Magic Leap 2

Product Specification Version 6.2

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In the Box

- Headset, Compute Pack, Controller
- Enterprise Charger - 2x USB-C charger and cables for Compute Pack and Controller
- Fit Kit for Headset. A set of nose pads and forehead pads to customize the fit for your Magic Leap 2
- Overhead Strap to support in-motion use and slippage
- Frame with eye cups to reduce rainbow effects if working under bright lights
- Shoulder Strap for crossbody wearing
- Controller lanyard to attach to user's wrist
- Cleaning cloth
- Carry Case for Headset, Compute Pack and Controller
- Quick Start and Safety Guide are accessed via QR code (located inside the Carry Case)

Accessories

- Prescription Insert that magnetically attaches to your Magic Leap 2 device for an optimized visual experience
  - Custom single vision prescription (Rx) lenses and no-line progressive prescription (Rx) lenses
  - Support for an expanded prescription range
    - Single vision: SPH: -10.0 to +5.0 | CYL: up to -5.0 | Total Power (SPH+CYL): -10.0 to +5.0
    - Progressive: SPH: -10.0 to +5.0 | CYL: up to -5.0 | Total Power (SPH+CYL): -10.0 to +5.0 Add power up to +4.0
  - Enhanced performance and aesthetics of the anti-reflecting lens properties enhance the user's overall clarity
  - Unique light management coating technology ensures compatibility of the Prescription Insert with Magic Leap 2 eye-tracking features
  - Easy snap-in installation and removal
  - Orders are managed and fulfilled by Frame of Choice by Rochester Optical
- Prescription Insert lens kits available to purchase on-line for short term use, supports 8 prescriptions
- Additional charger available to purchase

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Magic Leap 2 Regulatory / Operating Environments

Regulatory Standard	Description
Regional Regulatory Compliance	Including the United States, Canada, United Kingdom, Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Japan, Saudi Arabia and Singapore. Contact Magic Leap for updates on additional countries.
FCC (US)	Federal Communications Commission (FCC)
ISED (Canada)	Innovation, Science and Economic Development (ISED)
CE (EU)	Radio Equipment Directive (RED) Low Voltage Directive (LVD) Electromagnetic Compatibility Directive (EMC) Battery Directive Waste from Electrical and Electronic Equipment Directive (WEEE) Battery Directive
JTBL.JRL (Japan) certification	Japan Telecommunications Business Law (JTBL) Japan Radio Law (JRL)
ANSI/CAN/UL 8400 - Ed 1.0	Standard for Safety for Virtual Reality, Augmented Reality and Mixed Reality Technology Equipment
EN 62368	Safety standard for Audio/video, information and communication technology equipment
IEC 62471	Photobiological safety for IR LEDs
IEC 60825	Safety of laser products
RoHS/REACH	Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH-EU) assess the hazards of new and existing chemicals. Restriction of Hazardous Substances (RoHS-EU) applies to Electronics and Electrical Equipment (EEE).
Bluetooth® Sig Certification	Bluetooth® SIG Qualification Program
ISO 10993	Standards for evaluating the biocompatibility of medical devices to manage biological risk.
FDA 21 CFR 801.410	Use of impact-resistant lenses in eyeglasses and sunglasses

Environment	Specification
Operating environment	10 to 30 C / 5 to 95% Relative Humidity / 2000m equivalent
Non-operating storage	-20 C to 45 C / 5 to 95% Relative Humidity

U.S. Government Contracting

Regulatory Standard	Description
Trade Agreements Act, 19 U.S.C § 2501 et seq. (TAA)	Standard that governs trade agreements negotiated between the United States and other countries under the Trade Act of 1974

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Headset

- Includes optical and display components for generating lightfield, soundfield capability and a suite of computer vision sensors.
- Split architecture design delivers the lightest fully immersive standalone AR headset.
- Weight - 260g
- 21 CFR 801.4 - impact testing of lens
- ANSI Z87.1 eye safety testing ongoing

Fit and Comfort

The Magic Leap 2 headset is designed to fit a wide variety of faces and heads when measuring interpupillary distance (IPD), Forehead Breadth, Head Length, and Head Breadth - (98% of females and 99% of males across races and ethnicities, based on a representative North American population of 936 males and 799 females)

Designed to be physiologically correct, significantly reducing the risk of dizziness or nausea

Optimized for multi-hour comfort through thermal and weight distribution

Incredible visual comfort due to eye tracking default operating range for virtual content

Flexible torsion band system for a range of head sizes and shapes

4mm diameter cable with high flexibility and durability

Lightfield / Display

Largest digital content overlay in the market with up to 70° diagonal field of view (44.6° W x 53.6° H), enables visualization of: a full person, CAD models at full scale, room scale data visualization for command and control.

1440 x 1760 @ 24 bits per pixel per eye, angular resolution = 1.875 arcmin/pixel

120 Hz refresh rate, sRGB Color

Content range - default setting of 37cm (adjustable to 25cm minimum) to infinity enables greater depth and placement of digital content

Opacity control - Dynamic Dimming™ technology from 0.3% to 20% transmission to enable brighter digital content in a broad range of ambient light conditions.

World / Environment Sensing

ToF depth sensor
- FOV: 75°H x 70°V
- Resolution: 544 x 480 px

3x 1MP world sensing cameras
- Resolution: 1016 x 1016 px
- FOV [deg : res arcmin/px]: 100°H x 100°V : 5.9 x 5.9
- Nominal Framerate: 30 FPS, 60 FPS for dual exposure mode to improve fiducial tracking performance
- Shutter: Global
- Focus: Fixed, Hyperfocal @ ~0.3m
- Lens Type: Equidistant
- Exposure Control: Min = 7μs; Step size = 7μs

1x 12.6 MP auto-focus near and far mode RGB camera for see-what-I see, QR and barcode scanning
- Resolution: 4206 x 3120
- FOV: 65°H x 51°V
- Nominal Framerate: 30 FPS
- Max Framerate: 60 FPS (2x2bin, 3.3MP)
- Shutter: Rolling
- Focus: Variable, Near/Far
- Focus Distance: 2m & infinity
- Lens Type: Rectilinear

Ambient light sensor
- Supports broad range of ambient lighting, from 5 lux (low) to 1,000 lux (high)

Four Inertial Measurement Units: (2) in Headset, (1) in the Controller and (1) in the Compute Pack

Enterprise-quality tracking performance

Supports multi-user and multi-session sharing with high accuracy over large areas

Spatial Audio

Dedicated HiFi3z 1GHz DSP core with VFPU, 128kB SRAM I-Cache, 128kB SRAM D-Cache, 1152kB of local SRAM

2 on-device speakers

4 on-device microphones

Human Sensing / Input Modalities

Headpose

Hand tracking (60 Hz) - skeleton with 25 key points, plus managed poses

Eye tracking (capable of 60 Hz) - 4 eye cameras

Iris authentication

Voice control

6 DoF computer vision-based controller (delivered in the box)

Bluetooth keyboard and virtual keyboard support for rapid text entry

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Compute Pack

- Permanently attached to the back of the Headset via the cable to transfer data and supply electrical power
- Easily clips onto pockets or the accessory Shoulder Strap
- 106 mm diameter, 420g without the cable
- Active cooling solution for peak SoC usage, enables CPU/GPU boost for extreme apps
- Battery Life
  - Up to 3.5 hours, 7 hours sleep-mode
  - 110 minute charge time to 90%, 180 minute to 100%

Compute / Processors

Distributed compute architecture with custom, low power silicon to provide class leading compute

AMD 7nm Zen 2 x86-64
- CPU Core/Thread Count: 4/8
- Max CPU Frequency: 2.4 GHz
- Cache: 512 kB L2 per core and 4 MB total L3

14-Core Custom Computer Vision and Image Processing (CVIP) block (not accessible to application developers)
- Dedicated 1700 GOP/s Fixed Point HW
- 6 Vector Computer Vision / Machine Learning Cores with 4MB SRAM
- 2 Dedicated Machine Learning Cores
- 6 ARM A55 Cores 1.28MB SRAM
- HW Decompression and Corner detection blocks
- Global 2MB cache and LP5 DRAM access
- Custom display driver
- Improved and class leading GPU performance and low motion-to-photon latency
- Localized Dynamic Dimming™ technology support

Memory / Storage

128-bit 16GB LPDDR5 5500

256GB 2-lane NVMe

Graphics

AMD RDNA 2 @ 1.1 GHz, 1SA, 4WGP (8 CU), 2RB+, 1MB L2 Cache
- >2x performance per watt vs Magic Leap 1
- View Instancing, Flexible Screen Rasterization, ray tracing, ultra-sharp upscaling

Connectivity

WiFi 6

Up to 2.4Gbps PHY Bandwidth at short range

Dense user scenarios

Range and capacity extensions

Enhanced Open, WPA/WPA2/WPA3 Personal & Enterprise, WPA3-Enterprise 192bit, EAP-TLS, EAP-TTLS WiFi security

Compatible with 5G mobile hotspot

Supports Ethernet connectivity with an Android-compatible USB-C to Ethernet adapter (adapter not included)

Bluetooth 5.0, multipoint-to-multipoint Bluetooth such as sharing and broadcast

USB-C for charging and loading data and applications

Controller

- Optical hand-held controller that is wirelessly connected to the Headset and Compute Pack enabling the user to navigate, maneuver, and interact with content
- 127x62x61 mm, 140g, 157 cc
- Proprietary computer vision based 6-DoF tracking
- Tracks outside the FOV of the display, even behind the user
- Optical-based tracking to maintain performance in ferrous environments
- Paired with Compute Pack and ready for use out of the box
- Touchpad, Trigger, Bumper, developer-assignable menu button, and Home button inputs
- Haptic feedback driver
- 2X World Cameras, 1X IMU
- Up to 6-hour battery life

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Features*

Feature*	Magic Leap 2
Magic Leap 2 Device (Headset, Compute Pack, Controller)	■
OS Version	Enterprise
OS updates	■
Supported by 3rd party Mobile Device Management	■
6DoF controller	■
Hand tracking	■
Eye tracking	■
Voice-enabled	■
Designed for extended wear	■
Largest FoV in its class	■
Dynamic Dimming™ technology	■
Mixed reality capture and streaming	■
Support for Custom Start Screen and App Launcher	■
Support for Locked Task Mode (Kiosk Mode)	■
Single-user mode	■
On device Spatial Mapping	■
Multi-user mode – Local multi-user accounts on device – Directory-managed users (e.g. Active Directory)	■
Iris ID authentication – Iris-based login – Single-sign on for applications	■
Commercial deployment rights	■

*Features, functionality, and dates are subject to change at any time without notice. Some features and functionality may not be available in all regions or languages or may be otherwise restricted. Additional terms, server-side components and/or charges may apply.
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For Developers

- Magic Leap provides robust support for solution developers and system integrators via our online developer portal. The developer portal includes:
    - Project guides and sample code to accelerate the development of business augmented reality solutions
    - Detailed API reference document
    - Public and private forums
- Magic Leap 2 is AndroidTM AOSP-based and supports multiple engines including
    - Unity
    - WebXR
    - Unreal Engine
    - Vuforia Engine
    - OpenXR™
    - C/C++, Java, and Kotlin via Android SDK
    - Support for additional third-party engines coming soon
- With support for Mixed Reality Toolkit (MRTK) and OpenXR™, Magic Leap 2 enables easy development of cross-platform (e.g. Hololens, Meta Quest) AR applications in Unity
- Access select device capabilities through Magic Leap APIs or MRTK such as head tracking, eye tracking, meshing, gestures, Dynamic Dimming™ technology, battery level, voice commands, and more.
- Developers, with permissions from users, are able to access data from the RGB camera, world cameras, depth sensor, eye cameras, IMU, magnetometers, ambient light sensor, altimeters and microphones in order to build more valuable algorithms and applications.
- Magic Leap 2 supports WebRTC data and content transfer, voice and RGB video streaming
- The Magic Leap Hub is a convenient desktop app that runs on Windows or Mac that accelerates workflows by consolidating several tools and utilities in one place. Magic Leap Hub tools and resources include:
    - Robust tool suite
        - Device bridge
        - OS Installer
        - Device stream
        - Performance profilers
        - Debugging tools
    - Quick SDK access
    - Software package management
    - Access to external tools
    - Options to manage apps and files

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