- RoHS compliant

ISV Certifications

ISV Certifications

Please visit www.thinkworkstations.com/isv-certifications/



3-YR On-site upgrade from 1-YR On-site delivery

★★★★★ (0)



3-YR On-site upgrade from 1-YR On-site delivery



[VIEW SERVICES](#)

Overview

Ratings & Reviews

Overview

Trust Lenovo to cover the full lifecycle of your IT assets and free up your technicians to focus on what counts. A true business partner dedicated to your satisfaction and success, Lenovo offers a portfolio of service and support solutions.

If your issue can't be resolved over the phone, Lenovo will dispatch a technician to your location.



STAY CONNECTED

SIGN UP

SELECT COUNTRY/REGION



ABOUT



PRODUCTS



CUSTOMER



RESOURCES



PORTFOLIO

LENOVO

HELP

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Lenovo Diagnostics UEFI Embedded/Bootable v04.12.001

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Objective

This document describes what is necessary to run the **Lenovo Diagnostics UEFI Embedded/Bootable** tests.

Install and Run the UEFI diagnostics



Note

No installation is required for the **Lenovo Diagnostics UEFI Embedded**.

Download the Lenovo Diagnostics UEFI Bootable and Create a Bootable USB Flash Drive Using Windows GUI

- 1. Save the UEFI Diagnostics image and Bootable Generator:**
 - a. Go to www.Lenovo.com/diags
 - b. Click on "Downloads"
 - c. Under "Lenovo Diagnostics UEFI Bootable", click on "Create Bootable USB with UEFI Diagnostics"
 - d. Download UEFI Diagnostics zip file. Save the file. (*If your system has an Atom CPU, then click on "Lenovo UEFI Diagnostics – Bootable USB for Atom CPU based Tablet – ThinkPad 10" instead.*)
 - e. Download Bootable Generator Zip file
- 2. Run the Bootable Generator application.**
 - a. Insert a USB flash drive
 - b. Go to the folder where you saved the bootable generator and double click on it
 - c. Double click "BootableGenerator.exe"
 - d. Your flash drive name will appear under "Select a device". Click to select it. If you want to, you can type a new name for the device.
 - e. Click on "Search". Click on the image name that you saved in step 1, letter d.
 - f. Click on "Generate".
 - g. A message will appear, warning that all existing files on the flash drive will be erased if you continue. If you are OK with that, then press "Yes" to continue.

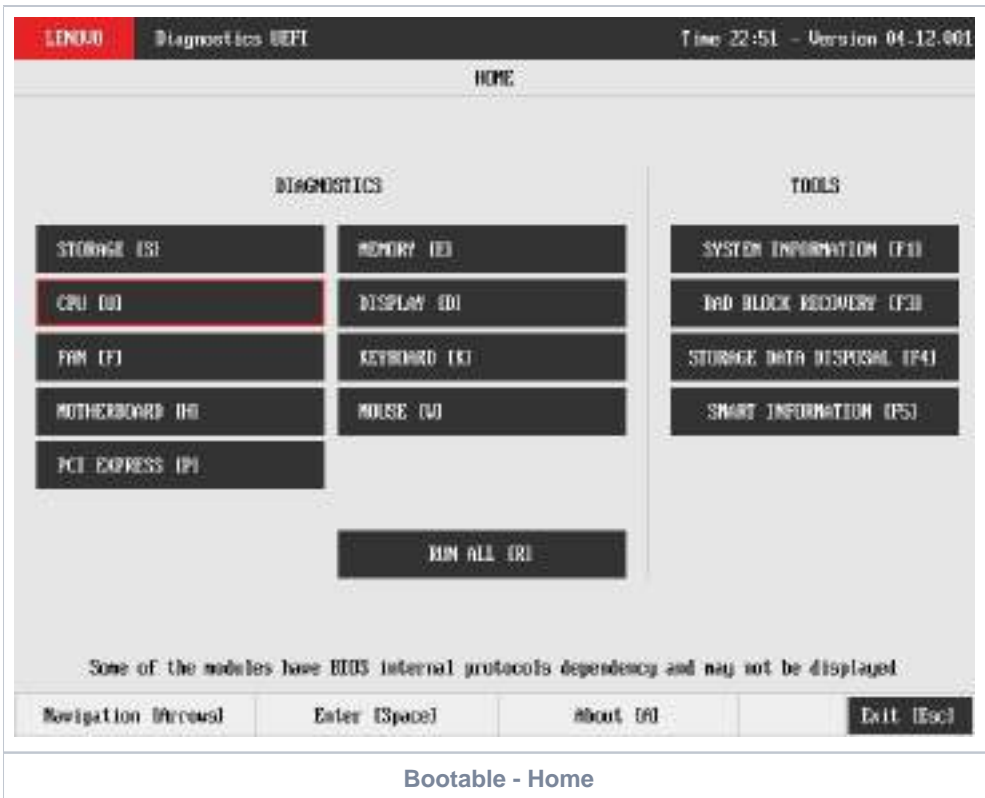
Run the UEFI Diagnostics

Run the Lenovo Diagnostics UEFI Bootable from a Bootable Flash Drive

1. Create the Bootable flash drive, as explained in sections 1 and 2.
2. If Secure Boot is enabled in BIOS, disable it.
3. Insert the flash drive.
4. Restart the machine, then immediately press F12.
5. On the boot menu, select your usb flash drive, and press Enter.
6. The UEFI diagnostics menu will display on your screen.

Home

The Home screen for Lenovo Diagnostics UEFI is shown in the next figure.



The Home screen is displayed right after the machine is booted from a USB flash drive containing the application. The Home screen provides options to run all available tests for devices installed in the machine, options to see detailed information about these devices, and option to exit the application. The Home screen is composed of:

- Application Header Bar
- Screen Title Bar
- Two main sections (Diagnostics and Tools)
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title Bar helps the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

Additionally, the Home screen has two main sections: Diagnostics and Tools. The Diagnostics section provides options to run all installed tests; and the Tools section provides options of using extra tools.

The currently selected option is outlined in red. The user can change the selected option either by using mouse / touch (*Bootable version only*) or by using the arrow keys () and to enter the selected option by pressing SPACE or ENTER.


Diagnostics options, sub-options and their descriptions are subsequently described:

- Run All: It allows the user to run all tests in one single execution. The Run all option has 4 modes:
 - Quick (Unattended): It executes the modules' quick diagnostics that are unattended (does not require human intervention).
 - Quick: It executes the all modules' quick diagnostics.
 - Full (unattended): It executes the modules' quick and extended diagnostics that are unattended.
 - Full: It executes all the modules' diagnostics.
- Battery: It selects and runs battery diagnostics.
- CPU
 - Quick: It selects and runs CPU quick diagnostics.
 - Extended: It selects and runs CPU extended diagnostics.
- Display: It selects and runs display diagnostics.
- Fan: It selects and runs fan diagnostics.
- Fingerprint: It selects and runs fingerprint diagnostics.
- Keyboard: It selects and runs keyboard diagnostics.
- Memory
 - Quick: It selects and runs memory quick diagnostics.
 - Extended: It selects and runs memory extended diagnostics.
- Motherboard: It selects and runs motherboard diagnostics.
- Mouse: It selects and runs mouse diagnostics.
- Optical: It selects and runs optical diagnostics.
- PCI Express: It selects and runs PCI express diagnostics.
- RAID: It selects and runs RAID diagnostics.
- Storage:
 - Quick: It selects and runs Storage quick diagnostics.

- Extended: It selects and runs Storage extended diagnostics.
- Touch: it selects and runs Touch diagnostics.
- WiFi: it selects and runs WiFi diagnostics.

Tools options are:

- System Information: On its main screen, it displays machine, BIOS and processor information, as well as a menu that it is possible to retrieve information from other devices modules.
- Hardware Diagnostic Events: It exhibits diagnostic events retrieved from the hardware.
- Bad Block Recovery: It allows to recover bad blocks on storage devices.
- Storage Data Disposal: Storage tool that erases all data from storage device.
- SMART Information: Tool used to obtain information related to the hardware condition, reported by the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) monitoring system of HDDs and SSDs , in order to prevent imminent hardware failures.

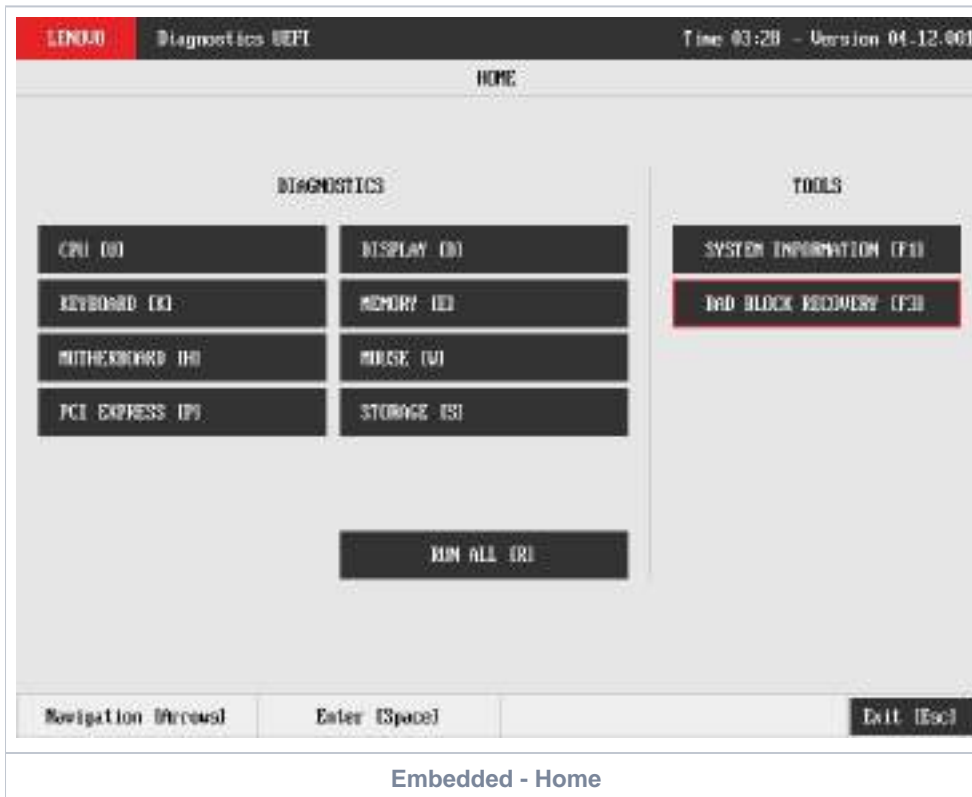
 Tests and tools rely on UEFI protocols availability, therefore some features might not be available on some systems.

Run the Lenovo Diagnostics UEFI Embedded

1. Boot the system, then immediately press:
 - F10 for Think systems;
 - F11 for IdeaPad systems;
 - Access Novo menu;
2. On the displayed menu, select Lenovo UEFI Diagnostics.

Home

The Home screen for Lenovo Diagnostics UEFI is shown in the next figure.



The Home screen provides options to run all available tests for devices installed in the system, options to see detailed information about these devices, and option to exit the application. The Home screen is composed of:

- Application Header Bar
- Screen Title Bar
- Two main sections (Diagnostics and Tools)
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title Bar helps the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

Additionally, the Home screen has two main sections: Diagnostics and Tools. The Diagnostics section provides options to run all installed tests; and the Tools section provides options of using extra tools.

The currently selected option is outlined in red. The user can change the selected option by using the arrow keys () and to enter the selected option by pressing SPACE or ENTER.

Diagnostics options, sub-options and their descriptions are subsequently described:

- Run All: It allows you to run all tests in one single execution. Depending on the running system, it's menu may vary:
 - Quick (Unattended): It executes the modules' quick diagnostics that are unattended (does not require human intervention).
 - Quick: It executes the all modules' quick diagnostics.
 - Full (unattended): It executes the modules' quick and extended diagnostics that are unattended.
 - Full: It executes all the modules' diagnostics.OR
 - Quick: It executes the modules' quick diagnostics.
 - Extended: It executes the modules' extended diagnostics.
 - Restrict prior selection to unattended tests: It restricts the prior selection to execute only tests that do not require human intervention.
- Battery: It selects and runs battery diagnostics.
- CPU
 - Quick: It selects and runs CPU quick diagnostics.
 - Extended: It selects and runs CPU extended diagnostics.
- Display: It selects and runs display diagnostics.
- Fan: It selects and runs fan diagnostics.
- Fingerprint: It selects and runs fingerprint diagnostics.
- Keyboard: It selects and runs keyboard diagnostics.
- Memory
 - Quick: It selects and runs memory quick diagnostics.
 - Extended: It selects and runs memory extended diagnostics.
- Motherboard: It selects and runs motherboard diagnostics.
- Mouse: It selects and runs mouse diagnostics.
- Optical: It selects and runs optical diagnostics.
- PCI Express: It selects and runs PCI express diagnostics.
- RAID: It selects and runs RAID diagnostics.
- Storage:
 - Quick: It selects and runs Storage quick diagnostics.
 - Extended: It selects and runs Storage extended diagnostics.
- Touch: it selects and runs Touch diagnostics.
- WiFi: it selects and runs WiFi diagnostics.

Tools options are:

- System Information: On its main screen, it displays machine, BIOS and processor information, as well as a menu that it is possible to retrieve information from other devices modules.
- Hardware Diagnostic Events: It exhibits diagnostic events retrieved from the hardware.
- Bad Block Recovery: It allows to recover bad blocks on storage devices.
- SMART Information: Tool used to obtain information related to the hardware condition, reported by the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) monitoring system of HDDs and SSDs , in order to prevent imminent hardware failures.



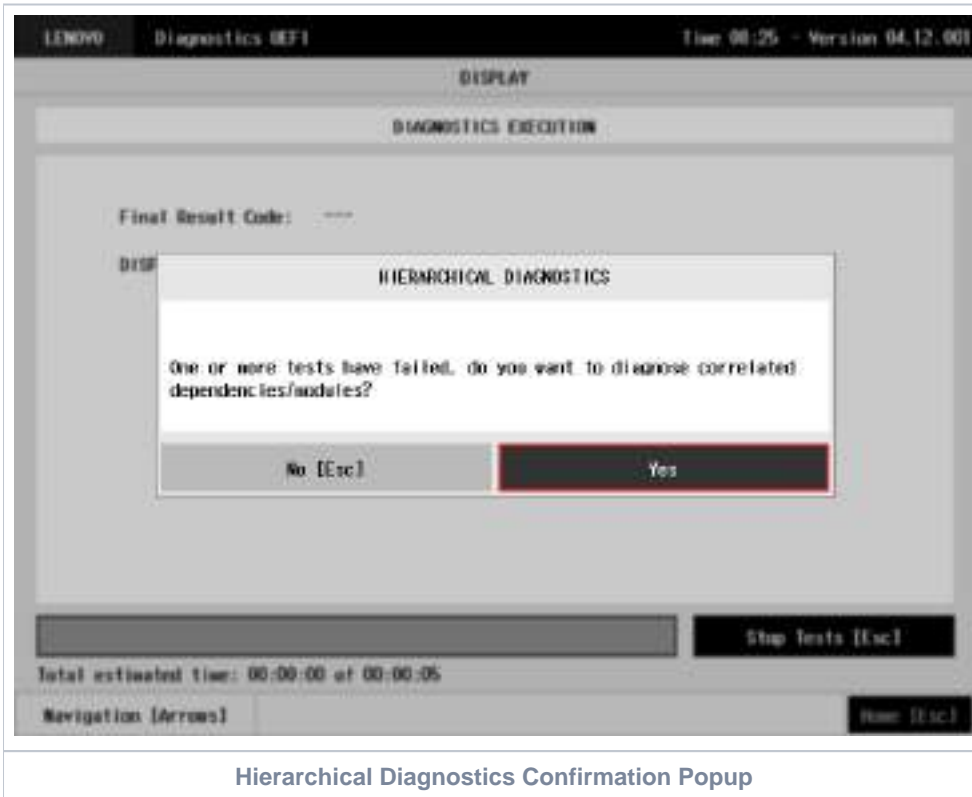
Tests and tools rely on UEFI protocols availability, therefore some features might not be available on some systems.

Hierarchical Diagnostics

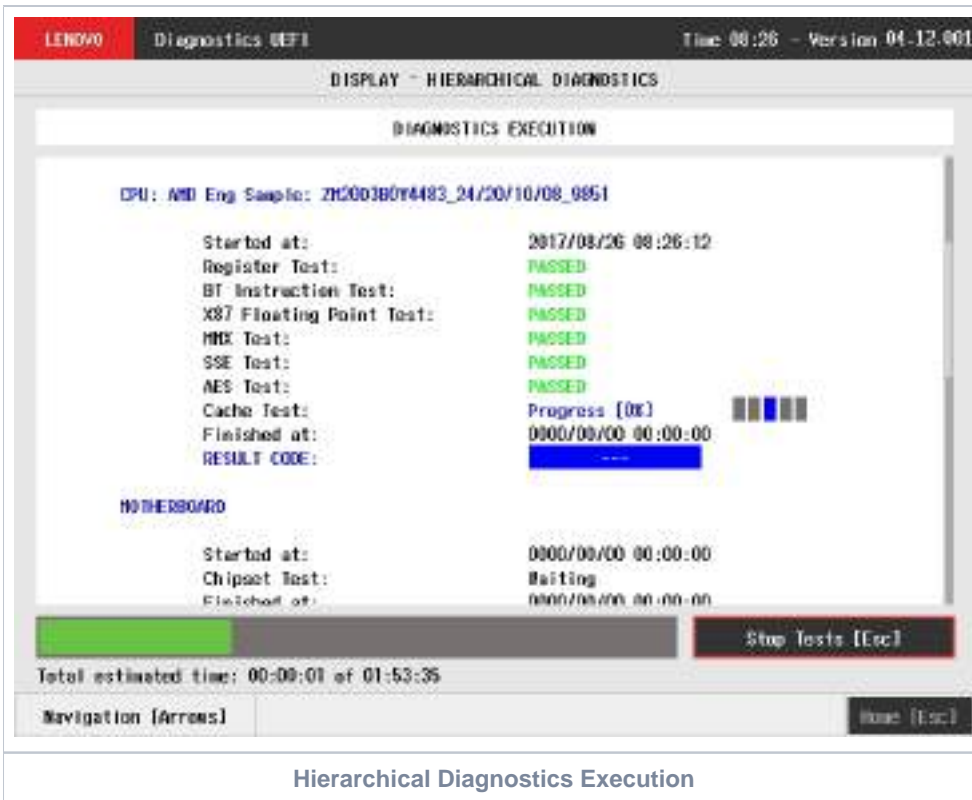
The hierarchical diagnostics functionality is a feature which conducts hierarchic sorted tests, in the way that the more independent is a module, the more its tests take precedent in the tests hierarchy.

That allows the identification of modules' failures that precede a specific module being diagnosed, where its corresponding tests have firstly failed.

After testing a specific module, in the case of at least one failure has occurred, the following popup will be displayed.



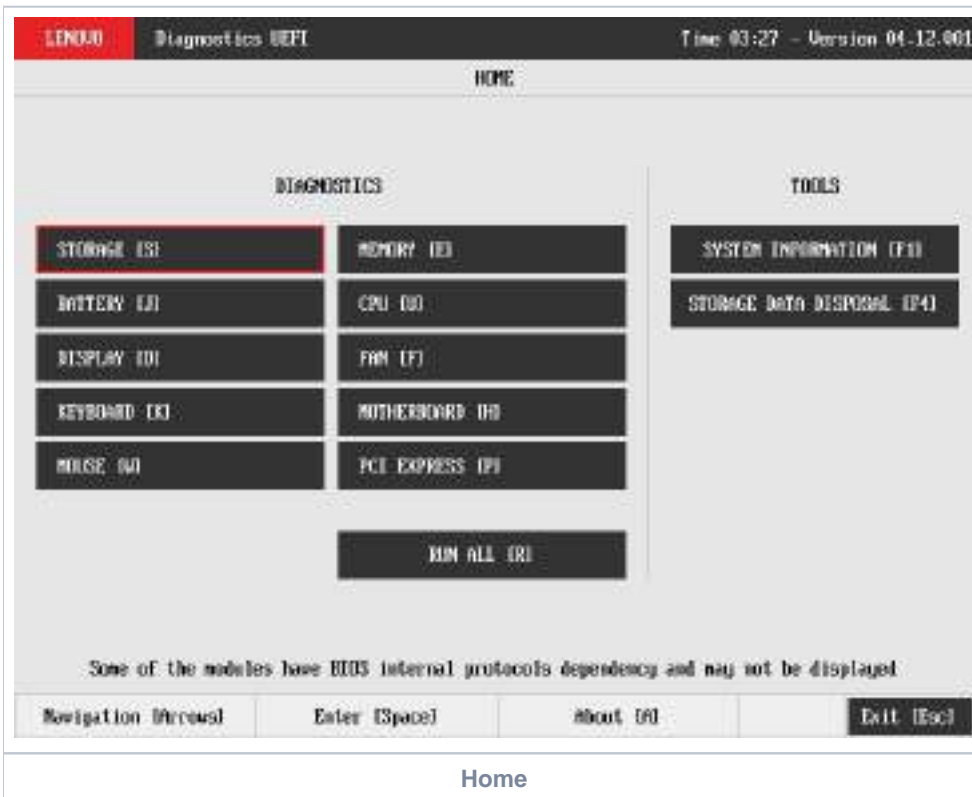
When choosing Yes, the application will test the correlated modules, as the following figure demonstrates it by using a Display test failure example.



Battery

The battery module is available in only few models due to UEFI protocols availability.

The system allows the user to access the battery diagnostics from the Home screen, Diagnostics, Battery.



After the user enters the Battery option, the application will display the battery devices available in the system. If there is more than one battery device installed, the menu Device Selection is displayed, as shown in the next figure.



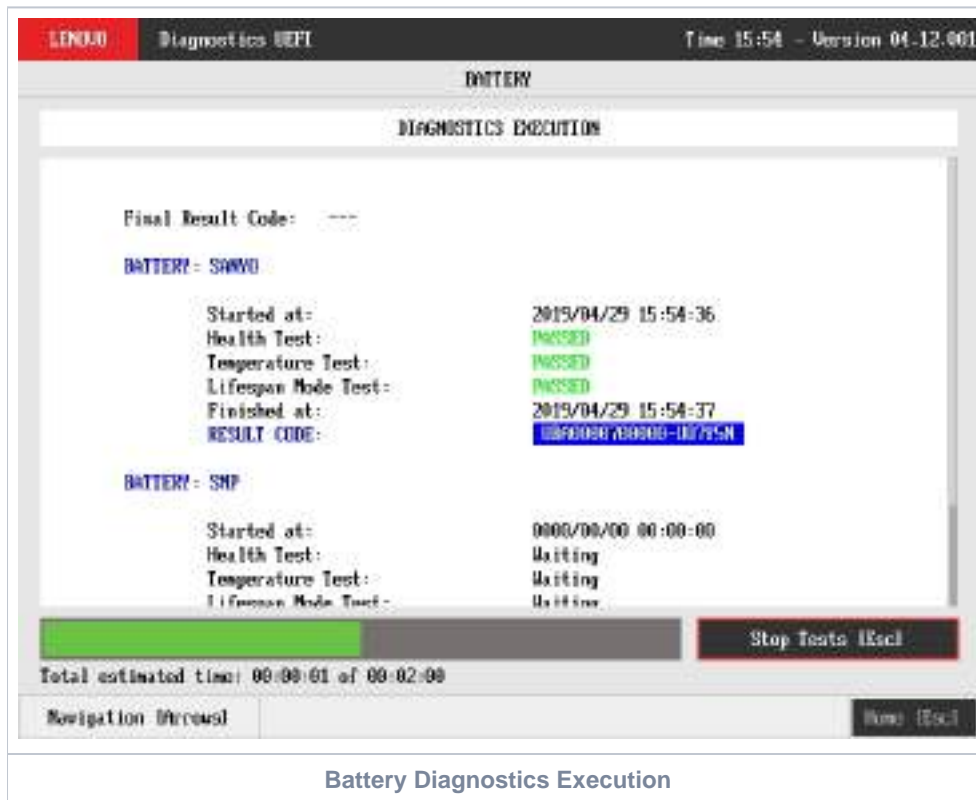
An item can be selected/deselected by pressing SPACE when it is highlighted. A desired item is selected when it shows "[X]" preceding it. In order to continue, the user has to press ENTER on the button Confirm. As a result, the system will show a list of tests, as illustrated in the next figure, where all the tests are initially selected to be tested.



The user can deselect a selected test by pressing the SPACE key when the test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the "Select/Deselect All Options" is selected. If the user presses the SPACE or ENTER key on that option, then all test options will be deselected. If the user selects the "Select/Deselect All Options" again, all tests options will be selected again.

At least one test must be selected, so that the application can run the diagnostic. After the user chooses which tests must be performed, the user can use the "Confirm" button. Consequently, the system will run all tests, as illustrated in the figure below.



The Battery Diagnostics Execution screen provides information about the battery diagnostics progress, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a "View Log" button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

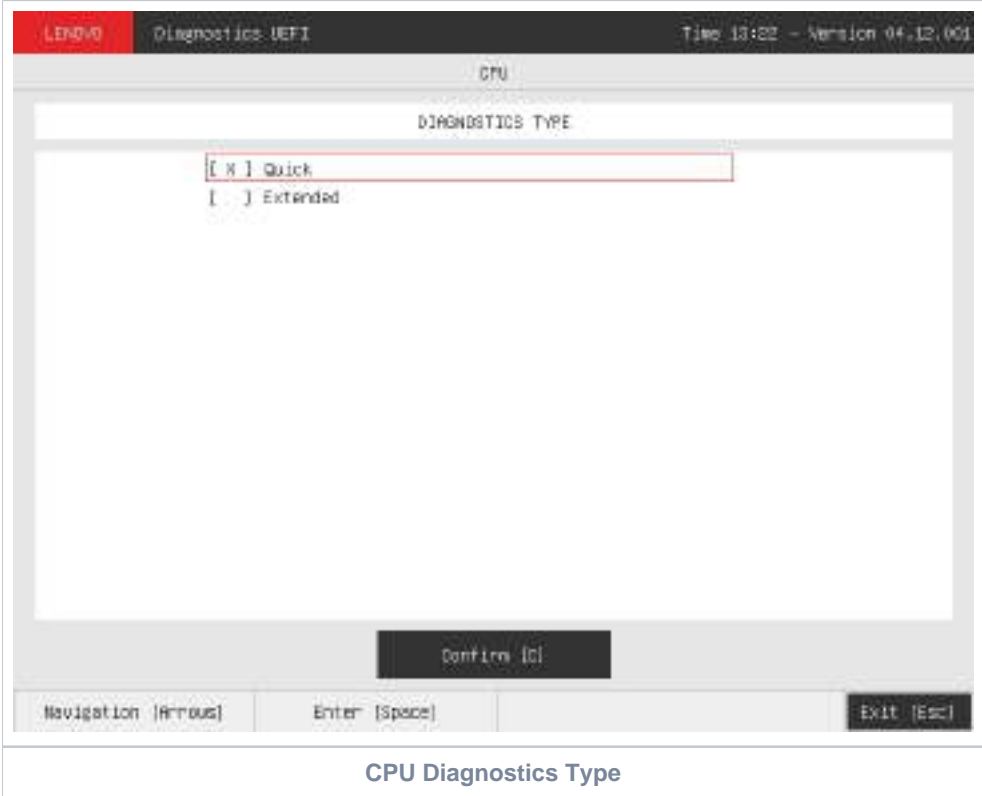
- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- Total estimated time of the current suite of diagnostic tests.
- A list with all the algorithms which compose device test and their respective status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to **CANCELED**. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

CPU

The system allows the user to access the CPU diagnostics from the Home screen, Diagnostics, CPU.

After the user enters the CPU option, the CPU diagnostics type's menu will be displayed, as the following image.



An item can be selected/deselected by pressing SPACE when it is highlighted. A desired item is selected when it shows "[X]" preceding it.

After the user enters the "Confirm" button, the application will display the CPU devices available in the system. If there is more than one CPU device installed, the menu Device Selection is displayed, as shown in the next figure.



CPU Quick Diagnostics

The system allows the user to access the CPU quick diagnostics from the Home screen, Diagnostics, CPU.

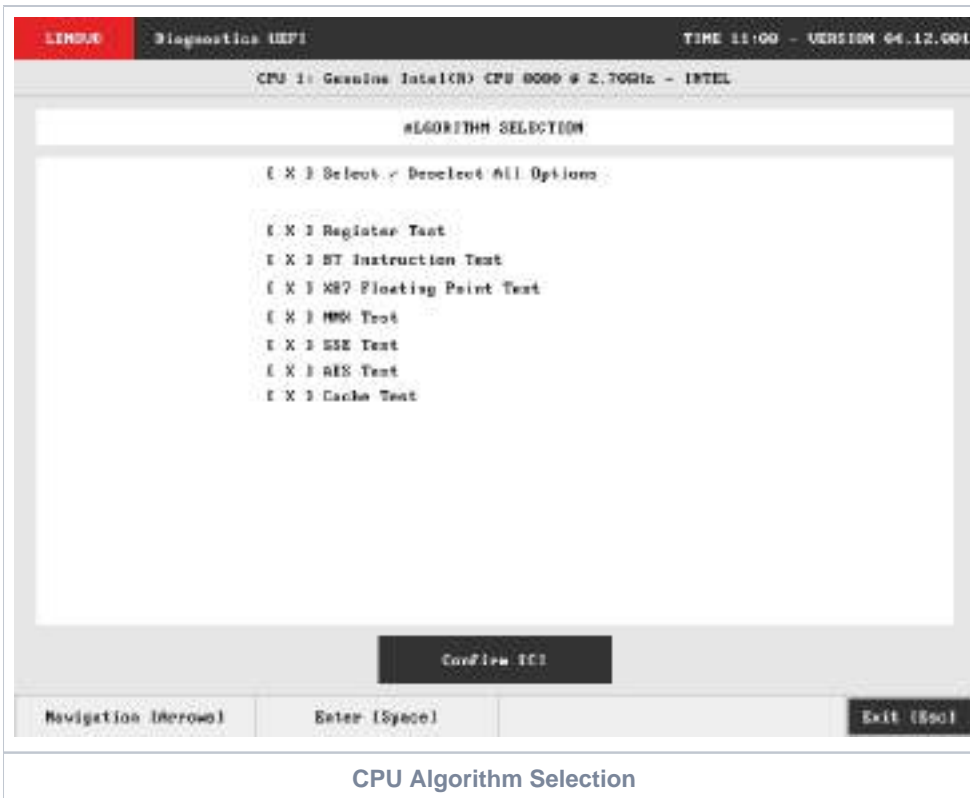
Quick diagnostics are test algorithms that take less than 10 minutes to execute each test.

An item can be selected/deselected by pressing SPACE when it is highlighted. A desired item is selected when it shows "[X]" preceding it. To access the CPU quick diagnostics, the user can use the UP/DOWN arrow key until "Quick" is focused and press SPACE key to select it.

In order to continue, the user has to press ENTER on the button Confirm. As a result, the system will show a list of tests, as illustrated in the next figure, and all the tests are initially selected to be tested.

The user can deselect a selected test by pressing the SPACE key when the test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the "Select/Deselect All Options" is selected. If the user presses the SPACE or ENTER key on that option, then all test options will be deselected. If the user selects the "Select/Deselect All Options" again, all tests options will be selected again.



At least one test must be selected, so that the application can run the diagnostic. After the user chooses which tests must be performed, the user can use the Confirm button. Consequently, the system will run all tests, as illustrated in the figure below.



The CPU Quick Diagnostics Execution screen provides information about the CPU diagnostics progress, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar

- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- Total estimated time of the current suite of diagnostic tests.
- A list with all the algorithms which compose device test and their respective status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

CPU Extended Diagnostics

The system allows the user to access the CPU extended diagnostics from the Home screen, Diagnostics, CPU.

Extended Diagnostics may take more than 10 minutes to complete each test.

An item can be selected/deselected by pressing SPACE when it is highlighted. A desired item is selected when it shows "[X]" preceding it. To access the CPU extended diagnostics, the user can use the UP/DOWN arrow key until "Extended" is focused and press SPACE key to select it.

In order to continue, the user has to press ENTER on the button Confirm. When the user presses ENTER, the application will run the "Stress Test", and it will take about 10 minutes to complete.

The CPU Extended Diagnostics Execution screen provides information about the CPU diagnostics progress, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- Total estimated time of the current suite of diagnostic tests.
- A list with all the algorithms which compose device test and their respective status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

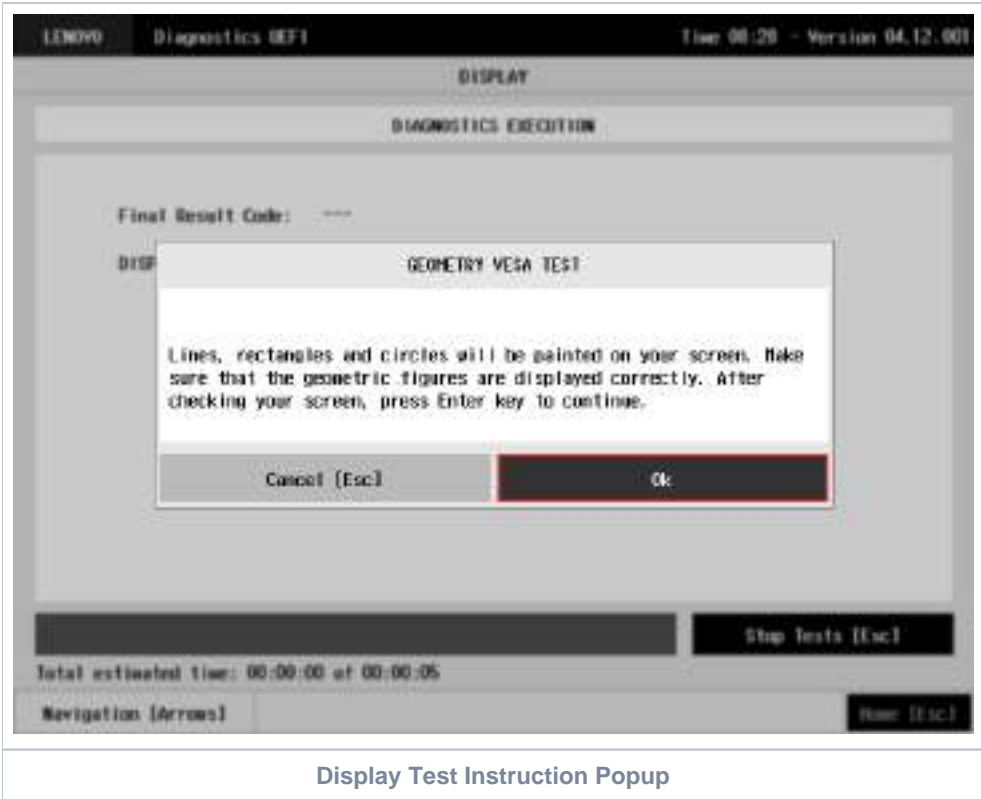
Display

After the user enters the Display option, the application computes the number of algorithms that can be performed by the diagnostic. If the diagnostic has more than one algorithm, Algorithm Selection screen is displayed, as shown in the figure below.

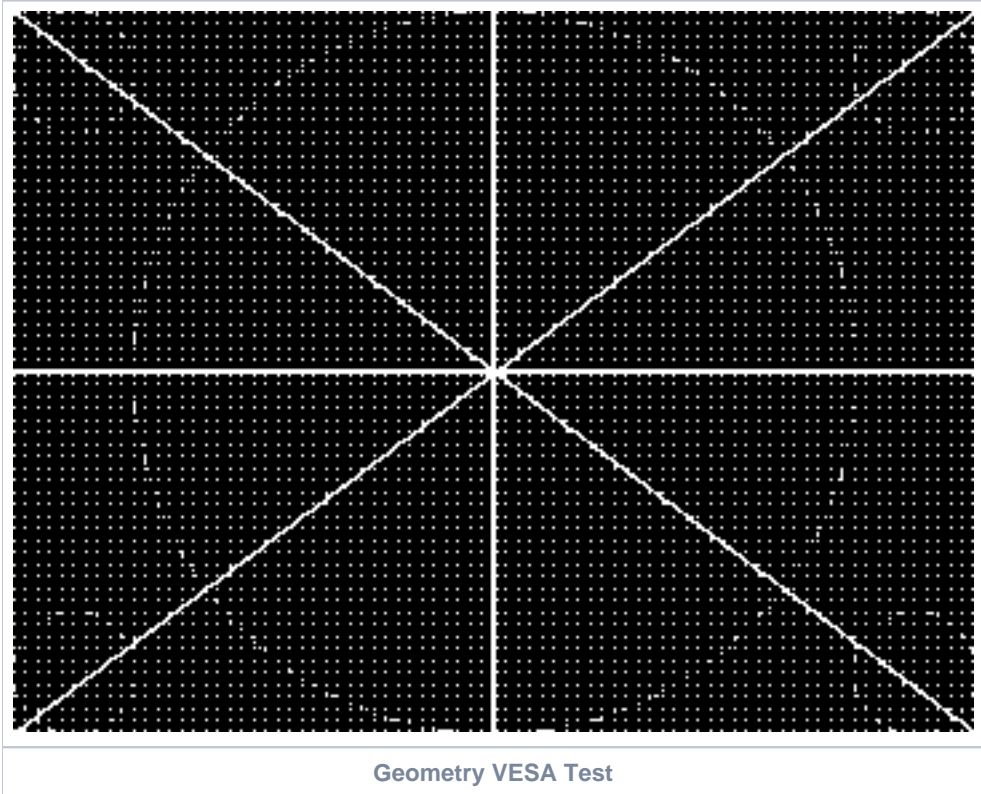


The Algorithm Selection screen allows the user to select which algorithms will be tested by the application. After the user chooses at least one test and chooses the Confirm button on the Algorithm Test screen, the Display tests start.

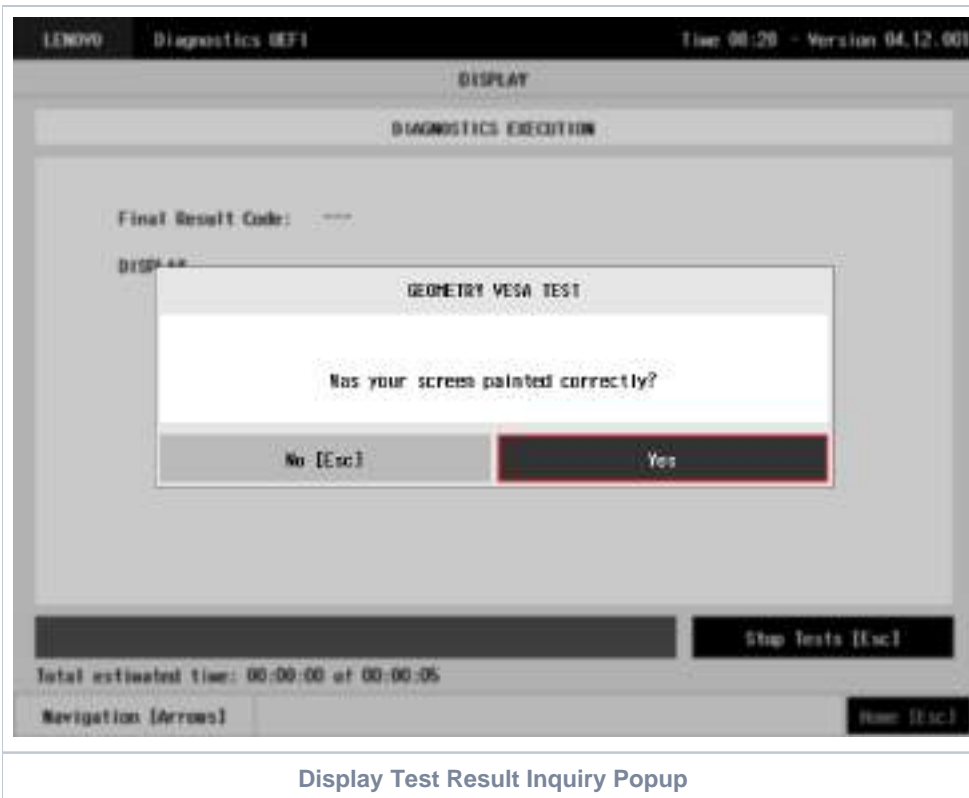
Before an algorithm is run, a popup containing instructions about the algorithm is displayed, as shown in the following figure. The user can press the ENTER key to proceed with the algorithm execution or can press ESC to abort the test.



If the user chooses to proceed with the test's execution, an image pattern will be displayed on the screen, as shown in the following figure. After the user checks the screen, any key can be pressed to proceed with the test's execution.



After that, a popup shows up, asking the user if the pattern was correctly painted on the display. If so, the user must press the ENTER key; if not, the user must press the ESC key. This popup can be seen in the next figure.



Display Test Result Inquiry Popup

This process is repeated for each selected algorithm. After the test is finished or canceled, the user can go back to the Home screen by pressing the ESC key again or to the Diagnostics Result Log screen by pressing the V key.

Fan

After the user enters the Fan option, the application verifies the number of algorithms that can be performed by the diagnostic. If the diagnostic has only one algorithm, it will be started, as shown in the next figure.



Fan Diagnostics Execution

The Fan Diagnostics Execution screen provides information about the fan diagnostics progress, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

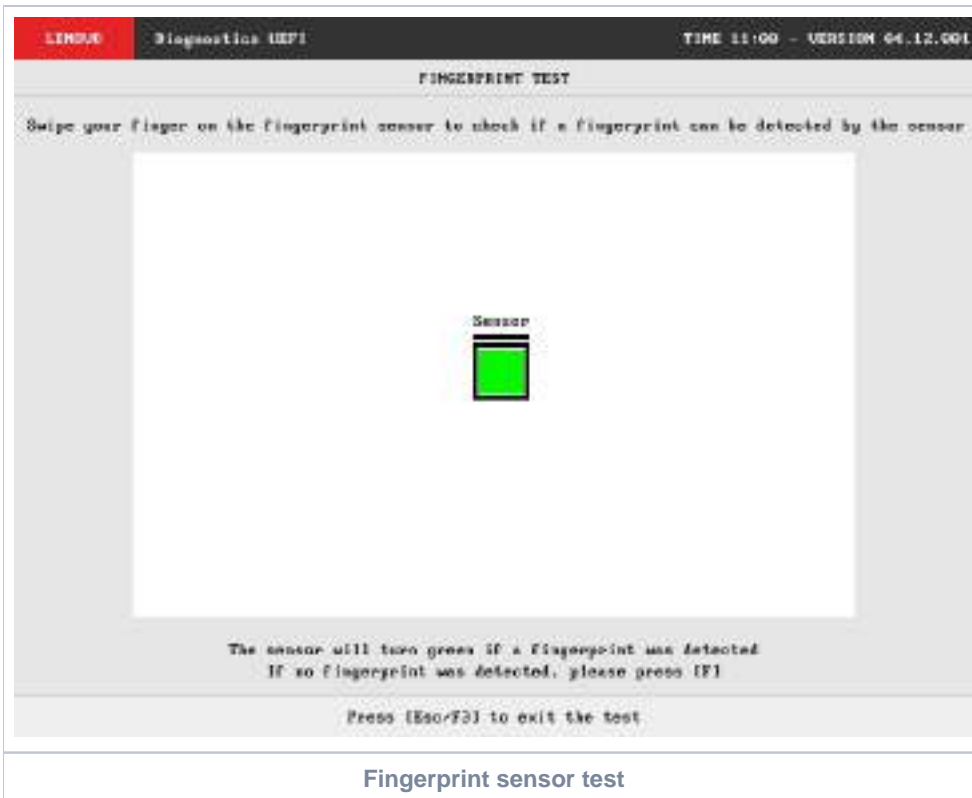
- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- Total estimated time of the current suite of diagnostic tests.
- A list with all the algorithms which compose device test and their respective status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

The dual fan support was added on **v04.06.000** version.

Fingerprint

After the user enters the Fingerprint option, the application will execute the sensor test that waits for the user to swipe or touch a finger on the fingerprint sensor, if it is detected, the test return **SUCCESS**, the square representing the sensor will turn green.



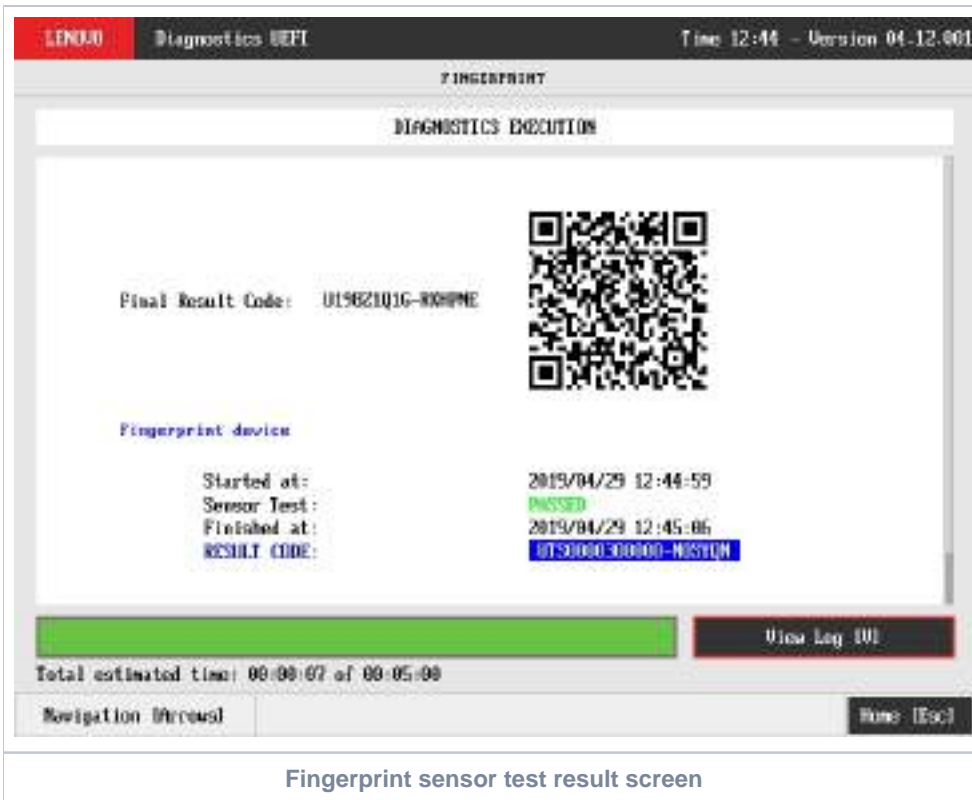
- **Sensor Test:**

- **Description:** "Sensor Test" is a sensor test that checks if its possible to read data from sensor within user interaction
- **Results:** **PASSED**; **FAILED**; **CANCELED**; **NOT APPLICABLE**.

In the Sensor test, it is an attended test that will ask the user to swipe a finger on the sensor to check if a fingerprint was detected.

- If the sensor detected successfully, the test is finished and finished execution screen is displayed
 - The test result will be **PASSED**
- If the sensor does not detect any fingerprint, the user can finish the test pressing **[F]**
 - The test result will be **FAILED**
- If the user press **[Esc]**, the test will be **CANCELED**
- If the test can not be executed the test result will be **NOT APPLICABLE**.

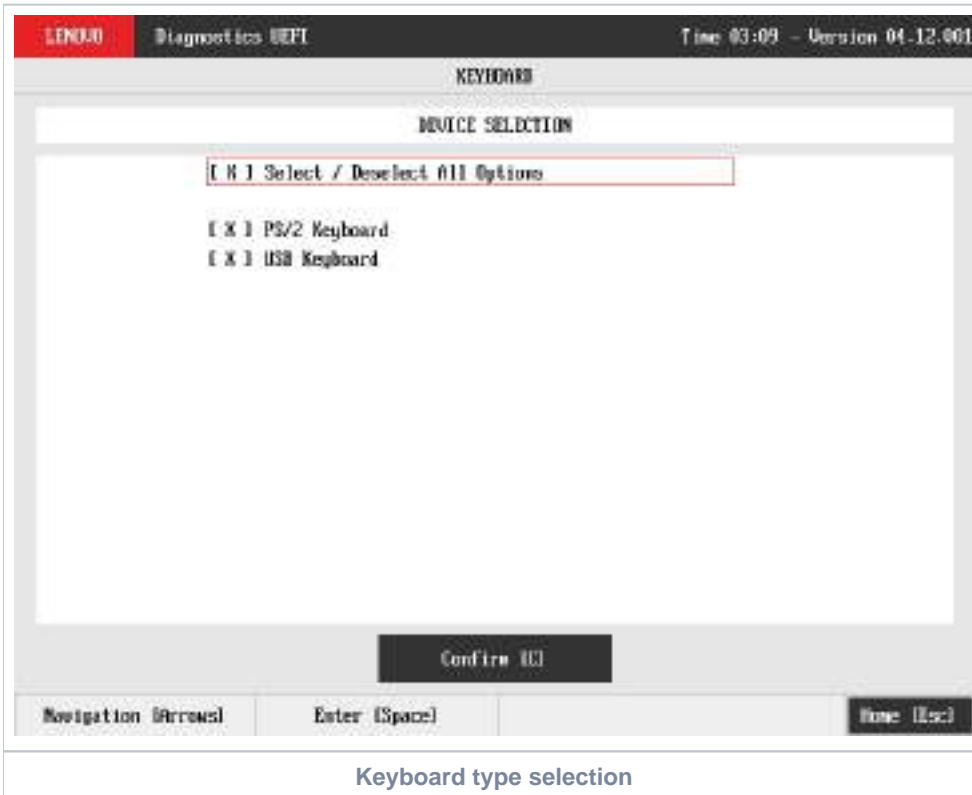
After the sensor test execution, the screen below is displayed with the test results:



Fingerprint sensor test result screen

Keyboard

The user can choose between PS/2 or USB keyboard as is shown in the figure below.



Keyboard type selection

After the selection of the desired keyboard, the user can select the tests for the selected keyboard type:

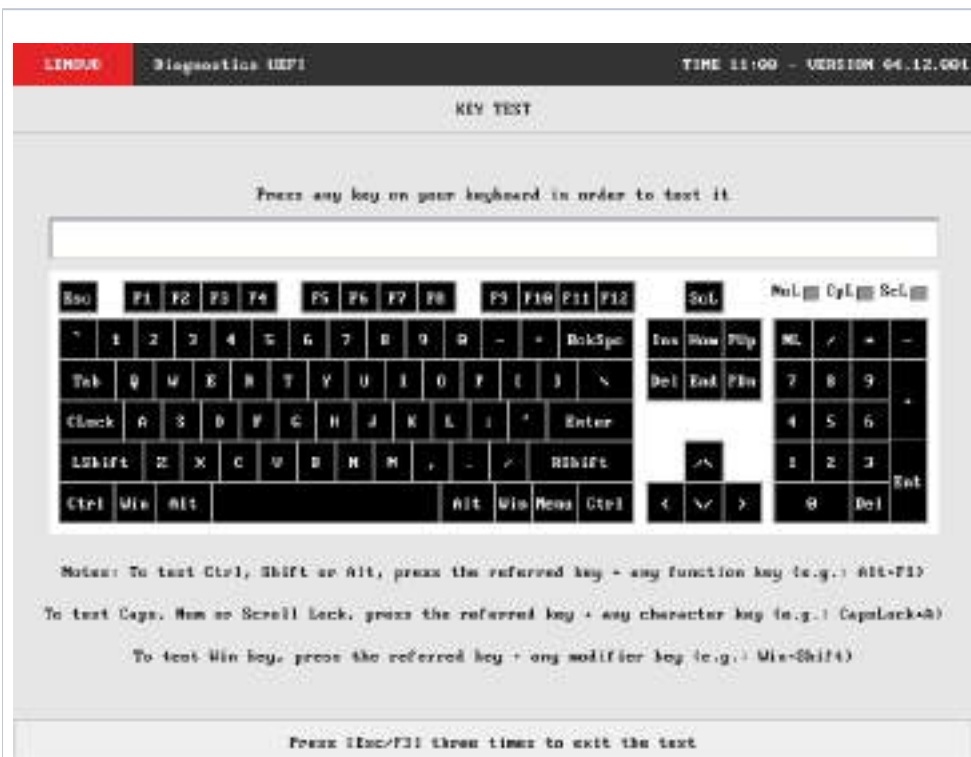
- **PS/2 Test:**
 - **Description:** "PS/2 Test" is a keyboard test that checks the access to PS/2 type keyboards.
 - **Results:** PASSED; FAILED; CANCELED; NOT APPLICABLE.
- **USB Test:**
 - **Description:** "USB Test" is a keyboard test that checks the access to USB type keyboards.
 - **Results:** PASSED; FAILED; WARNING¹; CANCELED; NOT APPLICABLE.
 - ¹: This test presents similar behavior to USB keyboard Test from Lenovo Diagnostics Windows, consequently, the **WARNING** test result is given when some information is not retrieved.
 - **Warning Message** (when some information is not retrieved): *WARNING Manufacturer or Product Name was not possible to be retrieved*
- **Key Test:**
 - **Description:** "Key Test" is an attended keyboard test that the user can check whether the keys and existing LEDs are properly working for PS/2 Keyboards.
 - **Results:** PASSED; FAILED; CANCELED.
- **USB Key Test:**
 - **Description:** "USB Key Test" is an attended keyboard test that the user can check whether the keys and existing LEDs are properly working for USB Keyboards.
 - **Results:** PASSED; FAILED; CANCELED.



At least one test must be selected, so that the application can run the diagnostic. After the user chooses which tests must be performed, the user can use the Confirm button. Consequently, the system will run all selected tests, as illustrated in the figures below.



Keyboard PS/2 Test execution



Keyboard Key Test execution



Note

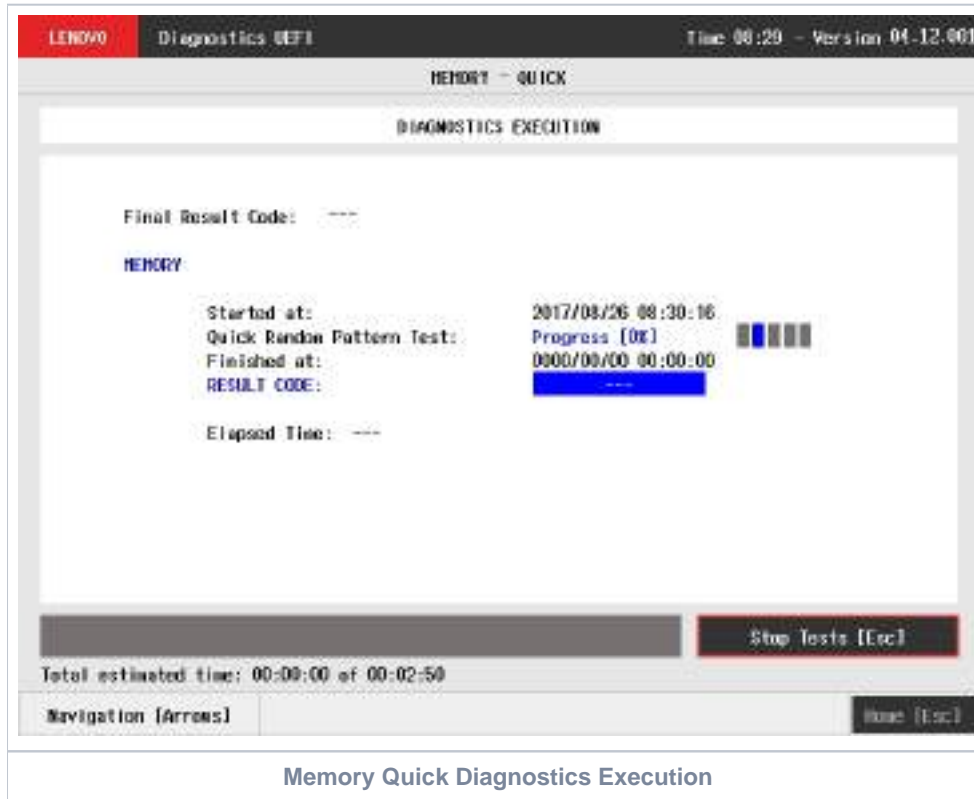
Keyboard attended test will automatically exist after 15 seconds of no user interaction.

Test Keyboard displayed layout may differ from physical device depending on system model

Memory

Memory Quick Diagnostics

The Memory Quick Diagnostics Execution screen is shown in the figure below.



The system allows the user to access the memory quick diagnostics from the Home screen, Diagnostics, Memory.

The Memory Quick Diagnostics Execution screen provides information about the memory diagnostics progress, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

- Final Result Code (an encrypted code that informs which modules were tested).
- QR Code (QR code shown on the right side of Final Result Code and that contain the information below, concatenated with semicolon):
 - Final Result Code;
 - Serial Number;
 - Test Date (YYYYMMDD format)
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- Total estimated time of the current suite of diagnostic tests.
- A list with all the algorithms which compose device test and their respective status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.

- **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
- **FAILED**, indicating the algorithm has found one or more faults.
- **CANCELED**, indicating the algorithm has been canceled by user.
- **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to **CANCELED**. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

Memory Extended Diagnostics

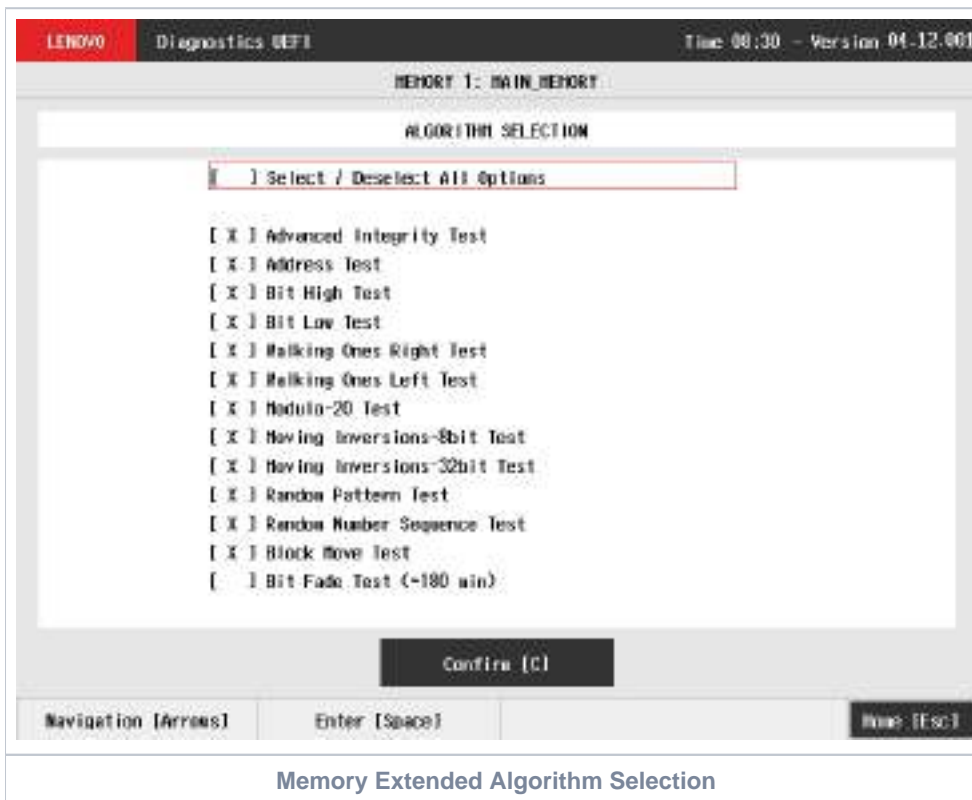
The system allows the user to access the memory extended diagnostics from the Home screen, Diagnostics, Memory.

An item can be selected/deselected by pressing SPACE when it is highlighted. A desired item is selected when it shows "[X]" preceding it. To access the memory extended diagnostics, the user can use the UP/DOWN arrow key until "Extended" is focused and press SPACE key to select it.

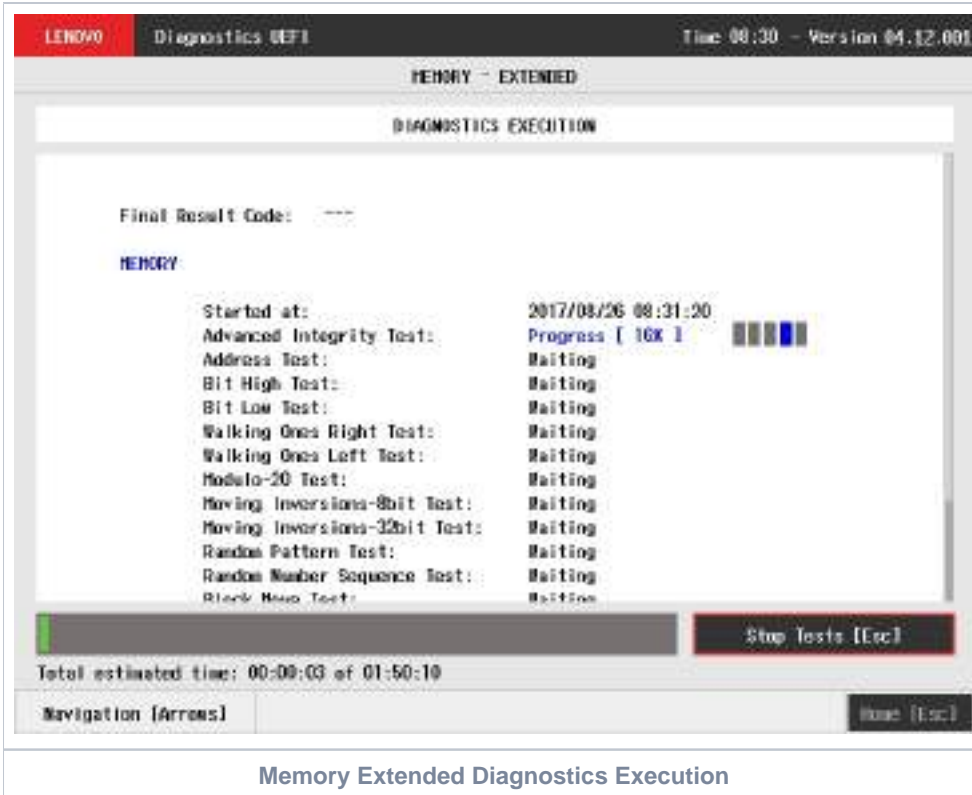
In order to continue, the user has to press ENTER on the button Confirm. As a result, the system will show a list of tests, as illustrated in the next figure, and all the tests are initially selected to be tested.

The user can deselect a selected test by pressing the SPACE key when the test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the "Select/Deselect All Options" is selected. If the user presses the SPACE or ENTER key on that option, then all test options will be deselected. If the user selects the "Select/Deselect All Options" again, all tests options will be selected again.



At least one test must be selected, so that the application can run the diagnostic. After the user chooses which tests must be performed, the user can use the Confirm button. Consequently, the system will run all tests, as illustrated in the figure below.



Memory Extended Diagnostics Execution

The Memory Extended Diagnostics Execution screen provides information about the memory diagnostics progress, as well as information about the results. This screen is composed of:


- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

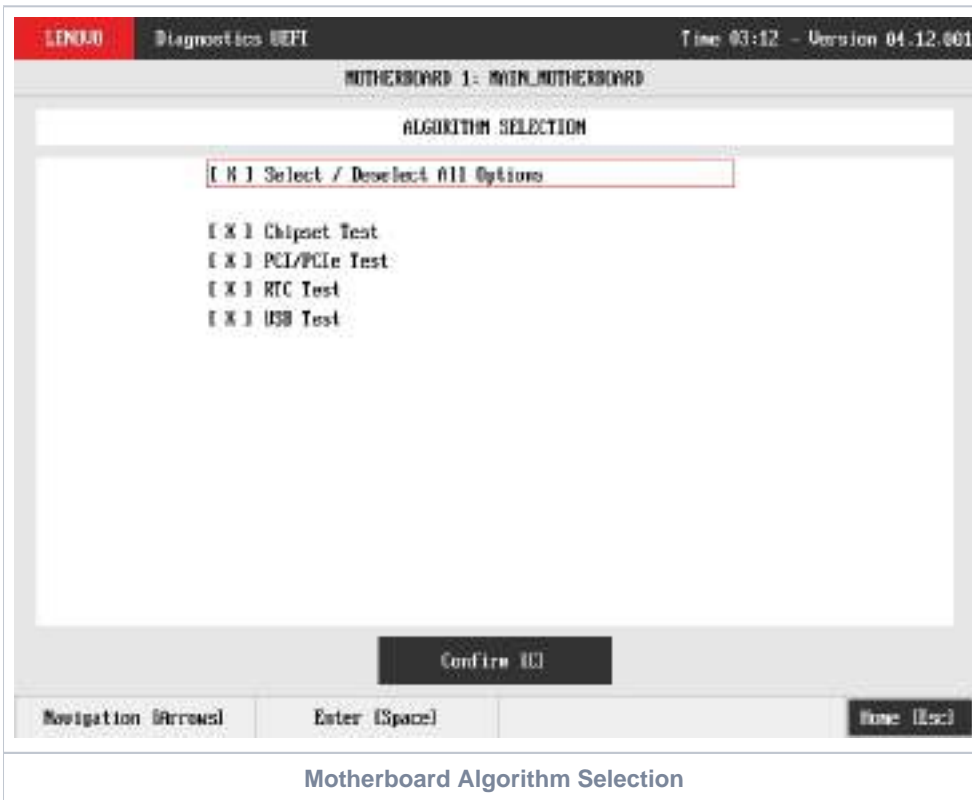
- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- Total estimated time of the current suite of diagnostic tests.
- A list with all the algorithms which compose device test and their respective status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

 For memory diagnostics there is an additional step to allocate and deallocate memory, where the deallocate step cannot be canceled as the test cannot keep memory allocated.

Motherboard

After the user enters the Motherboard option, the application computes the number of algorithms that can be performed by the diagnostic. If the diagnostic has more than one algorithm, Algorithm Selection screen is displayed, as shown in the next figure.

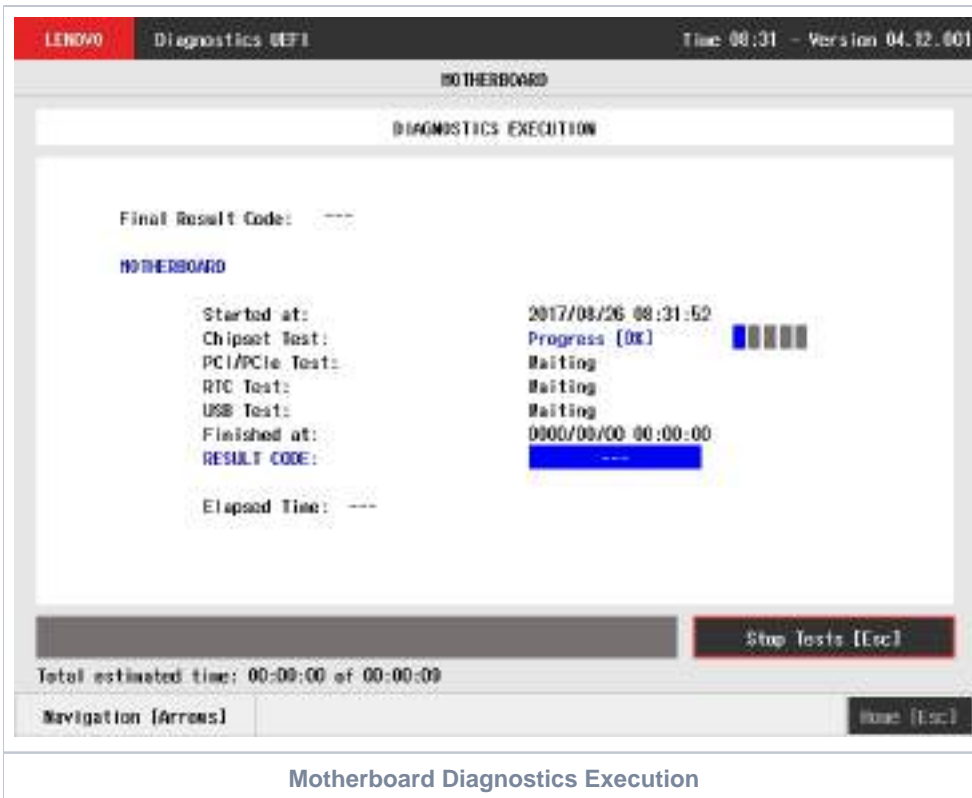


The system allows the user to access the motherboard diagnostics from the Home screen, Diagnostics, Motherboard.

The user can deselect a selected test by pressing the SPACE key when the test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the "Select/Deselect All Options" is selected. If the user presses the SPACE or ENTER key on that option, then all test options will be deselected. If the user selects the "Select/Deselect All Options" again, all tests options will be selected again.

At least one test must be selected, so that the application can run the diagnostic. After the user chooses which tests must be performed, the user can use the Confirm button. Consequently, the system will run all tests, as illustrated in the figure below.



Motherboard Diagnostics Execution

The Motherboard Diagnostics Execution screen provides information about the motherboard diagnostics progress, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- Total estimated time of the current suite of diagnostic tests.
- A list with all the algorithms which compose device test and their respective status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

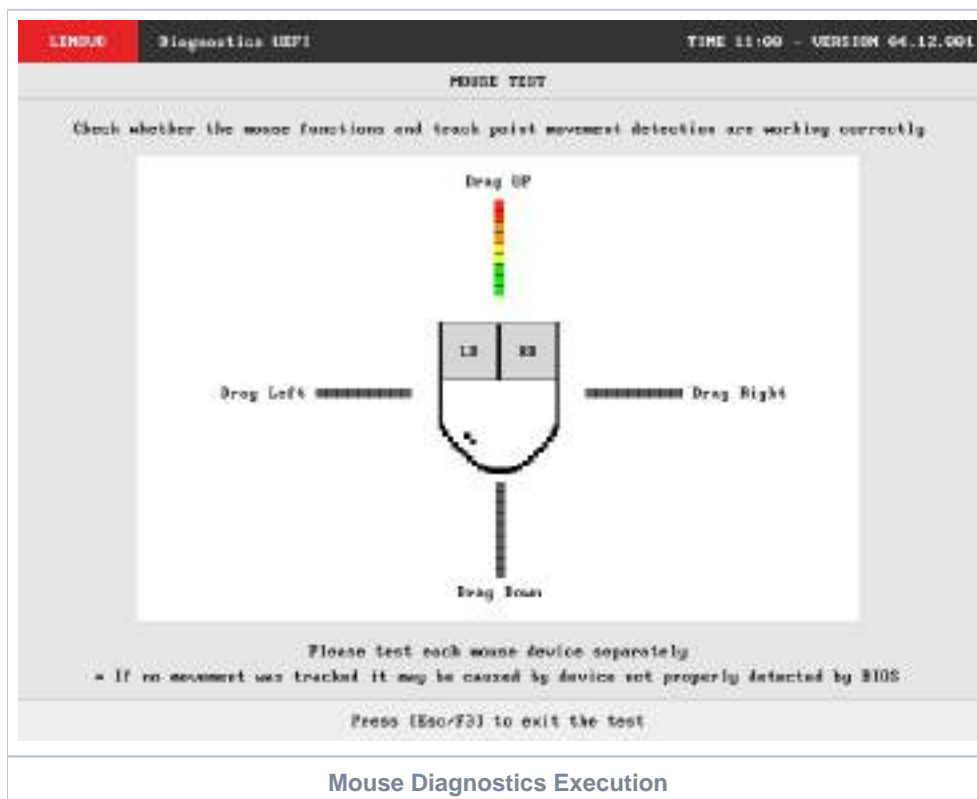
While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

Mouse

List of tests that can be performed:

- **Reset Test:**
 - **Description:** "Reset Test" is a mouse test that resets the connection for both PS/2 and USB External type mice.
 - **Results:** PASSED; FAILED; CANCELED; NOT APPLICABLE.
- **Mouse Test:**
 - **Description:** "Mouse Test" is a mouse test that checks the access and move detection to PS/2 type mice.
 - **Results:** PASSED; FAILED; CANCELED; NOT APPLICABLE.
- **USB External Mouse Test:**
 - **Description:** "USB External Mouse Test" is a mouse test that checks the access and move detection to USB type mouse.
 - **Results:** PASSED; FAILED; CANCELED; NOT APPLICABLE.

After the selection of the desired mouse type, the test begins as the screen below:



The Mouse Diagnostics Execution screen provides information about the memory diagnostics progress, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

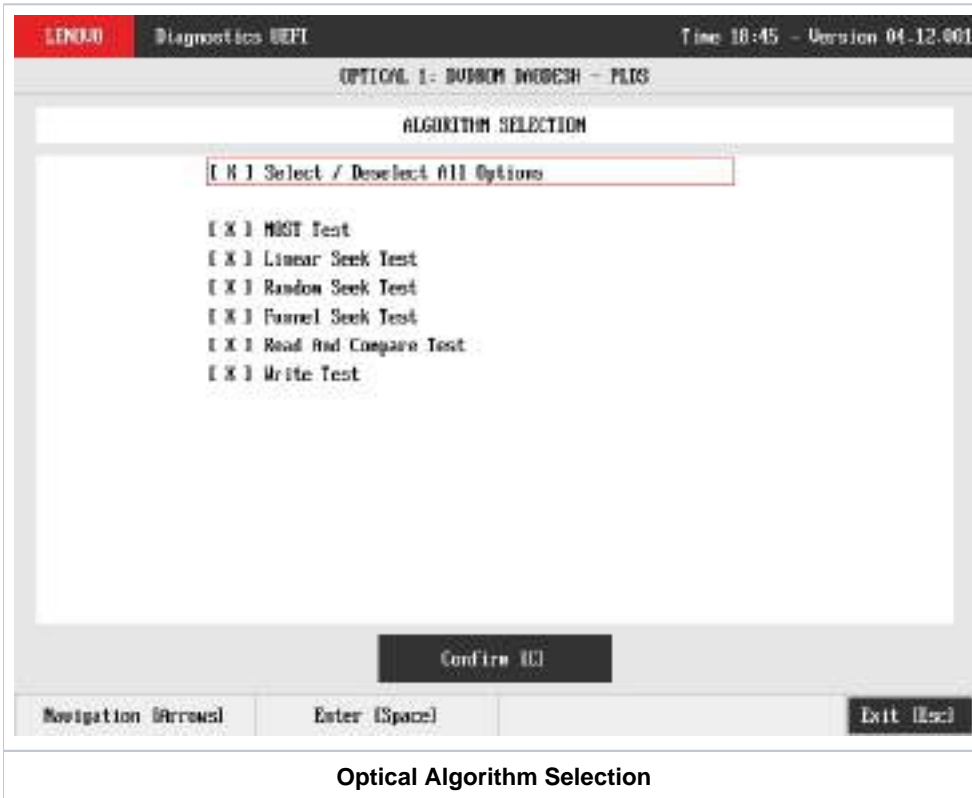
After the test finishes, a confirmation screen pop up to check if the test worked fine. After the confirmation, a screen with one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- A list with all the algorithms which compose device test and their respective status:
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

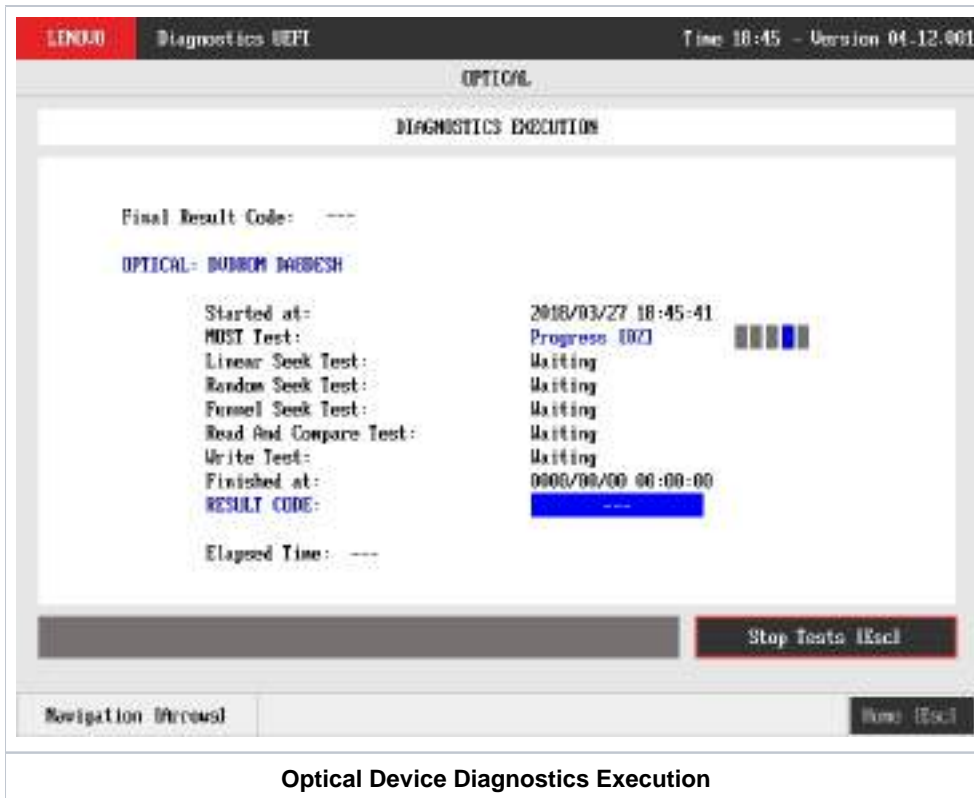
While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

Optical

The system allows the user to access the optical diagnostics from the Home screen, Diagnostics, Optical. After the user accesses the Optical option, the application displays the number of algorithms that can be performed. If the diagnostic has more than one algorithm, Algorithm Selection screen is displayed, as shown in the figure below.



At least one test must be selected, so that the application can run the diagnostic. After the user chooses which tests must be performed, the user can use the Confirm button. Consequently, the system will run all tests, as illustrated in the next figure.



Optical Device Diagnostics Execution

The Optical Diagnostics Execution screen provides information about the optical diagnostics progress, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- A list with all the algorithms which compose device test and their respective status, whereas an algorithm can have seven status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

PCI Express

After the user enters the PCI Express option, the application computes the number of algorithms that can be performed by the diagnostic. If the diagnostic has only one algorithm, it will be started, as shown in the next figure.



The PCI Express Diagnostics Execution screen provides information about the PCI Express diagnostics progress, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- Total estimated time of the current suite of diagnostic tests.
- A list with all the algorithms which compose device test and their respective status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

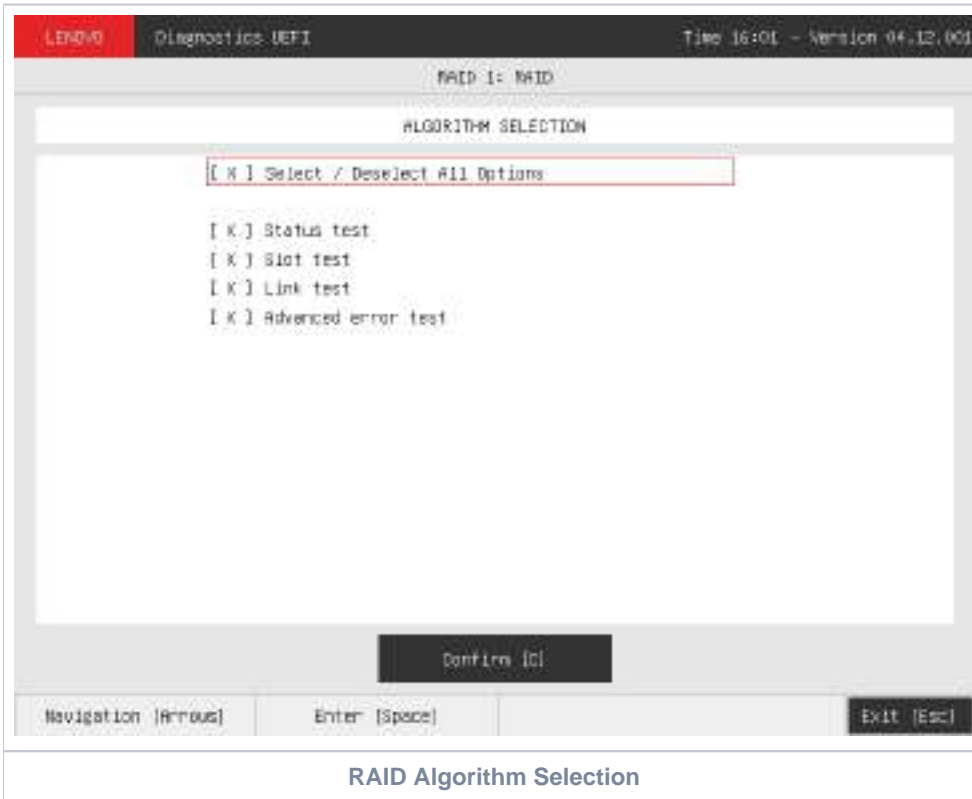
RAID

The system allows the user to access the RAID diagnostics from the Home screen, Diagnostics, RAID.

An item can be selected/deselected by pressing SPACE when it is highlighted. A desired item is selected when it shows "[X]" preceding it. In order to continue, the user has to press ENTER on the button Confirm. As a result, the system will show a list of tests, as illustrated in the next figure, and all the tests are initially selected to be tested.

The user can deselect a selected test by pressing the SPACE key when the test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the "Select/Deselect All Options" is selected. If the user presses the SPACE or ENTER key on that option, then all test options will be deselected. If the user selects the "Select/Deselect All Options" again, all tests options will be selected again.



At least one test must be selected so that the application can run the diagnostic. After the user chooses which tests will be performed, the user can press Confirm by pressing the ENTER key. Consequently, the system will run the tests, as illustrated in the following figure.



The RAID Diagnostics Execution screen provides information about the RAID diagnostics progress, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- Total estimated time of the current suite of diagnostic tests.
- A list with all the algorithms which compose device test and their respective status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

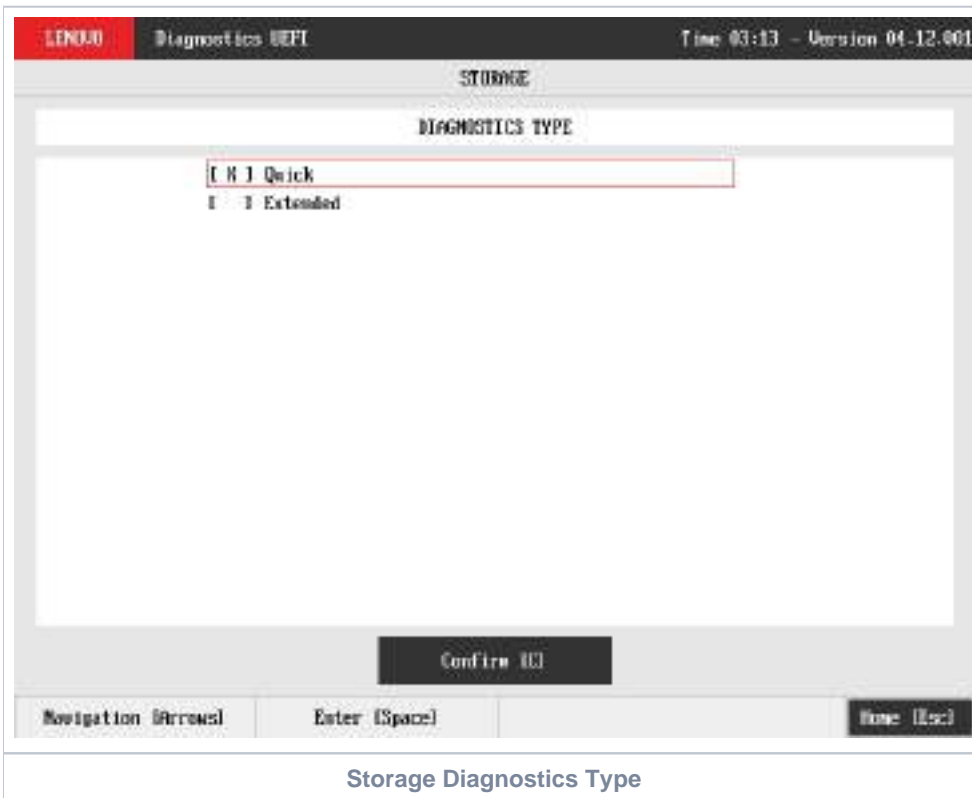
While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

Storage

 Storage devices connected as RAID will not be detected by UEFI diagnostics application, therefore they can not be tested.

The system allows the user to access the storage extended diagnostics from the Home screen, Diagnostics, Storage.

After the user enters the Storage option, the storage diagnostics type's menu will be displayed, as the following image.

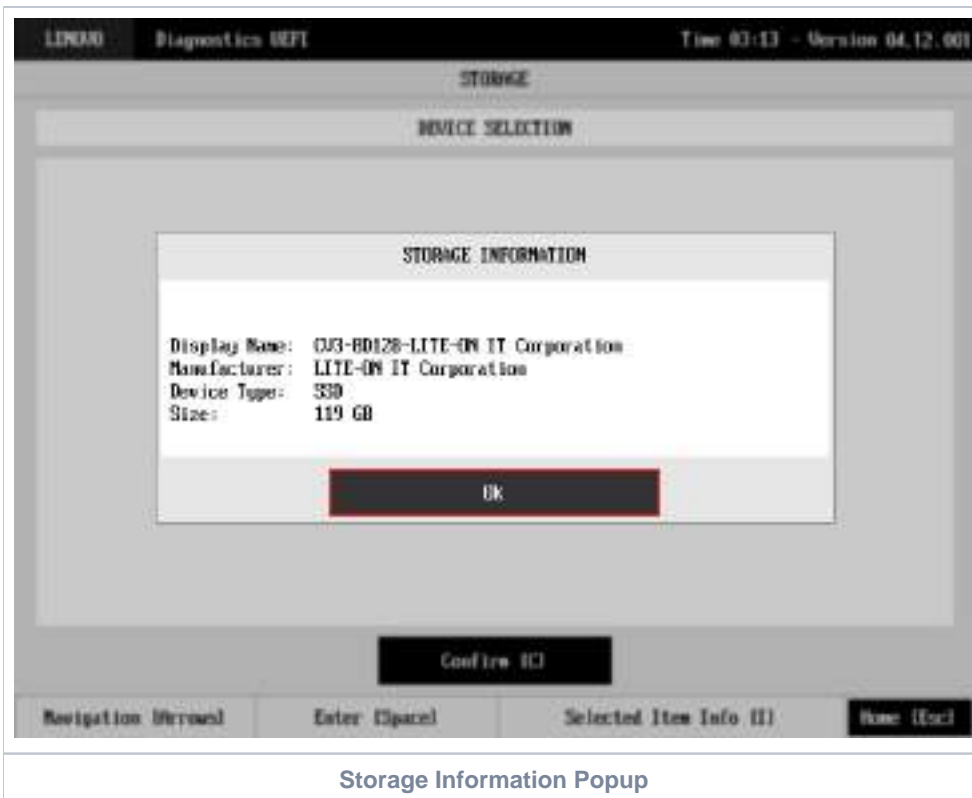


An item can be selected/deselected by pressing SPACE when it is highlighted. A desired item is selected when it shows "[X]" preceding it.

After the user enters the Confirm button, the application will display the number of storage devices available in the system. If there is more than one storage device installed, the menu Device Selection is displayed, as shown in the next figure.



This screen also allows seeing devices details. To access this feature, the user has to press the I key when the desired device is focused, leading to the exhibition of a popup with the device information, as shown in the subsequent figure.



Storage Quick Diagnostics

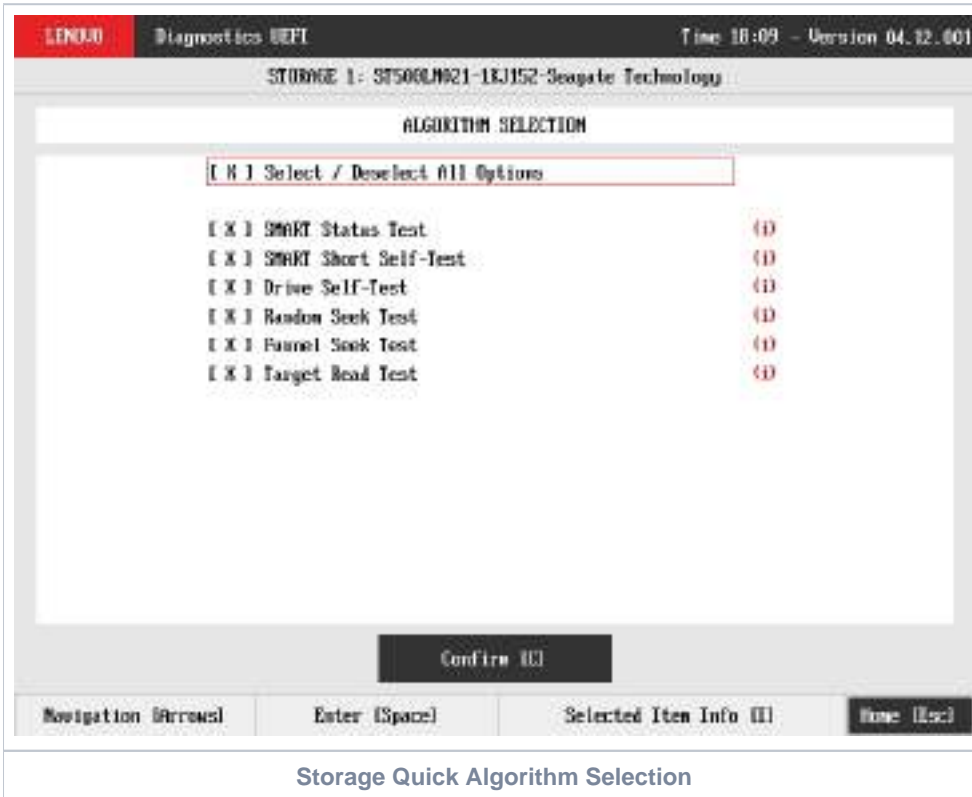
The system allows the user to access the storage quick diagnostics from the Home screen, Diagnostics, Storage.

An item can be selected/deselected by pressing SPACE when it is highlighted. A desired item is selected when it shows "[X]" preceding it. To access the storage quick diagnostics, the user can use the UP/DOWN arrow key until "Quick" is focused and press SPACE key to select it.

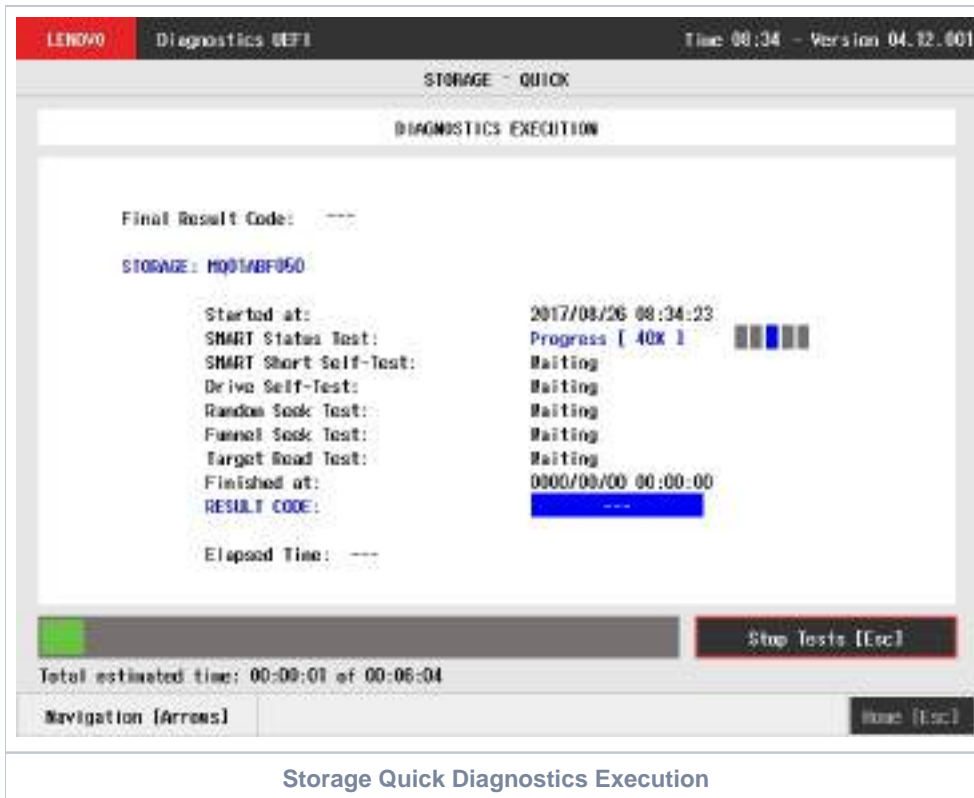
In order to continue, the user has to press ENTER on the button Confirm. As a result, the system will show a list of tests, as illustrated in the next figure, and all the tests are initially selected to be tested.

The user can deselect a selected test by pressing the SPACE key when the test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the "Select/Deselect All Options" is selected. If the user presses the SPACE or ENTER key on that option, then all test options will be deselected. If the user selects the "Select/Deselect All Options" again, all tests options will be selected again.



At least one test must be selected, so that the application can run the diagnostic. After the user chooses which tests must be tested, the user can use the Confirm button. It will start the diagnostic, as demonstrated in the next figure.



The Storage Quick Diagnostics Execution screen provides information about the storage diagnostics progress, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- Total estimated time of the current suite of diagnostic tests.
- A list with all the algorithms which compose device test and their respective status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

Storage Extended Diagnostics

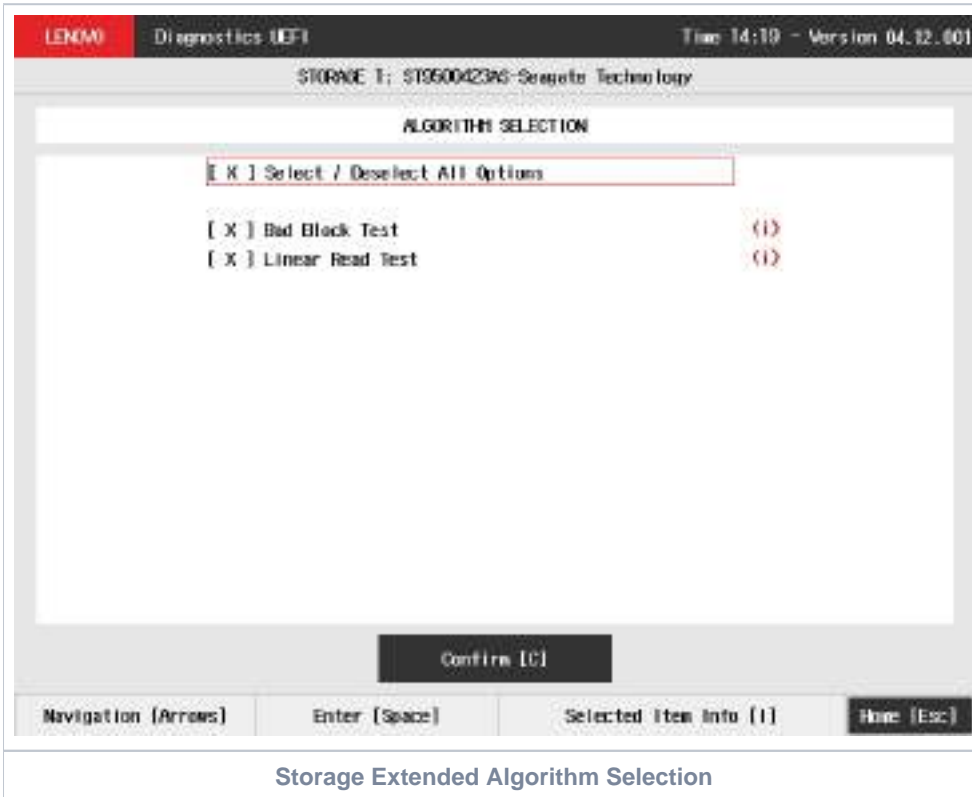
The system allows the user to access the storage extended diagnostics from the Home screen, Diagnostics, Storage.

An item can be selected/deselected by pressing SPACE when it is highlighted. A desired item is selected when it shows "[X]" preceding it. To access the storage extended diagnostics, the user can use the UP/DOWN arrow key until "Extended" is focused and press SPACE key to select it.

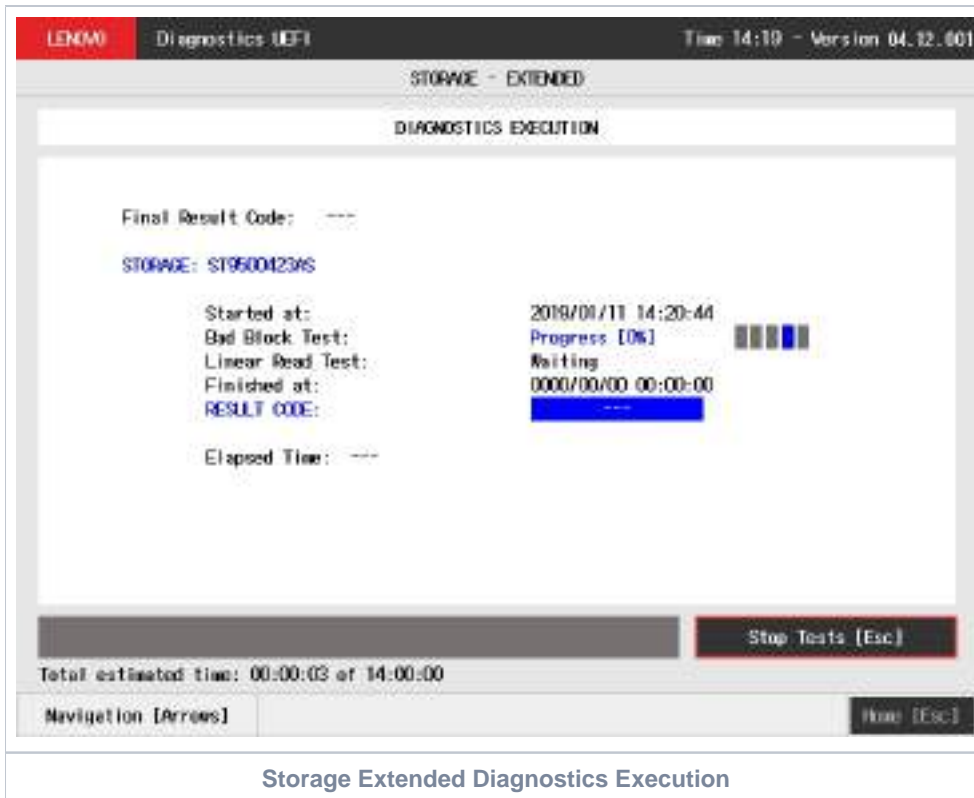
In order to continue, the user has to press ENTER on the button Confirm. As a result, the system will show a list of tests, as illustrated in the next figure, and all the tests are initially selected to be tested.

The user can deselect a selected test by pressing the SPACE key when the test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the "Select/Deselect All Options" is selected. If the user presses the SPACE or ENTER key on that option, then all test options will be deselected. If the user selects the "Select/Deselect All Options" again, all tests options will be selected again.



At least one test must be selected, so that the application can run the diagnostic. After the user chooses which tests must be tested, the user can use the Confirm button. It will start the diagnostic, as demonstrated in the next figure.



Storage Extended Diagnostics Execution

The Storage Extended Diagnostics Execution screen provides information about the storage diagnostics progress, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- Total estimated time of the current suite of diagnostic tests.
- A list with all the algorithms which compose device test and their respective status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

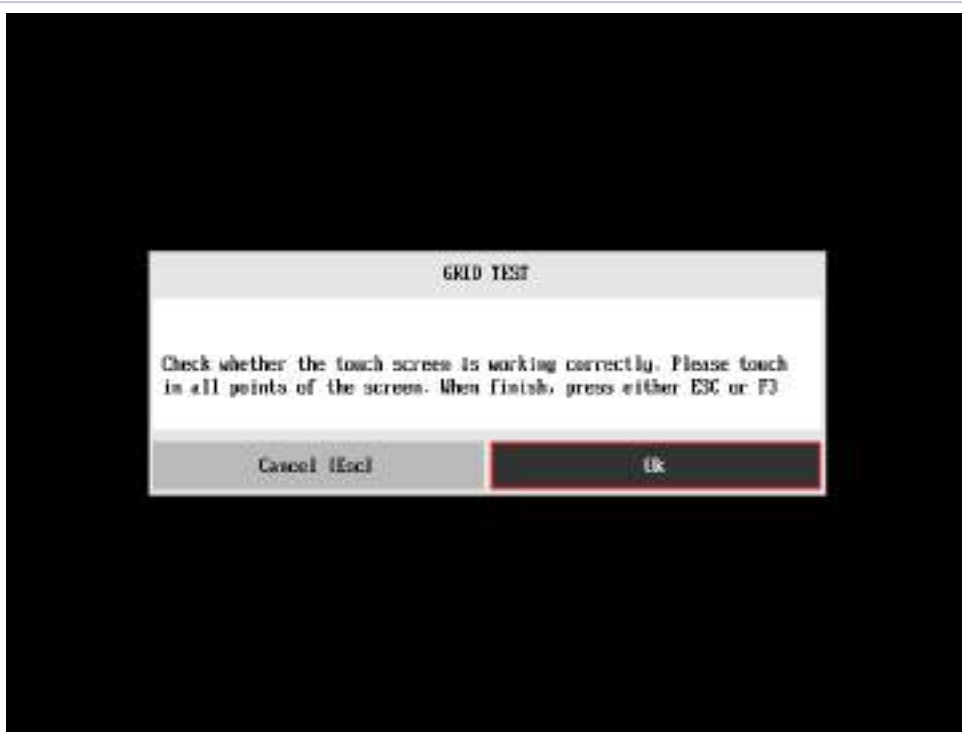
While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

Touch

The system allows the user to access the touch diagnostics from the Home screen, Diagnostics, Touch. After the user accesses the Touch option, the application displays the number of algorithms that can be performed. If the diagnostic has more than one algorithm, Algorithm Selection screen is displayed:

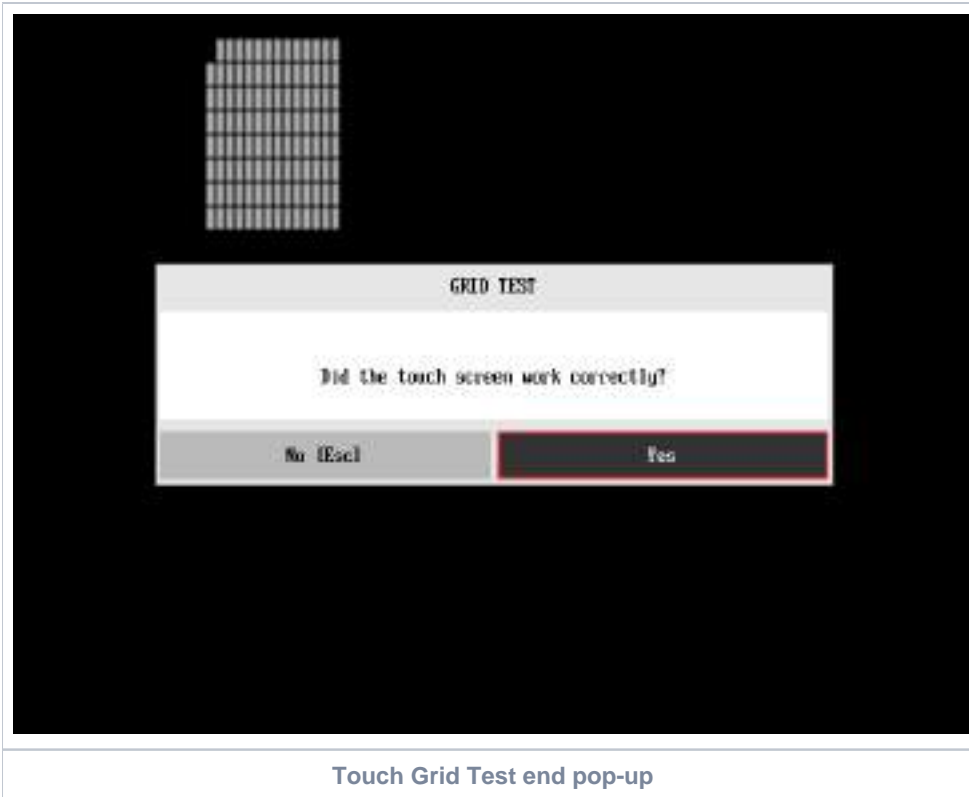
- **Reset Test:**
 - **Description:** *"Reset Test" is a touch device test that resets the connection with touch device.*
 - **Results:** **PASSED**; **FAILED**; CANCELED; NOT APPLICABLE.
- **Grid Test:**
 - **Description:** *"Grid Test" is a touch device test that tracks all touch events on touch device.*
 - **Results:** **PASSED**; **FAILED**; CANCELED; NOT APPLICABLE

On Grid test, a popup is show asking the user to touch the screen in all points to test if it is working correctly.



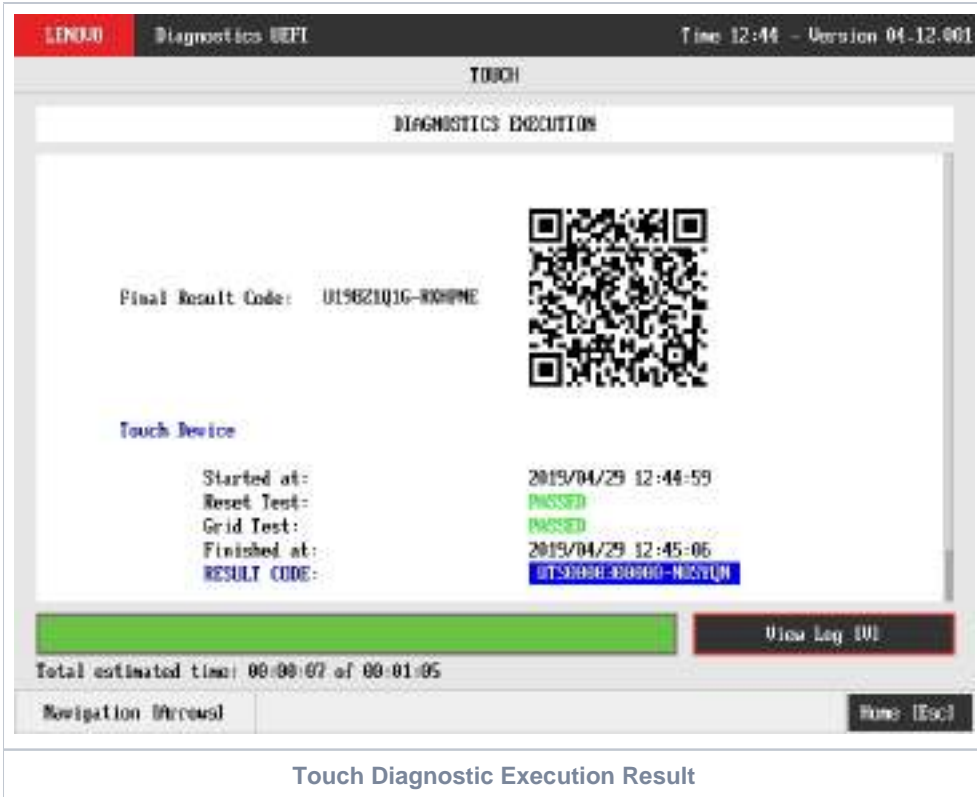
Touch Grid Test start pop-up

After the test finishes, a confirmation screen pop up to check if the test worked fine.



After the confirmation, a screen with one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- A list with all the algorithms which compose device test and their respective status:
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).



While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

WiFi

i WiFi Diagnostic is available on embedded version only and depend on WiFi UEFI Drivers availability.

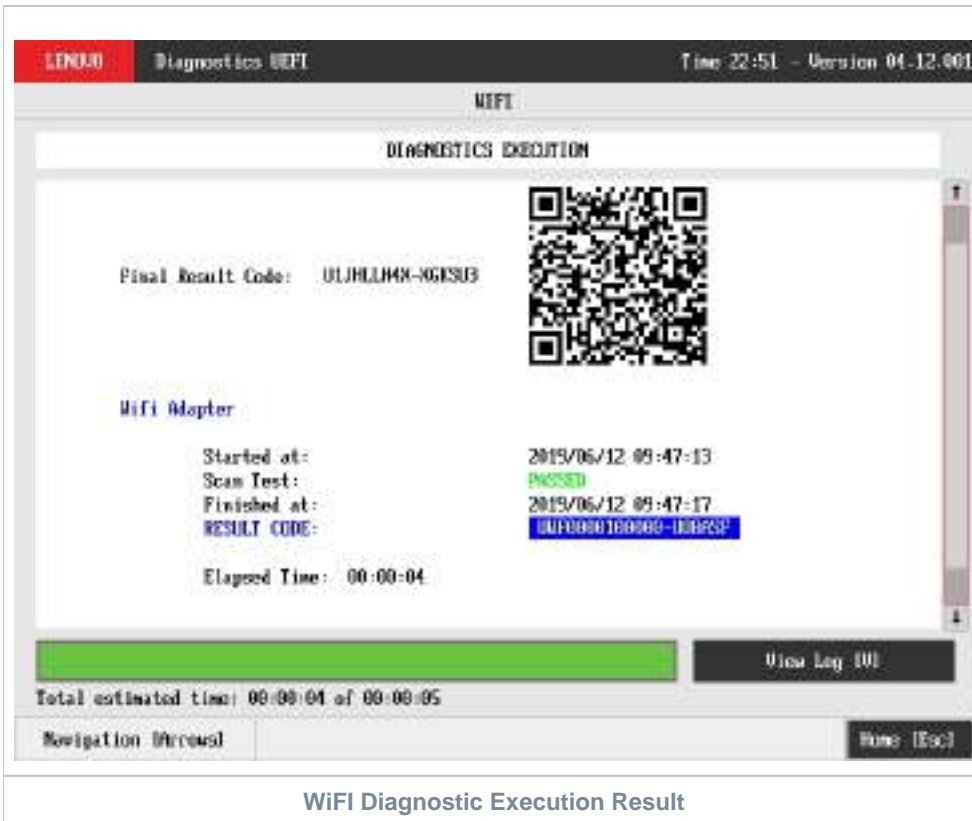
The system allows the user to access the WiFi diagnostics from the Home screen, Diagnostics, WiFi. After the user accesses the WiFi option, the application will display the available WiFi tests:

- **Scan Test:**
 - **Description:** "Scan Test" scans for nearby WiFi Networks.
 - **Results:** PASSED; WARNING FAILED; CANCELED; NOT APPLICABLE.

Scan test, an unattended test that will search for available WiFi networks

- If one or more networks are found:
 - The test result will be **PASSED**
- If the sensor does not detect any WiFi network
 - The test result will be **WARNING**
- If any error occurs when accessing the device and scanning for networks
 - The test result will be **FAILED**
- If the user press **[Esc]**, the test will be **CANCELED**
- If the test can not be executed the test result will be **NOT APPLICABLE**.

After the test is executed, the application will display the execution result screen as in the image below:

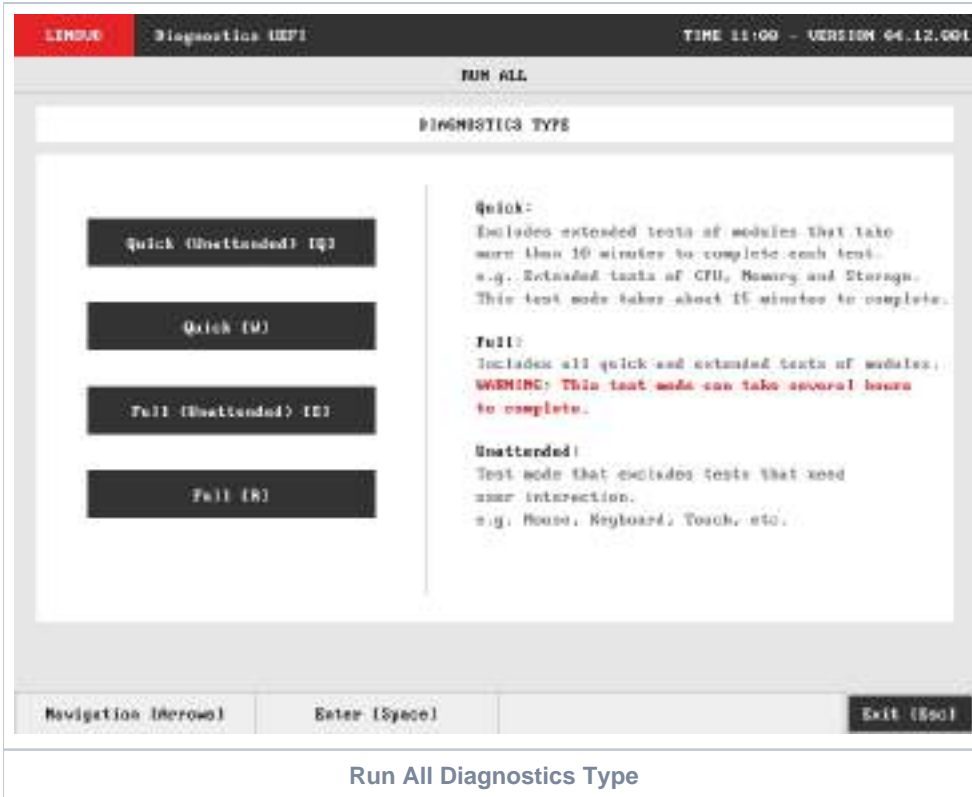


In the result log, the found WiFi networks are listed.

Run All

The system allows the user to access the run all diagnostics from the Home screen, Diagnostics, Run All.

An item can be selected/deselected by pressing SPACE when it is highlighted. To access a diagnostics type, the user can use the UP/DOWN arrow key until the desired item is focused and press SPACE key to select it, as illustrated in the figure below.



After the user selects one option of the run all modes, the application will display the entire set of modules of the UEFI Diagnostic application as follows:

- If a module is unavailable, the module will display as **Not Found**.

Quick (Unattended) [Q]:

- If a module has only attended tests, it will be displayed as **Not Selected**
- If a module has only extended tests, it will be displayed as **Not Selected**
- Attended tests will be displayed as **Not Selected** and won't be executed
- Extended tests will be displayed as **Not Selected** and won't be executed

Quick [W]:

- If a module has only extended tests, it will be displayed as **Not Selected**
- Extended tests will be displayed as **Not Selected** and won't be executed

Full (Unattended) [E]:

- If a module has only attended tests, it will be displayed as **Not Selected**
- Attended tests will be displayed as **Not Selected** and won't be executed

Full [R]:

- All tests will be selected.

The screenshot shows the 'Run All Diagnostics Execution' screen. At the top, it displays 'LENOVO Diagnostics UEFI' and 'Time 09:55 - Version 04-12-001'. Below this is a table of diagnostic components with their status and progress. A summary section on the right provides details about the current test, including start and finish times, a result code, and elapsed time. At the bottom, there is a progress bar for the total estimated time, a 'FINAL RESULT CODE' with a QR code, and a footer with navigation instructions.

Diagnostic	Status	Progress	Summary
DISPLAY	NOT SELECTED	>	STORAGE: WDS000LPLX-002NTT0
KEYBOARD	PASSED	100% >	Started at: 2019/04/18 09:55:32
MOUSE	PASSED	100% >	SMART Status Test: CANCELED
OPTICAL	N/A	>	SMART Short Self-Test: CANCELED
TOUCH	N/A	>	Drive Self-Test: CANCELED
BATTERY	N/A	>	Random Seek Test: CANCELED
CPU	CANCELED	100% >	Full Seek Test: CANCELED
FAN	CANCELED	100% >	Target Read Test: CANCELED
MEMORY	CANCELED	100% >	Finished at: 2019/04/18 09:55:46
MOTHERBOARD	CANCELED	100% >	RESULT CODE: U10Q4P101-E0MTP9
PCI EXPRESS	CANCELED	100% >	Elapsed Time: 00:00:14
WIFI	N/A	>	
STORAGE	CANCELED	100% >	

Total estimated time: 00:02:07 of 00:10:00
 Final Result Code: U10Q4P101-E0MTP9
 Passed: 02 Failed: 00 N/A: 04 Canceled/Not Selected: 07

Navigation (Arrows) View Log (V) Home (Esc)

Run All Diagnostics Execution

The Run All Diagnostics Execution screen provides information about the diagnostics progress of all modules, as well as information about the results. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the diagnostic, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize tests details after finishing the diagnostic execution. That section contains the following diagnostics information:

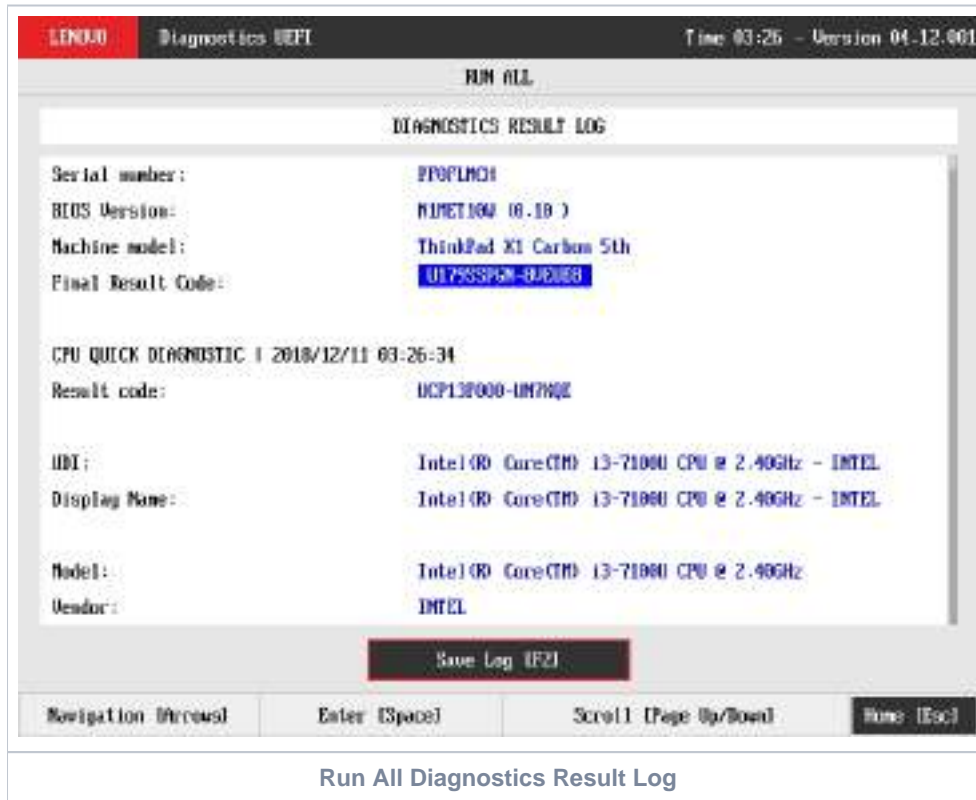
- Final Result Code (an encrypted code that informs which modules were tested).
- Date and time that diagnostic has started.
- Test (name of the test being currently run).
- Progress of the current test (current test's progress in percentage).
- Total estimated time of the current suite of diagnostic tests.
- A list with all the algorithms which compose device test and their respective status:
 - **Waiting**, indicating the test is waiting to be run.
 - **Progress** (plus the test execution percentage), indicating the test is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **WARNING**, when applicable, indicating the algorithm has detected signs to the user be aware (for instance, of an imminent failure).
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
 - **NOT APPLICABLE**, indicating the algorithm is not supported by device.
- Date and time that the tests are finished (displayed after test is finished).
- Result Code for test.
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the test log (by pressing the V key).

A total sum of **Passed** (**Warning** tests are also counted as passed as it does not indicates a hardware failure, it just indicates a point of attention), **Failed**, **N/A** (Not Applicable) and **Canceled / Not Selected** tests are displayed in the Footer Bar.

Diagnostics Result Log

After a test or a recover operation is finished, the user can see the Diagnostics Result Log screen by pressing the V key. That screen is shown in the following figure.



The Diagnostics Result Log screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Diagnostic Log Section
- Save Log Button
- Instruction Footer Bar

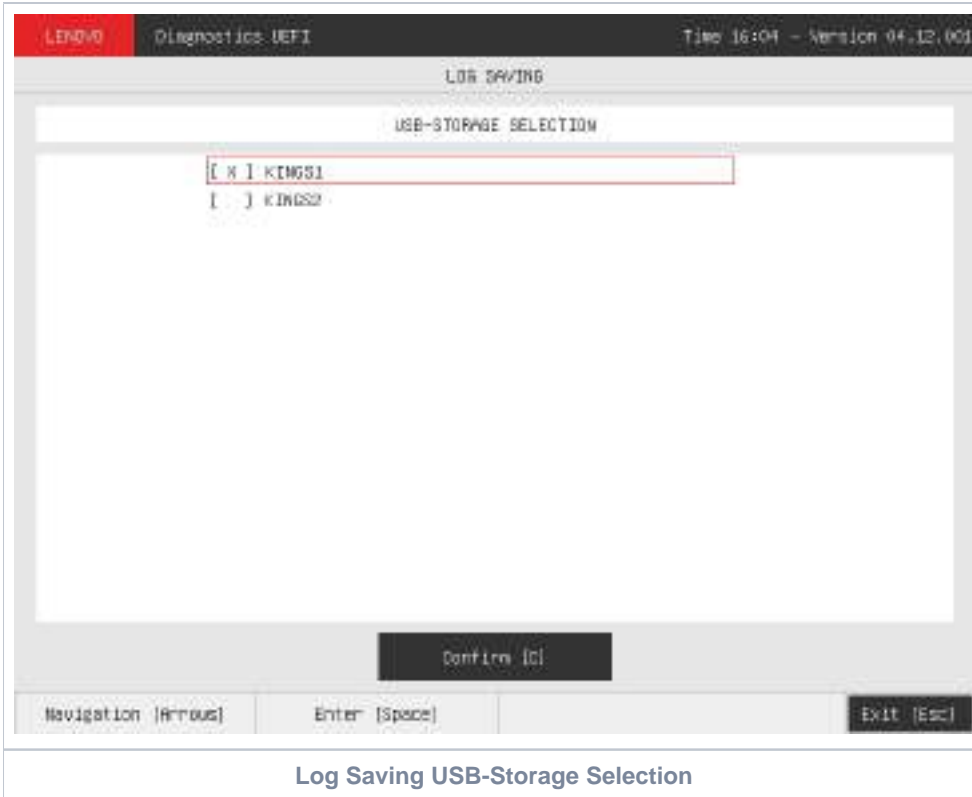
The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

Additionally, the screen has one main section that shows the diagnostic log, and a Save Log button that allows the user to store the log into an USB-Storage.

If the log content has many rows, user can scroll by pressing the Page Up and Page Down to move the displayed region up and down, respectively. The user can also go back to the Home screen by pressing the ESC key and save the log by pressing the F2 key.

Log Saving

If the user chooses to save the log by pressing the Save Log button on the Diagnostics Result Log screen, the Log Saving screen is displayed, as shown in the figure below.



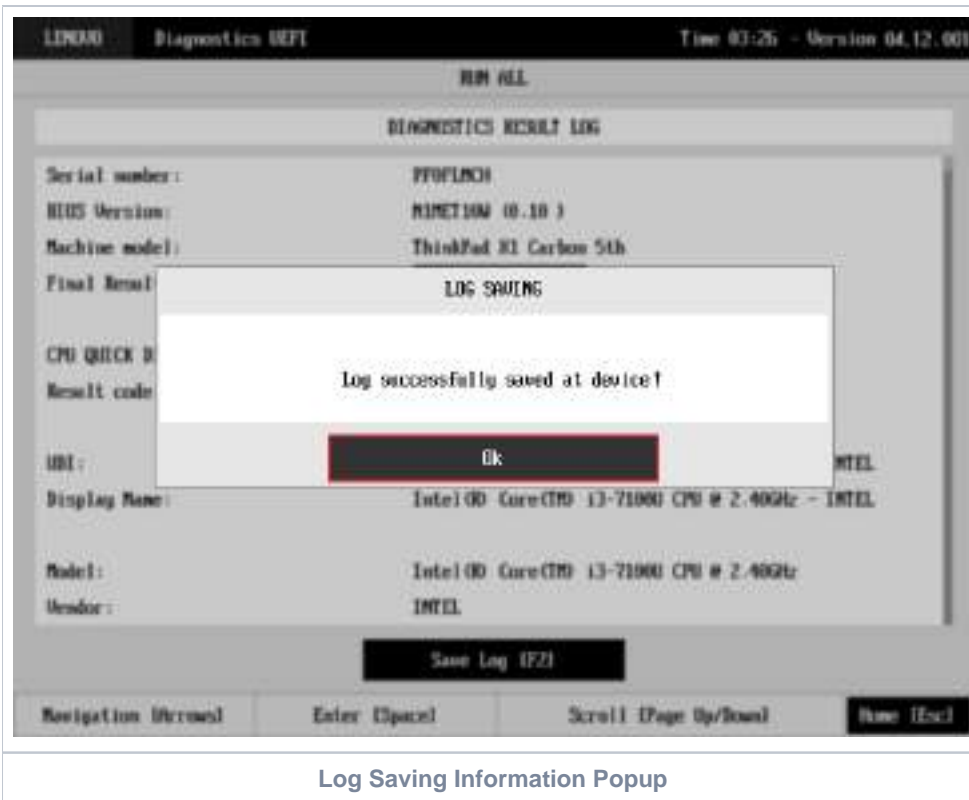
The Log Saving screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- USB-Storage Selection List
- Confirm Button
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

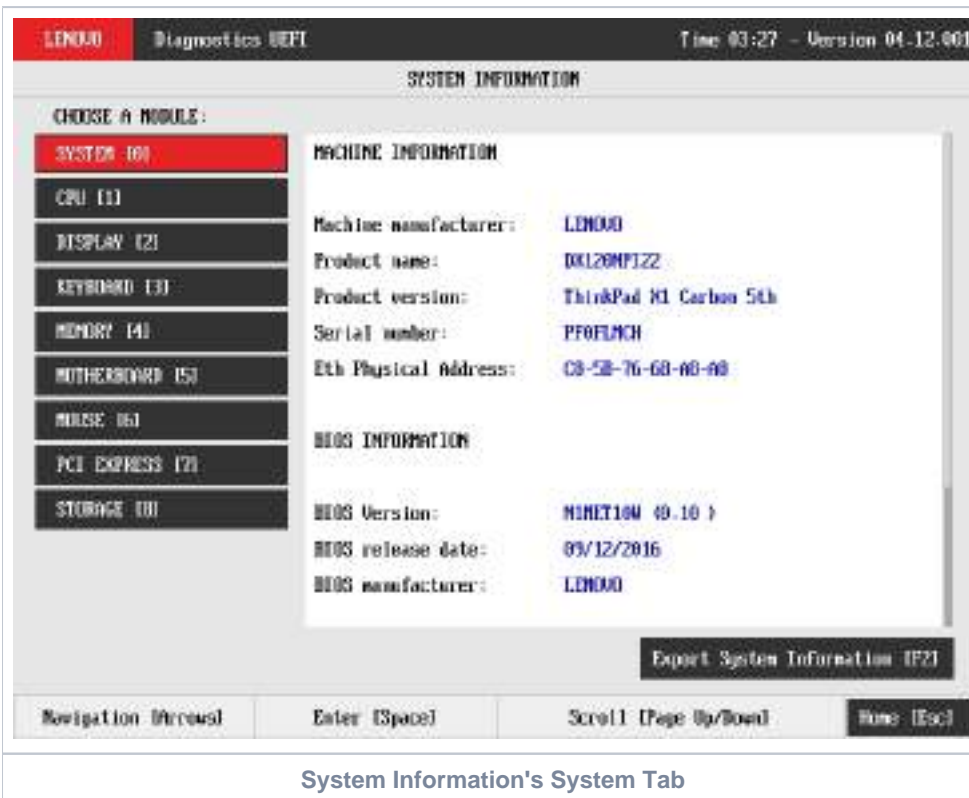
In addition, user can choose a device from the USB-Storage Selection List to save the log in. After the user chooses a device, s/he can press Confirm. The application will attempt to save the log into the selected device.

If the saving operation is successful, a window will be displayed to inform the user that the operation was successful (as shown in the next figure). If the operation does not work, a window will be displayed to inform the user that the operation was not successful. In both cases, the user must press ENTER, and the Diagnostics Result Log screen will be displayed again.

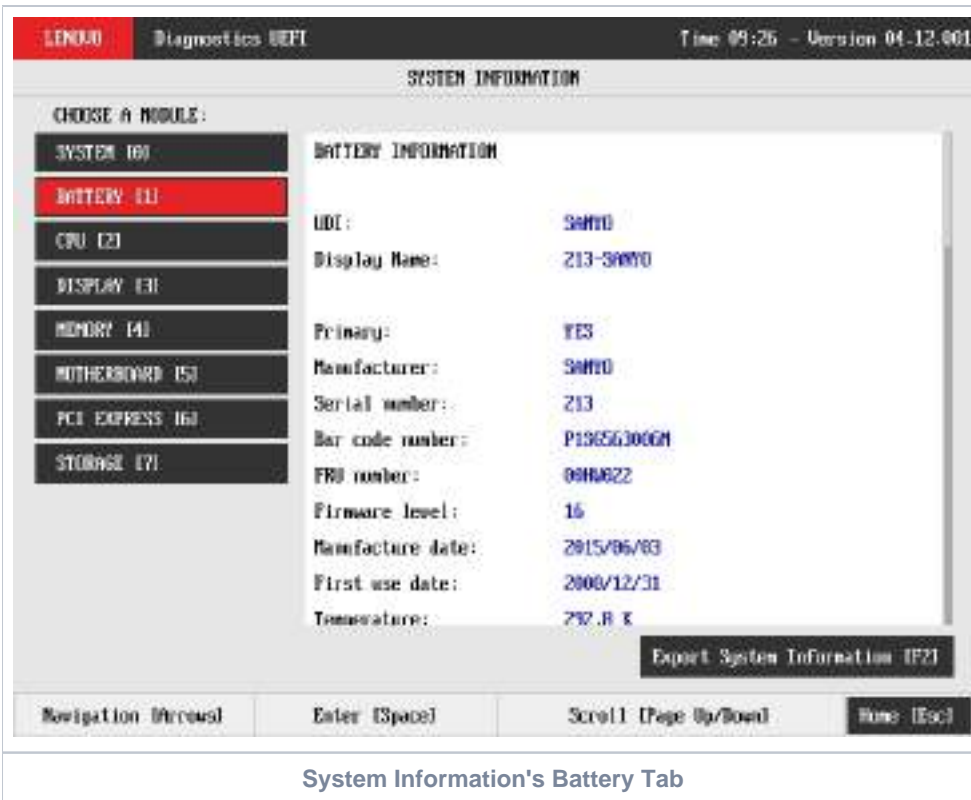


System Information

The System Information screen with the System tab selected is shown in the following figure.



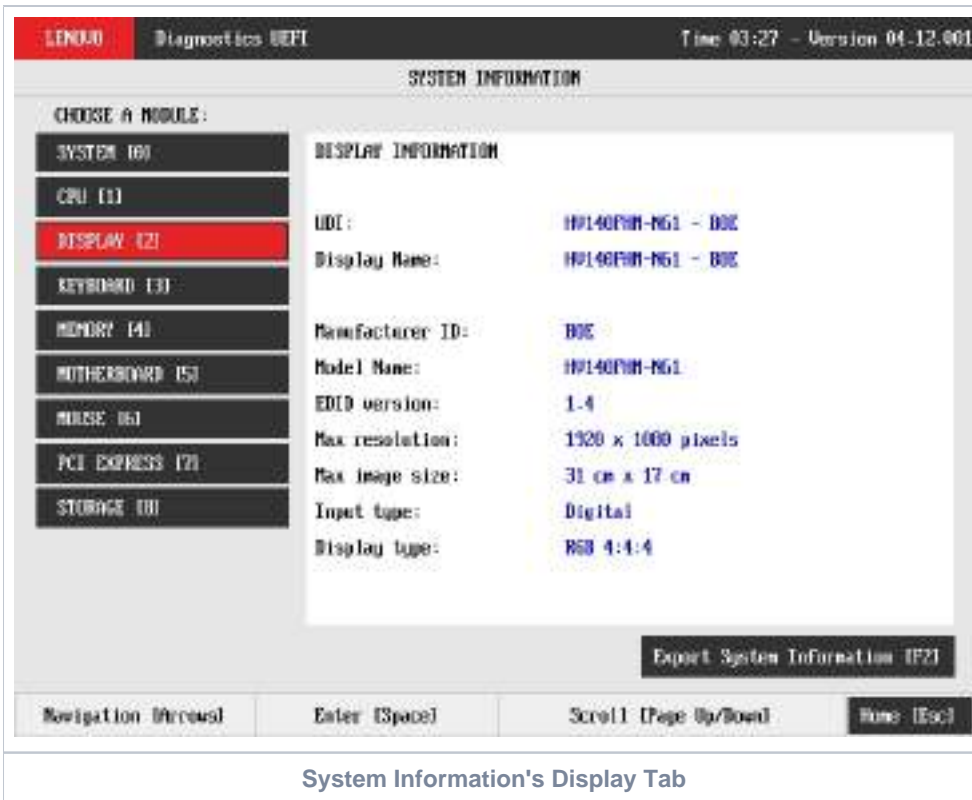
The System Information screen with the Battery tab selected is shown in the following figure.



The System Information screen with the CPU tab selected is shown in the following figure.



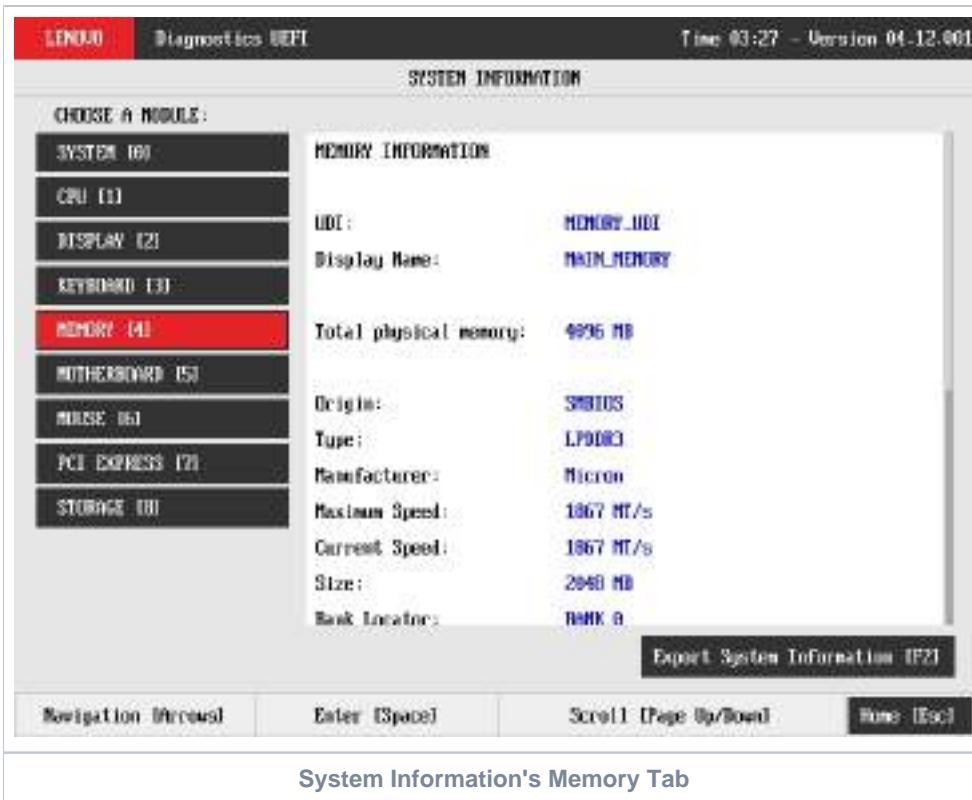
The System Information screen with the Display tab selected is shown in the following figure.



The System Information screen with the Fan tab selected is shown in the following figure.

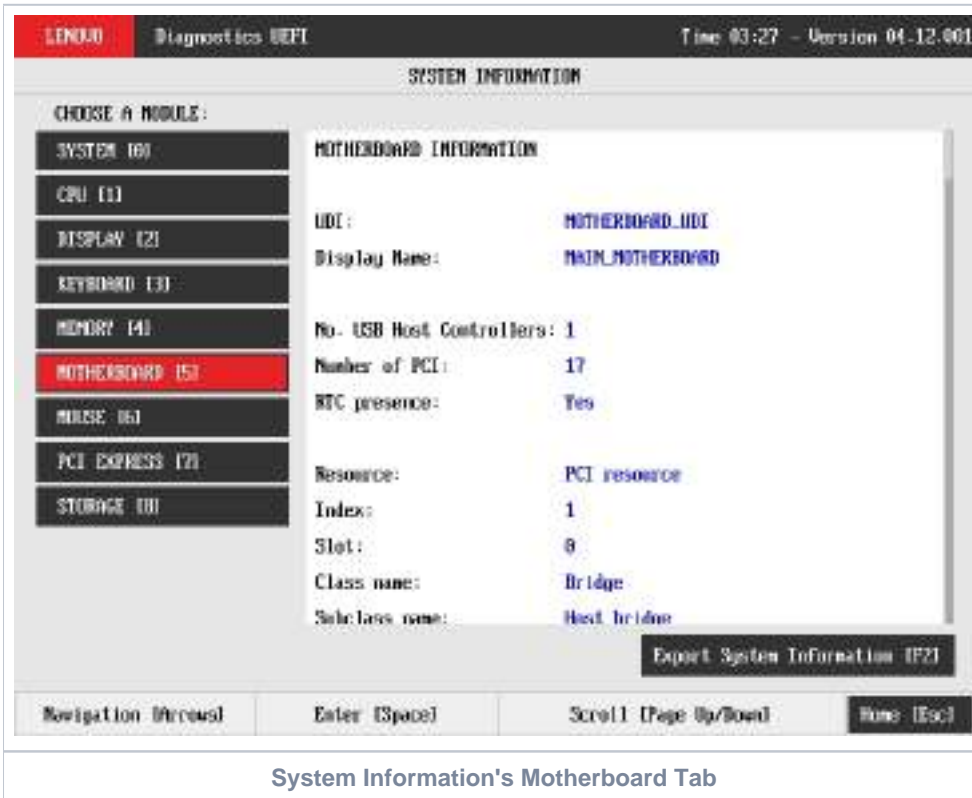


The System Information screen with the Memory tab selected is shown in the following figure.



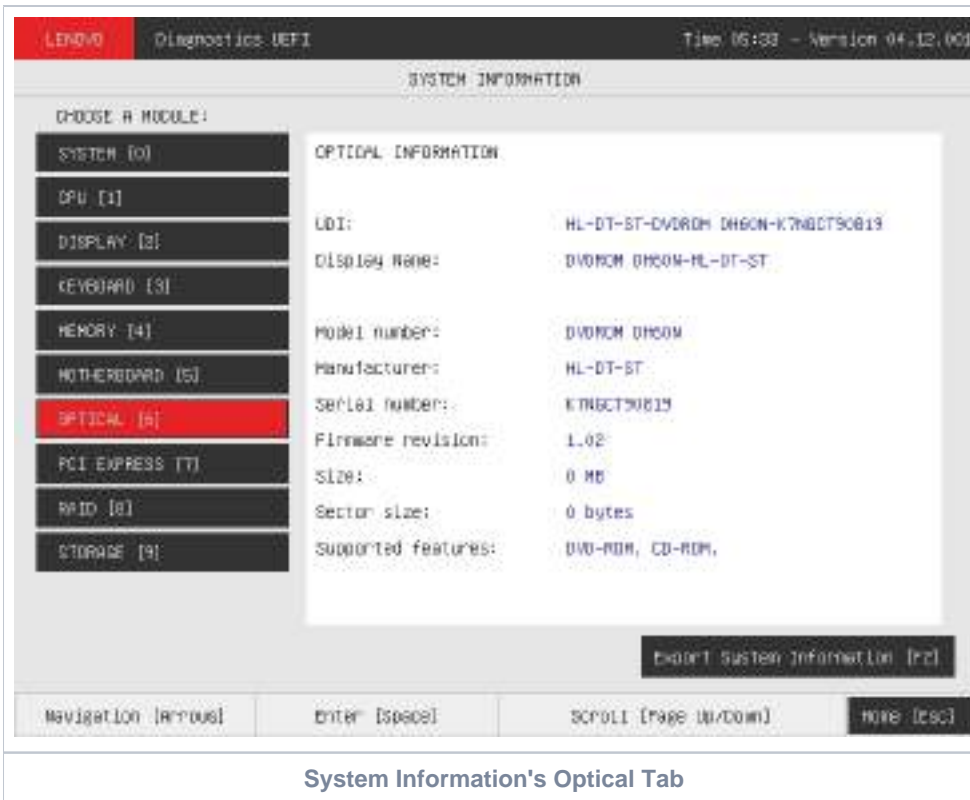
System Information's Memory Tab

The System Information screen with the Motherboard tab selected is shown in the following figure.



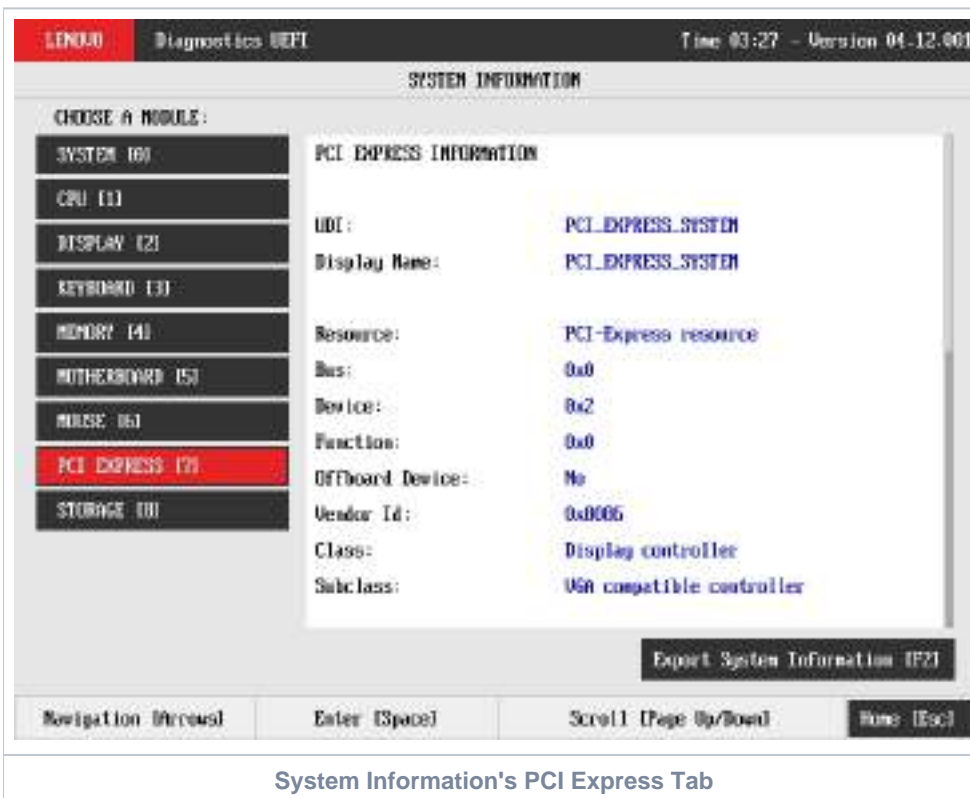
System Information's Motherboard Tab

The System Information screen with the Optical tab selected is shown in the following figure.



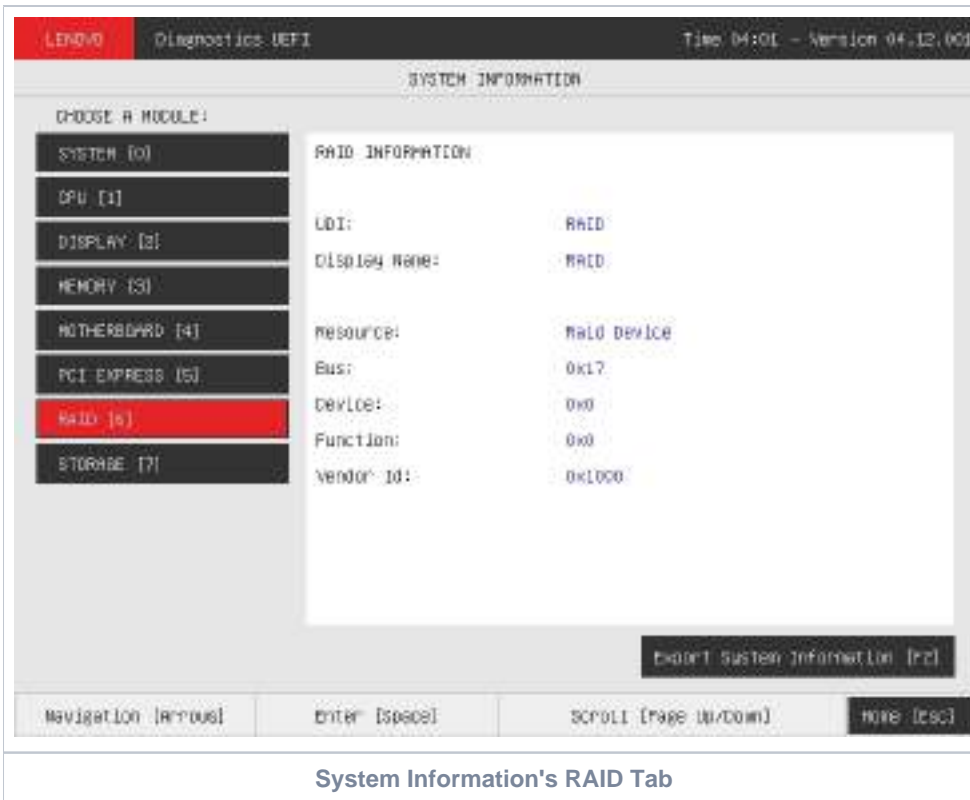
System Information's Optical Tab

The System Information screen with the PCI Express tab selected is shown in the following figure.



System Information's PCI Express Tab

The System Information screen with the RAID tab selected is shown in the following figure.



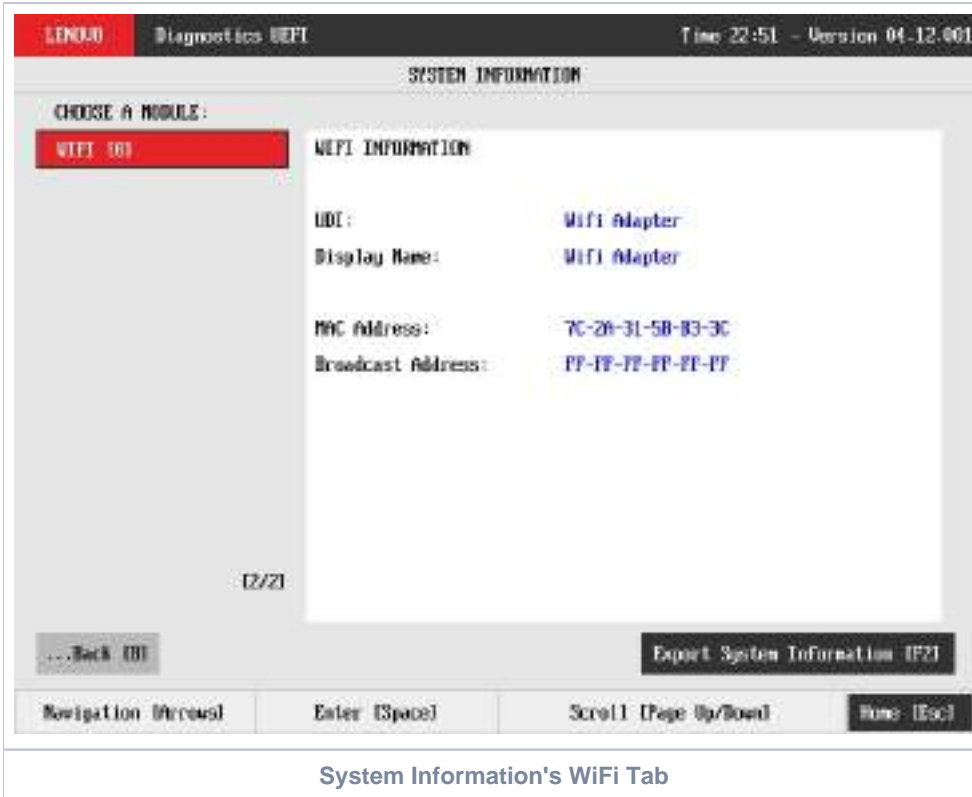
System Information's RAID Tab

The System Information screen with the Storage tab selected is shown in the following figure.



System Information's Storage Tab

The System Information screen with the WiFi tab selected is shown in the following figure.



System Information's WiFi Tab

The System Information screen is displayed after the user enters the option System Information on the Home screen. The System Information screen provides detailed information about the machine, the memory devices, and the storage devices. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Modules Tabs Bar;
- Content Tab;
- Export System Information Button;
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title Bar helps the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

Modules Tabs Bar contains the modules options to load information and displays the tab currently selected (the name of current tab has a red background to differentiate it from the other tabs), while the Content Tab is the region that exhibits information corresponding to the selected tab.

Export System Information Button can be accessed between the Content Tab and the Instruction Footer Bar, where it is possible to export all the modules' information at once to an USB-Storage device.

The user can change the current tab either by using mouse/touch device (*Bootable version only*) or by using the up () and down () keys to navigate among the options and by pressing ENTER to access the option. The Content Tab region will display information about the device on the selected tab. The user can also scroll information content using the Page Up and Page Down keys if the number of content rows is greater than the number of rows on the screen.

For the **System tab**, the following information is displayed on the Content Tab:

- Machine Manufacturer;
- Product Name;
- Product Version;
- Serial Number;
- BIOS Version;
- BIOS Release Date;
- BIOS Manufacturer;
- Processor Manufacturer;
- Processor Version.

For the **Battery tab**, the following information is displayed on the Content Tab:

- Primary;
- Manufacturer;
- Serial Number;
- Bar Code Number;

- FRU Number;
- Firmware Level;
- Manufacture Date;
- First Use Date;
- Temperature;
- Device Chemistry;
- Cycle Count;
- Charging Status;
- Remaining Charge;
- Capacity Mode;
- Full Charge Capacity;
- Remaining Capacity;
- Design Capacity;
- Current;
- Voltage;
- Design Voltage;
- Warranty Period;
- Warranty Cycles;
- OptionalMFGFunction2.

For the **CPU tab**, the following information is displayed on the Content Tab:

- UDI;
- Display Name;
- Model;
- Vendor;
- Number of Cores;
- Number of Enabled Cores;
- Number of Threads;
- Signature;
- Max Speed;
- Current Speed;
- Features;
- Cache L1;
- Cache L2;
- Cache L3.

For the **Display tab**, the following information is displayed on the Content Tab:

- UDI;
- Display Name;
- Manufacturer ID (a three-letter code identifying the manufacturer);
- Model Name;
- EDID Version;
- Max Resolution (in pixels);
- Max Image Size (in cm);
- Input Type (Analog or Digital);
- Display Type.

For the **Fan tab**, the following information is displayed in the Content Tab:

- UDI;
- Display Name;
- CPU Fan Speed;
- CPU Temperature.

For the **Fingerprint tab**, the following information is displayed in the Content Tab:

- UDI;
- Display Name;
- Serial Number:
- Manufacturer:
- Product Name:

For the **Keyboard tab**, the following information is displayed in the Content Tab:

- UDI;
- Display Name;
- Device Type;
- Serial Number (when applicable);
- Manufacturer (when applicable);
- Product Name (when applicable);

For the **Memory tab**, the following information is displayed on the Content Tab:

- UDI;
- Display Name;
- Total Physical Memory (total of physical memory of machine in MB) and, for each memory device installed on machine:
 - Origin (Identification of memory device);
 - Type (DDR2, DDR3, EEPROM and so on);

- Manufacturer;
- Maximum Speed (in MT/s);
- Current Speed (in MT/s);
- Size (in MB);
- Part Number;
- Serial Number.

For the **Motherboard tab**, the following information is displayed on the Content Tab:

- UDI;
- Display Name;
- No. of USB Host Controllers;
- Number of PCI;
- RTC Presence;
- Resource;
- Index;
- Slot;
- Class Name;
- Subclass Name.

For the **Mouse tab**, the following information is displayed on the Content Tab:

- UDI;
- Display Name;
- Device Type;
- Resolution X;
- Resolution Y;
- Has Left Button;
- Has Right Button;
- Serial Number (when applicable);
- Manufacturer (when applicable);
- Product Name (when applicable);

For the **Optical tab**, the following information is displayed on the Content Tab:

- UDI;
- Display Name;
- Model Number;
- Manufacturer;
- Serial Number;
- Firmware Revision;
- Size;
- Sector Size;
- Supported Features.

For the **PCI Express tab**, the following information is displayed on the Content Tab:

- UDI;
- Display Name;
- Resource;
- Bus (current item bus hexadecimal id);
- Device (current item device hexadecimal id);
- Function (current item function hexadecimal id);
- Offboard Device (in case it's an external PCI Express off board connected);
- Vendor ID (current item vendor hexadecimal id);
- Class (current item class name);
- Subclass (current item subclass name).

For the **RAID tab**, the following information is displayed on the Content Tab:

- UDI;
- Display Name;
- Resource;
- Bus (current item bus hexadecimal id);
- Device (current item device hexadecimal id);
- Function (current item function hexadecimal id);
- Vendor ID (current item vendor hexadecimal id).

For the **Storage tab**, the following information is displayed on the Content Tab:

- UDI;
- Display Name;
- Model Number;
- Manufacturer;
- Device Type;
- Serial Number;
- Firmware Revision;
- Size (in GB);
- Rotation Rate;
- Temperature (in Celsius);

- Physical Block Size (in bytes);
- Logical Block Size (in bytes);
- No. of Logical Blocks;
- Supported Standards;
 - ATA/ATAPI 4;
 - ATA/ATAPI 5;
 - ATA/ATAPI 6;
 - ATA/ATAPI 7;
 - ATA8_ACS;
- Standard Version;

For the **Touch tab**, the following information is displayed on the Content Tab:

- UDI;
- Display Name;
- Absolute Min X;
- Absolute Min Y;
- Absolute Min Z;
- Absolute Max X;
- Absolute Max Y;
- Absolute Max Z;
- Supports Alternative Button;
- Supports Pressure as Z;
- Serial Number;
- Manufacturer;
- Product Name;

For the **WiFi tab**, the following information is displayed on the Content Tab:

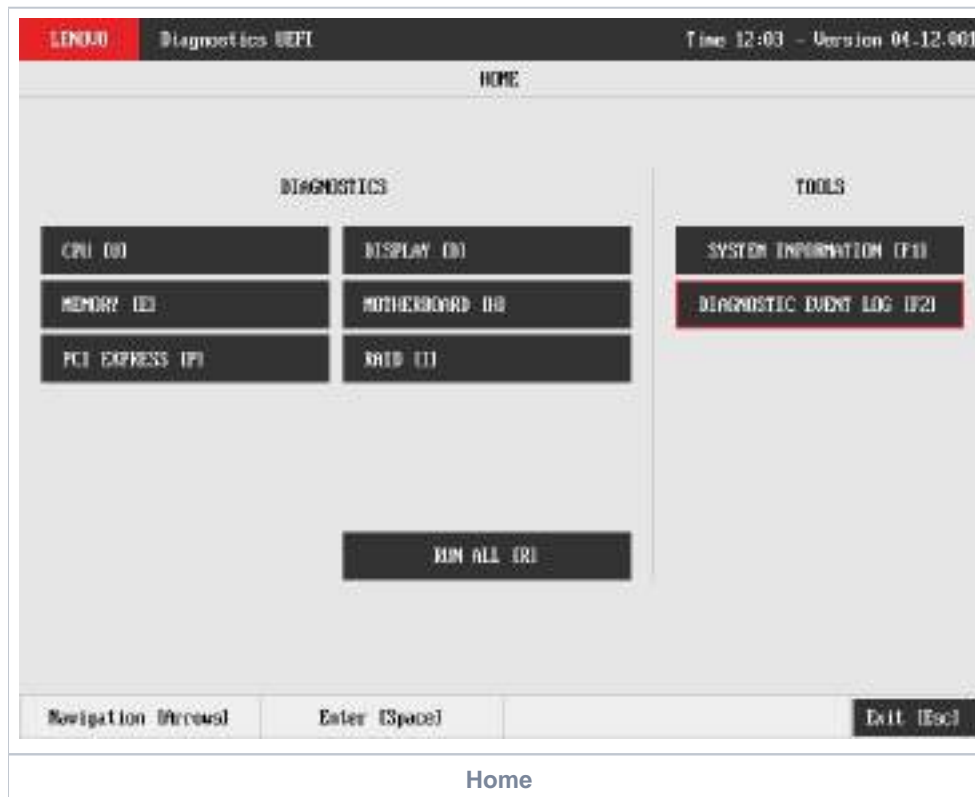
- UDI;
- Display Name;
- MAC Address;
- Broadcast Address;

To exit the System Information screen and go back to the Home screen, the user must press the ESC key.

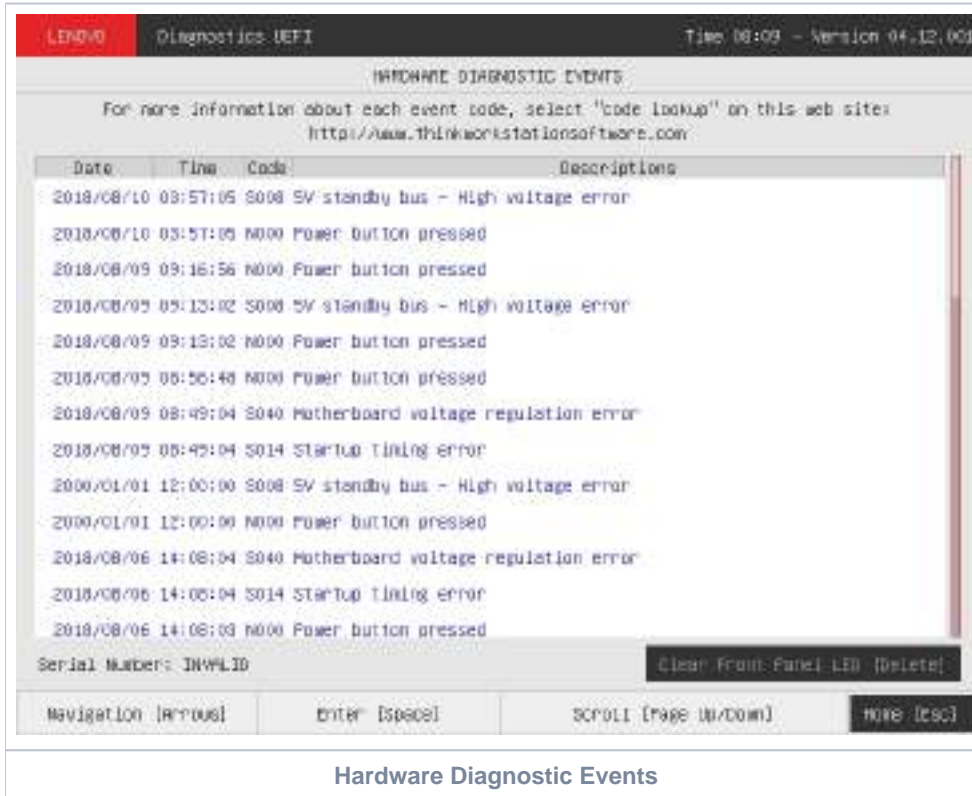
Hardware Diagnostic Events (for ThinkStation)

Hardware Diagnostic Events are exhibited by accessing the Home screen, Tools, Diagnostic Event Log.

Nevertheless, this tool is currently limited to only ThinkStation products, specifically to P520C, P520, P720 and P920.



When entering the tool, the events are loaded and displayed, as demonstrated in the next image.

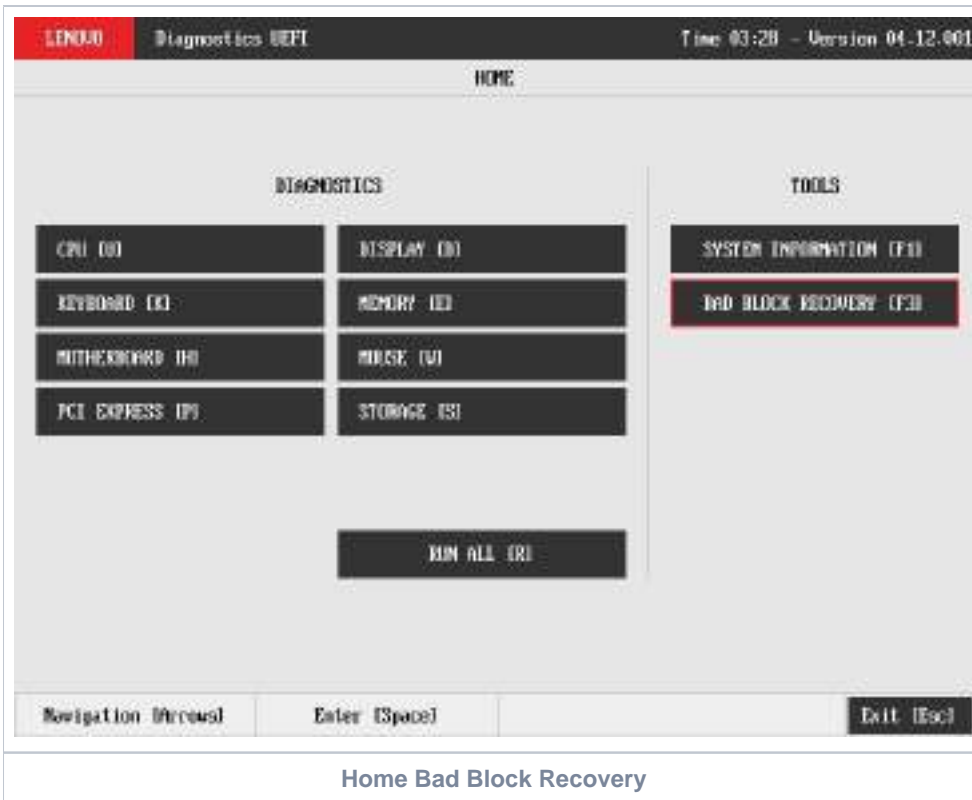


The application may be unable to retrieve the requested information. When that occurs, users can use the "Clear Front Panel LED" button to be able again to retrieve hardware diagnostic events.

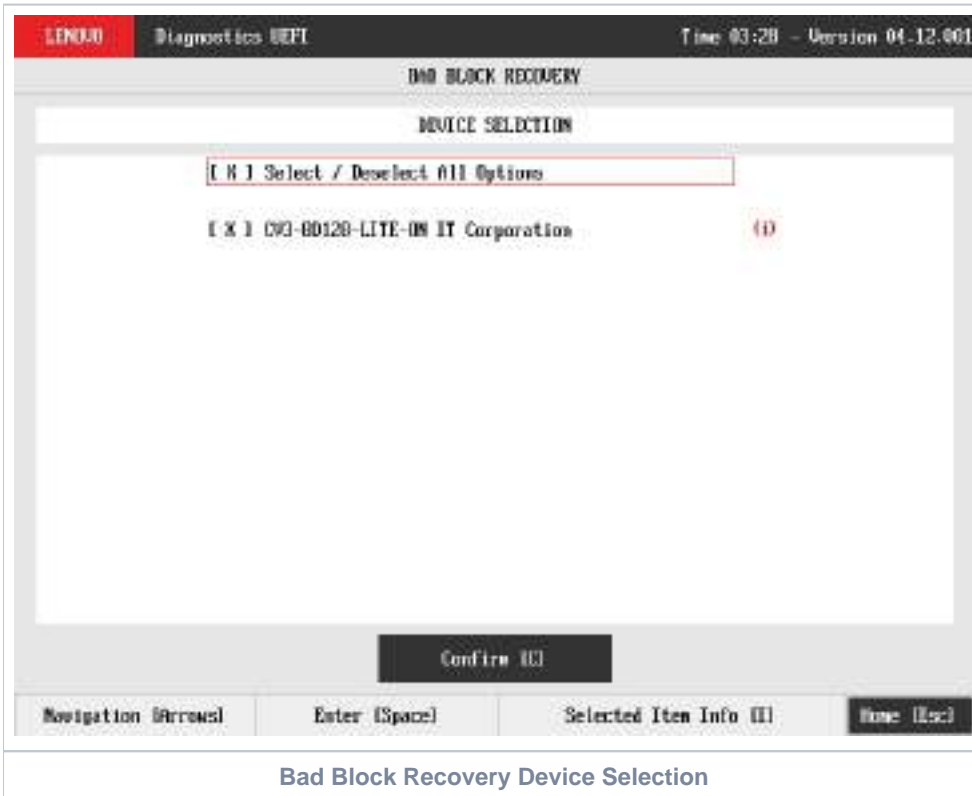
Bad Block Recovery

The Bad Block Recovery is a tool that recovers bad blocks in a storage device.

The system allows the user to access that tool by accessing the Home screen, Tools, Bad Block Recovery.



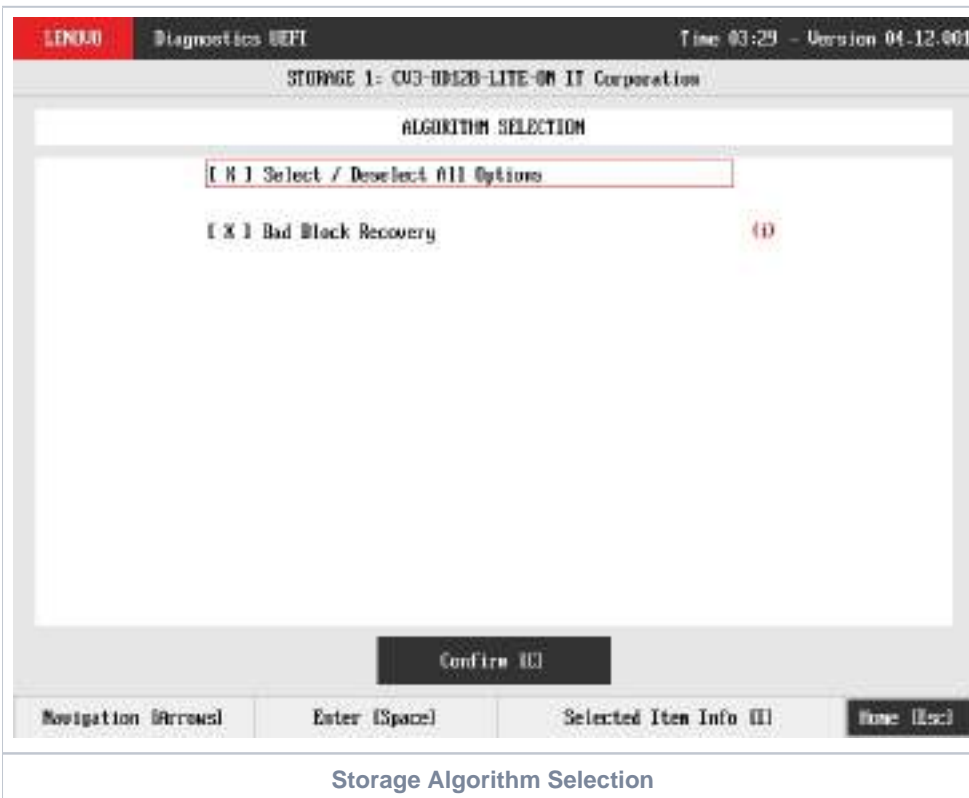
After the user enters the Bad Block Recovery option, the application will display the storage devices available in the system. The menu Device Selection is displayed, as shown in the next figure.



This screen also allows seeing devices details. To access this feature, the user has to press the I key when the desired device is focused, leading to the exhibition of a popup with the device information, as shown in the subsequent figure.



An item can be selected/deselected by pressing SPACE when it is highlighted. A desired item is selected when it shows "[X]" preceding it. In order to continue, the user has to press ENTER on the button Confirm. As a result, the system will show the Bad Block Recovery item, as illustrated in the next figure, where the item is selected to be executed.



That screen also allows seeing the algorithm details. To access this feature, the user has to press the I key when the Bad Block Recovery item is focused, leading to the exhibition of a popup with the algorithm information, as shown in the subsequent figure.



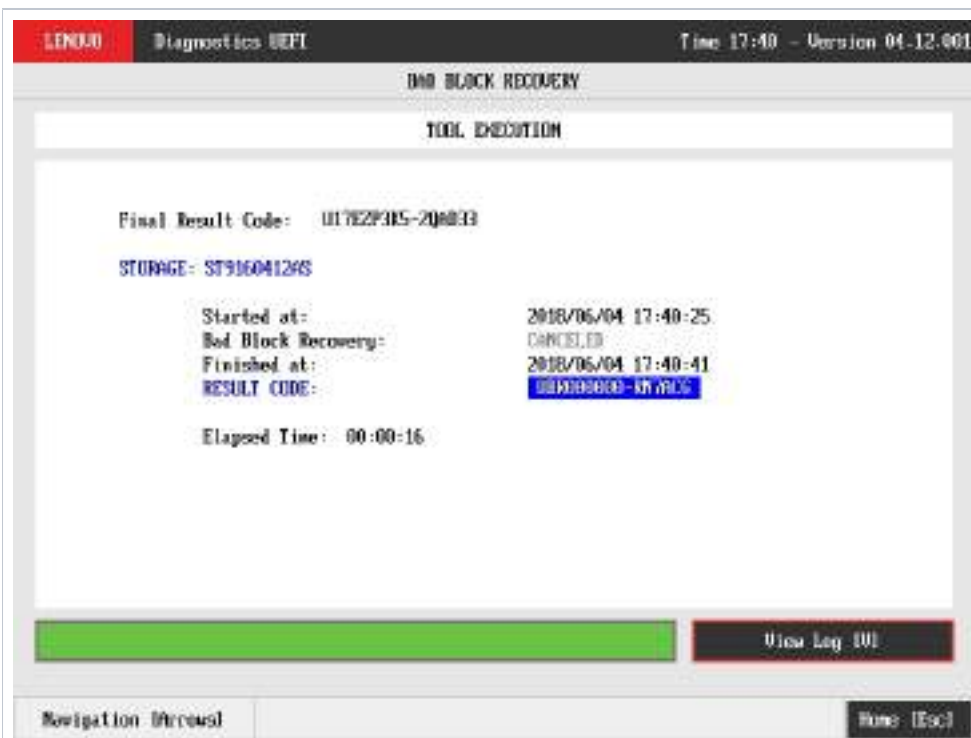
Bad Block Recovery Information Popup



Note

Once the Bad Block Recovery might perform write operations on a device, it may cause data loss. Consequently, the user must backup his or her data before running that operation.

In order to confirm the tool's execution, the user can use the Confirm button. Consequently, the system will run the tool, as illustrated in the figure below.



Bad Block Recovery Tool Execution

The Bad Block Recovery Tool Execution screen provides information about the Bad Block Recovery tool progress, as well as its result when it has finished. This screen is composed of:

- Application Header Bar
- Screen Title Bar
- Screen Sub-title Bar
- Tool Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the tool, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize the algorithm execution details after finishing the tool execution. That section contains the following information:

- Final Result Code (an encrypted code that informs the algorithm's execution).
- Date and time that the operation has started.
- Bad Block Recovery (name of the algorithm being currently run).
- Progress of operation (algorithm's progress in percentage).
- The tool's algorithm can have these status:
 - **Progress** (plus the tool execution percentage), indicating the tool is being run.
 - **PASSED**, indicating the algorithm has found no problems at device.
 - **FAILED**, indicating the algorithm has found one or more faults.
 - **CANCELED**, indicating the algorithm has been canceled by user.
- Date and time that the operation is finished (displayed after it is finished).
- Result Code for the tool's algorithm.
- Elapsed time, that is a duration of the tool's algorithm in hours, minutes and seconds (displayed after it is finished).

While the tool is running, the user can stop it at any time by pressing the ESC key. If the user does that, the operation is aborted and its status is changed to CANCELED. After the operation is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the tool log (by pressing the V key).

Storage Data Disposal

Data Disposal Tool is a storage tool that erases all data from storage device.

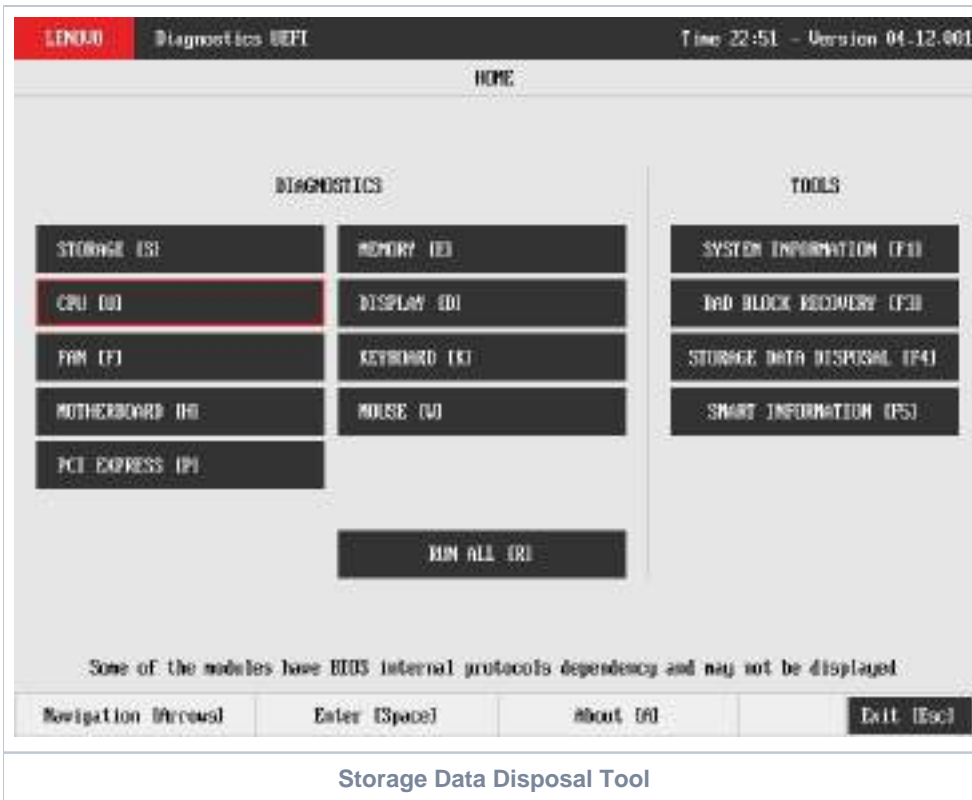


Storage Data Disposal tool is available in Bootable version only

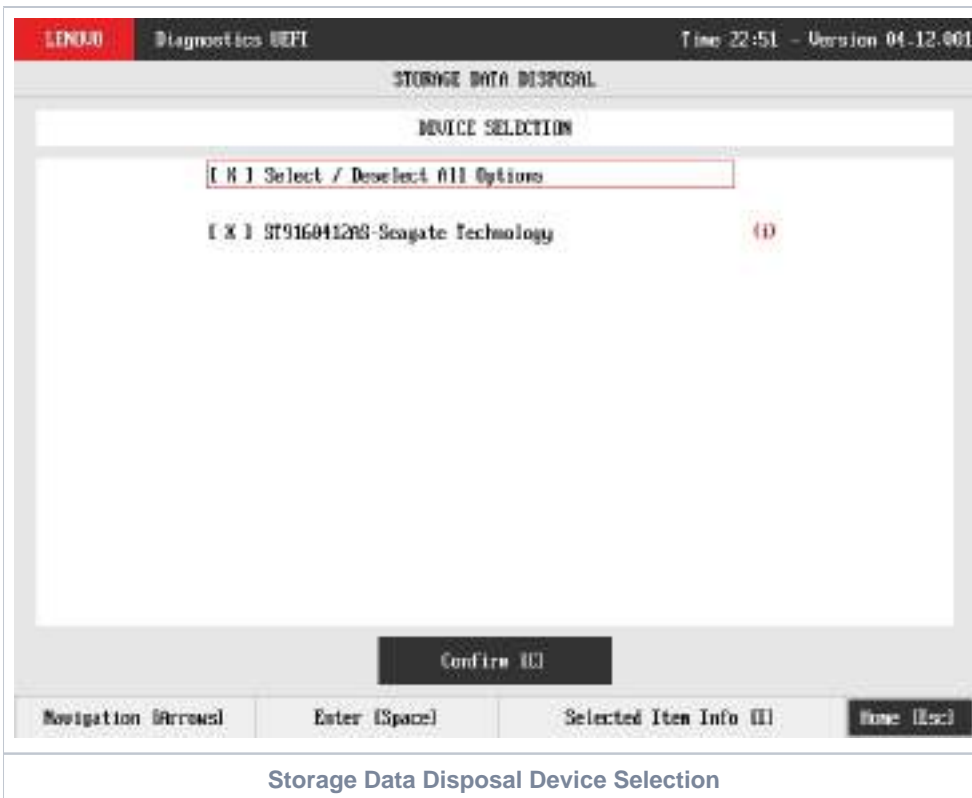


The data erasing process may take a long time to complete. Before running it, you should perform a complete backup as the data will not be restorable from the disk

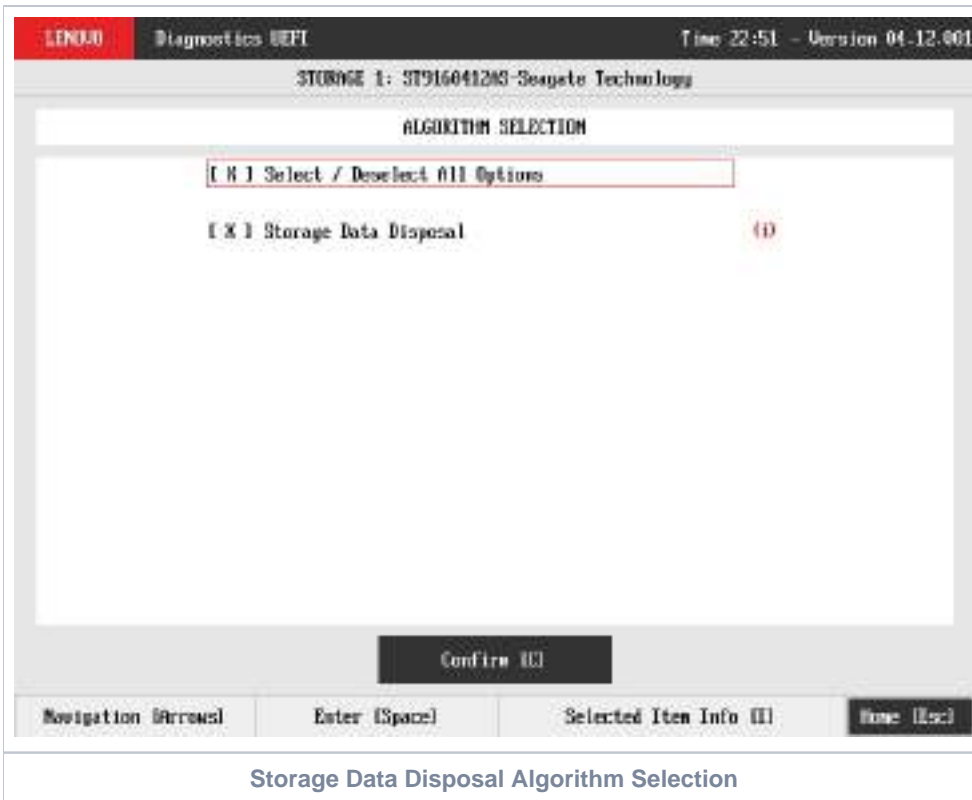
The system allows the user to access this tool by accessing the Home screen, Tools, Storage Data Disposal



After the user enters the Storage Data Disposal option, the application will display the storage devices available in the system. The menu Device Selection is displayed, as shown in the next figure.



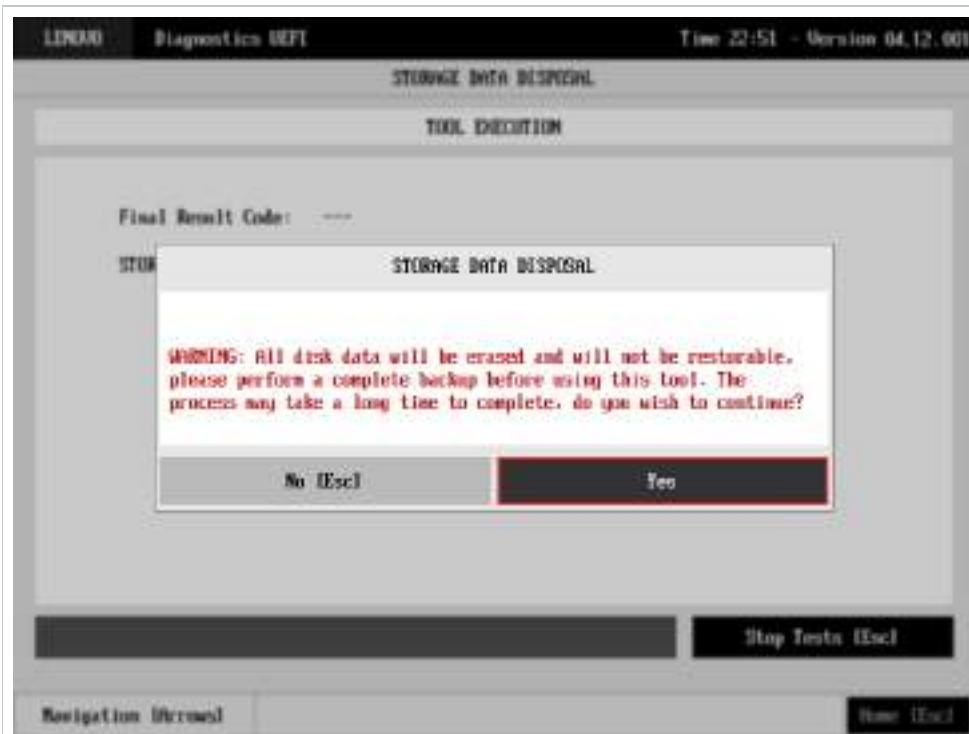
An item can be selected/deselected by pressing SPACE when it is highlighted. A desired item is selected when it shows "[X]" preceding it. In order to continue, the user has to press ENTER on the button Confirm. As a result, the system will show the Storage Data Disposal item, as illustrated in the next figure, where the item is selected to be executed.



That screen also allows seeing the algorithm details. To access this feature, the user has to press the I key when the Storage Data Disposal item is focused, leading to the exhibition of a popup with the algorithm information, as shown in the subsequent figure.

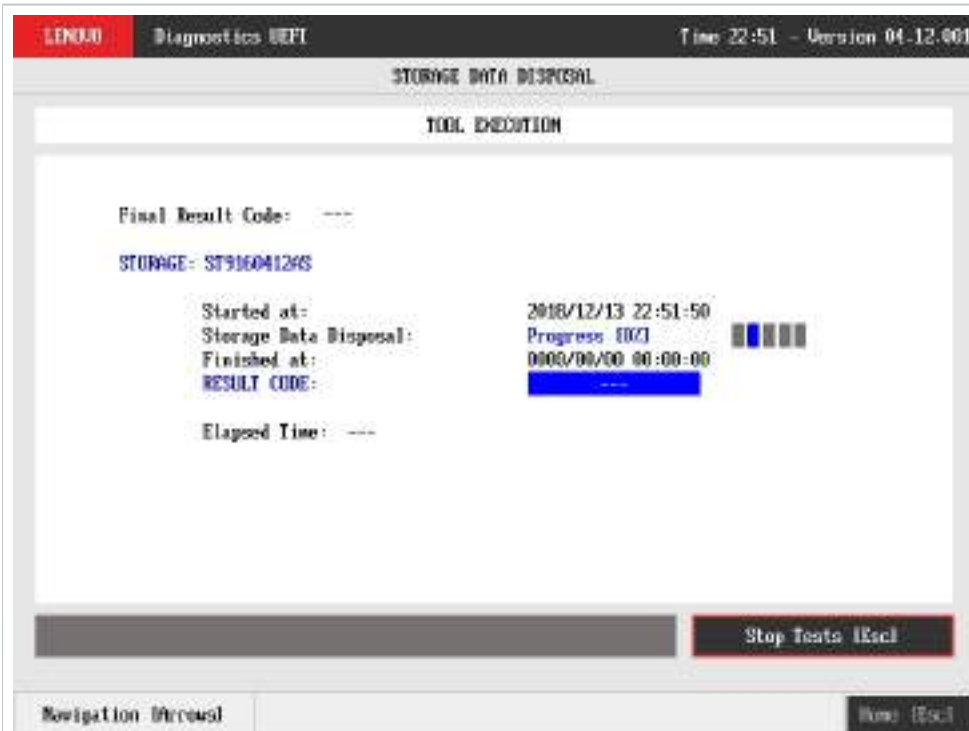


In order to confirm the tool's execution, the user can use the Confirm button. Consequently, the system will display a warning message about the data disposal process, as illustrated in the figure below.



Storage Data Disposal Warning Message

After reading the warning message, the user can confirm the tool's execution. Consequently, the system will start the data disposal process, as displayed in the figure below.



Storage Data Disposal Execution

The Storage Data Disposal Tool Execution screen provides information about the data disposal progress, as well as its result when it has finished. This screen is composed of:

- Application Header Bar

- Screen Title Bar
- Screen Sub-title Bar
- Tool Information Section
- Instruction Footer Bar

The Application Header Bar contains the name of the application, system's time and application's current version; the Screen Title and Screen Sub-title Bars help the user to be attentive of where s/he is throughout the application; and the Instruction Footer Bar contains additional instructions for using the screen, as well as the Exit button.

The screen has one main section that provides information about the tool, as well as a progress bar and a View Log button, both placed at the bottom of the section, where the former indicates the global execution progress and the latter allows to visualize the algorithm execution details after finishing the tool execution. That section contains the following information:

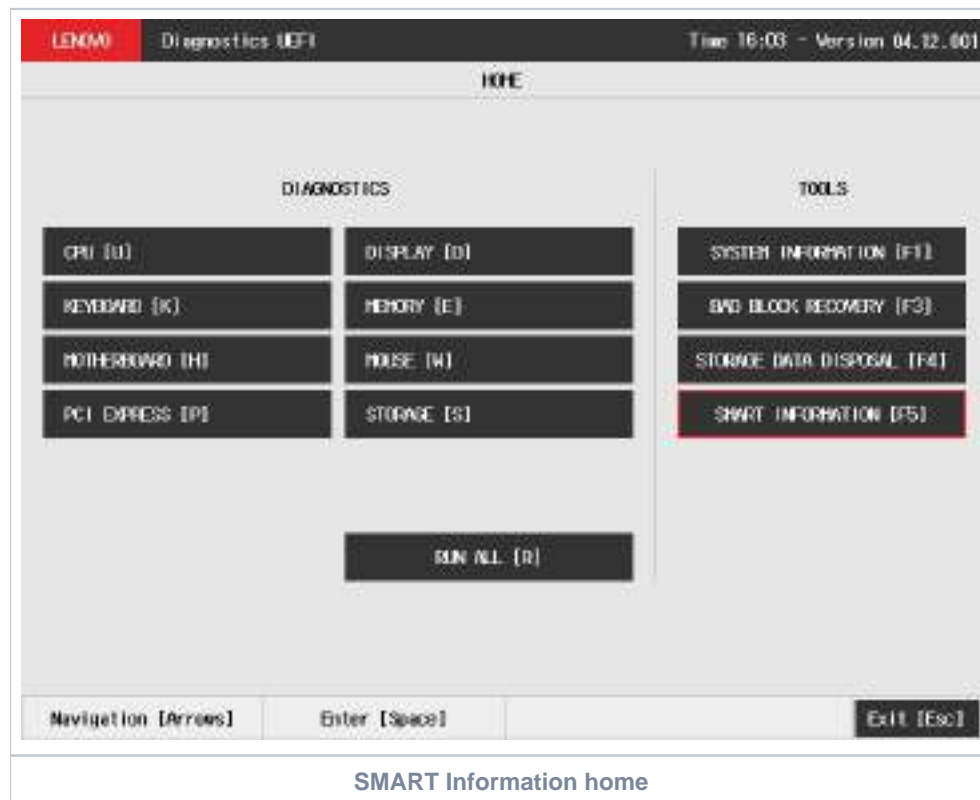
- Final Result Code (an encrypted code that informs the algorithm's execution).
- Date and time that the operation has started.
- Storage Data Disposal (name of the algorithm being currently run).
- Progress of operation (algorithm's progress in percentage).
- The tool's algorithm can have these status:
 - **Progress** (plus the tool execution percentage), indicating the tool is being run.
 - **SUCCESS**, indicating the algorithm has found no problems at device.
 - **CANCELED**, indicating the algorithm has been canceled by user.
- Date and time that the operation is finished (displayed after it is finished).
- Result Code for the tool's algorithm.
- Elapsed time, that is a duration of the tool's algorithm in hours, minutes and seconds (displayed after it is finished).

While the tool is running, the user can stop it at any time by pressing the ESC key. If the user does that, the operation is aborted and its status is changed to CANCELED. After the operation is finished or canceled, the user can go back to the Home screen (by pressing ESC again) or visualize the tool log (by pressing the V key).

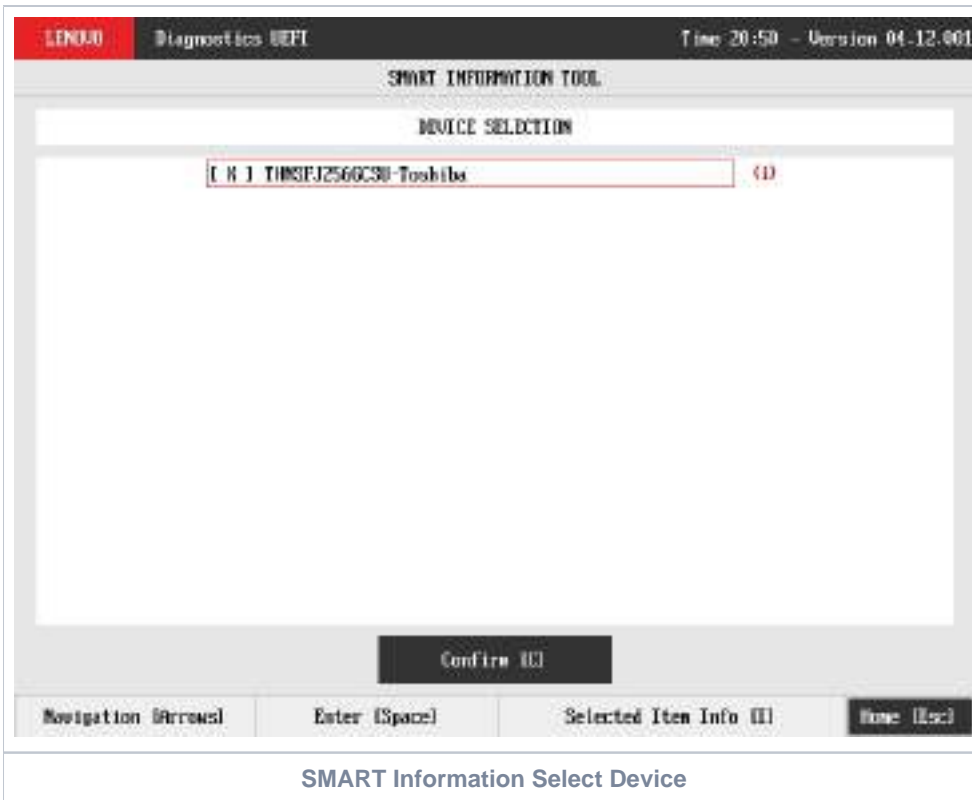
SMART Information

SMART Information is a tool used to obtain information related to the hardware condition, reported by the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) monitoring system of HDDs and SSDs , in order to prevent imminent hardware failures.

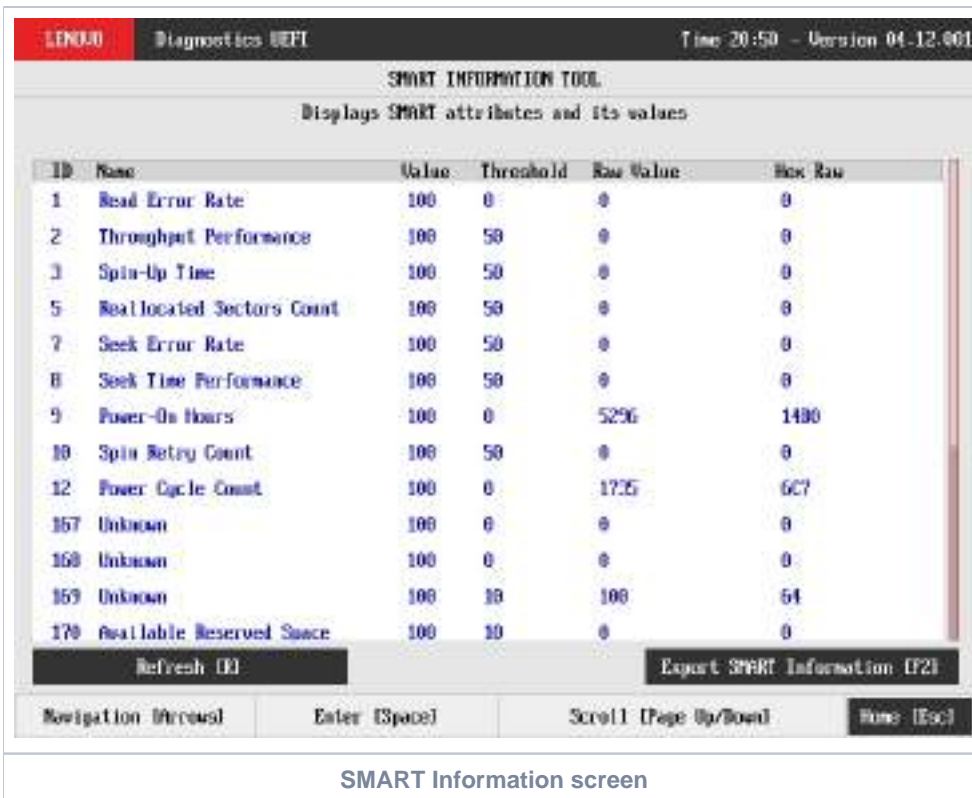
The system allows the user to access this tool by accessing the Home screen, Tools, SMART Information Tool, as displayed in the figure below.



After the user enters the SMART Information option, the application will display the storage devices available in the system. The menu Device Selection is displayed, as shown in the next figure.



An item can be selected/deselected by pressing SPACE when it is highlighted. A desired item is selected when it shows "[X]" preceding it. In order to continue, the user has to press ENTER on the button Confirm. As a result, the system will show the SMART Information, as illustrated in the next figure.



Exit Application

To exit the application, the user must select the option "Exit" on the Home screen and press the ENTER key. Then, the interface will be closed and the machine will be reset.

About

Lenovo Diagnostics for UEFI

04.12.001

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www.fit-tecnologia.org.br

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MOUSE Lenovo USB - Overview



Foto meramente illustrativa

Overview

Experience the performance of high-definition tracking, full programmability and the superior comfort of the new Lenovo Mouse. Optical technology delivers extraordinary accuracy and more responsiveness than traditional mice, resulting in smoother tracking on virtually any surface. A tilting scrollwheel allows the user to scroll through documents and webpages both horizontally and vertically. Designed for both right- and left-handed use, the Lenovo Mouse offers the ultimate in all-day comfort, precision and performance.

- 1000 dpi resolution
- Fully programmable tilting scrollwheel and buttons
- Ambidextrous design for both right- and left-handed users
- Full-speed USB connection
- Full-featured Lenovo Mouse software suite
- Exclusive soft-to-the-touch metallic black finish

Tech Specs

Ship Group	Enhanced Optical USB Mouse
Agency Approvals & Certifications EN 60825-1,EN 60950,BSMI,C-ick,CISPR-22 Class B, RoHS, CUL,TUV,VCCI,FCC Class B - Part 15,IEC 60825-1,IEC-60950-1 (CB Certificate and CB Test Report),MIC (Korea),EN 55022,EN 55024	
Maximum Operating Humidity	80
Maximum Operating Humidity Units	%
Minimum Operating Humidity	8
Minimum Operating Humidity Units	%
Maximum Operating Temperature	40
Maximum Operating Temperature Units	C
Minimum Operating Temperature	0
Minimum Operating Temperature Units	C
Depth Metric	115
Depth	115mm
Depth Metric Units	mm
Depth (US)	4.5in
Height Metric	36
Height	36mm
Height Metric Units	mm
Height (US)	1.43in
Max Operating Humidity + Units	80%



Min Operating Humidity + Units	8%
Max Operating Temperature + Units	40C
Min Operating Temperature + Units	0C
Weight US	0.2
Weight US Units	lbs
Weight Metric	0.095
Weight Metric Units	Kg
Width Metric	61
Width	61mm
Width Metric Units	mm
Width (US)	2.4in
Warranty Type	Customer Replaceable Unit



Teclado Lenovo Pro USB – Overview



(*) Foto meramente ilustrativa

Features and specifications

- Quiet 107-key full-size layout (includes three Windows keys)
- Detachable rubberized palm/wrist rest for additional comfort
- Three levels of keyboard tilt
- Common Windows shortcuts are highlighted on key skirts helps improve productivity
- USB-attach
- Keyboard USB cable length: 2.0 m (6.56 feet)
- Spill-resistant
- Choice of multiple [keyboard languages](#)
- Language Layout – Brazilian Portuguese (ABNT2)

Physical specifications

- Lenovo Pro USB Keyboard
 - Approximate weight: 0,80 kg (1,76 lb)
 - Approximate height: 34 mm (1.3 in)
 - Approximate depth: 169 mm (6.6 in)
 - Approximate width: 453 mm (17.8 in)
 - Approximate USB cable length: 2.00 m (6.56 ft)
- Lenovo Preferred Pro USB Keyboard packaged in a shipping carton:
 - Approximate weight: 1.63 kg (3.6 lb)
 - Approximate height: 63 mm (2.5 in)
 - Approximate depth: 233 mm (9.2 in)
 - Approximate width: 495 mm (19.5 in)

Warranty

3 year Limited – customer carry-in exchange

- Announce date: June 2017 (Worldwide)
- Available date: June 2017 (Worldwide)

Hardware compatibility

Desktop or notebook systems with available 1.1 , 2.0, 3.0 or 3.1 USB Port.

Software requirements

Operating systems that supports a standard USB keyboard.

Packaging

- Lenovo Pro USB Keyboard (unique version for each language: [Preferred Pro Keyboard Languages](#))
- Palm/wrist rest
- User's Guide

Agency approvals

CFCC Part 15 (Class B), UL 1950-1 (E164844), CSA C22.2 #0950-M89 (LR94275), Canada ICES-003 Class B; Canada NMB-003, Class B), CE (IEC 950, IEC 801-2, Level 3), RoHS, CE (IEC 950, IEC 801-2, Level 3), VCCI, C-Tick, BSMI, MIC

Additional product information

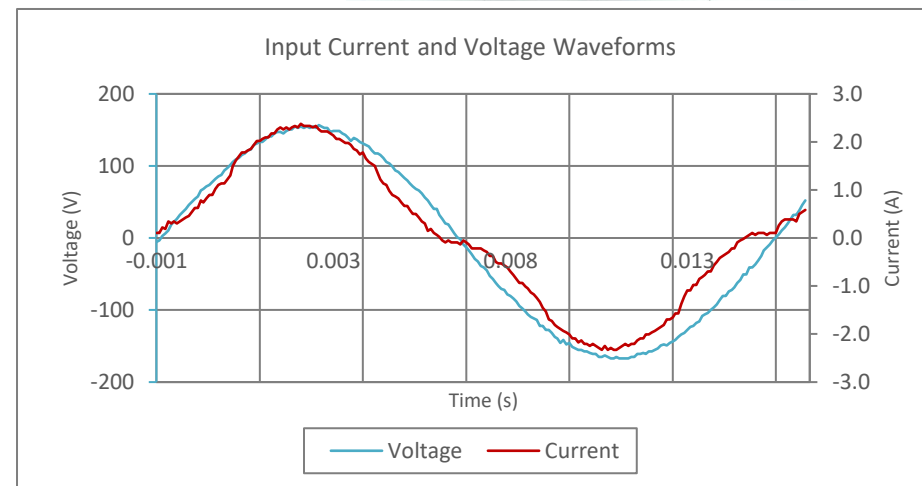
- [Service parts](#) - Parts listing for your product
- [Personal Systems Reference \(PSREF\)](#) - Comprehensive information on the features and technical specifications of Lenovo products.

80 PLUS Verification and Testing Report

TYPICAL EFFICIENCY (50% Load):	90.76%
AVERAGE EFFICIENCY :	89.31%
80 PLUS COMPLIANT:	YES



ID Number	5739
Manufacturer	Lenovo (United States), Inc.
Model Number	(Lenovo)PCK023
Serial Number	N/A
Year	2019
Type	ATX12V
Test Date	10/28/19

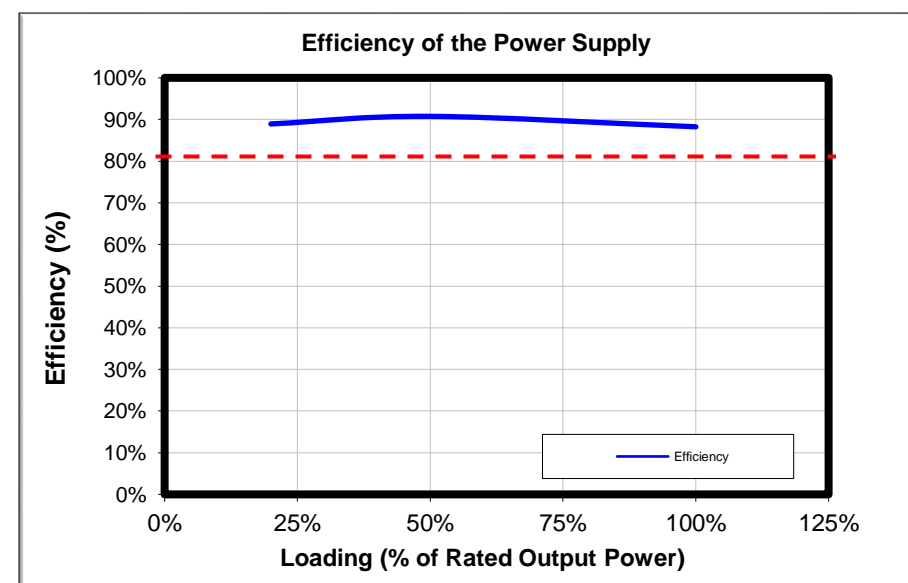
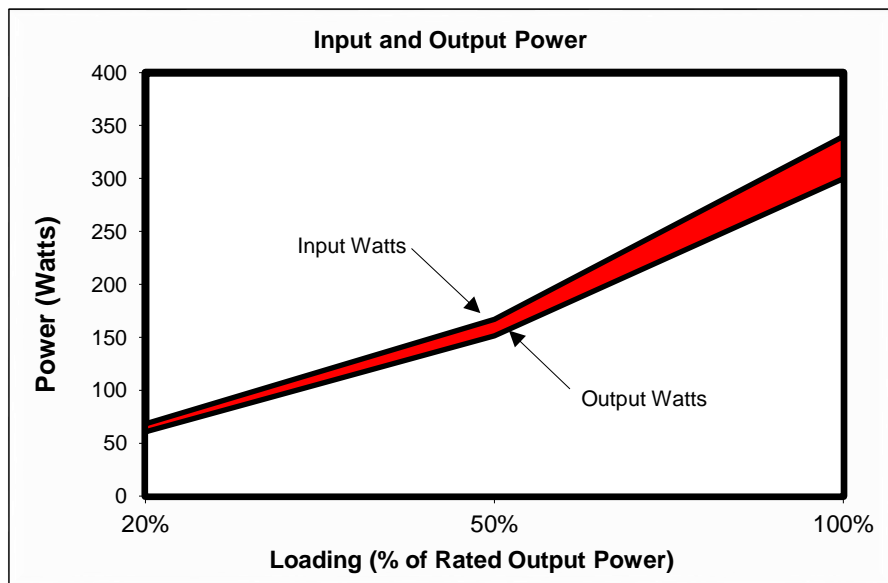


Rated Specifications	Value	Units
Input Voltage	100-240	Volts
Input Current	5	Amps
Input Frequency	50/60	Hz
Rated Output Power	300	Watts

Note: All measurements were taken with input voltage at 115 V nominal at 60 Hz.

Input AC Current Waveform (ITHD = 17.45%, 50% Load)

I _{RMS}	PF	I _{THD}	Load	Input Watts	DC Terminal Voltage (V)/ DC Load Current (A)		Output Watts	Efficiency
					12V (cumulative of 12V1, 12V2, etc.)	-12V		
0.32	0.94	22.34%	10%	35.12	12.14/2.49	11.75/0.02	30.46	86.72%
0.61	0.97	20.39%	20%	68.35	12.12/4.98	11.71/0.04	60.79	88.93%
1.48	0.98	17.45%	50%	166.83	12.06/12.46	11.7/0.1	151.41	90.76%
2.99	0.99	9.71%	100%	339.80	11.95/24.89	11.77/0.2	299.85	88.24%



These tests were conducted by a third party independent testing firm on behalf of the 80 PLUS Program. 80 PLUS is a certification program to promote highly-efficient power supplies (greater than 80% efficiency in the active mode) in technology applications. <http://www.80plus.org/>





**UNMATCHED POWER.
UNMATCHED CREATIVE
FREEDOM.**
NVIDIA® QUADRO® P1000

Full Professional Performance and Features in a Small Form Factor.

The Quadro P1000 combines a 640 CUDA core Pascal GPU, 4 GB GDDR5 on-board memory and advanced display technologies in a low-profile form factor to deliver amazing graphics performance for demanding professional applications. Support for four 4K displays (4096x2160 @ 60Hz) with HDR color gives you an expansive visual workspace to see your ideas come to life in stunning detail.

Quadro cards are certified with a broad range of sophisticated professional applications, tested by leading workstation manufacturers, and backed by a global team of support specialists. This gives you the peace of mind to focus on doing your best work. Whether you're developing revolutionary products or telling spectacularly vivid visual stories, Quadro gives you the performance to do it brilliantly.

FEATURES

- > Four DisplayPort 1.4 Connectors¹
- > DisplayPort with Audio
- > NVIDIA nView® Desktop Management Software
- > HDCP 2.2 Support
- > NVIDIA Mosaic²
- > NVIDIA Iray and MentalRay Support



SPECIFICATIONS

GPU Memory	4 GB GDDR5
Memory Interface	128-bit
Memory Bandwidth	Up to 82 GB/s
NVIDIA CUDA® Cores	640
System Interface	PCI Express 3.0 x16
Max Power Consumption	47 W
Thermal Solution	Active
Form Factor	2.713" H x 5.7" L, Single Slot, Low Profile
Display Connectors	4x mDP 1.4
Max Simultaneous Displays	4 direct, 4 DP 1.4 Multi-Stream
Display Resolution	4x 4096x2160 @ 60Hz 4x 5120x2880 @ 60Hz
Graphics APIs	Shader Model 5.1, OpenGL 4.5 ³ , DirectX 12.0 ⁴ , Vulkan 1.0 ³
Compute APIs	CUDA, DirectCompute, OpenCL™

¹ VGA/DVI/HDMI support via adapter/connector/bracket | ² Windows 7, 8, 8.1 and Linux | ³ Product is based on a published Khronos Specification, and is expected to pass the Khronos Conformance Testing Process when available. Current conformance status can be found at www.khronos.org/conformance | ⁴ GPU supports DX 12.0 API, Hardware Feature Level 12_1

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22290-240 Tel.: (21) 2132-5252 Fax: (21) 2132-5082

Internet: www.ibm.com.br CNPJ: 33.372.251/0001-56

DECLARAÇÃO

A IBM Brasil - Indústria, Máquinas e Serviços Ltda., inscrita no CNPJ 11°33.372.251/0001-56, por intermédio do seu representante legal abaixo assinado, declara para os devidos fins, que presta serviços de suporte técnico para a Lenovo Tecnologia (Brasil) Ltda, incluindo serviços de instalação e reparos para toda a sua linha de produtos Think (Servidores, Workstation, Desktops, Notebook e Tablet) em todo o território nacional, de acordo com o contrato Master Agreement for Services & MA-14-000138 (the "Master Agreement") e os contratos: SERVICES AGREEMENT SOW & SA-49S1600326 (the "CC&FS SOW") e o contrato SERVICES AGREEMENT SOW SA-49S1600327 the "Parts SOW") firmados entre ambas as partes.

Informamos ainda que possuímos centros de apoio reparos para assegurar atendimento local, na modalidade Centro de Atendimento Técnico do Próprio Fabricante, através de nossas filiais assim distribuídas:



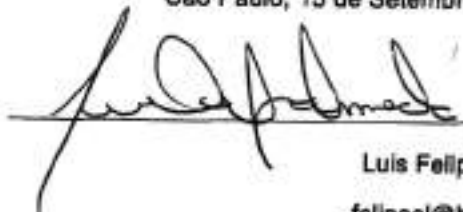
SEDE TÉCNICA	ENDEREÇO	CIDADE	UF	CEP	TELEFONE	Responsável Técnico	Cargo	E-mail
Regional Brasília (DF)	SCS Ed. Bradesco - Bloco B - 2ª andar - nr. 81	Brasília	DF	70329-900	(62) 98111-3651	CASSIUS CRUIDO COUTO	GERENTE REGIONAL	casscdo@br.ibm.com
Regional Belo Horizonte (MG)	Rua Rio de Janeiro, 328 - 4 andar - Centro	Belo Horizonte	MG	30160-040	(31) 99897-3254	GUSTAVO CAIXETA	GERENTE REGIONAL	gcaixeta@br.ibm.com
Regional Curitiba (PR)	Av. Presidente Afonso Camargo, 177 - 2 Andar - Jardim Botânico	Curitiba	PR	80060-540	(41) 99176-8712	VALMIR MARTINS FARIA	GERENTE REGIONAL	vmfaria@br.ibm.com
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Regional Porto Alegre (RS)	Av. Dolores Alcaraz Caldas, 90 - Praia de Belas	Porto Alegre	RS	90110-180	(51) 99725-7976	ROBERTO SCHNEIDER	GERENTE REGIONAL	rschneider@br.ibm.com
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Regional Rio de Janeiro (RJ)	Rua São Cristovão, 600 - 2 andar - São Cristovão	Rio de Janeiro	RJ	20940-000	(21) 99530-8217	CARLOS COSTA	GERENTE REGIONAL	carlcos@br.ibm.com
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Regional Florianópolis (SC)	Rua Fúlvio Aducci, 809 - 1 andar - Estreito	Florianópolis	SC	88075-001	(11) 99801-7708	KAIO CORREA	GERENTE REGIONAL	kaiopc@br.ibm.com
Sede Técnica João Pessoa (PB)	Rua Duque de Caxias, 401 - 1 andar - Centro	João Pessoa	PB	58010-821	(81) 98299-4205	JULLIUS ANDERSON REICHERT DO AMARAL	GERENTE REGIONAL	reichera@br.ibm.com
Sede Técnica Rio Branco (AC)	Av. Rio Branco, 477 - 2 andar - Centro	Rio Branco	AC	69900-058	(82) 98125-1119	LUCIENEDA SILVA CARVALHO	GERENTE REGIONAL	carasilv@br.ibm.com
Sede Técnica São Luís (MA)	Av. Magalhães de Almeida, 300/304 - Centro	São Luís	MA	65015-250	(85) 98219-3781	FABIO REGIS	GERENTE REGIONAL	fregis@br.ibm.com
Regional Vitória (ES)	Rua General Osório 124 - 2 andar - Centro	Vitória	ES	29010-035	(19) 99726-1784	EDUARDO PONSONI	GERENTE REGIONAL	eponsoni@br.ibm.com
Sede Técnica Maceió (AL)	Rua do Livramento, 101 - 2 andar - Centro	Maceió	AL	57020-030	(71) 99609-0061	GILBERTO BITENCOURT MAIA JUNIOR	GERENTE REGIONAL	maiaj@br.ibm.com
Sede Técnica Natal (RN)	Av. Rio Branco, 477 - 2 andar - Centro	Natal	RN	59025-001	(85) 98219-2210	LEONARDO RABELLO	GERENTE REGIONAL	lecox@br.ibm.com
Sede Técnica Teresina (PI)	Rua Alvaro Mendes, 991 - 2 andar - Centro	Teresina	PI	64000-060	(85) 98219-2210	LEONARDO RABELLO	GERENTE REGIONAL	lecox@br.ibm.com
Sede Técnica Porto Velho (RO)	Rua Barão do Rio Branco, 199 - Fundos	Porto Velho	RO	76801-072	(82) 98125-1119	LUCIENEDA SILVA CARVALHO	GERENTE REGIONAL	carasilv@br.ibm.com

IBM

Declara ainda que dispõe de peças de reposição que suportam o atendimento dos chamados técnicos efetuados e toda e qualquer abertura de chamado de produtos em garantia, deve ser efetuada através dos telefones 0800 701 4815 (Ligações fora da cidade de São Paulo) e 11 3889-8986 (Ligações da cidade de São Paulo).

Tendo também como pessoa para contato o Sr. Luis Felipe Almeida, Gerente de Vendas, através do telefone (11) 2132-5168 ou pelo email felipeal@br.ibm.com.

São Paulo, 15 de Setembro de 2020



Luis Felipe Almeida

felipeal@br.ibm.com

Gerente de Vendas Consultor

IBM Brasil Indústria Máquinas e Serviços Ltda

CPF: 287.858.338-86

RG: 18.608.143-1


THE ECO DECLARATION



ECMA/TC38-TG3/2015/026
(Rev. 1 – 15 April 2017)

Annex B2 - Product environmental attributes Desktop/All-in-One Computers

The declaration may be published only when all rows and/or fields marked with * are filled-in (n.a. for not applicable). Additional information regarding each item may be found under P15.


Brand *	Lenovo	Logo 
Company name *	Lenovo	
Contact information * e-mail address	Lenovo Global Environmental Affairs Alvin L Carter alcarter@lenovo.com	
Internet site *	http://www.lenovo.com/social_responsibility/us/en/environment.html	
Additional information	The latest version of this document can be found at: http://www.lenovo.com/ecodeclaration	

The company declares (based on product specification or test results based obtained from sample testing), that the product conforms to the statements given in this declaration.	
Type of product *	Workstation
Commercial name *	ThinkStation P340 Tower
Model number *	30DH, 30DJ, 30DM
Issue date *	2020/05/13
Intended market *	<input checked="" type="checkbox"/> Global <input type="checkbox"/> Europe <input type="checkbox"/> Asia, Pacific & Japan <input type="checkbox"/> Americas <input type="checkbox"/> Other
Additional information	


This is an uncontrolled copy when in printed form. Please refer to the contact information for the latest version.

About Annex B2

Annex B2 reflects Product environmental attributes relevant for Computers and Computer Monitors. The following items from the ECMA-370 Main body are not shown in the template:
P4.1 – P4.3 Consumable materials
P9.1 TEC and Print speed
P10.2 - P10.3 Chemical emissions from printing products
P11.1 - P11.3 Consumable materials for printing products.

Model number *	30DH, 30DJ, 30DM	Logo			
Issue date *	2020/05/13				
Product environmental attributes - Legal requirements				Requirement met	
Item			Yes	No	n.a.
P1	Hazardous substances and preparations				
P1.1*	Products do comply with current European RoHS Directive. (See legal reference and NOTE B1)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
P1.2*	Products do not contain Asbestos (see legal reference). Comment: Legal reference has no maximum concentration value.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
P1.3*	Products do not contain Ozone Depleting Substances: Chlorofluorocarbons (CFC), hydrobromofluorocarbons (HBFC), hydrochlorofluorocarbons (HCFC), Halons, carbon tetrachloride, 1,1,1-trichloroethane, methyl bromide (see legal reference). Comment: Legal reference has no maximum concentration values.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
P1.4*	Products do not contain more than; 0,005% polychlorinated biphenyl (PCB), 0,005% polychlorinated terphenyl (PCT) in preparations (see legal reference).		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
P1.5*	Products do not contain more than 0,1% short chain chloroparaffins (SCCP) with 10-13 carbon atoms in the chain containing at least 48% per mass of chlorine in the SCCP (see legal reference).		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
P1.6*	Parts with direct and prolonged skin contact do not release nickel in concentrations above 0,5 µg/cm ² /week (see legal reference). Comment: Max limit in legal reference when tested according to EN1811:2011-5.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P1.7*	REACH Article 33 information about substances in articles is available at (add URL or mail contact): https://www.lenovo.com/us/en/Lenovo-REACH-SVHC-Disclosure		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P2	Batteries				
P2.1*	If the product contains a battery or an accumulator, the battery/accumulator is labeled with the disposal symbol. Information on proper disposal is provided in user manual. (See legal reference)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P2.2*	Batteries or accumulators do not contain more than 0,0005% of mercury or 0,002% of cadmium. (See legal reference)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P2.3*	Batteries and accumulators are readily removable. (See legal reference)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P3	Conformity verification & Eco design (ErP)				
P3.1*	The product is CE-marked to show conformance with applicable legal requirements (see legal reference). The Declaration of Conformity can be requested at: https://www.lenovo.com/us/en/compliance/eu-doc		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P3.2*	The product complies with the Eco design requirements for energy-related products, (see legal reference). Required information is; <input type="checkbox"/> given in item P15 or added to this document, <input checked="" type="checkbox"/> available at: https://www.lenovo.com/us/en/compliance/eco-declaration		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P5	Product packaging				
P5.1*	Packaging and packaging components do not contain more than 0,01% lead, mercury, cadmium and hexavalent chromium by weight of these together.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
P5.2*	The packaging materials are marked with abbreviations and numbers indicating the nature of the material(s) used (see legal reference).		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P5.3*	The product packaging material is free from ozone depleting substances as specified in the Montreal Protocol (see legal reference). Comment: Legal reference has no maximum concentration values.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P6	Treatment information				
P6.1*	Information for recyclers/treatment facilities is available (see legal reference).		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

NOTE B1 Restriction applies to the homogeneous material, unless other specified and expressed in weight %. Stating "Yes" means that the product is compliant with the mandatory requirements.

Model number *	30DH, 30DJ, 30DM	Logo				
Issue date *	2020/05/13					
Product environmental attributes - Market requirements (See General NOTE GN below)						
- Environmental conscious design					Requirement met	
Item	* = mandatory to fill in. Additional information regarding each item may be found under P14.			Yes	No	n.a.
P7	Design, Disassembly, recycling					
P7.1*	Parts that have to be treated separately are easily separable			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.2*	Plastic materials in covers/housing have no surface coating.			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.3*	Plastic parts > 100 g consist of one material or of easily separable materials.			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.4*	Plastic parts > 25 g have material codes according to ISO 11469 referring ISO 1043-4.			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.5	Plastic parts are free from metal inlays or have inlays that can be removed with commonly available tools.			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.6*	Labels are easily separable. (This requirement does not apply to safety/regulatory labels).			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product lifetime						
P7.7*	Upgrading can be done e.g. with processor, memory, cards or drives			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.8*	Upgrading can be done using commonly available tools			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.9	Spare parts are available after end of production for: 5 years					<input type="checkbox"/>
P7.10	Service is available after end of production for: 5 years					<input type="checkbox"/>
Material and substance requirements						
P7.11*	Product cover/housing material type (e.g. plastics, metal, aluminum): Material type: ABS Material type: Material type:					
P7.12	Insulation materials of external electrical cables are PVC free.			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
P7.13	Insulation materials of internal electrical cables are PVC free.			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
P7.14	External plastic casing/cover parts > 25 g contain no more than 0,1% weight (1000 ppm) bromine and 0,1% weight (1000 ppm) chlorine attributable to brominated flame retardants, chlorinated flame retardants, and polyvinyl chloride or 0,3% weight (3000 ppm) bromine and 0,3% weight (3000 ppm) chlorine in parts containing more than 25% post-consumer recycled content.			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.15	Printed circuit boards, PCBs (without components) are low halogen: all <input type="checkbox"/> PCBs > 25 g <input checked="" type="checkbox"/> are low halogen as defined in IEC 61249-2-21. (See 1NOTE B2)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.16	Flame retarded plastic parts > 25 g in covers / housings are marked according ISO 1043-4: Marking: >ABS <			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.17	Alt. 1: Chemical specifications of flame retardants in printed circuit boards > 25 g (without components): <input type="checkbox"/> TBBPA (additive), <input checked="" type="checkbox"/> TBBPA (reactive) (See NOTE B3), <input type="checkbox"/> Other: , CAS #: 79-94-7			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Alt. 2: Chemical specifications of flame retardants in printed circuit boards (without components) > 25 g according ISO 1043-4:			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P7.18	Alt. 1: Flame retarded plastic parts > 25 g contain the following flame retardant substances/preparations in concentrations above 0,1%: 1. Chemical name: , CAS #: (See NOTE B4) 2. Chemical name: , CAS #: " 3. Chemical name: , CAS #: "			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Alt. 2: Chemical specifications of flame retardants in plastic parts > 25 g according ISO 1043-4:			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P7.19	In plastic parts > 25 g, flame retardant substances/preparations above 0,1% are used which have been assigned the following Risk phrases; and Hazard statements: The source(s) for these classifications is/are found at (add URL(s)): , (See note B5)			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.20*	Postconsumer recycled plastic material content is used in the product (See Note B6): If YES; at least one of the two alternatives below shall be answered; a) Of total plastic parts' weight > 25 g, the postconsumer recycled plastic material content (calculated as a percentage of total plastic by weight) is 38.6% . or b) The weight of recycled material is 243.2 g .			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


GENERAL NOTE Standard references should direct to the latest version of a standard. If an older version of a standard is used, section P15 shall be used for explanation.

NOTE B2 IEC 61249-2-21 defines maximum limits of 900 ppm for each of the substances chlorine and bromine and a maximum limit of 1500ppm of these substances combined. The standard does not address fluorine, iodine and astatine which are included in the group of halogens.

NOTE B3 and B4 A Guidance document on Chemical substances is available; see <http://www.ecma-international.org/publications/standards/Ecma-370.htm>

NOTE B5 If a certain substance has been assigned a certain risk phrases / hazard statement in the referenced source, this does not necessarily mean the substance has been tested for all of the hazards referred to by a certain customer.

NOTE B6 Applies to a product containing plastic parts whose combined weight exceeds 100 g with the exception of printed circuit boards, cables, connectors and electronic components and bio-based plastic material.

Model number *	30DH, 30DJ, 30DM	Logo	
Issue date *	2020/05/13		


Product environmental attributes - Market requirements (continued)		Requirement met		
Item		Yes	No	n.a.

Material and substance requirements (continued)				
P7.21*	Biobased plastic material content is used in the product (See NOTE B7):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P7.22*	Light sources are free from mercury, i.e. less than 0,1 mg/lamp. If mercury is used specify: Number of lamps: and maximum mercury content per lamp: mg	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P8 Batteries				
P8.1*	Battery chemical composition:			<input checked="" type="checkbox"/>
P9 Energy consumption (See NOTE B8)				
P9.1 For the product the following power levels or energy consumptions are reported:				
Energy mode *	Power level at 100 V AC	Power level at 115 V AC	Power level at 230 V AC	Reference/Standard for energy modes and test method * <input type="checkbox"/>
Peak (On-max)	136.03 W	157.53 W	147.33 W	Full load
Category				
Short Idle State - WOL Enabled	34.4 W	34.62 W	34.14 W	Use for ENERGY STAR V8 registration (P_{idle})
Long Idle State - WOL Enabled	32.62 W	32.61 W	32.25 W	Use for ENERGY STAR V8 registration (P_{idle})
Sleep (S3) - WOL Enabled	4.37 W	4.37 W	4.38 W	Use for ENERGY STAR V8 registration (P_{sleep})
Off (S5) - WOL Enabled	1.04 W	1.04 W	1.02 W	Use for ENERGY STAR V8 registration (P_{off})
Off (S5) - WOL Disabled	W	W	1.02 W	Use for ErP
EPS No-load (External power supply / charger plugged in the wall outlet but disconnected from the product.)	W	W	W	<input type="checkbox"/>
PTEC * Typical Energy Consumption	20.20 W	20.27 W	20.03 W	<input type="checkbox"/>
ETEC * Annual Energy Consumption	kWh/year	kWh/year	kWh/year	$E_{TEC} = (8760/1000) \times (P_{off} \times 0.45 + P_{sleep} \times 0.05 + P_{long_idle} \times 0.15 + P_{short_idle} \times 0.35)$ <input checked="" type="checkbox"/>
<i>P_{off}: Off Mode(S5) - WOL Enabled; P_{sleep}: Sleep Mode(S3) - WOL Enabled; P_{idle}: Idle State - WOL Enabled</i>				
External Power Supply Efficiency Level (International Efficiency Marking Protocol) * :				<input checked="" type="checkbox"/>
Display resolution * : megapixels				<input checked="" type="checkbox"/>
Default time to enter energy save mode: 25 minutes				<input type="checkbox"/>
P9.2*	Information about the energy save function is provided with the product.			<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
P9.3	Energy efficiency class (monitors only):			<input checked="" type="checkbox"/>
P10 Emissions				
Noise emission – Declared according to ISO 9296 (See NOTE B9)				
P10.1	Mode	Mode description	Statistical upper limit A-weighted sound power level, L _{WA,c} (B)	
	Idle	* HDD:Idle	* 3.2 <input type="checkbox"/>	
	Operation	* HDD: Operating	* 3.2 <input type="checkbox"/>	
	Other mode	Declared A-weighted sound pressure level (dBL)(A)	18.6 (operator position desktop – idle)	
	Other mode	Declared A-weighted sound pressure level (dBL)(A)	19 (operator position desktop – HDD operating)	
Measured according to: <input checked="" type="checkbox"/> ISO 7779 <input checked="" type="checkbox"/> ECMA-74 <input type="checkbox"/> Other (only if not covered by ECMA-74)				

NOTE B7 The following is to be excluded from the calculation of percentage: printed circuit boards, labels, cables, connectors and electronic components and postconsumer recycled plastic

NOTE B8 A Guidance document on Energy Efficiency is available;
see <http://www.ecma-international.org/publications/standards/Ecma-370.htm>

NOTE B9 A Guidance document on Acoustic Noise is available;
see <http://www.ecma-international.org/publications/standards/Ecma-370.htm>

Model number *	30DH, 30DJ, 30DM			Logo		
Issue date *	2020/05/13					
Product environmental attributes - Market requirements (continued)					Requirement met	
Item				Yes	No	n.a.
Electromagnetic emissions						
P10.4	Computer display meets the requirement for low frequency electromagnetic fields of the following voluntary program(s):			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P12 Ergonomics for computing products						
P12.1*	The display meets the ergonomic requirements of ISO 9241-307 for visual display technologies.			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P12.2*	The physical input device meets the requirements of ISO 9995 and ISO 9241-410.			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P13 Packaging and documentation						
P13.1*	Product packaging material type(s): Paper weight (kg): 1.076 Product packaging material type(s): LDPE weight (kg): 0.356 Product packaging material type(s): weight (kg):					
P13.2*	Product plastic primary packaging is free from PVC.			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P13.3*	For product primary corrugated fiberboard packaging, specify the contained percentage of minimum post-consumer recovered fiber content: 30 %					<input type="checkbox"/>
P13.4*	Specify media for user and product documentation (tick box): <input checked="" type="checkbox"/> Electronic, <input checked="" type="checkbox"/> Paper, <input type="checkbox"/> Other					<input type="checkbox"/>
P13.5	(Please only complete this item if paper documentation used) User and product documentation on paper media is chlorine-free: If Yes, please specify: Totally chlorine-free Elemental chlorine-free Processed chlorine-free			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
P14 Voluntary programs						
P14.1	The product meets the requirements of the following voluntary program(s): ENERGY STAR® Criteria version: 8.0 Date: 2020/3/31 Product category: Workstation Eco-label: EPEAT Criteria version: 2018 Date: 2020/7/21 Product category: Workstation Eco-label: Criteria version: Date: Product category:					
P15 Additional information (See NOTE B10)						
P9	Energy consumption of specific configuration may vary; description of the tested product configuration: NOTE: Supplier makes no representations, guarantees, assurances or warranties whether express or implied, regarding the information contained in this document. All information provided by supplier in this document is provided based on supplier's knowledge available at the time of completion, and supplier shall have no obligation to update such information. The information provided here is approximate and provided for informational purposes only. See a Lenovo Account Representative for more information.					
P9	See Energy Star Qualified Notebooks & Tablet Computers for the latest information: http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CO					

NOTE B10 Additional lines may be inserted to declare further items, by positioning the cursor at the far right of the row and hitting the <Enter> key.

Legal references Europe Annex B2

Reference	Declaration item
Directive 2011/65/EU (RoHS Directive) * * Specific exemptions apply for certain products and applications.	P1.1
Regulation (EC) 1907/2006(REACH, Annex XVII)	P1.2, P1.4, P1.6, P1.7
Regulation (EC) 2037/2000, 2038/2000, 2039/2000 (Marketing and use of Ozone layer depleting substances)	P1.3, P5.3
Norwegian regulation relating to restrictions on the use of certain dangerous chemicals 20.12.2002	P1.5
Directive 2013/56/EC (Battery and accumulators Directive) * * These provisions shall not apply where, for safety, performance, medical or data integrity reasons, continuity of power supply is necessary and requires a permanent connection between the appliance and the battery or accumulator.	P2.1, P2.2, P2.3, P8.1
Directive 2006/95/EC (Low Voltage Directive)	P3.1
Directive 2004/108/EC (EMC Directive)	P3.1
Directive 1999/5/EC (R&TTE Directive)	P3.1
Regulation (EC) 801/2013 amending Regulation (EC) No 1275/2008 with regard to ecodesign requirements for standby, off mode electric power consumption of electrical and electronic household and office equipment, and amending Regulation (EC) No 642/2009 with regard to ecodesign requirements for televisions	P3.1, P3.2
Regulation (EC) No 1272/2008 (CLP Regulation)	P7.19
Directive 2004/12/EC (Packaging Directive)	P5.1
Decision 97/129/EC (Secondary packaging legislation)	P5.2
Directive 2012/19/EU (WEEE directive)	P6.1

Lenovo ErP Lot3 Information Sheet


- PC / Notebook -

As required by COMMISSION REGULATION (EU) No 617/2013 of 26 June 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for computers and computer servers (ErP Lot3).

Products scope of this sheet:

Desktop computer, integrated desktop computer, and notebook computer

This document is only valid in connection with the IT Eco Declaration of the specific Product.

Commercial name	ThinkStation P340 Tower	Logo 
Model Number	30DH, 30DJ, 30DM	
Issue Date	2020/05/13	
Additional information	Energy Star 8.0;	

P7.1.1 Product environmental attributes					
(d) year of manufacture:		2020			
(e) Etec value (kWh) per ErP Lot 3 Category and capability adjustments applied when all discrete graphics cards (dGfx) are disabled and if the system is tested with switchable graphics mode with UMA driving the display.					
(f) Etec value (kWh) per ErP Lot 3 Category and capability adjustments applied when all discrete graphics cards (dGfx) are enable					
		Category A <small>(according to ErP Lot 3)</small>	Category B <small>(according to ErP Lot 3)</small>	Category C <small>(according to ErP Lot 3)</small>	Category D <small>(according to ErP Lot 3)</small>
capability adjustments applied during testing	Memory over base [GB]				
	Additional internal storage	(Yes / No)	(Yes / No)	(Yes / No)	(Yes / No)
	Discrete television tuner	(Yes / No)	(Yes / No)	(Yes / No)	(Yes / No)
	Discrete Audio Card	(Yes / No)	(Yes / No)	(Yes / No)	(Yes / No)
	Discrete graphics Card(s) [number / #]	(Yes / No) #:	(Yes / No) #:	(Yes / No) #:	(Yes / No) #:
	Category of discrete graphics Card(s)				
Test results	Etec Value (kWh) - dGfx disabled <small>all discrete graphics cards (dGfx) are disabled/ UMA is active for switchable graphics/ product has no graphics cards (dGfx)</small>				
	Etec Value (kWh) - dGfx enabled <small>all discrete graphics cards (dGfx) are enabled</small>				
(g) Idle state power demand (Watts);		34.22			
(h) Sleep mode power demand (Watts);		NA			
(i) Sleep mode with WOL enabled power demand (Watts) (where enabled);		4.31			
(j) Off mode power demand (Watts);		NA			
(k) Off mode with WOL enabled power demand (Watts) (where enabled);		1.02			
(l) Internal power supply efficiency at 10 %, 20 %, 50 % and 100 % of rated output power (if applicable): PCK010-EL0G: 10% 90.72% 20% 92.57% 50% 93.57% 100% 90.38% Average 92.17% PCK023-EL0G: 10% 86.72% 20% 88.93% 50% 90.76% 100% 88.24% Average 89.31%					
(m) External power supply efficiency (if applicable)*: Average active efficiency: N/A <small>*internal note: show values for all available external power supplies</small>					
(o) Minimum number of loading cycles that the batteries can withstand (applies only to notebook computers):		N/A			
(p-1) Measurement methodology used to determine information mentioned in points (l) – internal PSU efficiency: Generalized Test Protocol for Calculating the Energy Efficiency of Internal Ac-Dc and Dc-Dc Power Supplies Revision 6.6					

(p-2)	Measurement methodology used to determine information mentioned in points (m) – external PSU efficiency: N/A
(p-3)	Measurement methodology used to determine information mentioned in points (o) – loading cycles batteries: N/A
(p-4)	Measurement methodology used to determine information mentioned in maximum, idle, sleep, off mode power as defined in Point P9.1 in the Product IT Eco Declaration: IEC 62623 Ed. 1.0, 2012-10
(q)	Sequence of steps for achieving a stable condition with respect to power demand: Based on user manual/Power on->Wait 5 minutes->Stable condition
(r)	Description of how sleep and/or off mode was selected or programmed: Based on user manual/Begin menu -> Power -> Select sleep or off mode
(s)	Sequence of events required to reach the mode where the equipment automatically changes to sleep and/or off mode: Based on user manual/Control Panel->Power Options-> Change Settings-> Restore default settings for this plan
(t)	Duration of idle state condition before the computer automatically reaches sleep mode , or another condition which does not exceed the applicable power demand requirements for sleep mode (in minutes): 20
(u)	Length of time after a period of user inactivity in which the computer automatically reaches a power mode that has a lower power demand requirement than sleep mode (in minutes): NA
(v)	Length of time before the display sleep mode is set to activate after user inactivity (in minutes): 10
(w)	Information on the energy-saving potential of power management functionality: Based on user manual
(x)	User information on how to enable the power management functionality: Based on user manual
(z)	Test parameters for measurements: — test voltage in V and frequency in Hz, — total harmonic distortion of the electricity supply system, — information and documentation on the instrumentation, set-up and circuits used for electrical testing: 230V, 50Hz, Total Harmonic Distortion <2 %

Additional Notebook Battery Information:

	Battery[ies] not user replaceable	Battery[ies] user replaceable	n/a
	The battery[ies] in this product cannot be easily replaced by users themselves. ¹⁾		
Internal/built-in Battery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External/detachable Battery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bios Backup Battery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional information

¹⁾
The battery[ies] in this product cannot be easily replaced by users themselves.
Акумуляторната[ите] батерия[и] в този продукт не може да се замени[ят] лесно от самите потребители.
Las baterías de este producto no pueden ser sustituidas fácilmente por los propios usuarios.
Výměnu baterie/baterií v tomto výrobku by neměli provádět sami uživatelé.
Brugeren kan ikke uden videre udskifte batteriet/batterierne i dette produkt.
Der Akku/die Akkus dieses Produkts kann/können nicht ohne weiteres vom Benutzer selbst ausgetauscht werden.
Kasutajad ei saa selle toote akut/akusid ise hõlpsasti asendada.
Η μπαταρία[ς] στο προϊόν αυτό δεν μπορούν να αντικατασταθούν εύκολα από τους ίδιους τους χρήστες.
La/les batterie(s) présente(s) dans ce produit ne peuvent être facilement remplacée(s) par les utilisateurs eux-mêmes.
Korisnik ne može lako zamijeniti Bateriju sam u ovom proizvodu.
La batteria/le batterie in questo prodotto non può/possono essere facilmente sostituita/e dall'utente.
Lietotāji paši nevar nomainīt šā ražojuma akumulatoru(-us).
Šio gaminio baterijos [baterijų] pats vartotojas negali lengvai pakeisti.
A termék akkumulátorát/akkumulátorait a felhasználó nem tudja egyedül egyszerűen kicserélni.
Il-batterija/batteriji f'dan il-prodott ma tistax/jistghux tiġi/jiġu sostitwita/i mill-utenti stess.
Batteriet [ene] i dette produktet kan ikke lett erstattes av brukerne selv.
De batterij(en) in dit product is (zijn) door de gebruiker niet gemakkelijk vervangbaar.
Użytkownik nie może sam w łatwy sposób wymienić baterii w tym produkcie.
A ou as baterias deste produto não podem ser facilmente substituídas pelos próprios utilizadores.
Bateria (bateriile) din acest produs nu poate (pot) fi ușor înlocuită (înlocuite) de utilizatorii înșiși.
Batériu(-ie) v tomto výrobku nemôže vymieňať používateľ.
Baterij/baterije v tem izdelku uporabniki sami ne morejo zlahka zamenjati.
Tämän tuotteen akku [akut] ei[vät] ole helposti käyttäjän vaihdettavissa.
Det är inte enkelt för kunden att själv byta ut batteriet/batterierna.
Bu üründeki batarya(lar) kullanıcılar tarafından kolaylıkla değiştirilemez.

Members

The Responsible Business Alliance is the world's largest industry coalition dedicated to corporate social responsibility in global supply chains.

Beginning with eight members in 2004, today the RBA is comprised of more than 150 electronics, retail, auto and toy companies with combined annual revenue greater than \$5 trillion, directly employing over 6 million people. In addition to RBA members, thousands of companies that are Tier 1 suppliers to those members are required to implement the RBA Code of Conduct. More than 3.5 million people from over 120 countries contribute to the manufacture of RBA members' products.

[Learn about member benefits and requirements](#)

A

- AcBel Polytech Inc.
- Acer
- Advanced Micro Devices
- Advania AB
- Allegro MicroSystems, LLC
- Alphabet Inc.
- Altria Client Services LLC.
- Amazon.com, Inc.
- Amkor Technology, Inc.
- Amphenol Corporation
- Analog Devices, Inc.
- Apple Inc.
- Applied Materials
- Arista Networks
- Arlo Technologies, Inc.
- ARRIS Group
- ASE Technology Holding Co., Ltd.
- ASM International
- ASML Holding
- ASUSTeK Computer Inc.
- Atea ASA
- Avaya

B

- Best Buy
- BMW Group
- Bose Corporation
- Brother Industries Ltd.
- BT plc

C

- Cadence Design Systems
- Canon Inc.
- Celestica
- Chicony Electronics Co., Ltd
- Ciara
- Ciena
- Cisco
- Citrix
- Compal Electronics
- Cypress Semiconductor Corp.
- Cirrus Logic, Inc.

D

- Dell Inc.
- Dustin AB

E

- Edwards Ltd.
- EIZO Corporation
- Ericsson

F

- Fabrinet
- Facebook
- Fairphone B.V.
- Fitbit, Inc.
- Flex
- Ford Motor Company
- Foxconn
- Fujitsu Limited
- Funai Electric Co., Ltd.

G

- GlobalFoundries

H

- Hasbro, Inc.
- Hewlett Packard Enterprise
- Hi-P (Xiamen) Precision
Plastics Manufacturing Co. Ltd
- Hisense USA Corporation
- HP Inc.
- Huawei Technologies Co., Ltd.

I

- IBM Corporation
- Infineon Technologies
Americas Corp.
- Insight Enterprises, Inc.
- Intel Corporation
- Inventec Corporation
- iRobot Corporation

J

- Jabil
- Jasco
- JB HI-FI Limited
- JK Imaging Ltd.
- Juniper Networks

K

- Keysight Technologies, Inc.
- Keurig Dr Pepper
- Kingston Technology
- KLA Corporation
- Konica Minolta

L

- Lam Research Corporation
- Lenovo
- Lexmark
- LG Electronics
- Logitech Inc.
- Longwell Company
- Lumentum Holdings Inc.

M

- Marvell
- Media-Saturn-Holding GmbH
- Microchip Technology Incorporated
- Micron Technology, Inc.
- Microsoft
- ModusLink
- Molex
- Motorola Solutions, Inc.

N

- NetApp
- NETGEAR
- New Kinpo Group
- Nexperia
- Nielsen
- Nikon Corporation
- Nvidia Corporation
- NXP Semiconductors

O

- ON Semiconductor
- Oracle America, Inc.
- OSRAM Licht AG

P

- Pegatron
- Philips
- Plexus
- Poly
- Positivo Tecnologia S.A.
- Powertech Technology Inc.
- Pure Storage, Inc.

Q

- Qorvo, Inc.
- Qualcomm
- Quanta Computer Inc.

R

- Ricoh Company Ltd.

S

- Samsung Electronics
- Sanmina
- Schneider Electric
- Seagate Technology
- Seiko Epson Corporation
- Semtech Corporation
- Senju Metal Industry Co., Ltd.
- Sierra Wireless, Inc.
- Signify
- Siltronic AG
- Simatelex Manufactory Co. Ltd.
- SK hynix Inc.
- Sky CP Ltd
- Skyworks Solutions, Inc.
- SMART Modular Technologies
- Snap Inc.
- Sony Corporation
- STMicroelectronics
- Sumitomo Electric Industries, Ltd.
- Symantec
- Synopsys, Inc.

T

- Taiwan Chinsan Electronics Industrial Co., Ltd.
- Taiwan Semiconductor Manufacturing Company, Ltd.
- TCL North America
- TDK Corporation
- Technicolor SA
- Tesla, Inc.
- Texas Instruments
- 3M Electronics and Energy Business Group
- Tokyo Electron Limited
- TomTom International BV
- Toshiba Corp.
- TT Electronics Plc

V

- Veritas
- VIAVI Solutions Inc.
- Vishay Intertechnology, Inc.
- VIZIO Inc.
- Volvo Car Group
- V.S. Plus Sdn Bhd

W

- Walmart
- Western Digital
- Wistron Corp.

X

- Xerox
- XP Power

Z

- Zebra Technologies Corporation
- ZTE (USA), Inc.



Lenovo - ThinkStation P340 : 30DH

Specifications

Brand Name:	Lenovo
Model Name:	ThinkStation P340
Model Number:	30DH
Type:	Workstation
Workstations: Processor Brand:	Intel
Workstations: Processor Name:	W-1290P
Workstations: Operating System Name:	Windows 10
Workstations: Base Processor Speed Per Core (GHz):	3.7
Workstations: System Memory (GB):	128
Workstations: Hard Drives (count):	6
Workstations: Off Mode (watts):	1.0
Workstations: Sleep Mode (watts):	4.4
Workstations: Long Idle (watts):	32.6
Workstations: Short Idle (watts):	34.6
Workstations: Weighted Power of Model (watts):	20.3
Sleep Mode Default Time Upon Shipment (min.):	25
Display Sleep Mode Default Time Upon Shipment (min.):	10
WOL (Wake on LAN) From Sleep:	Shipped Enabled Under All Conditions
Will the Speed of Any Active 1 GB/s or Higher Ethernet Network Links be Reduced to Less Than 1 GB/s When Transitioning to Sleep or Off Mode?:	Yes
Ethernet Capability:	Yes
Date Available On Market:	2020-06-09
Date Certified:	2020-04-24
Markets:	United States, Switzerland, Taiwan, Japan, Canada
ENERGY STAR Certified:	Yes

Additional Model Information

ThinkStation P340,30DJ,; ThinkStation P340,30DM,

11/11/2020

[← RETORNAR À PESQUISA](#)

ThinkStation P340 Tower

Sumario de produtos:

Tipo de Produto: **Posto de trabalho**

Registrado: **Estados Unidos**

Fabricante: **Lenovo**

Camada EPEAT: **Prata**

Data de registro: **28-06-2020**

Status do produto: **Ativo**

Detalhe de pontuação de nível EPEAT

Para que um produto seja listado no Registro EPEAT, ele deve, no mínimo, atender aos critérios “obrigatórios” aplicáveis. [Clique aqui para ver uma lista dos critérios necessários para esta categoria de produto.](#)

Este produto atendeu aos critérios exigidos necessários .

Junto com os critérios obrigatórios, os produtos também podem atender aos critérios opcionais e marcar pontos opcionais. Não é necessário que um produto alcance nenhum ponto opcional.

Os produtos que atendem a todos os critérios exigidos e atingem menos de 50% dos pontos opcionais são classificados na

EPEAT Bronze

Os produtos que atendem a todos os critérios exigidos e atingem de 50 a 74% dos pontos opcionais são avaliados pela

EPEAT Silver

Os produtos que atendem a todos os critérios exigidos e atingem 75 - 100% dos pontos opcionais são avaliados em

EPEAT Gold

Os critérios opcionais para esta categoria de produto e os pontos opcionais alcançados por este produto estão listados abaixo.

Critérios Opcionais	Pontuações
4.1 Gestão de Substâncias	7/16
(4.1.2.1) Restrições ao uso de cádmio	1
(4.1.4.1) Restrição do uso de berílio	0
(4.1.5.2) Redução adicional do teor de bromo e cloro em materiais plásticos	0
(4.1.6.1) Prevenção ou eliminação de substâncias no REACH da UE, Anexo XIV (lista de autorização)	0
(4.1.6.2) Redução de substâncias na lista de candidatos ao REACH da UE de SVHCs	0
(4.1.8.1) Avaliação e seleção química	0

(4.1.9.1) Substâncias declaráveis IEC 62474	0
(4.1.9.2) Solicitando inventário de substâncias	1
(4.1.9.3) Inventário de substâncias adquiridas	1
(4.1.10.1) Reduzir as emissões de gases fluorados da fabricação de monitores de tela plana	2
(4.1.10.2) Reduzir as emissões de gases de efeito estufa fluorados da produção de semicondutores	2
4.2 Seleção de Materiais	2/3
(4.2.1.2) Plástico reciclado pós-consumo superior, derivado de ITE reciclado pós-consumo, ou conteúdo de base biológica	2
(4.2.1.3) Plástico reciclado pós-consumo, derivado de ITE reciclado pós-consumo	0
4.4 Longevidade do produto / extensão do ciclo de vida	2/2
(4.4.2.2) Informações de serviço publicamente disponíveis	1
(4.4.2.5) Capacidade de atualização e reparo do produto	1
4.5 Conservação de Energia	1/2
(4.5.1.3) Eficiência energética para fontes de alimentação internas	1
4.7 Embalagem	0/2

(4.7.3.2) Embalagem composta de conteúdo reciclado e / ou de base biológica e / ou florestado de forma sustentável	0
(4.7.4.1) Oferta de opção de embalagem a granel	0
4.8 Avaliação do ciclo de vida e pegada de carbono	6/6
(4.8.1.1) Avaliação do ciclo de vida do produto e divulgação pública das análises	2
(4.8.1.2) Emissões de gases de efeito estufa específicas do produto - pegada de carbono do produto	2
(4.8.2.1) Pegada de carbono corporativa	1
(4.8.2.2) Emissões de gases de efeito estufa do transporte do produto	1
4.9 Desempenho Ambiental Corporativo	9/9
(4.9.1.2) Sistema de gestão ambiental (EMS) certificado por terceiros para instalações de fabricação de fornecedores	1
(4.9.2.2) Relatório de desempenho ambiental corporativo por fornecedores	1
(4.9.3.1) Sistema de gestão de energia / melhoria de desempenho de energia - fabricantes	1
(4.9.3.2) Sistema de gestão de energia / melhoria de desempenho de energia para fornecedores	2
(4.9.4.1) Uso de energia renovável pelo fabricante	2
(4.9.4.2) Uso de energia renovável por fornecedores fabricantes	2

4.10 Responsabilidade social corporativa 2/6

(4.10.1.1) Fabricação socialmente responsável: Mão de obra 0

(4.10.1.2) Fabricação socialmente responsável: OHS 0

(4.10.2.2) Participação em um programa na região que promove o abastecimento responsável de minerais de conflito 1

(4.10.2.3) Participação do fundidor e do refinador em mecanismos de terceiros alinhados à OCDE 1

PONTUAÇÃO TOTAL DOS CRITÉRIOS OPCIONAIS: 29/46

Observe que não é necessário que um produto atinja nenhum ponto opcional.

Alguns critérios opcionais podem não ser aplicáveis a um produto. Os critérios opcionais que não são aplicáveis (N / A) ao produto não estão incluídos na pontuação total dos critérios opcionais e não estão refletidos acima.

Para quaisquer perguntas, comentários ou feedback sobre o Registro EPEAT, entre em contato conosco .

SUORTE AO

MANUAL DE POLÍTICAS DO PROGRAMA EPEAT

Lenovo (Singapore) Pte. Ltd.
151 Lorong Chuan,
#02-01, New Tech Park,
Singapore, 556741
(Tel - 65-6827-1000 & Fax- 65-6827-1100)



EU Declaration of Conformity

For the **Lenovo ThinkStation P340 (Tower) Series Workstation Computer**
Machine Type: 30DH, 30DJ, 30DM

We, Lenovo (Singapore) Pte Ltd, declare under sole responsibility that the above products,
manufactured for:

Lenovo PC HK Limited.
23/F, Lincoln House, Taikoo Place 979 King's Road,
Quarry Bay, Hong Kong


to which this declaration relates, is in conformity with the requirements of the following EU Directives:

- **Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.**
- **Directive 2009/125/EC establishing a framework for the setting of Ecodesign requirements for Energy-related products.**
- **Council Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment as amended by Directive 2015/863/EU.**

The conformity assessment procedure referred to in Article 17.4a of Directive 2014/53/EU has been followed and performed with the involvement of a Notified Body, in accordance with Article 3.2:

Notified Body Name/number : DEKRA Testing and Certification, S.A.U./1909
Issued the EU-type examination certificate: 56476RNB.043

The Technical Documentation (TD), relevant to the product described above and which support this DoC is available from the EU contact address on this DoC.

Signed:  Date: 26 May 2020
Joseph Chua (Executive Director)
Place of issue: Lenovo (Singapore) Pte Ltd.

European Contact for regulatory topics only:
Lenovo (Slovakia), Landererova 12, 811 09 Bratislava, Slovakia
Tel: +421 2 6868 3018

Lenovo (Singapore) Pte. Ltd.
 151 Lorong Chuan,
 #02-01, New Tech Park,
 Singapore, 556741
 (Tel - 65-6827-1000 & Fax- 65-6827-1100)



Standards References

The following harmonized standards and normative documents are those to which the product's conformance is declared, and by specific reference to the essential requirements of the referenced Directives:

RE Directive

Article 3.1a (Safety & Health)	EN 60950-1	: 2006 + A11: 2009 + A1: 2010 + A12: 2011 + A2: 2013	✓
	EN 62311	: 2008	✓
	EN 62479	: 2010	✓

Article 3.1b (EMC)	EN 55032	: 2015+AC:2016	✓
	EN 61000-3-2	: 2014	✓
	EN 61000-3-3	: 2013	✓
	EN 55035	: 2017	✓
	Draft EN 301 489-1	V2.2.1 2019-03	✓
	EN 301 489-3	V2.1.1 2019-03	✓
	Draft EN 301 489-17	V3.2.0 2017-03	✓

					Wireless module inside				
					WLAN with Bluetooth 1				
Article 3.2 (Radio Spectrum)	EN 300 328	V2.1.1	2016-11	✓					
	EN 301 893	V2.1.1	2017-05	✓					
	EN 300 440	V2.2.1	2018-07	✓					

RoHS Directive	EN 50581:2012	✓
	EC 617/2013 ErP – Class B EN 50564:2011	✓

Wireless modules

Wireless module inside	MODEL
WLAN with Bluetooth 1	AX201NGW

European Contact for regulatory topics only:
 Lenovo (Slovakia), Landererova 12, 811 09 Bratislava, Slovakia
 Tel: +421 2 6868 3018



Microsoft

Hardware certification report **Approved**

Private product ID: **13603286602352528**
Shared product ID: **400029732**
Submission ID: **1152921505689620792**
Submission date: **4/21/2020**
Completion date: **4/21/2020**
Company: **Lenovo**
Product name: **ThinkStation P340**
Category: **System**
Product type: **Desktop**
Qualification level: **Certified for Microsoft Windows 10 Client family version 1903, x64**
Marketing name: **N/A**

Microsoft
Certified



Ministério do Meio Ambiente
Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis



CADASTRO TÉCNICO FEDERAL
CONSULTA PÚBLICA A CERTIFICADO DE REGULARIDADE - CR

Registro n.º: Data da consulta: CR emitido em: CR válido até:

Dados básicos

CNPJ:
Razão social:
Nome fantasia:
Data de abertura:

Endereço

Logradouro: Complemento:
N.º: Município:
Bairro: UF:
CEP:

Cadastro Técnico Federal de Atividades Potencialmente Poluidoras e Utilizadoras de Recursos Ambientais – CTF/APP

<u>Categoria</u>	<u>Detalhe</u>
5 - Indústria de material Elétrico, Eletrônico e Comunicações	2 - Fabricação de material elétrico, eletrônico e equipamentos para telecomunicação e informática

Conforme dados disponíveis na presente data, a pessoa jurídica acima possui Certificado de Regularidade em conformidade com as obrigações cadastrais e de prestação de informações ambientais sobre as atividades desenvolvidas sob controle e fiscalização do Ibama, por meio do CTF/APP.

O certificado de regularidade emitido pelo CTF/APP não desobriga a pessoa inscrita de obter licenças, autorizações, permissões, concessões, alvarás e demais documentos exigíveis por instituições federais, estaduais, distritais ou municipais para o exercício de suas atividades.

O Certificado de Regularidade do CTF/APP não habilita o transporte e produtos e subprodutos florestais e faunísticos.

Cadastro Técnico Federal de Atividades e Instrumentos de Defesa Ambiental - CTF/AIDA

<u>Código</u>	<u>Atividade</u>
0004-00	Gerenciamento de resíduos sólidos não perigosos - Lei nº 12.305/2010
0005-10	Gerenciamento de resíduos perigosos - geração de resíduos perigosos - Lei nº 12.305/2010
0005-40	Gerenciamento de resíduos perigosos - armazenamento de resíduos perigosos - Lei nº 12.305/2010

Conforme dados disponíveis na presente data, a pessoa jurídica acima possui Certificado de Regularidade, em conformidade com as obrigações cadastrais do CTF/AIDA.

A inscrição no CTF/AIDA constitui declaração, pela pessoa jurídica, de observância dos padrões técnicos normativos estabelecidos pela Associação Brasileira de Normas Técnicas – ABNT, pelo Instituto Nacional de Metrologia, Qualidade e Tecnologia – INMETRO e pelo Conselho Nacional de Meio Ambiente - CONAMA.

O Certificado de Regularidade emitido pelo CTF/AIDA não desobriga a pessoa inscrita de obter licenças, autorizações, permissões, concessões, alvarás e demais documentos exigíveis por instituições federais, estaduais, distritais ou municipais para o exercício de suas atividades, especialmente os documentos de responsabilidade técnica, qualquer o tipo e conforme

regulamentação do respectivo Conselho de Fiscalização Profissional, quando exigíveis.

O Certificado de Regularidade no CTF/AIDA não produz qualquer efeito quanto à qualificação e à habilitação técnica da pessoa jurídica inscrita.

[Fechar](#)

BRASIL

Acesso à informação

Participe

Serviços

Legislação

Canais

Instituto Nacional da

Propriedade Industrial

Ministério da Economia

Consulta à Base de Dados do INPI

[Início | Ajuda?]

» Consultar por: No.Processo | Marca | Titular | Cód. Figura]

1/0

Marca

Meus Pedidos

Nº do Processo: **910114544**
 Marca: Lenovo
 Situação: Registro de marca em vigor
 Apresentação: Nominativa
 Natureza: De Serviço

Classificação de Produtos / Serviços

Classe de Nice	Situação da Classe	Especificação
NCL(10) 42	Vide Situação do Processo	Serviços de consultoria de computador [consultoria em tecnol...

Titulares

Titular(1):	Nome
	Lenovo (Beijing) Limited

Representante Legal

Procurador:	Nome
	David do Nascimento Advogados Associados

Datas

Data de Depósito	Data de Concessão	Data de Vigência
09/10/2015	21/11/2018	21/11/2028

Prazos para prorrogação de registro de marca

	Prazo Ordinário	Prazo Extraordinário
Início	22/11/2027	22/11/2028
Fim	21/11/2028	21/05/2029

Petições [?]

Pgo	Protocolo	Data	Img	Serviço	Cliente	Delivery	Data
✓	850180000027	02/01/2018		333	LENOVO (BEIJING) LIMITED		-
✓	800170436689	22/12/2017	-	372	LENOVO (BEIJING) LIMITED		-
✓	850150231036	09/10/2015		394	LENOVO (BEIJING) LIMITED		-

Publicações [?]

RPI	Data RPI	Despacho	Certificado	Inteiro Teor	Complemento do Despacho
2498	21/11/2018	Concessão de registro	-	-	
2497	13/11/2018	Recurso não provido (decisão mantida)	-	-	<p>Protocolo: 850180000027 (02/01/2018) Petição (tipo): Recurso contra decisão em processo de registro (333.17) Requerente(es): LENOVO (BEIJING) LIMITED Procurador: David do Nascimento Advogados Associados Detalhes do despacho:Recurso conhecido. Negado provimento. Mantido o deferimento do pedido de registro, observada a manutenção da especificação deferida.</p> <p>Protocolo: 850180000027 (02/01/2018) Petição (tipo): Recurso contra decisão em processo de registro (333.17) Titular: LENOVO (BEIJING) LIMITED Procurador: David do Nascimento Advogados Associados Detalhes do despacho:Contra ato denegatório da Diretoria de Marcas.</p>
2463	20/03/2018	Notificação de recurso	-	-	
2459	20/02/2018	Anulação de despacho (em processo)	-	-	Detalhes do despacho: Concessão de registro, publicada na RPI 2454, de 16/01/2018, tendo em vista pet. de recurso 850180000027, de 02/01/2018.
2454	16/01/2018	Concessão de registro		-	<p>Detalhes do despacho: Alterada a especificação para melhor adequação à classe reivindicada. Incluídas as seguintes ressalvas: [consultoria em tecnologia da computação] para "serviços de consultoria de computador"; [concepção, projeto e desenvolvimento de sistema de computador] para "sistema de computador e integração de rede de computador"; [diagnóstico de problemas de software] para "serviços diagnósticos eletrônicos de cliente"; [consultoria em concepção, projeto e desenvolvimento de hardware e software de computador] para "serviços de consultoria para hardware e software de computador para uso no campo de trocadores de calor e administração térmica"; e [programação de] em "serviços de computador, a saber, ". Excluídos os seguintes serviços por serem pertencentes a outras classes: "instalação" e "manutenção" de "hardware de computador"; "provisão de serviços de consultoria e serviços de suporte técnico, a saber, suporte de solução de problemas" para "computadores", hardware de computador, "periféricos de computador", "equipamentos de rede", "e dispositivos eletrônicos de cliente, incluindo dispositivo eletrônico portátil móvel digital". Excluído o termo "computador e" por indicar produto.</p>
2445	14/11/2017	Deferimento do pedido	-	-	

RPI	Data RPI	Despacho	Certificado	Inteiro Teor	Complemento do Despacho
2339	03/11/2015	Publicação de pedido de registro para oposição (exame formal concluído)	-	-	

Dados atualizados até **04/05/2021** - Nº da Revista: **2626**

Rua Mayrink Veiga, 9 - Centro - RJ - CEP: 20090-910





Processador Intel® Xeon® W-1270

16M de cache, 3,40 GHz

Especificações

Especificações de exportação

Essenciais

Coleção de produtos	Processador Intel® Xeon® W
Codinome	Produtos com denominação anterior Comet Lake
Segmento vertical	Workstation
Número do processador	W-1270
Status	Launched
Data de introdução	Q2'20
Litografia	14 nm
Itens incluídos	This product is available in tray and box. For boxed product, a thermal solution is included
Condições de uso	Workstation
Preço recomendado para o cliente	\$362.00 - \$365.00

Especificações da CPU

Número de núcleos	8
Nº de threads	16
Frequência baseada em processador	3.40 GHz
Frequência turbo max	5.00 GHz
Cache	16 MB Intel® Smart Cache
Velocidade do barramento	8 GT/s
Frequência da Tecnologia Intel® Turbo Boost Max 3.0 †	5.00 GHz
Tecnologia Intel® Turbo Boost frequência 2.0 ‡	4.90 GHz
TDP	80 W

Informações complementares

Opções integradas disponíveis	Não
-------------------------------	-----

Especificações de memória

Tamanho máximo de memória (de acordo com o tipo de memória)	128 GB
Tipos de memória	DDR4-2933
Nº máximo de canais de memória	2
Largura de banda máxima da memória	45.8 GB/s
Compatibilidade com memória ECC †	Sim

Gráficos de processador

Gráficos do processador †	Gráficos UHD Intel® P630
Frequência da base gráfica	350 MHz
Máxima frequência dinâmica da placa gráfica	1.20 GHz
Quantidade máxima de memória gráfica de vídeo	64 GB
Suporte para 4K	Yes, at 60Hz
Resolução máxima (HDMI 1.4)‡	4096x2160@30Hz
Resolução máxima (DP)‡	4096x2304@60Hz
Resolução máxima (eDP - tela plana integrada)‡	4096x2304@60Hz

Suporte para DirectX*	12
Suporte para OpenGL*	4.5
Intel® Quick Sync Video	Sim
Tecnologia Intel InTru 3D	Sim
Tecnologia de Alta Definição Intel® Clear Video	Sim
Intel® Clear Video Technology	Sim
Nº de monitores aceitos †	3
ID do dispositivo	0x9BC6

Opções de expansão

Escalabilidade	1S Only
Revisão de PCI Express	3.0
Configurações PCI Express †	Up to 1x16, 2x8, 1x8+2x4
Nº máximo de linhas PCI Express	16

Especificações de encapsulamento

Soquetes suportados	FCLGA1200
Configuração máxima da CPU	1
Especificação de solução térmica	PCG 2015W
T _{JUNCTION}	100°C
Tamanho do pacote	37.5mm x 37.5mm

Tecnologias avançadas

Compatível com Intel® Optane™ Memory †	Sim
Intel® Thermal Velocity Boost	Não
Tecnologia Intel® Turbo Boost Max 3.0 †	Sim
Tecnologia Intel® Turbo Boost †	2.0
Elegibilidade da plataforma Intel® vPro™ †	Sim
Tecnologia Hyper-Threading Intel® †	Sim
Tecnologia de virtualização Intel® (VT-x) †	Sim
Tecnologia de virtualização Intel® para E/S dirigida (VT-d) †	Sim
Intel® VT-x com Tabelas de páginas estendidas (EPT) †	Sim
Intel® TSX-NI	Não
Intel® 64 †	Sim
Conjunto de instruções	64-bit
Extensões do conjunto de instruções	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2
Estados ociosos	Sim
Tecnologia Enhanced Intel SpeedStep®	Sim
Tecnologias de monitoramento térmico	Sim
Tecnologia de proteção da identidade Intel® Identity †	Sim

Segurança e confiabilidade

Novas instruções Intel® AES	Sim
Chave Segura	Sim
Intel® Software Guard Extensions (Intel® SGX)	Yes with Intel® ME
Intel® OS Guard	Sim
Intel® Trusted Execution Technology †	Sim
Bit de desativação de execução †	Sim
Intel® Boot Guard	Sim

Pedidos e conformidade

Imagens do produto

Drivers e software

Documentação técnica

Todas as informações fornecidas estão sujeitas a alterações a qualquer momento, sem aviso prévio. A Intel pode alterar o ciclo de vida da fabricação, as especificações e as descrições dos produtos a qualquer momento, sem aviso prévio. As informações aqui contidas são fornecidas "no estado em que se encontram" e a Intel não atribui qualquer declaração ou garantias relacionadas à precisão das informações, nem sobre os recursos dos produtos, disponibilidade, funcionalidade ou compatibilidade dos produtos listados. Para obter mais informações sobre os produtos ou sistemas, entre em contato com o fornecedor do sistema.

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Consulte a Ficha técnica para obter definições formais de propriedades e recursos de produtos.

‡ Este recurso pode não estar disponível em todos os sistemas de computação. Verifique com o fornecedor do sistema para determinar se seu sistema oferece este recurso ou consulte as especificações de seu sistema (motherboard, processador, chipset, alimentação, HDD, controle gráfico, memória, BIOS, drivers, monitor de máquina virtual [VMM], software de plataforma e/ou sistema operacional) para saber sobre a compatibilidade do recurso. A funcionalidade, o desempenho e outros benefícios deste recurso podem variar, dependendo das configurações do sistema.

SKUs "anunciados" ainda não estão disponíveis. Favor consultar a data de lançamento para a disponibilidade no mercado.

Consulte <https://www.intel.com.br/content/www/br/pt/architecture-and-technology/hyper-threading/hyper-threading-technology.html?wapkw=hyper+threading> para obter mais informações, incluindo detalhes sobre quais processadores são compatíveis com a Tecnologia Hyper-Threading Intel®.

Os processadores compatíveis com a computação de 64 bits na arquitetura Intel® requerem BIOS habilitados para arquitetura Intel 64.

Os números dos processadores Intel não são indicação de desempenho. Os números dos processadores diferenciam recursos dentro de cada família de processador, e não entre famílias diferentes de processadores. Consulte <https://www.intel.com.br/content/www/br/pt/processors/processor-numbers.html> para obter mais detalhes.

O TDP máximo e do sistema se baseiam nos piores casos. O TDP real pode ser inferior, se nem todas as E/Ss para chipsets forem utilizadas.

Consulte <https://www.intel.com/content/www/br/pt/architecture-and-technology/identity-protection/identity-protection-technology-generat.html> para sistemas compatíveis com a Tecnologia de proteção da identidade Intel®.

Alguns produtos suportam as novas instruções AES com uma atualização da Configuração do processador, em particular, I7-2630QM/I7-2635QM, I7-2670QM/I7-2675QM, I5-2430M/I5-2435M, I5-2410M/I5-2415M. Favor entrar em contato com o OEM para o BIOS que inclui a mais recente atualização da Configuração do processador.

Frequência máxima de turbo refere-se à frequência máxima do processador de núcleo único que pode ser atingida com a Tecnologia Intel® Turbo Boost. Mais informações estão disponíveis no site <https://www.intel.com/content/www/br/pt/architecture-and-technology/turbo-boost/turbo-boost-technology.html>.

Informações sobre a empresa

Nosso compromisso

Diversidade e inclusão

Relações com investidores

Fale conosco

Sala de imprensa

Mapa do site

Empregos



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intel

CERTIFICATE

Certificate Number: 111968.00

The Environmental Management System and implementation of:

Lenovo Group, LTD.

8001 Development Drive
Morrisville, NC 27560
United States

meets the requirements of the standard:

ISO 14001:2015

Scope of Certification:

Design, development, manufacturing, distribution, fulfillment, and repair of computer products and devices, data center products, mobile devices, smart devices and accessories.

Certificate Expires:	June 16, 2022
Certificate Issued:	June 17, 2019
Certified Since:	June 17, 2013



Dr. Cem O. Onus
Managing Director
DEKRA Certification, Inc.
1120 Welsh Road, Suite 210
North Wales, PA 19454 USA
(215) 997-4519

www.dekra.us/en/audits



ADDENDUM

Certificate Number: 111968.00

Standard: ISO 14001:2015

The Environmental Management System and implementation of:
Lenovo Group, LTD

Site Address	Scope Per Site:
HQ: 8001 Development Drive, Morrisville, NC 27560 USA	Responsibility of the company's overall EMS through the management of documentation/changes, management review, corrective actions, internal audit, planning/evaluation and compliance to applicable requirements.
8001 Development Drive, Morrisville, NC 27560 USA	Design and development of data center products.
19/1A, & 2A Edayar, Cuddalore Main Road, Edayar Palayam Village – Pondicherry, India	Manufacturing of computer products and devices.
Apodaca (Monterrey), Mexico, Boulevard Escobedo No 316, Apodaca Industrial Park, PO 66600	Manufacturing of computer products and devices and data center products.
Estrada Municipal José Costa de Mesquita, 200 – Chácara Alvorada – Indaiatuba/SP, Brazil	Manufacturing of computer products and devices and data center products.
6540 Franz Warner Parkway, Whitsett, NC 27377 USA	Manufacturing, distribution, fulfillment, and repair of computer products and devices, data center products, mobile devices, smart devices, and accessories.
Am Zehnthof 77, 45307 Essen, Germany	Design and development of computer products and devices.
Minatomiral Center Building, 21F 3-6-1, Minatomiral, Nishi-Ku, Yokohama, Japan	Design and development of computer products and devices.





管理体系认证证书

证书编号: 01116E30073R5L(FT)

OID 编号: 1.2.156.1.2.01116E30073R5L(FT)

兹证明

联想(北京)有限公司

(社会信用代码: 911101087000064508)

(北京市海淀区上地西路6号2幢2层201-H2-6, 100085)

环境管理体系符合标准:

GB/T 24001-2016/ISO14001:2015 《环境管理体系 要求及使用指南》

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总经理

发证日期: 2016年11月17日

换证日期: 2018年12月5日

有效期至: 2019年11月16日

北京赛西认证有限责任公司



地址: 北京市东城区安定门东大街1号



客服电话: 400-071-9000

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CERTIFICATE OF MANAGEMENT SYSTEM CERTIFICATION

Certificate No: 01116E30073R5L(F1)

OID No: 1.2.156.1.2.01116E30073R5L(F1)

This is to certify that the Environmental Management Systems of

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(Certificate of Social Credit Code : 91110108700004588)

(NO. 2 BUILDING, 201-H2-6, NO. 6 SHANGDI WEST ROAD, HAIDIAN DISTRICT, BEIJING, CHINA, 100085)

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Guidance for use**

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General Manager

CESI Certification Co., Ltd.

Issue Date:2016-11-17

Exchange Date:2018-12-05

Valid Until:2019-11-16



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环境认证证书附件

QUALITY MANAGEMENT SYSTEMS CERTIFICATE APPENDIX

证书编号: 01116E30073R5L(F1)
Certificate No: 01116E30073R5L(F1)
OID 编号: 1.2.156.1.2.01116E30073R5L(F1)
OID No: 1.2.156.1.2.01116E30073R5L(F1)

名称: 联想(北京)有限公司
Name of Body: LENOVO (BEIJING) CO., LTD.

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- 3. NO. 696 SONGTAO ROAD, PUDONG NEW DISTRICT, SHANGHAI, CHINA**
- 4. NO. 68 BUILDING 199 FENJU ROAD FREE-TRADE-ZONE SHANGHAI, CHINA**
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管理体系认证证书

证书编号: 01116E30084R0M(F1)

OID 编号: 1.2.156.1.2.01116E30084R0M(F1)

兹证明

联想（北京）信息技术有限公司

(社会信用代码: 9111010097717380M)

(北京市海淀区上地西路6号2幢2层201-H2-2, 100085)

环境管理体系符合标准:

GB/T 24001-2016/ISO14001:2015 《环境管理体系 要求及其使用指南》

本证书覆盖下述范围:

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上海市张江科技园春晓路289号张江大厦7A, 9A, 10A, 11A层

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联想（北京）信息技术有限公司环境管理体系范围内的

与服务器的设计、开发、生产（外包）和服务

服务器系统软件的设计、开发和服务

相关的环境管理体系活动

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总经理

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换证日期: 2018年12月12日

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北京赛西认证有限责任公司



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Certificate No: 01116E30084R0M(FI)
OID No: 1.2.156.1.2.01116E30084R0M(FI)

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has complied with the requirements of
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Environmental management systems-Requirements with Guidance for use
This Environmental Management System applies to the following area:

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THESE ENVIRONMENTAL MANAGEMENT SYSTEM APPLIED TO THE FOLLOWING AREAS:

1. LENOVO HQ WEST, BUILDING 2, NO.10 COURTYARD XIBEIWANG EAST ROAD, HAIDIAN DISTRICT, BEIJING, CHINA
2. 7A, 9A, 10A, 11A, ZHANGJIANG BUILDING, NO. 289 CHUANXIAO ROAD, ZHANGJIANG TECHNOLOGY ZONE, SHANGHAI, CHINA
3. 4F, 5F, 8F, NO. 66, SAN CHONG ROAD, NAN GANG DISTRICT TAIPEI CITY, TAIWAN

THE VALIDITY OF THIS CERTIFICATE DEPENDS ON THE CONSEQUENCE OF THE ANNUALLY SURVEILLANCE EXECUTED BY THE CERTIFICATION BODY
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Note: The scope of product services without the related administrative permits and qualifications is not included in the scope of certification registration.

Issue Date:2016-12-16
Exchange Date:2018-12-12
Valid Until:2019-12-15

General Manager

CESI Certification Co., Ltd.



中国认可
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管理体系
MANAGEMENT SYSTEM
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Add: No.1Aandingmen Dongdajie Dongchengqu,Beijing,China Tel: 400-071-9000 [Http://www.cc.cesi.cn](http://www.cc.cesi.cn)



中质协质量保证中心

环境管理体系认证证书

注册号: 00619E30025R0L

兹证明

联宝(合肥)电子科技有限公司

统一社会信用代码: 91340100586142822H

注册地址: 中国·安徽省·合肥市经济技术开发区云谷路3188-1号(合肥出口加工区内)

审核地址: 中国·安徽省·合肥市经济技术开发区云谷路3188-1号(合肥出口加工区内)

环境管理体系符合

GB/T 24001-2016/ISO 14001:2015

认证范围

便携式计算机及主板、用于物联网智能计算机电子设备
(不包括许可证产品)的设计开发、生产和售后服务

该组织零设分场所信息: "无"

本证书有效期: 2019年01月22日至2022年01月21日

证书有效期内每年监督审核合格并粘贴标识后方为有效, 证书有效性查询请登录www.qac.com.cn;

本证书信息可在国家认证认可监督管理委员会官方网站www.cnca.gov.cn上查询

中质协质量保证中心



代表签字:

毅永刚

颁证日期: 2019年01月22日



中国认可
国际互认
管理体系
MANAGEMENT SYSTEM
CNAS C001-M

北京市海淀区三虎桥百慧村6号 100048



Quality Assurance Centre of China Association for Quality

CERTIFICATE OF ENVIRONMENTAL MANAGEMENT SYSTEM

Certificate No. 00619E30025R0L

This is to certify that the Environmental Management System of

LCFC (HeFei) Electronics Technology Co., Ltd.

Unified social credit code: 91340109586142822H

Registered Address: No. 3188-1 Yungu Road (Hefei Export Processing Zone), Hefei Economic & Technological Development Area, Anhui

Audit Address: No. 3188-1 Yungu Road (Hefei Export Processing Zone), Hefei Economic & Technological Development Area, Anhui

is in conformity with

GB/T 24001-2016/ISO 14001:2015

The Environmental Management System applies in the following area:

Design, development, production and after-sales service of portable computers and motherboards, intelligent computer electronic equipment for Internet of things (excluding licensed products)

Standing Branch Information: "None"

Term of validity of this certificate from: 22nd Jan. 2019 to 21st Jan. 2022

Certificate Validity Information can be inquired on (www.qac.com.cn) and (www.cnca.gov.cn)

Quality Assurance Centre

of China Association
for Quality

(QAC)

Representative:

Duan Yonggang

General Manager

Issue Date: 22nd Jan. 2019



中国合格评定
国家认可委员会
管理体系
CNAS C001-M

COPY

BUREAU VERITAS
Certification



Certification

Awarded to

NEC Personal Computers, Ltd.

Bureau Veritas Japan Co., Ltd. certify that the management system of the above organization has been audited and found to be in accordance with the requirements of the management system standards detailed below.

— STANDARDS —

ISO14001:2015, JIS Q 14001:2015

— SCOPE OF SUPPLY —

- DESIGN, DEVELOPMENT AND PRODUCTION OF PERSONAL COMPUTERS
- SERVICE OF PERSONAL COMPUTERS AND PERIPHERALS (FAILURE DIAGNOSIS AND REPAIR)
- REUSE OF USED PERSONAL COMPUTERS (BUYBACK, RECYCLING)

— SITE NAME, SCOPE OF SITE and LOCATION OF SITE —

YONEZAWA PLANT : DESIGN, DEVELOPMENT AND PRODUCTION OF PERSONAL COMPUTERS, REUSE OF USED PERSONAL COMPUTERS (BUYBACK AND RECYCLING).

6-80, SHIMOHANAZAWA 2-CHOME, YONEZAWA-CITY, YAMAGATA, 141-0032, JAPAN

GUNMA PLANT : SERVICE OF PERSONAL COMPUTERS AND PERIPHERALS (FAILURE DIAGNOSIS AND REPAIR).

32, NISHIJAJIMA-CHO, OHTA-SHI, GUNMA, 373-0823, JAPAN

Original Approval Date: **22 DECEMBER 2011**

Certification Cycle Start Date: **22 DECEMBER 2017**

Subject to the continued satisfactory operation of the organization's management system, this certificate is valid until: **21 DECEMBER 2020**

To check this certificate validity please call (+81 43 631 4784)

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by contacting the organization

Version: **2.0**

Approval Date: **09 NOVEMBER 2018**

Certificate Number: **4026297**

Bureau Veritas Japan Co., Ltd.
Certification Division
Certification Representative
Kazuhiko KAGEI



CERTIFICATE

Certificate Number: 140049.00

The Environmental Management System and implementation of:

Motorola Mobility LLC

222 W Merchandise Mart Plaza
Chicago, IL 60654
United States

meets the requirements of the standard:

ISO 14001:2015

Scope:

Research and development of wireless communication equipment and accessories for the global market place.

Certificate Expires: March 28, 2021
Certificate Issued: March 29, 2018
Certified Since: March 29, 2018



Dr. Cem O. Onus
Managing Director, Business Assurance
DEKRA Certification, Inc.

1120 Welsh Road, Suite 210
North Wales, PA 19454 USA
(215) 997-4519
dekra-certification.us



Certificate CN19/31787.06

The management system of

Lenovo Tecnologia (Brazil) Ltd.

Business Registration Address: ESTRADA MUNICIPAL JOSÉ COSTA DE MESQUITA, 200–BAIRRO CHÁCARA ALVORADA–MODULES 5 TO 10 –INDAIATUBA / SP BRAZIL–ZIP CODE: 13.337–200 Brasil
Business Operation Address: ESTRADA MUNICIPAL JOSÉ COSTA DE MESQUITA, 200–BAIRRO CHÁCARA ALVORADA–MODULES 5 TO 10 –INDAIATUBA / SP BRAZIL–ZIP CODE: 13.337–200 Brasil



has been assessed and certified as meeting the requirements of

ISO 45001:2018

For the following activities

Manufacture of Computer Products and Servers.

This certificate is valid from 28 October 2019 until 27 October 2022 and remains valid subject to satisfactory surveillance audits. Recertification audit due a minimum of 60 days before the expiration date Issue 1. Certified since 28 October 2019

Multiple certificates have been issued for this scope
The main certificate is numbered CN19/31787.00

Authorised by

A handwritten signature in black ink, consisting of stylized initials.



0005

SGS United Kingdom Ltd
Rossmore Business Park Ellesmere Port Cheshire CH65 3EN UK
t +44 (0)151 350-6666 f +44 (0)151 350-6600 www.sgs.com

HC SGS 45001 2018 0219 M3(5)

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Members Elect Dell and Google to Trusted Computing Group Board of Directors

Date Published: December, 01, 2014

New Members Join TCG in Drive to Improve Cybersecurity

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PORTLAND, Ore., Dec. 17, 2014 – Members have elected Dell (<https://www.dell.com/>) and Google (<https://www.google.com/intl/en/about/>) to the board of directors of the Trusted Computing Group (/) (TCG), a worldwide open industry standards organization.

Representatives from Dell and Google will work with TCG board members from Advanced Micro Devices, Cisco, Fujitsu Ltd., Hewlett-Packard, IBM, Infineon Technologies AG, Intel Corporation, Juniper Networks, Lenovo Holdings Ltd., Microsoft and Wave Systems to help drive the development and adoption of specifications based on the root of trust for computing across devices, networks and the cloud.

To further advance the role of trust across computing, GROWING, MAFAZO LLC, Pulse Secure LLC, Swisscom and Unisys Corporation recently have joined TCG. Experts from these companies will join those from TCG's 100-plus members across computing to support work groups for Trusted Platform Module, embedded systems, mobile platforms, virtualized platforms and cloud security.

The Trusted Computing Group (TCG) provides open standards that enable a safer computing environment across platforms and geographies. Benefits of Trusted Computing include protection of business-critical data and systems, secure authentication and strong protection of user identities, and the establishment of strong machine identity and network integrity. Organizations using built-in, widely available trusted hardware and applications reduce their total cost of ownership. TCG technologies also provide regulatory compliance that is based upon trustworthy hardware. More information and the organization's specifications and work groups are available at the Trusted Computing Group's website, trustedcomputinggroup.org (/).

Follow TCG on Twitter (<https://www.twitter.com/TrustedComputin>) and on LinkedIn (<https://www.linkedin.com/groups?mostPopular=&gid=1857141>).

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Contact Us

Trusted Computing Group Administration

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CPU Benchmarks

Over 1,000,000 CPUs Benchmarked

Intel Xeon W-1270 @ 3.40GHz

Price and performance details for the Intel Xeon W-1270 @ 3.40GHz can be found below. This is made using thousands of [PerformanceTest](#) benchmark results and is updated daily.

- The first graph shows the relative performance of the CPU compared to the 10 other common (single) CPUs in terms of PassMark CPU Mark.
- The 2nd graph shows the value for money, in terms of the CPUMark per dollar.
- The pricing history data shows the price for a single Processor. For multiple Processors, multiply the price shown by the number of CPUs.

<p> CPUS</p> <hr/> <p> High End</p> <p>High Mid Range</p> <p>Low Mid Range</p> <p>Low End</p> <hr/> <p> Best Value (On Market)</p> <p>Best Value XY Scatter</p> <p>Best Value (All time)</p> <hr/> <p> New Desktop</p> <p>New Laptop</p> <hr/> <p> Single Thread</p> <p>Systems with Multiple CPUs</p> <p>Overclocked</p> <p>Power Performance</p> <p>CPU Mark by Socket Type</p> <p>Cross-Platform CPU Performance</p> <hr/> <p> CPU Mega List</p> <p>Search Model</p> <hr/> <p> Compare ⁰</p> <hr/> <p> Common</p> <p>Most Benchmarked</p> <hr/> <p> AMD vs Intel Market Share</p>	<p>Intel Xeon W-1270 @ 3.40GHz</p> <hr/> <p>Description: Intel UHD Graphics P630</p> <p>Class: Server</p> <hr/> <p>Socket: FCLGA1200</p> <p>Clockspeed: 3.4 GHz</p> <hr/> <p>Turbo Speed: 5.0 GHz</p> <p>Cores: 8</p> <p>Threads: 16</p> <hr/> <p>Typical TDP: 80 W</p> <hr/> <p>Other names: Intel(R) Xeon(R) W-1270 CPU @ 3.40GHz</p> <hr/> <p>CPU First Seen on Charts: Q2 2020</p> <hr/> <p>CPUmark/\$Price: 49.25</p> <hr/> <p>Overall Rank: 238</p> <hr/> <p>Last Price Change: \$362.00 USD (2020-04-01)</p> <hr/> <p>CPU Test Suite Average Results for Intel Xeon W-1270 @ 3.40GHz</p> <table border="1"> <tr> <td>Integer Math</td> <td>62,328 MOps/Sec</td> </tr> <tr> <td>Floating Point Math</td> <td>39,219 MOps/Sec</td> </tr> <tr> <td>Find Prime Numbers</td> <td>59 Million Primes/Sec</td> </tr> <tr> <td>Random String Sorting</td> <td>33 Thousand Strings/Sec</td> </tr> <tr> <td>Data Encryption</td> <td>6,319 MBytes/Sec</td> </tr> <tr> <td>Data Compression</td> <td>257.3 MBytes/Sec</td> </tr> </table>	Integer Math	62,328 MOps/Sec	Floating Point Math	39,219 MOps/Sec	Find Prime Numbers	59 Million Primes/Sec	Random String Sorting	33 Thousand Strings/Sec	Data Encryption	6,319 MBytes/Sec	Data Compression	257.3 MBytes/Sec	<p>Average CPU Mark</p> <div style="text-align: center;"> <p>17830</p> </div> <p>Single Thread Rating: 3071</p> <p>Cross-Platform Rating: 37,593</p> <p>Samples: 6*</p> <p>*Margin for error: Medium</p> <p style="text-align: center;">+ COMPARE</p>
Integer Math	62,328 MOps/Sec													
Floating Point Math	39,219 MOps/Sec													
Find Prime Numbers	59 Million Primes/Sec													
Random String Sorting	33 Thousand Strings/Sec													
Data Encryption	6,319 MBytes/Sec													
Data Compression	257.3 MBytes/Sec													

Physics

951 Frames/Sec

Single Thread

3,071 MOps/Sec

From submitted results to PerformanceTest V10 as of 30th of June 2021.

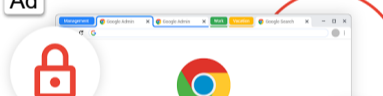
CPU Mark Distribution for Intel Xeon W-1270 @ 3.40GHz

Submitted Baseline Distribution Graph as of 30th of June 2021



Not Enough Data to Create Distribution Graph.

From submitted results to PerformanceTest V10 as of 30th of June 2021.

Ad



Work in Chrome
Move faster with Chrome sync and cross-

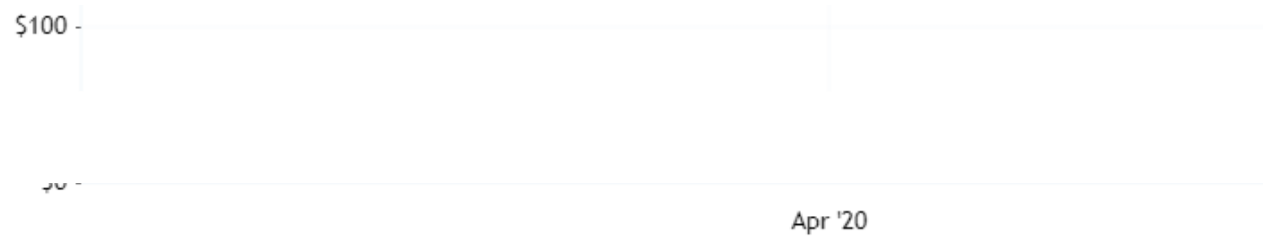
Search for **Intel Xeon W-1270 @ 3.40GHz**
from the Featured Merchants below:



Note: PassMark Software may earn compensation for sales from links on this site through affiliate programs.

Pricing History





CPU Mark Relative to Top 10 Common Server CPUs

As of 30th of June 2021 - Higher results represent better performance

Processor	Average CPU Mark
AMD EPYC 7763	87,767
AMD EPYC 7713	85,792
AMD EPYC 7702	71,686
AMD EPYC 7443P	59,870
AMD EPYC 7302P	32,480
Intel Xeon W-1270 @ 3.40GHz	17,830
Intel Xeon E5-1650 v3 @ 3.50GHz	10,377
Intel Xeon E5-2689 @ 2.60GHz	9,766
Intel Xeon E5-2620 v3 @ 2.40GHz	7,928
Intel Xeon E5-1620 v3 @ 3.50GHz	6,992
Intel Xeon E5-1620 @ 3.60GHz	5,869

CPU Value (CPU Mark / \$Price)

As of 30th of June 2021 - Higher results represent better value

Processor	CPU Mark / \$Price
Intel Xeon E5-2620 v3 @ 2.40GHz	123.95
Intel Xeon E5-2689 @ 2.60GHz	53.44
Intel Xeon W-1270 @ 3.40GHz	49.25
AMD EPYC 7443P	44.78
Intel Xeon E5-1620 @ 3.60GHz	40.85
Intel Xeon E5-1620 v3 @ 3.50GHz	29.50
AMD EPYC 7302P	23.20
Intel Xeon E5-1650 v3 @ 3.50GHz	13.95
AMD EPYC 7702	8.43
AMD EPYC 7713	NA
AMD EPYC 7763	NA

Single Thread Rating

Processor	Average Thread Rating
Intel Xeon W-1270 @ 3.40GHz	3,071
AMD EPYC 7443P	3,016
AMD EPYC 7713	2,738
AMD EPYC 7763	2,639
Intel Xeon E5-1650 v3 @ 3.50GHz	2,115
AMD EPYC 7702	2,098
Intel Xeon E5-1620 v3 @ 3.50GHz	2,028
AMD EPYC 7302P	1,878
Intel Xeon E5-1620 @ 3.60GHz	1,777
Intel Xeon E5-2620 v3 @ 2.40GHz	1,688
Intel Xeon E5-2689 @ 2.60GHz	1,559

Last 5 Baselines for Intel Xeon W-1270 @ 3.40GHz

Most recent listed first

Baseline	CPU Mark
BL1361273 - Jan 26 2021	18807
BL1357723 - Jan 19 2021	18057
BL1349904 - Jan 04 2021	19659
BL1349628 - Jan 04 2021	11050
BL1283104 - Aug 18 2020	19872

Popular comparisons for Intel Xeon W-1270 @ 3.40GHz

As of 30th of June 2021 - Higher results represent better performance

Processor	Average CPU Mark
Intel Xeon W-1270 @ 3.40GHz	17,830
Intel Xeon W-1270P @ 3.80GHz	19,347
AMD EPYC 3251	14,072
Intel Xeon W-1250 @ 3.30GHz	14,001
AMD EPYC 7232P	16,658

Intel Xeon E-2236 @ 3.40GHz	14,412
Intel Xeon W-1250P @ 4.10GHz	14,632
Intel Xeon W-11855M @ 3.20GHz	20,088
Intel Xeon E-2136 @ 3.30GHz	13,506
Intel Xeon E5-2687W v3 @ 3.10GHz	14,779
Intel Xeon W-10855M @ 2.80GHz	13,136
Intel Xeon E-2278GE @ 3.30GHz	17,210

Software

- [BurnInTest](#)
- [PerformanceTest](#)
- [OSForensics](#)
- [MemTest86](#)
- [WirelessMon](#)
- [Zoom Search Engine](#)
- [Free Software](#)

Hardware

- [USB3.0 Loopback Plugs](#)
- [USB2.0 Loopback Plugs](#)
- [PCIe Test Cards](#)
- [USB Power Delivery Tester](#)
- [Serial and Parallel Loopback Plugs](#)
- [USB Short Circuit Testers](#)

Benchmarks

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RoHS/REACH Engineering Specification



Lenovo RoHS/REACH Engineering Specification Addendum to Lenovo Environmental Specification 41A7731

Number	41A7733
Version	2020-1
Applicability	Lenovo brand products worldwide
Owner	Global Environmental Affairs

Contents

- 1.0 Purpose and Scope
- 2.0 ROHS Requirements
- 3.0 Substances of Very High Concern (SVHC) in Articles - Reporting Requirements
- 4.0 Definitions
- Appendix: RoHS Guidance: summary checklist
- Revision History

1.0 Purpose and Scope

This Specification communicates Lenovo's requirements for Lenovo brand products and materials, parts and assemblies incorporated into Lenovo Brand products worldwide, in accordance with European Union directive for the Restriction of Hazardous Substances (RoHS) and the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) in electrical and electronic equipment, similar regulations in other markets and more stringent limits set by Lenovo.

This Specification does not apply to spare parts for the repair, or reuse, of electrical and electronic equipment put on the market before the date defined by each regional RoHS directive, batteries or process chemicals.

1.1 Other Jurisdictions

There are other jurisdictions, other than the EU Member States, with RoHS types of requirements. The list below is not complete and is provided for information only. In some jurisdictions the product scope and requirements are different from the scope and requirements of the EU Directive. Deliverables to Lenovo which cite this specification must meet the requirements of this specification irrespective of the jurisdiction where the Deliverable is transferred to Lenovo.

- Multiple US States
- New York City
- People's Republic of China
- European Economic Area (EEA) States
- European Free Trade Association (EFTA) States
- EU Candidate Countries - Albania, Montenegro, Macedonia, Serbia, and Turkey
- EU potential Candidate Countries – Bosnia and Herzegovina, Kosovo
- EAEU
- UEE
- Brazil
- Korea
- Ukraine
- Vietnam
- India
- Japan
- Thailand

2.0 RoHS Requirements

Lenovo brand products and materials, parts and assemblies in Lenovo brand electrical and electronic products must meet the following requirements:

1. Applicable laws and regulations;
2. Lenovo Engineering Specification [41A7731](#) Baseline Environmental Requirements for Materials, Parts and Products for Lenovo Hardware Products; and
3. This Lenovo RoHS/REACH Engineering Specification [41A7733](#).

Homogeneous materials within new Lenovo brand products and parts and assemblies for new Lenovo brand products must comply with the criteria shown in Table 1.

Non-Lenovo brand (i.e., third-party/Supplier logo) products must comply with applicable legal requirements.

Should the requirements of this Specification conflict with applicable governmental regulations or legislation the more stringent requirements shall take precedence.

2.2 Verification

Suppliers are expected to complete and submit an IPC 1752A XML Full Material Disclosure (FMD) via the Green Data Exchange (GDx), refer to [Lenovo Guide to Full Material Disclosures \(Version 2\)](#).

At Lenovo’s request, the supplier must be able to provide technical documentation in the form of internal design controls, supplier data or analytical test reports.

An authorized person, product assurance or similar must also sign the [Lenovo Supplier Material Self-Declaration](#). Lenovo specifications are available at: www.lenovo.com–About Lenovo–Sustainability - Resources-Procurement/Suppliers.

2.3 Substances Prohibited from Use

The DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 bans the use of the following in new electrical and electronic products put on the market after July 1, 2006:

- **Lead (Pb),**
- **Mercury (Hg),**
- **Cadmium (Cd),**
- **Hexavalent chromium (Cr+6),**
- **Polybrominated biphenyl (PBB) flame retardants and**
- **Polybrominated diphenyl ether (PBDE) flame retardants.**
- **Bis (2-ethylhexyl) phthalate (DEHP)¹**
- **Butyl benzyl phthalate (BBP)¹**
- **Dibutyl phthalate (DBP)¹**
- **Diisobutyl phthalate (DIBP)¹**

¹On 4 June 2015, the EU commission published a new Directive (EU) 2015/863 to amend Annex II to EU RoHS 2 (Directive 2011/65/EU) to add the following 4 phthalates onto the list of restricted substances. Restriction become effective July 22, 2019.

This prohibition applies to the above substances and all compounds containing these substances. These substances and compounds must not be in or on any Deliverable above the allowed concentrations found in **Table 1** below; except for the exemptions listed in Section 2.4. The maximum allowable level found in a Homogeneous Material (e.g., metal, adhesive, paint, plastic, plating), cannot exceed the levels found in the table below.

Table 1: EU RoHS Maximum Concentration Values (MCV)		
Substance	RoHS Maximum Concentration Value in a Homogeneous Material % by weight or (ppm)	Additional application restrictions may apply. See Lenovo specification 41A7731 for more details
Lead (Pb)	0.1% or 1,000 ppm	Specific applications have more restrictive levels.

Lenovo RoHS/REACH Specification 41A7733

Mercury (Hg)	0.1% or 1,000 ppm	Any detectable level must be reported except unavoidable impurities at levels below 10ppm.
Cadmium (Cd)	0.01% or 100 ppm	0.0 Any detectable level must be reported for plating and surface coating applications.
Hexavalent chromium (Cr +6)	0.1% or 1,000 ppm	Specific applications have more restrictive levels.
Polybrominated biphenyl (PBB) flame retardants	0.1% or 1,000 ppm	Any detectable level must be reported.
Polybrominated diphenyl ether (PBDE) flame retardants. Note: IBM includes Decabromodiphenyl ether in this category	0.1% or 1,000 ppm	Any detectable level must be reported.
Bis (2-ethylhexyl) phthalate (DEHP)	0.1% or 1,000 ppm	Specific applications have more restrictive levels.
Butyl benzyl phthalate (BBP)	0.1% or 1,000 ppm	Specific applications have more restrictive levels.
Dibutyl phthalate (DBP)	0.1% or 1,000 ppm	Specific applications have more restrictive levels.
Diisobutyl phthalate (DIBP)	0.1% or 1,000 ppm	Specific applications have more restrictive levels.

Note:

1 - Certain substances affected by the European Commission's Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) are already restricted by other regulations at concentration levels that are more stringent than those associated with RoHS compliance. Lenovo Engineering Specification 41A7731 provides the detailed requirements for these substances as defined by certain existing legislation and/or Lenovo internal standards.

2 - Test methodology for RoHS substances must be in accordance with the latest version of IEC 62321 Electrotechnical products – Determination of levels of six regulated substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers) as referred to in EN50581:2012, Technical Documentation for the Assessment of Electrical and Electronic Products with Respect to the Restriction of Hazardous Substances.

2.4 Exemptions

The following are the applications which are exempt from the requirements of RoHS as cited by the EU Directive, and subsequent amendments. The prohibition, as stated in Section 2.3, is in place for all other applications. Lenovo has determined some of the exemptions will be allowed for Lenovo products. This information is noted by the exemption. Where specified by Lenovo in the procurement documents some of these exemptions may still be used when the order is for spare parts for the repair and reuse of equipment placed on the market prior to a specific date.

The exemptions in **Table 2** were set to expire on July 21st, 2016. Currently these exemptions have been submitted for extension. Under the RoHS-2 Directive, exemptions remain in effect until a decision is made on the renewal applications that have been submitted. If notification is received from the EU regarding exemption expirations, Lenovo will assess and update this specification and table as necessary.

Note: A table providing an overview of Annex III and IV exemptions, including their validity status and submitted exemption requests is available for download [here](#).

Exemption No.	Description	Current EU Expiration Date	Current Status
5(b)	Lead (Pb) in glass of fluorescent tubes not exceeding 0.2% by weight		Extension requested
6(a)	Lead (Pb) as an alloying element in steel for machining purposes and in galvanized steel containing up to 0.35% lead by weight	Various dates, see next column and next row. Information technology equipment is generally in Category 3	Expires 1 July 2019 for Categories 1 to 7 and 10 ----- Expires 21 July 2021 for Categories 8, 9 and 11
6(a)-I	Lead as an alloying element in steel for machining purposes containing up to 0.35% lead by weight and in batch hot	21-Jul-21	Expires 21 July 2021 for Categories 1 to 7 and 10

Lenovo RoHS/REACH Specification 41A7733

	dip galvanised steel components containing up to 0.2% lead by weight		
6(b)	Lead (Pb) as an alloying element in aluminum containing up to 0.4% lead by weight	Various dates, see next column and next row. Information technology equipment is generally in Category 3	Expires 1 July 2019 for Categories 1 to 7 and 10 ----- Expires 21 July 2021 for Categories 8, 9 and 11
6(b)-I	Lead as an alloying element in aluminium containing up to 0.4% lead by weight, provided it stems from lead-bearing aluminium scrap recycling	21-Jul-21	Expires 21 July 2021 for Categories 1 to 7 and 10
6(b)-II	Lead as an alloying element in aluminium for machining purposes with a lead content of up to 0.4% lead by weight	18-May-2021	Expires 18 May 2021 for Categories 1 to 7 and 10
6(c)	Copper alloy containing up to 4% lead (Pb) by weight	Various dates, see next column and next row. Information technology equipment is generally in Category 3	Expires 21 July 2021 for Categories 1 to 7 and 10 Expires on: 21 July 2023 for category 8 in vitro diagnostic medical devices; 21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; 21 July 2021 for all other categories and subcategories
7(a)	Lead (Pb) in high melting temperature type solders (i.e. lead-based alloys containing 85% by weight or more lead)	Various dates, see next column and next row. Information technology equipment is generally in Category 3	Expires 21 July 2021 for Categories 1 to 7 and 10 Expires on: 21 July 2023 for category 8 in vitro diagnostic medical devices; 21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; 21 July 2021 for all other categories and subcategories
7(c)-I	Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound	Various dates, see next column and next row. Information technology equipment is generally in Category 3	Expires 21 July 2021 for Categories 1 to 7 and 10 Expires on: 21 July 2023 for category 8 in vitro diagnostic medical devices; 21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; 21 July 2021 for all other categories and subcategories
7(c)-II	Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher		Expires 21 July 2021 for Categories 1 to 7 and 10
8(b)	Cadmium and its compounds in electrical contacts		Applies to categories 8, 9 and 11 and expires on: —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; —21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.

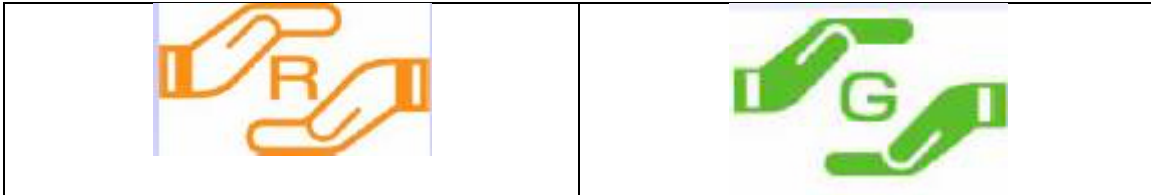
Lenovo RoHS/REACH Specification 41A7733

8(b)-I	<p>Cadmium and its compounds in electrical contacts used in:</p> <ul style="list-style-type: none"> - circuit breakers, - thermal sensing controls, - thermal motor protectors (excluding hermetic thermal motor protectors), - AC switches rated at: <ul style="list-style-type: none"> o 6A and more at 250V AC and more, or o 12A and more at 125V AC and more, - DC switches rated at 20 A and more at 18 V DC and more, and - switches for use at voltage supply frequency \geq 200 Hz. 		Applies to categories 1 to 7 and 10 and expires on 21 July 2021.'
13(a)	Lead in white glasses used for optical applications	21-Jul-21	Expires on: 21 July 2023 for category 8 in vitro diagnostic medical devices; 21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; 21 July 2021 for all other categories and subcategories
13(b)	Cadmium and lead in filter glasses and glasses used for reflectance standards		Expires 5 July 2018 for Categories 1 to 7 and 10 ----- Expires 21 July 2021 for Categories 8, 9 and 11
13(b)-(I)	Lead in ion coloured optical filter glass types	21-Jul-21	Valid for Categories 1 to 7 and 10 from 6 July 2018
13(b)-(II)	Cadmium in striking optical filter glass types; excluding applications falling under point 39 of this Annex	21-Jul-21	Valid for Categories 1 to 7 and 10 from 6 July 2018
13(b)-(III)	Cadmium and lead in glazes used for reflectance standards	21-Jul-21	Valid for Categories 1 to 7 and 10 from 6 July 2018
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages		Extension requested
24	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors	Various dates, see next column and next row. Information technology equipment is generally in Category 3	Expires 21 July 2021 for Categories 1 to 7 and 10 Expires on: 21 July 2023 for category 8 in vitro diagnostic medical devices; 21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; 21 July 2021 for all other categories and subcategories
34	Lead in cermet-based trimmer potentiometer elements	Various dates, see next column and next row. Information technology equipment is generally in Category 3	Expires 21 July 2021 for Categories 1 to 7 and 10 Expires on: 21 July 2023 for category 8 in vitro diagnostic medical devices; 21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; 21 July 2021 for all other categories and subcategories
37	Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body		Extension requested
39(a)	Cadmium selenide in downshifting cadmium-based semiconductor nanocrystal quantum dots for use in display lighting applications (less than 0.2 microgram Cd per mm ² of display screen area)	31-Oct-19	Expires for all categories on 31 October 2019

2.5 Product Marking and Information Disclosure

2.5.1 Products for Japan: must meet the requirements of Japanese Industrial Standard for The Marking the presence of the Specific Chemical Substances for electrical and electronic equipment (JIS C 0950:2005, "J-MOSS"). Product development teams must provide product conformity declarations to Lenovo's Japan Environment representative before offering product for sale in Japan.



1. Mandatory "R" mark if the product does not meet the requirements of the RoHS Directive.
2. Optional* green "G" mark to show no such substances are contained (*not required by Lenovo).
3. Product material declaration table in Japanese on external [Lenovo Japan Environmental website](#)



2.5.2 "Korea RoHS": must meet the requirements of The Act for Resource Recycling of Electrical and Electronic Equipment and Vehicles ("Korea RoHS"). Product development teams must provide product conformity declarations to Korea's Country Manager representative before offering product for sale in Korea. Product declarations must be on the Korea ECOAS (<http://www.ecoas.or.kr/>) web page before offering product for sale in Korea.

2.5.3 Products for Turkey: must meet the requirements of Turkey's Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) regulation. Product development teams must provide product conformity declarations to Lenovo's Turkey Country Manager representative, annually beginning June 2009 for submission to the Turkey Ministry of Environment and Forestry.

2.5.4 Products for People's Republic of China: must meet requirements of "Management Methods for Restricted Use of Hazardous Substances in Electronic and Electrical Products" ("China RoHS"). The official documents are in Chinese at <http://www.mii.gov.cn/>

<p>1. Environmental Protection Use Period (EPUP) Electronic and electrical products, parts, accessories, options, Field Replacement Units (FRUs) and Customer Replaceable Units (CRUs) for "independent commercial sale" in China must be marked with one of two logos:</p> <p>Logo 1: "e" inside circle indicates product is compliant with Requirements of concentration limits for certain substances in electrical and electronic products GB/T 26572-2011 or</p> <p>Logo 2: Environment Protection Use Period (EPUP) in years in circle indicating product is noncompliant (exceeds) Requirements of concentration limits for certain substances in electrical and electronic products GB/T 26572-2011</p> <p>Exception: Parts purchased for manufacturing (internal to a product) do NOT need to be marked</p> <p>EPUP Mark artwork, color, size, font specifications are provided in: Labeling Standard SJ/T 11364-2014</p> <ul style="list-style-type: none"> • Logo 1 Green Mark: C: 85,M: 30,Y: 85,K: 20; Logo 2 Orange Mark: C: 0,M: 75,Y: 100,K: 0 	<div style="text-align: center;">  <p>No "China RoHS" Substances</p> </div> <div style="text-align: center; margin-top: 20px;">  <p>Contains "China RoHS" Substances In this example: "10" means EPUP period is 10 years</p> </div>
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- EPUP mark must be on product unless the product total surface area is <5000mm² or is of irregular shape. In this case, the EPUP mark must be included in the product documentation that accompanies the product.
- Minimum 5 mm x 5 mm EPUP mark size
- There are no marking color restrictions as long as the mark is visible (black and white is acceptable). The color green should not be used for Logo 2.
- Lenovo products use EPUP number is "10" for most PC products, monitors and options; "20" for enterprise and mobile products; "5" for batteries. Should the EPUP mark on a product differ from the EPUP mark on product documentation, the mark on the product shall take precedence.

2. Substance Disclosure Table

Products that require **Logo 2** must have a Substance Disclosure Table in the product documentation that accompanies the product (software or paper-based). This includes system products, parts, FRUs, accessories and options for independent commercial sale.

- Text must be in Simplified Chinese (except for "O" and "X")
- Table must include Product Name, Part Name(s), Insert "O" or "X" for each key part. In cases where "X" is shown, Lenovo uses an EU RoHS exemption
- Minimum font size is 1.8 mm
- See the example table below

Example: Substance Disclosure Table

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板组件*	X	O	O	O	O	O
外壳及附件	X	O	O	O	O	O
本表格依据SJ/T 11364的规定编制。 O：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。 X：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。 表中标记“X”的部件，皆因全球技术发展水平限制而无法实现有害物质的替代。						

2.5.4.1 China RoHS Conformity Assessment System

According to Arrangements for the Implementation of the RoHS Conformity Assessment System for Electrical and Electronic Products (hereinafter referred to as "Arrangements"), which are hereby announced. All products that are included in the Management Catalogue of Electrical and Electronic Products (EEP) that Should Meet the RoHS Standards and are shipped out of factory or imported after November 1, 2019 shall meet the requirements of the Arrangements.

Modes of Conformity Assessment

- The unified voluntary RoHS certification scheme introduced by the State for EEPs (hereinafter referred to as "State-introduced voluntary certification")
- The supplier's declaration of RoHS conformity for EEPs (hereinafter referred to as "SDoC")

The supplier of an EEP included in the Management Catalogue shall choose the State-introduced voluntary certification mode or SDoC mode to complete the RoHS conformity assessment. Product conformity information should be submitted to China RoHS public service platform within 30 days after the product is put on the market. And Enterprise self-declaration and technical support documents are conformity information for SDoC mode.

Labels of Conformity Assessment

The below Design I will be used as the conformity assessment label for the products undergoing the State-introduced voluntary certification, and The identification of the certification authority in the box should be confirmed with the corresponding certification authority. While Design II will be used as the conformity assessment label for the products going through the SDoC procedure.

Vector drawings of basic patterns of green product identification can be downloaded on the information platform. Green product labels can be scaled up or down, and should be clearly identifiable after labeling.

Unless otherwise required by relevant systems or certification bodies, enterprises can independently choose any manufacturing process (such as printing, molding, etc.) to use or display the green product logo on the product body, nameplate, packaging, attached documents (such as instruction manual, qualification certificate, etc.), operating system, electronic sales platform, etc.

The color of green product logo should be white background plate, green pattern.



For China RoHS and China RoHS Conformity Assessment related requirement, please refer to <http://www.cesi.cn/rohs/page/fgptbz.jsp?catalog=/001/001-008/001-008-006/001-008-006-001>

2.5.5 Vietnam RoHS: must meet the requirements of Circular, provisionally stipulating allowable limit contents of a number of toxic or hazardous chemicals in electric or electronic products (“Vietnam RoHS”). Product development teams can choose one of following disclosure to show the information on the allowable limits of restricted substances before offering product for sale in Vietnam:

- Upload on Website of company
- User’s guide / Instruction manual of product
- Information in electronic form (e.g. CD)
- Printing on the product or packaging

2.5.6 Taiwan RoHS: Must meet the requirements for the certified national standards, Guidance for the reduction of restricted chemical substances in electrical and electronic equipment (CNS15663). This provides the product categories, types of restricted hazardous substances, quantity standards and standardisation methods.

The presence restricted substances requires the use of the following mark and disclosure table on the body, packages, stickers, or user documentation:

設備名稱：液晶電視機，型號：YYY

單元	限制物質及其化學符號					
	鉛 (Pb)	汞 (Hg)	鎘 (Cd)	六價鉻 (Cr ⁶⁺)	多溴聯苯 (PBB)	多溴二苯醚 (PBDE)
電路板	○	○	○	○	○	○
外殼	○	○	○	○	○	○
玻璃面板	—	○	○	○	○	○
揚聲器	○	○	○	○	○	○
配件(例：遙控器等)	—	○	○	○	○	○

備考1. "○" 係指該項限制物質之百分比含量未超出百分比含量基準值。
備考2. "—" 係指該項限制物質為排除項目。

設備名稱：液晶電視機，型號：XXX

單元	限制物質及其化學符號					
	鉛 (Pb)	汞 (Hg)	鎘 (Cd)	六價鉻 (Cr ⁶⁺)	多溴聯苯 (PBB)	多溴二苯醚 (PBDE)
電路板	超出 0.1 wt %	○	○	○	○	○
外殼	○	○	超出 0.01 wt %	○	○	超出 0.1 wt %
玻璃面板	—	○	○	○	○	○
揚聲器	○	○	○	超出 0.1 wt %	○	○
配件(例：遙控器等)	—	○	○	○	○	○

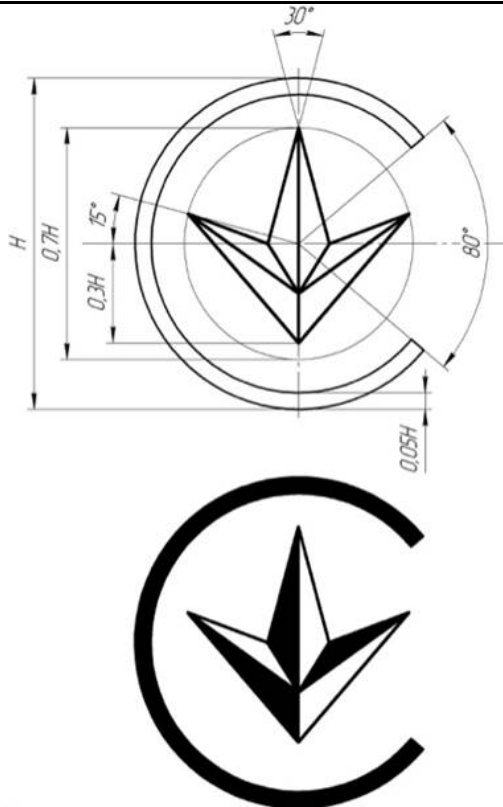
備考1. "超出0.1 wt %" 及 "超出0.01 wt %" 係指限制物質之百分比含量超出百分比含量基準值。
備考2. "○" 係指該項限制物質之百分比含量未超出百分比含量基準值。
備考3. "—" 係指該項限制物質為排除項目。

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2.5.7 Ukraine RoHS: Must meet the requirements in accordance with Decree #139 of the Council of Ministers of Ukraine. This provides the product categories, types of restricted hazardous substances, quantity standards and standardization methods.

Beginning July 23, 2018 the national conformity mark of Ukraine must be placed directly on the EEE or on a nameplate with the technical specifications of the equipment. The mark must be visible, clear and indelible. If this is not possible or feasible due to the nature of the product, then the national conformity mark must be placed on the packaging and the accompanying documentation.

The general principles of placing the national mark of conformity are set out by Decree No. 1184, 2015. The Decree provides for the description of the national mark of conformity and the rules of its application.



3.0 REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation

3.0.1 Substances of Very High Concern (SVHC) in Articles - Reporting Requirements

Lenovo requires suppliers to identify if any Substances of Very High Concern (SVHC) present in an Article (Deliverable or Sub-Deliverable as defined by latest EU Article definition) at or above the 0.1% weight by weight (w/w) concentration and report the name and CAS number of the SVHC candidate and the quantity on the IPC 1752A XML Full Material Disclosure (FMD) via the Green Data Exchange (GDx), refer to [Lenovo Guide to Full Material Disclosures \(Version 2\)](#), for the Deliverable/Sub-Deliverable.

The current candidate list of REACH SVHC as published by the EU is located at:

http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp.

This list is subject to change by the European Chemicals Agency (ECHA); contains 209 unique substances/entries on the date this specification was published. Also refer to Lenovo Engineering Specification 41A7731 Annex DD for the list of SVHC Candidate Substances as of the date of this document.

If an SVHC is present in a Deliverable at or above the reporting concentrations, the Supplier must provide a customer communication to Lenovo meeting the requirements of Article 33 of the EU REACH Regulation.

EU REACH Regulation Number 1907/2006 can be found at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02006R1907-20140410>

The EU provides guidance documents for REACH, specifically guidance documents for Substances in Articles as well as the candidate list for SVHC at http://guidance.echa.europa.eu/guidance_en.htm
Additional information about REACH can be found at the European Chemicals Agency web site at <http://echa.europa.eu>

3.0.2 Restricted Substances in Articles (Annex XVII) - Reporting Requirements

Lenovo requires suppliers to identify if any Restricted Substances (Annex XVII) present in an Article (Deliverable or Sub-Deliverable as defined by latest EU Article definition) at or above the prescribed weight by weight (w/w) concentration (ranging from 0-0.1%) and report the name and CAS number of the SVHC candidate and the quantity on the IPC 1752A XML Full Material Disclosure (FMD) via the Green Data Exchange (GDx), refer to [Lenovo Guide to Full Material Disclosures \(Version 2\)](#), for the Deliverable/Sub-Deliverable.

The current candidate list of REACH Restricted Substances as published by the EU is located at:

<https://echa.europa.eu/substances-restricted-under-reach>.

This list is subject to change by the European Chemicals Agency (ECHA); contains 70 unique substances/entries on the date this specification was published. Also refer to Lenovo Engineering Specification 41A7731 Annex DD for the list of SVHC Candidate Substances as of the date of this document.

If a Restricted Substance is present in a Deliverable at or above the reporting concentrations, the Supplier must provide a customer communication to Lenovo meeting the requirements of Article 33 of the EU REACH Regulation.

EU REACH Regulation Number 1907/2006 can be found at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02006R1907-20140410>

The EU provides guidance documents for REACH, specifically guidance documents for Substances in Articles as well as the candidate list for SVHC at http://guidance.echa.europa.eu/guidance_en.htm
Additional information about REACH can be found at the European Chemicals Agency web site at <http://echa.europa.eu>

4.0 Definitions

REACH: an acronym for the European Commission Regulation Number 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals.

RoHS: European Union Directive 2011/65/EU restriction of the use of certain hazardous substances in new electrical and electronic equipment that became effective July 1, 2006.

Substance(s) of Very High Concern (SVHC)

1. Substances meeting the criteria for classification in accordance with EU Directive 67/548/EEC:

- Carcinogenic category 1 or 2
- Mutagenic category 1 or 2
- Toxic for reproduction category 1 or 2;

2. Substances which are persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) in accordance with the criteria set out in Annex XIII of the EU REACH Regulation;

3. Substances- such as those having endocrine disrupting properties or those having PBT properties or vPvB properties which do not fulfill the criteria of 2 above - for which there is scientific evidence of probable serious effects to human health or the environment which give rise to an equivalent level of concern to those of other substances listed in 1 or 2 and which are identified on a case-by-case basis in accordance with the procedure set out in Article 59 of REACH. This definition is from the EU REACH Regulation, Article 57.

Article - an object composed of one or more substances or mixtures which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition. Every single component in a product can also be defined as an article. This definition is from EU Regulation 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Deliverable(s): any tangible item(s) delivered by or for a Supplier to Lenovo in accordance with a purchase contract or other agreement with Lenovo. Deliverables include, but are not limited to,

components, materials, parts, and products.

Electronic Product Environmental Assessment Tool (EPEAT): based upon IEEE Standard 1680 for the Assessment of Personal Computer Products (1680). Refer to: <http://www.epeat.net/>

Intentionally added: deliberate use in a product, material, part, assembly

Homogenous material: of uniform composition throughout (e.g., plastics, ceramics, glass, metals, alloys, resins, coatings, solder, flux).

Mechanically disjointed: Separated by mechanical actions such as unscrewing, cutting, crushing, grinding, and abrasive processes

ppm = parts per million = mg / kg. Mass of substance as a percentage of the homogenous material, not the weight of substance in the entire part or product unless otherwise noted. 1000 ppm = 0.1%; 100 ppm = 0.01% by weight

Preparation: a mixture or solution composed of two or more substances, for example paint, lubricant or ink. This definition is found in the EU Council Directive relating to restrictions on the marketing and use of certain dangerous substances and preparations and EU Regulation 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Substance: a chemical element and its compounds in the natural state or obtained by any manufacturing process, including any additive necessary to preserve its stability and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition. This definition is found in the EU Council Directive relating to restrictions on the marketing and use of certain dangerous substances and preparations and EU Regulation 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). Substance includes such examples as ethanol and metals. Note: metals are included here not in the form of a part or product such as a heat sink or sheet metal cover but as a metal such as aluminum or aluminum alloy. Substance goes beyond a pure chemical compound defined by a single molecular structure. The definition of the substance includes different constituents such as impurities. Also note the word "substance" is used throughout this specification, only the "Substance" with a capital letter refers to this specific definition.

Threshold level: Concentration limit above which the presence of a substance in a material or product must be declared.

Appendix: Guidance: RoHS summary checklist			Requirement Met	
1. General			Yes	No
a. Lenovo Environmental Specifications 41A7731, 417733	Requirement:	Mandatory for new Lenovo brand products, materials, parts and assemblies incorporated into Lenovo Brand products worldwide*.		
	Affected Parts:	Electronic Hardware parts / Products		
	Supplier must declare compliance by:	Lenovo Supplier Material Declaration		
b. European Union RoHS Compliance	Requirement:	Mandatory for new Lenovo brand products, materials, parts and assemblies incorporated into Lenovo Brand products worldwide*.		
	Affected Parts:	New electronic Hardware products and parts. Does not apply to spare parts for equipment put on the market before July 1, 2006, batteries.		
	Supplier must declare compliance by:	Lenovo Supplier Material Declaration		
c. "China RoHS" Compliance	Requirement:	Mandatory for products offered for sale in the People's Republic of China		
	China Affected Parts:	Electronic hardware parts / products with batteries,		
	Supplier must declare compliance by:	1. EPUP Mark on the product/option (or on the Pubs if the product is small or of irregular shape) 2. Substance Disclosure Table inside the product box shipping into China (must be in Chinese, except "O", "X") 3. Date of manufacture in YYYY-MM-DD format on the product or on the product's sales package 4. "China RoHS" Packaging Recycle Marks		
d. "J-Moss" Compliance	Requirement:	Mandatory for products imported into or manufactured in Japan		
e. "Turkey RoHS" Compliance	Requirement:	Mandatory for products offered for sale in the Republic of Turkey		
	Affected parts:	New products, options and parts must comply with Turkey RoHS material restrictions (same as European Union RoHS material restrictions)		
	Supplier must declare compliance by:	Lenovo Supplier Material Declaration Keep all information and documents showing that products they sale to Lenovo meet the technical criteria mentioned in this Regulation for 5 years starting from the date the product is released to the market. Retain information in Lenovo Filenet(ECM)-Worldwide Supplier Material Declarations		
f. "Korea RoHS" Compliance	Requirement:	Mandatory for products for Korea. Product Declaration required on Korea website before product is offered for sale		

Appendix: Guidance: RoHS summary checklist			Requirement Met	
g. Supplier RoHS-compliance	Supplier responsibility	Mandatory. Supplier maintains effective compliance process including technical documentation which demonstrates actions to verify RoHS-compliance. Upon request by Lenovo the supplier will verify compliance of materials, parts, components, and/or products to Lenovo's RoHS Specification via analytical testing or other suitable means.		
h. Lenovo approved Lead (Pb)-free solder	Supplier	Lenovo approved lead (Pb)-free solders: Tin-silver-copper (Sn-Ag-Cu (SAC)) solder. Other lead (Pb)-free solders must be approved by Lenovo, on a case by case basis		
i. Lenovo approved Lead (Pb)-free printed circuit board finish	Supplier	. Lenovo approved lead (Pb)-free Printed Circuit Boards finishes: Organic Solder Preservatives (OSP). Other materials may be approved by Lenovo, on a case by case basis		
j. Whisker Mitigation	Supplier	Suppliers shall implement whisker growth countermeasures. Reference: JEDEC Standard JESD22-A121 Lenovo reserves the right to request Supplier tin whisker test data		

Revision History

Version	Date	Change Description
0	Jun 2006	Initial issue
1	Nov 2006	Added EU RoHS exemptions 22-29, Revised Cd threshold from 75 to 100 ppm, Added requirement for Supplier Test Report upon request, Defined OEM-contract manufacturer responsibility for Supplier Material Declaration, Added reference to China RoHS, J-Moss, US RoHS regulations
2	Jun 2007	Updated to include systems, printers, options, visual display devices, Deleted expired RoHS exemption for Cr6, Updated Packaging Specification Reference
3	Dec 2007	Added reference to Korea RoHS Declaration, ppm calculation, exemption 9a may not be used, Added Consumer product signoff
4	Aug 2008	EC MO7149H. Added Lenovo RoHS Checklist, China RoHS Supplier Letter, J-Moss marks.
5	October 2008	Cr6 threshold changed to intentionally added; corrected typo (Table 1: 0.01 corrected to 0.1 for lead), added reference to Turkey RoHS effective June 2009); added 3 new RoHS exemptions 30. Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more. 31. Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting). 32. Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes
6	March 2010	Added REACH information (requirements, SVHC listing, etc.); added/updated EU RoHS exemptions 33-38 (Cadmium, Lead, Mercury); updated Turkey RoHS information.
7	September 2012	Updated RoHS exemption list; updated REACH SVHC listing
8	September 2013	Updated and included other jurisdictions with RoHS requirements. Updated RoHS exemption list per Directive 2011/65/EU. Updated REACH SVHC listing per 20 June 2013 Candidate List. Updated Environmental Protection Use Period (EPUP) information to reflect current regulation requirements. Added information describing Vietnam RoHS requirements. Updated EU Directive to reflect the current version.
9	July 2014	Updated REACH SVHC listing per 16 June 2014 Candidate List
10	March 2015	Updated REACH SVHC listing per 17 December 2014 Candidate List. Update: 600ppm allowance for PBBs, PBDEs, excluding DecaBDE in PCC recycle and plastic resins.
11	August 2015	Added 4 phthalates per new Directive (EU) 2015/863 to amend Annex II to EU RoHS 2 (Directive 2011/65/EU). Updated REACH SVHC listing per 15 June 2015 Candidate List
2016-1	March 2016	Updated REACH SVHS listing per 17 December 2015 Candidate List. Added Taiwan RoHS mark and Disclosure table information.
2016-2	October 2016	Added: Section 2.3 Substances Prohibited from Use Updated: Table 1: EU RoHS Maximum Concentration Values (MCV) Added: Section 2.4 Exemptions Added: Table 2: ROHS Exemptions Removed: Table 2. Lenovo Maximum Concentrations for Substances of Very High Concern (SVHC) Revised: Section 3 to refer to ECHA online candidate list of SVHC Update: Lenovo Guide to Full Material Disclosure (Version 2); new link Update: Lenovo Supplier Material Self-Declaration; new link
2017-1	March 2017	Update/corrected: Table of Contents. Update: Removed RoHS exemptions 13(b), 34, 38 that were not renewed by the EU. Update: Section 3 – number of unique substances in SVHC candidate list (173). Update: Taiwan RoHS mark and Disclosure table information.
2018-1	April 2018	Update: Section 3 – number of unique substances in SVHC candidate list (181).
2018-2	September 2018	Update: Added Section 2.5.7 – Ukraine RoHS requirements. Update: Section 3 – number of unique substances in SVHC candidate list (191).
2018-3	November 2018	Update: Table 2: RoHS Exemptions – expiration dates for multiple exemptions.
2019-1	January 2019	Update: Added reference to RoHS 3 effective date for 4 phthaltes (DEHP, DPB, BBP, DIBP). Update: Section 3 – number of unique substances in SVHC candidate list (197). Update: Listed a link to a table providing an overview of Annex III and IV exemptions, including their validity status and submitted exemption requests Update: Hyperlinks for Lenovo Guide to Full Material Disclosures (Version 2), Lenovo Supplier Material Self-Declaration, Lenovo Japan Environmental website, EU REACH Regulation Number 1907/2006

Lenovo RoHS/REACH Specification 41A7733

2019-2	September 2019	Update: Various url's and hyperlinks to new Lenovo sustainability web pages Update: Added sec 2.5.4.1 China RoHS Conformity Assessment System Update: Section 3 – number of unique substances in SVHC candidate list (201).
2020-1	May 2020	Update: Section 3 – number of unique substances in SVHC candidate list (205). Update: Section 3 – added REACH Restricted Substance requirement
2020-2	June 2020	Update: Section 3 – number of unique substances in SVHC candidate list (209).



** Para Serviços de Imagem e Instalação, favor consultar o time de Serviços*

PN	Compatibilidade	Descrição do Serviço	Tipo de Serviço
5WS0T36200	Think Centre Desktop - M6xx, M7xx, M8xx, Vxx	Premier Support (OS) - Período 3 anos	Premier Support
5WS0G05475	Think Centre Desktop - M6xx, M7xx, M8xx, Vxx	Solução no Primeiro Próx. Dia Útil - 9x5 - 3 anos	SLA - Tempo de Solução
5WS0Q11754	ThinkStation - P300, P320 (Tiny), P330 (SFF), P330 (CT), P310, P320 (SFF)	Garantia de 1 para 3 anos Onsite	Manutenção
5WS1C95379	ThinkStation - P300, P320 (Tiny), P330 (SFF), P330 (CT), P310, P320 (SFF)	Solução no Primeiro Próx. Dia Útil - 9x5 - 3 anos	SLA - Tempo de Solução

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Visão geral da tecnologia Trusted Platform Module

28/11/2018 • 5 minutos para ler •  

Neste artigo

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[Aplicações práticas](#)

[Funcionalidade nova e alterada](#)

[Atestado de integridade de dispositivo](#)

[Versões com suporte para atestado de integridade do dispositivo](#)

[Tópicos relacionados](#)

Aplica-se a

- Windows 10
- Windows Server 2016
- Windows Server 2019

Este tópico para o profissional de TI descreve o TPM (Trusted Platform Module) e como o Windows o usa para controle de acesso e autenticação.

Descrição do recurso

A tecnologia TPM foi desenvolvida para fornecer funções relacionadas à segurança com base em hardware. Um chip TPM é um processador de criptografia seguro projetado para desempenhar as operações de criptografia. O chip inclui vários mecanismos de segurança física para torná-lo resistente a adulterações nas funções de segurança do TPM por software mal-intencionado. Algumas das principais vantagens do uso da tecnologia TPM são a possibilidade de:

- Gerar, armazenar e limitar o uso de chaves de criptografia.
- Usar a tecnologia TPM para autenticação de dispositivo de plataforma com a chave RSA de autogravação exclusiva do TPM.

- Ajudar a garantir a integridade da plataforma, executando e armazenando medidas de segurança.

As funções mais comuns do TPM são para medições de integridade do sistema e uso e criação de chaves. Durante o processo de inicialização de um sistema, o código de inicialização que é carregado (incluindo firmware e componentes do sistema operacional) pode ser medido e gravado no TPM. As medidas de integridade podem ser usadas como prova de como um sistema foi iniciado e como garantia de que uma chave baseada no TPM só foi usada com o software correto para inicializar o sistema.

As chaves baseadas no TPM podem ser configuradas de várias maneiras. Uma opção é tornar uma chave baseada no TPM indisponível fora do TPM. Isso é bom para reduzir ataques de phishing porque impede que a chave seja copiada e usada sem o TPM. As chaves baseadas no TPM também podem ser configuradas para exigir um valor de autorização de uso. Se ocorrerem muitas tentativas de autorização incorretas, o TPM ativará sua lógica de ataque de dicionário e evitará novas tentativas de valor de autorização.

Versões diferentes do TPM estão definidas nas especificações pelo TCG (Trusted Computing Group). Para obter mais informações, consulte o [site do TCG](#).

Inicialização automática do TPM com o Windows 10

Desde o Windows 10, o sistema operacional é inicializado automaticamente e assume propriedade do TPM. Isso significa que, na maioria dos casos, recomendamos que você evite configurar o TPM por meio do console de gerenciamento do TPM, **TPM.msc**. Há algumas exceções, principalmente relacionadas à redefinição ou à realização de uma instalação limpa em um computador. Para obter mais informações, consulte [Limpar todas as chaves do TPM](#). Não estamos [mais desenvolvendo ativamente o console de gerenciamento do TPM a partir do](#) windows Server 2019 e do Windows 10, versão 1809.

Em determinados cenários corporativos específicos limitados ao Windows 10, versões 1507 e 1511, a Política de Grupo pode ser usada para fazer backup do valor de autorização do proprietário do TPM no Active Directory. Como o estado do TPM é preservado em todas as instalações de sistema operacional, essas informações do TPM são armazenadas em um local separado dos objetos do computador no Active Directory.

Aplicações práticas

É possível instalar ou criar certificados em computadores usando o TPM. Depois que um computador é configurado, a chave privada RSA para obter um certificado é vinculada ao

TPM e não pode ser exportada. O TPM também pode ser usado como um substituto para cartões inteligentes, o que reduz os custos associados à criação e distribuição de cartões inteligentes.

O provisionamento automatizado no TPM reduz o custo de implantação do TPM em uma empresa. As novas APIs para gerenciamento do TPM podem determinar se as ações de provisionamento do TPM exigem a presença física de um técnico de serviço para aprovar solicitações de alteração de estado do TPM durante o processo de inicialização.

O software antimalware pode usar as medições de inicialização do estado inicial do sistema operacional para comprovar a integridade de um computador no qual o Windows 10 ou o Windows Server 2016 esteja em execução. Essas medições incluem a inicialização do Hyper-V para testar se os datacenters usando a virtualização não estão executando hipervisores não confiáveis. Com o Desbloqueio pela rede do BitLocker, os administradores de TI podem enviar por push uma atualização sem a preocupação de que um computador está esperando a entrada do PIN.

O TPM tem diversas configurações de Política de Grupo que podem ser úteis em determinados cenários corporativos. Para obter mais informações, consulte [Configurações da Política de Grupo do TPM](#).

Funcionalidade nova e alterada

Para obter mais sobre as funcionalidades nova e alterada para Trusted Platform Module no Windows 10, consulte [Novidades no Trusted Platform Module?](#).

Atestado de integridade de dispositivo

O atestado de integridade de dispositivo permite que as empresas tenham confiança nos componentes de hardware e software de um dispositivo gerenciado. Com o atestado de integridade de dispositivo, você pode configurar um servidor MDM para consultar um serviço de atestado de integridade que permitirá ou negará o acesso de um dispositivo gerenciado a um recurso seguro.

Algumas coisas que você pode verificar no dispositivo são:

- A Prevenção de Execução de Dados é compatível e está habilitada?
- A Criptografia de Unidade de Disco BitLocker é compatível e está habilitada?
- A Inicialização Segura é compatível e está habilitada?

ⓘ Observação

O Windows 10, o Windows Server 2016 e o Windows Server 2019 dão suporte ao atestado de integridade do dispositivo com TPM 2,0. O suporte para o TPM 1,2 foi adicionado a partir da versão 1607 do Windows (RS1). TPM 2,0 requer firmware UEFI. Um computador com BIOS herdado e TPM 2,0 não funcionará conforme o esperado.

Versões com suporte para atestado de integridade do dispositivo

Versão do TPM	Windows 10	Windows Server 2016	Windows Server 2019
TPM 1.2	>= ver 1607	>= ver 1607	Sim
TPM 2.0	Sim	Sim	Sim

Tópicos relacionados

- [Trusted Platform Module](#) (lista de tópicos)
- [Detalhes sobre o padrão TPM](#) (tem links para recursos usando TPM)
- [Portal de serviços base do TPM](#)
- [API de serviços base TPM](#)
- [Cmdlets do TPM no Windows PowerShell](#)
- [Preparar sua organização para o BitLocker: planejamento e políticas - configurações do TPM](#)
- [Provisionamento de dispositivo do Azure: atestado de identidade com TPM](#)
- [Provisionamento de dispositivo do Azure: uma linha do tempo de fabricação para dispositivos TPM](#)
- [Windows 10: Habilitando o vTPM \(TPM virtual\)](#)
- [Como fazer multi-inicialização com o BitLocker, TPM e um sistema operacional que não seja Windows](#)

Esta página é útil?

Sim Não



Hardware

[Ubuntu Desktop](#) > [Procurar Resultados](#) > [Detalhe](#)

Ubuntu na torre Lenovo P340

Comentários

Se houver algum problema com as informações deste sistema, entre em [contato conosco](#).

O desktop **Lenovo P340 Tower** com os componentes descritos abaixo obteve o status de pré-instalação certificada para Ubuntu.

Observe que para sistemas pré-instalados:

1. O sistema está disponível em algumas regiões com uma imagem especial do Ubuntu pré-instalada pelo fabricante. Ele tira proveito dos recursos de hardware deste sistema e pode incluir software adicional. Você deve verificar ao comprar o sistema se esta é uma opção.
2. As imagens padrão do Ubuntu podem não funcionar no sistema ou podem não funcionar bem, embora a Canonical e os fabricantes de computador tentem certificar o sistema com futuras versões padrão do Ubuntu.

Ubuntu 20.04 LTS 64 bits

Pré-instalado pelo fabricante

Detalhes de teste

Este sistema foi testado com 20.04 LTS, rodando o kernel 5.6.0-1011-oem.

Notas de certificação

Inicialização segura não compatível

O UEFI Secure Boot está atualmente desativado neste sistema. O suporte para inicialização segura virá em uma atualização futura.

BIOS

LENOVO: S08KT07A

Resumo de hardware

Este sistema foi testado com estes componentes principais:

Rede

Conexão Ethernet Intel Corp. (11) I219-LM (8086: 0d4c)

Processador	Intel Corp. Intel (R) Core (TM) i5-10400 CPU a 2,90 GHz
Vídeo	Intel Corp. 8086: 9bc5 (8086: 9bc5)
Sem fio	Intel Corp. Wireless AX201 (8086: 06f0)

Detalhes de hardware

Áudio	Intel Corp. Comet Lake PCH cAVS (8086: 06c8) Intel Corp. Desconhecido
BIOS	Lenovo S08KT07A
Bluetooth	Intel Corp. 8087:0026 (8087:0026)
Cardreader	Realtek Semiconductor Co., Ltd. RTS5129 Card Reader Controller (0bda:0129)
Cdrom	HL-DT-ST DVD-ROM DUE0N
Disk	WDC PC SA530 SDASB8Y512G1001
Keyboard	Lenovo 17ef:6099 (17ef:6099)
Mouse	Lenovo Optical Mouse (17ef:608d)
Network	Intel Corp. Ethernet Connection (11) I219-LM (8086:0d4c)
Processor	Intel Corp. Intel(R) Core(TM) i5-10400 CPU @ 2.90GHz
System	Lenovo ThinkSataionP340-Tower
USB	Intel Corp. Comet Lake USB 3.1 xHCI Host Controller (8086:06ed) SanDisk 0781:55a3 (0781:55a3)
Video	Intel Corp. 8086:9bc5 (8086:9bc5)
Wireless	Intel Corp. Wireless AX201 (8086:06f0)

Other

HDA Intel PCH Front Headphone

HDA Intel PCH Front Mic

HDA Intel PCH HDMI/DP,pcm=10

HDA Intel PCH HDMI/DP,pcm=3

HDA Intel PCH HDMI/DP,pcm=7

HDA Intel PCH HDMI/DP,pcm=8

HDA Intel PCH HDMI/DP,pcm=9

HDA Intel PCH Line Out

HDA Intel PCH Mic

Power Button

Sleep Button

Video Bus

Intel Corp. Sky Lake Gaussian Mixture Model (8086:1911)

Intel Corp. Unknown

Shenzhen Rapoo Technology Co., Ltd. 2.0 root hub (1d6b:0002)

Shenzhen Rapoo Technology Co., Ltd. 3.0 hub raiz (1d6b: 0003)

Dispositivos de Componentes

Fornecedor	Modelo	Faço	14.04 LTS	Núcleo 16	16.04 LTS	Core 18	18.04 LTS	Core 20	20.04 LTS	comentários
Intel Corp.	Conexão de rede Intel I210 Gigabit	Conexão de rede I210 Gigabit							✓	
nVidia	nVidia RTX4000	RTX4000							(1) ✓	
nVidia	nVidia RTX2060	nVidia RTX2060							(1) ✓	

✓ Suportado

X não suportado

? Em progresso

(1) Pode ser necessário um driver de terceiros.

[Ver todos os dispositivos componentes](#)

BACK TO TOP

NUVEM

SERVIDOR

ÁREA DE TRABALHO

IOT

GESTÃO

BAIXAR

APOIO, SUPORTE

SOBRE

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