# OVERVIEW




| | |
|---|---|
| 1. 12-24V DC-in | 5. 2x 2.5GbE Ethernet (RJ-45) |
| 2. 1x USB-C (USB 10Gbps) | 6. 1x Serial (RS232 / RS422 / RS485) |
| 3. 3x USB-A (USB 5Gbps) | 7. I/O expansion slot * |
| 4. 1x USB-A (Hi-Speed) | |

Notes:

- Items with * are only available on selected models

# PERFORMANCE

## Processor

**Processor Family**

Intel Core™ 5 / 7 Processor (Series 1)

**Processor****

| Processor Name | Cores | Threads | Max Frequency | Cache | Processor Graphics |
|---|---|---|---|---|---|
| Core 5 120UL | 10 (2 P-core + 8 E-core) | 12 | P-core 4.6GHz / E-core 3.4GHz | 12MB Intel® Smart Cache | Intel® Graphics |
| Core 5 130UL | 10 (2 P-core + 8 E-core) | 12 | P-core 4.7GHz / E-core 3.5GHz | 12MB Intel® Smart Cache | Intel® Graphics |
| Core 7 150UL | 10 (2 P-core + 8 E-core) | 12 | P-core 5.0GHz / E-core 3.7GHz | 12MB Intel® Smart Cache | Intel® Graphics |
| Core 7 160UL | 10 (2 P-core + 8 E-core) | 12 | P-core 5.2GHz / E-core 3.9GHz | 12MB Intel® Smart Cache | Intel® Graphics |

## Operating System

**Operating System**

- Windows® 11 IoT Enterprise LTSC 2024
- Ubuntu (Desktop) 24.04 LTS 64 Bit (kernel 6.17)
- IGEL Linux OS12
- No preload operating system

## Graphics

**Graphics**

| Graphics | Type | Memory | Max Resolution | Connector | Key Features |
|---|---|---|---|---|---|
| Intel® Graphics | Integrated | Shared | 3840x2160@60Hz(USB-C®) | 1x USB-C® | DirectX® 12.1 |

## Monitor Support

**Monitor Support**

Supports up to 2 independent displays via native display and 1 external monitor; supports external monitor via USB-C®

## Chipset

**Chipset**

Intel® SoC (System on Chip) platform

## Memory

**Max Memory**

Up to 32GB DDR5-5200

**Memory Slots**

One DDR5 SODIMM slot

**Memory Type**[1]

DDR5-5200

Notes:

[1] Installed memory is actually DDR5-5600 but may run as DDR5-5200 depending on the memory support capability of Intel®.

## Storage

**Max Storage Support**[1]

Up to two drives, 1x M.2 SATA SSD + 1x M.2 SSD
• M.2 2280 SSD up to 1TB
• M.2 2242 SATA SSD up to 1TB

**Storage Type**

| Disk Type | Interface | Security |
|---|---|---|
| M.2 2242 SSD | SATA 6Gb/s | - |
| M.2 2280 SSD | PCIe® NVMe®, PCIe® 4.0 x4 | Opal 2.0 |
| M.2 2280 SSD | PCIe® NVMe®, PCIe® 5.0 x4 Performance | Opal 2.0 |

Notes:

[1] The storage capacity supported is based on the test results with current Lenovo® storage offerings.

## Multi-Media

**Audio Chip**

High Definition (HD) Audio, Realtek® ALC888S-VD2-GR codec

**Speakers**

Integrated Speakers, 2W x2

## Power Supply

**Power Supply****

| Power | Type | Efficiency | Key Features |
|---|---|---|---|
| 150W | Adapter | 89% | 150W, for operating temperature 0~40°C<br>120W, for operating temperature 0~50°C<br>100V-240V, 50-60Hz, input<br>12V@12.5A, output |
| 170W | Adapter | 90% | 170W, for operating temperature 0~35°C<br>120W, for operating temperature 0~50°C<br>100V-240V, 50-60Hz, input<br>20V@8.5A, output |
| No power adapter | - | - | - |

# DESIGN

## Display

**Display**

| Size | Resolution | Touch | Type | Brightness | Aspect Ratio | Contrast Ratio | Viewing Angle (L/R/U/D) |
|---|---|---|---|---|---|---|---|
| 21.5" | FHD (1920x1080) | Multi-touch | IPS | 250nits | 16:9 | 1000:1 | 85° / 85° / 85° / 85° |

**Touchscreen**

Capacitive-type multi-touch, supports 10-point touch

## Input Device

**Keyboard**

No keyboard

**Mouse**

No mouse

## Mechanical

**Dimensions (WxDxH)**[1]

538.05 × 341.05 × 64.0 mm (21.18 x 13.43 × 2.52 inches)

**Packaging Dimensions (WxDxH)**

Models without Stand: 645 x 507 x 130 mm (25.39 x 19.96 x 5.12 inches)

**Weight**[2]

Around 7.3 kg (16.09 lbs)

**Packaging Weight**

Models with stand: 11.4 kg (25.13 lbs)

**Case Color**

Black

**Expansion Slots**

Three M.2 slots (Key E for WLAN, Key M for PCIe® 4.0 x4 NVMe® SSD, Key B for SATA SSD)[3]

**Mounting*****

- Wall Mount Bracket
- Monitor stand
- 21" Panel Mount
- Supports VESA mount 75mm
- None

Notes:

[1] The system dimensions may vary depending on configurations.
[2] The system weight is approximate and based on results in Lenovo® lab, which varies depending on the source of component, variance of the distribution of each component, and manufacturing process. It may not be the exact weight for each specific model.
[3] Gen 5 SSD on M.2 PCIe® 4.0 slot will run on PCIe® 4.0 protocols.

# CONNECTIVITY

## Network

**Ethernet**

- 2.5GbE, Intel® Ethernet Controller I225-LM, 1x RJ-45, supports Wake-on-LAN
- 2.5GbE, Intel® Ethernet Controller I226-LM, 1x RJ-45, supports Wake-on-LAN

**WLAN + Bluetooth®[1]**

- Intel® Wi-Fi® 6E AX210, 802.11ax 2x2 Wi-Fi® + Bluetooth® 5.3
- No WLAN and Bluetooth®

Notes:

[1] Wi-Fi® operation (including Wi-Fi® 6, Wi-Fi® 6E, Wi-Fi® 7, etc.) is subject to the regulatory requirements of each country. Bluetooth® may operate at a lower version than hardware design depending on the factors such as operating system, driver, etc.

## Ports[1]

**Rear Ports**

- 1x USB-C® (USB 10Gbps / 3.2 Gen 2), power output 5V@3A and Display Port 1.4
- 1x USB-A (Hi-Speed USB / USB 2.0)
- 3x USB-A (USB 5Gbps / USB 3.2 Gen 1)
- 1x 12-24V DC-in
- 1x Serial (RS232 / RS422 / RS485)

**Optional Rear Ports**

- 4x USB-A (5Gbps / USB 3.2 Gen 1) IET module
- 1x 12-bit GPIO + 1x 2-pin CAN bus IET module
- 2x Isolated RS-232 IET module
- None

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;
USB4® 20Gbps / USB 3.2 Gen 2x2 (SuperSpeed USB 20Gbps): 20 Gbit/s;
USB4® 40Gbps (USB 40Gbps): 40 Gbit/s;
Thunderbolt™ 3/4: 40 Gbit/s.
Thunderbolt™ 5: 80 Gbit/s (bidirectional), up to 120 Gbit/s in bandwidth boost mode for video-intensive applications.

# SECURITY & PRIVACY

## Security

**Security Chip**

Discrete TPM 2.0, TCG certified

**BIOS Security**

- Administrator password
- Intel® BIOS guard
- Hard disk password
- Secure boot
- More BIOS security features, please visit BIOS Simulator

# SERVICE

## Warranty[1]

**Base Warranty****

- 1-year courier or carry-in service
- 1-year limited onsite service
- 3-year limited onsite service

Notes:

[1] The warranty upgrades may be bundled with some models, please check the "Included upgrade" column in the specific model's configurations. For more service extensions, please go to https://smartfind.lenovo.com/. To learn more details of warranty policy, please access https://support.lenovo.com/warrantylookup/warrantypolicy.

# OPERATING REQUIREMENTS

## Operating Environment

**Temperature**

- Operating: IEC60068-2-1 Test A: Cold, IEC 60068-2-2 Test B: Dry heat, 0°C (32°F) to 50°C (122°F) with 0.7m/s air flow
- Storage: IEC60068-2-3 Test Ca: High temperature & Humidity storage, IEC60068-2-1 Test Ab:Cold, -20°C (-4°F) to 60°C (140°F)

**Relative Humidity**

- Relative humidity operating: IEC 60068-2-78 Test cab: Damp heat, steady state 95%@40°C non-condensing
- Relative humidity storage: IEC 60068-2-78 Damp heat, steady state 90%@60°C

**Shock Protection**

shock, operating, 20G / 11ms, half sine

**Vibration Protection**

IEC 60068-2-64, Vibration, Operating, 2Grms, random, 5 ~ 500Hz, 0.5hr/axis

**MTBF Prediction**

MTBF @25°C

**Ingress Protection**

- Back cover: IP41 (except IO area)
- Front panel: IP65

# CERTIFICATIONS

## Green Certifications

**Green Certifications**

- GREENGUARD®
- REACH
- RoHS compliant
- TED (The ECO-declaration)
- WEEE

## Other Certifications

### EMC

- EMC CE / FCC Class A
- FCC for USA
- CE for Europe
- IC for Canada
- RCM for Australia / New Zealand
- VCCI for Japan
- BSMI for Taiwan
- KCC for Korea

### Safety

- CB for WW
- NRTL (ETL, cETL) for USA / Canada
- EAC for Kazakhstan/Armenia/Kyrgyzstan
- Ukrsepro for Ukraine
- KUCAS for Kuwait
- KVALITET for Serbia
- NOM-019 for Mexico
- SABS for South Africa

### RF

- CE for Europe
- SRRC for China
- SUBTEL for Chile
- UKCA for United Kingdom
- WPC for India
- NOM-208 for Mexico
- NTC for Philippines
- SDPPI for Indonesia
- SIRIM for Malaysia
- ANRT for Morocco

### Other Certifications

- AWS IoT Greengrass Certified
- IGEL Certified
- Red Hat Enterprise Linux Certified
- Ubuntu Desktop Certified

### Mil-Spec Test

MIL-STD-810H w-Change 1-2022 (Low Pressure [Altitude] 500.6, High Temperature 501.7, Low Temperature 502.7, Temperature Shock 503.7, Solar Radiation 505.7, Humidity 507.6, Sand and Dust 510.7, Vibration 514.8, Shock 516.8)

- Feature with ** means that only one option listed under the feature can be configured on selected models. Please refer to the model configuration for specific information.
- Feature with *** means that one or more options listed under the feature can be configured on selected models. Please refer to the model configuration for specific information.
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